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# ACER/CEER

## Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2012

# ACER/CEER

## Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2012

November 2013



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## Foreword by the Chair of ACER's Board of Regulators and CEER, and by the Director of ACER



We are pleased to present the second joint annual Market Monitoring Report by the Agency for the Cooperation of Energy Regulators ('the Agency') and the Council of European Energy Regulators (CEER). By producing a joint Report, we aim to provide as complete an assessment as possible of the progress made so far towards the implementation of the Third Energy Legislative Package ('the 3<sup>rd</sup> Package') and the completion of the internal energy market.

This Report covers the same areas as last year – retail electricity and gas prices, access to networks including access of electricity produced from renewable energy sources, and compliance with the consumer rights laid down in Directives 2009/72/EC and 2009/73/EC – and focuses on the remaining barriers to the completion of well-functioning electricity and gas markets.

The 3<sup>rd</sup> Package has moved the European energy sector an important step closer to establishing a single energy market in Europe, not only by strengthening the provisions in areas already addressed by previous Packages – for example, on network unbundling; powers and independence of energy regulators; and consumer rights – but also by envisaging, for the first time, a more significant EU dimension in the planning of energy networks, the development of detailed EU-wide rules on network and market operation, and the establishment of ACER and ENTSOs with their respective responsibilities. In 2011, the European Council agreed on 2014 as the target date for the completion of the internal energy market, a goal recently reaffirmed. At the same time, the objective of removing energy islands by 2015 was set.

A well-functioning single internal energy market must deliver tangible benefits to European energy consumers, in terms of greater choice and better prices. This requires the timely and complete transposition of the 3<sup>rd</sup> Package into national law and the full and effective implementation of its provisions. EU-wide network codes and market rules must be developed and adopted. Monitoring is essential to assess the way in which energy markets actually operate, both at wholesale and retail level, and to highlight where improvements are needed. This Report provides an indication of the degree to which rules are implemented in practice and of the barriers which must still be overcome, particularly relevant given the approaching 2014 deadline. It also provides a level of transparency that should instil confidence in energy consumers throughout Europe.

Overall, our findings show a continuing internal market development and improvements in line with the EU's energy objectives. In particular, our analysis of wholesale electricity markets shows that market coupling has facilitated price convergence and intraday markets have made it easier for renewables to become a successful market player. However, the growing phenomenon of 'unscheduled flows' in parts of Europe constitutes a barrier to the further integration of the internal market, arguably giving rise to wholesale price divergence and reduced market efficiency. In gas, although price correlation between European hubs remains high, price differentials in parts of Europe remain significant, leading to substantial welfare losses.



With a few exceptions in North-West Europe, the liquidity of gas hubs is still unsatisfactory, whilst congestion remains a significant feature at a number of interconnection points and in some cases contractual congestion is not reflected in physical congestion.

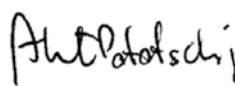
Barriers to entry persist in many national retail markets, thus hampering retail competition and consumer choice. Moreover, despite the economic downturn, consumer prices for electricity and gas have increased in the majority of Member States. These prices differ remarkably across national markets, with no sign of convergence. Finally, regulated prices remain a prominent feature of European retail energy markets, with little progress towards their removal recorded last year. Imperfect integration and retail market fragmentation throughout the EU have led to significant social welfare losses for European energy consumers, in the order of several billion euros in 2012 (gross of the cost of any required investment in new transmission or transportation infrastructure). Our findings therefore highlight the need for a renewed effort towards the removal of barriers to market efficiency.

The data used for compiling this Report have been collected and provided by National Regulatory Authorities for energy (NRAs), the European Commission, and the European Networks of Transmission System Operators (ENTSOs) for electricity and gas. We are grateful to all of them for their contribution. Our most sincere appreciation also goes to our colleagues in the market monitoring team at the Agency for their sustained effort in continuously monitoring market developments and to those in CEER examining consumer issues, and to both in producing this Report.

The Agency is committed to continue monitoring progress towards the completion of a well-functioning internal energy market. From next year, it will also start monitoring, together with NRAs and ENTSOs, the implementation of network codes to ensure that the new EU-wide rules to support the integration of the electricity and gas markets are fully and correctly applied. The Agency is also looking into whether the Electricity and Gas Target Models, which are common visions for the internal electricity and gas markets, need enhancing to address future challenges. For its part, CEER is also committed to dedicating significant resources to monitoring complementary market issues, including LNG access and gas storage transparency; TSO and DSO unbundling; the roll-out of smart meters; the various possible approaches to smart grids; the levels of renewable energy and energy efficiency support schemes across Europe and consumer access to information on the cost (and sources) of energy supplied. Working nationally, regionally and at European level with policy makers – in collaboration, notably, with the European Commission and Parliament – together with the industry, all energy regulators remain committed to putting the legal, regulatory, and operational framework in place that will deliver an internal energy market for Europe's consumers.



**Lord Mogg**  
Chair of ACER's Board of  
Regulators and CEER



**Alberto Pototschnig**  
ACER Director

# Executive Summary

## Introduction

**Structure of the report** This is the second annual Monitoring Report by the Agency for the Cooperation of Energy Regulators ('the Agency') and the Council of European Energy Regulators (CEER), covering the developments in EU electricity and gas markets in 2012. Expanding on the analysis already performed last year, this report focuses on retail markets and consumer issues, on the main developments in gas and wholesale electricity market integration and on network access issues. It provides an analysis of continuing barriers to further market integration.

The report is divided into three main sections: (i) the electricity market; (ii) the gas market; and (iii) consumer protection and empowerment. The electricity and gas chapters are further sub-divided into retail and wholesale/network access issues.

## Retail electricity and gas markets

In 2012, the Agency and CEER undertook extensive data gathering and expanded the analysis performed in 2011, in order to assess the state of play in retail markets. The report focuses on the evolution of retail prices by component and on other relevant factors such as entry and exit activity, foreign presence in national retail markets and switching behaviour. In a liberalised energy market, wholesale market integration and improved cross-border network access should be beneficial to end users.

**Retail prices** Despite low economic growth, gas and electricity prices rose significantly for both households and industrial consumers in the majority of EU Member States (MSs) in 2012<sup>1</sup>. On average, post-tax electricity prices increased by 4.6% for households and by 5.2% for industrial consumers between 2011 and 2012. Post-tax gas prices for households and industrial consumers rose by 10% and 11%, respectively.

Large disparities in pre-tax electricity and gas prices for both households and industrial consumers persist across the EU, even between countries with similar retail market frameworks. As expected, retail liberalisation in some MSs led to greater market dynamism in the industrial sector.

In most MSs, household energy prices are greatly influenced by taxation and network charges, which usually make up more than half the total energy bill. Over the last few years, these non-contestable charges have significantly increased in many MSs, particularly as a result of costs related to support schemes for renewable energy sources. As a consequence, retail price competition is weakened by the decreasing contestability of end-user prices.

<sup>1</sup> From next year, this report will also cover Croatia, which joined the EU on 1 July 2013.

**Retail market integration** As a measure of retail market integration, the report assesses the extent to which foreign energy suppliers, relative to the number of competitive suppliers, have been expanding their coverage across borders. In gas, the Czech Republic, Great Britain, the Netherlands, Slovakia, and Spain show stronger signs of the presence of operators from other MSs. In electricity, Great Britain shows the strongest sign of this presence, followed by Portugal and the Netherlands. In gas, geographically peripheral MSs, such as Latvia, Lithuania, Estonia, Finland, Greece, Bulgaria, Poland, Portugal and Slovenia, are the least integrated. Between 2008 and 2012 Belgium, Germany, Spain and Portugal recorded a significant net increase in the number of electricity suppliers, while the Czech Republic, Germany, Ireland, Slovakia and the Netherlands recorded a net increase in the number of gas retailers. However, little or no effective entry occurred in a significant number of MSs, such as Greece, Latvia, Lithuania, Luxembourg, Poland and Sweden for gas and in Bulgaria, Cyprus, Estonia and Malta for electricity.

**Barriers to entering retail energy markets** Relevant barriers to entry into retail energy markets persist across the EU-27, with a few exceptions. According to a survey of national regulatory authorities (NRAs) conducted by the Agency in early 2013, the main barriers to entry are the difficulties and reluctance of consumers to switch, retail price regulation and the regulatory framework for network pricing. In addition to these barriers, NRAs mentioned illiquid and concentrated wholesale gas markets and insufficiently unbundled electricity suppliers.

In the gas sector, those MSs with higher savings potentials from switching tend to feature higher switching rates. In electricity, no clear pattern has been detected. Non-quantifiable aspects of consumer behaviour might act as a barrier to retail entry in some MSs, such as consumer loyalty, inertia and risk aversion. In some cases, consumer behaviour is influenced by other barriers, such as the presence of strong traditional brands (incumbents and state-owned companies), as well as the persistence of regulated end-user prices.

**Consumer choice and switching behaviour** In general, consumer choice can be facilitated by having web comparison tools in place (allowing reliable, comprehensive, and easy ways to compare suppliers), adopting standardised fact sheets for each retail offer, publishing easily comparable unit prices in terms of standing charge and variable rates for standard consumption profiles, and promoting systems/platforms fostering collective switching. These measures do not interfere with the ability of suppliers to set prices.

Switching and competition were more pronounced in Ireland, but are either stabilising or decreasing in strength in mature markets such as Great Britain. There remain considerable regulatory concerns about lack of switching. In other markets, such as Germany and the Netherlands, some dynamism has been observed.

**Regulatory framework** Regulated prices remained an important feature of retail energy markets in 2012, with 18 out of 27 MSs in electricity and 15 out of 25 MSs in gas still applying regulated prices to household consumers. Since 2008, about one half of EU households have consistently been subject to regulated energy prices. In these countries, market prices (when available) sometimes tend to cluster around the regulated price. In order to continue promoting market entry, retail price regulation should be removed when the main barriers to entering retail markets have been addressed.

In a number of MSs, public authorities set retail prices with greater attention to political considerations than to underlying supply costs. In other MSs, the public authority (usually the NRA) still sets end-user tariffs, but with some reference to wholesale prices. In a minority of MSs (for instance in Great Britain, Germany, the Netherlands, the Czech Republic, and the Nordic countries), retail prices are fully liberalised, and there is no government intervention apart from social security policies.

If price regulation reduces margins (even without pushing them to negative levels), it usually dampens entry incentives, increases investor uncertainty and might prompt consumers to disengage from the switching process. Regulated prices might sometimes act as a focal point which competing suppliers are able to cluster around and – at least in markets featuring strong consumer inertia – this situation might considerably dilute competition.

Regulated prices should be set at levels which avoid stifling the development of a competitive retail market. They must be consistent with the provisions of the 3<sup>rd</sup> Package, and should be removed where a sufficient level of retail competition is achieved. In the meantime, those MSs which still regulate end-user prices should allow free opting in and out of regulated prices and update the sourcing cost parameter(s) in the regulated tariff more frequently in order to track wholesale prices more closely.

In those countries where the incidence of regulated transmission/distribution network charges and taxation is high, *ceteris paribus* the ability for new entrants to differentiate final prices will be limited in terms of relative pricing. Even if network charges and energy taxes are set and regulated in a purely non-discriminatory way, different charging structures might still influence retailers' entry choices between national markets. Some harmonisation of cost assessment methodologies and efficiency analysis might be needed to progress towards internal market integration.

In some countries, retail competition has taken forms going beyond the price dimension (e.g. in Great Britain, Ireland, the Netherlands and Spain). The relevance and effectiveness of non-price competition will require more monitoring in the future, along with further assessment of dual-fuel and web-only offers. Some regulators do not seem very active in tackling malfunctioning retail energy markets. In 2012, a relatively limited number of EU regulators finalised probes or reviews into the effectiveness of retail competition.

## Consumer protection and empowerment

**Consumer rights** Despite the fact that almost all MSs have transposed the 3<sup>rd</sup> Package into national law, some disparity remains in the practical implementation of consumer-related provisions across the EU. This relates especially to the supplier switching period, the protection of vulnerable consumers and to alternative dispute resolution mechanisms. Such disparity is often due to differences in the interpretation and/or transposition of the Electricity and Gas Directives across MSs.

MSs made some progress in shortening the switching period and, in most of them, a three-week switching deadline already applies to electricity consumers, whereas only half of gas consumers currently benefit from it. For example, Italy is about to implement this stipulation in both electricity and gas, and Great Britain has introduced a licence condition for suppliers which imposes three-week switching: industry systems are capable of achieving this in electricity, but not yet in gas, where necessary changes are due to be implemented by the end of 2013. France already complies with CEER recommendations: a supplier switch can be completed in 24 hours in electricity. In gas, a switch takes four days.

Most MSs have designated suppliers of last resort for both electricity and gas. However, their function and the number of consumers captured by this regime vary greatly between countries.

Some MSs still have to define the concept of ‘vulnerable consumers’ as specified in the 3<sup>rd</sup> Package. Different measures to protect such consumers are identified across MSs: for example, the Irish code of practice includes rules about supply, disconnection and communication with vulnerable consumers, while Germany and Sweden provide support to vulnerable consumers through the social security system.

No-disconnection policies have been put in place in several MSs. The Netherlands applies such a policy in winter for electricity and gas consumers where disconnection could create a life-threatening situation. Greece takes a similar approach and protects gas consumers with special medical needs. In France, there is a prohibition on disconnecting electricity and gas households in winter in the event of non-payment.

**Complaints** Most MSs have implemented an alternative dispute resolution scheme, either as part of NRA responsibilities or through an external body. In most countries, a three-month limit on handling disputes applies.

There are significant differences in European NRAs' methods of collecting data. These differences depend on whether the authority is the single point of contact and is in charge of handling complaints directly, as opposed to having to refer to third parties (such as consumer organisations or energy companies).

Most MSs use the ERGEG proposal from 2010 as a basis for their consumer complaint classification. The proposed classification consists of 14 categories.

The number of reported complaints increased in most MSs. A notable exception is Sweden, where a significant reduction in the number of consumer complaints has been observed since July 2009, when mandatory monthly meter readings (previously annual) were introduced. Such readings and information on actual consumption have led to greater trust in metering and billing.

**Smart metering** The 3<sup>rd</sup> Package introduces smart meters as a measure to assist the active participation of consumers in the energy supply market, and recommends that MSs conduct a cost-benefit analysis (CBA) to decide whether and how smart metering systems should be rolled out.

By early 2013, most MSs had addressed the roll-out issue. Some have already taken a formal or legal decision to roll out smart meters, but have yet to do so in practice. Others have taken a formal decision not to roll out smart meters following a negative CBA. Among those MSs which did not make a formal decision, different trends can be noted. In gas, only one MS (Italy) has been rolling out smart meters and seven MSs plan to do so. All will aim to achieve a 95% roll-out rate as a minimum. In electricity, two countries have completed their roll-out (Sweden, 100%; Italy, 95%). Finland is close to reaching the 80% target by the end of 2013, while 15 countries are rolling out or planning to roll out smart meters. Of these, eleven will target a 95% roll-out rate or higher; while two countries will target at least 80% and one (Germany) will aim for 15% by 2020.

The technical design of smart metering systems varies from one MS to another. Despite many years spent assessing European standards, the European Union has no common standard for smart energy meters yet and continues to lack interoperability.

## Electricity market integration and network access

**Market integration** There remains significant scope for further wholesale electricity price convergence across the EU. For instance, in 2012, the Central-West Europe (CWE) region recorded a notable decrease in terms of price convergence (down by 18%) compared with 2011, partly reflecting the challenge represented by the integration of renewables. However, price convergence in the Central-East Europe (CEE) region was significantly enhanced following the implementation of market coupling between the Czech Republic, Hungary and Slovakia, where full price convergence was achieved more than 80% of the time in the last quarter of 2012. Overall, our analysis confirms that market coupling is an important driver of price convergence.

The report also assesses the day-ahead utilisation rate of cross-border capacity and shows that, following the implementation of market coupling, the overall efficient use of interconnectors (power flowing from lower to higher price zones) increased from 60% at the end of 2010 to 76% in 2012. Of those interconnectors which remain uncoupled, the social welfare loss due to, inter alia, the absence of market coupling is the highest on the Swiss borders. The Agency recommends the rapid implementation of market coupling on all borders.

The report shows a limited use of cross-border capacity after day-ahead market closure. Around 60% of total capacity remains unused after the intraday timeframe. Developing efficient cross-border intraday and balancing trades should contribute to better market integration.

**Loop flows** Loop flows constitute an important barrier to market integration and to secure grid operation. Such flows are particularly pronounced in the CEE, CWE and Central-South (CSE) regions. The increasing problems relating to loop flows include, among other things, reduced availability of cross-border capacity on some borders and associated social welfare losses. The high volatility and limited predictability of loop flows are a challenge for the operation of the network.

Therefore, the appropriate monitoring of loop flows and associated externalities, along with the implementation of adequate remedial actions, are urgently needed. There is a lack of adequate transparency with regard to the level of loop and transit flows and with regard to the number and costs of remedial actions applied by Transmission System Operators (TSOs) to redress the negative effects of loop flows. The recently adopted Transparency Regulation should contribute to improve the situation (especially with respect to the costs incurred and the actions undertaken by TSOs). It is important that the relevant parties make available all information listed in the above-mentioned Regulation well before February 2015, when the data will become available in any case through the Transparency Platform of the European Network of Transmission System Operators for Electricity (ENTSO-E).

**Integrating intermittent generation into EU power systems** The increasing penetration of intermittent renewable energy sources (RES) poses a challenge to TSOs in terms of balancing supply and demand. This is because the output generated by such energy sources is hardly predictable and is decoupled from usual electricity demand patterns.

In view of the increasing share of RES-based generation, TSOs will have to draw on additional (flexible) resources to be able to balance systems instantly in a cost-efficient way. The most economically efficient way to pursue the deployment of sufficiently flexible resources in the system is to create a well-functioning energy market attracting existing resources through efficient pricing. The value of flexibility reflected in market prices will send appropriate market signals to stimulate the right amount of investment in both new generation (if needed) and networks.

Therefore, the full implementation of the Electricity Target Model (ETM) for cross-border trade, in particular in the intraday and balancing timeframes, remains an absolute priority so as to arrive at sound prices reflecting the correct value of flexibility.

Flexibility in wholesale electricity markets (including RES balancing) also requires efficient and well-integrated gas markets, which depend on, inter alia, balancing regimes, flexibility tools (such as storage and line-pack), nomination and re-nomination lead times, bundled capacity products at border points, transparent and consistent cross-IP transportation tariffs and well-functioning secondary capacity markets and platforms.

### Gas market integration and network access

**Demand and price trends** The EU-27 gas consumption in 2012 decreased by 4.1% in comparison with 2011, mostly as a result of the continuing economic downturn. A significant fraction of this reduction was observed in gas demand from electricity producers, given the escalation of coal as fuel of choice and the increasing penetration of renewable sources for electricity production. Even if subdued demand should have pushed prices down<sup>2</sup> by releasing supply and transportation capacity, EU gas prices continued to grow as demand decreased. Three factors explain this trend: the lack of competition in terms of geographical source, the influence of liquefied natural gas (LNG) premiums paid in East Asia over EU prices, and the continuing (albeit declining) indexation of long-term contracts to oil prices.

The global nature of the gas market is such that European policies by themselves do not necessarily affect European gas prices. However, gas-on-gas competition improved during the year, as more gas was traded at hubs. Hub prices were, on average, lower than estimated long-term contract prices. Hub price convergence is now a *fait accompli* in North-West Europe, although some instances of winter price decoupling still occur in response to seasonal demand needs and to residual instances of contractual congestion at spe-

<sup>2</sup> Higher wholesale prices lead to even lower gas demand in difficult economic circumstances, when income effects dominate.



cific borders. Central and Southern Europe, especially Austria and Italy, have experienced price convergence with the North-West since the first quarter of 2012, against a background of rising wholesale prices.

#### Liquidity and welfare losses

Liquidity in organised markets generally increased in 2012 as a result of a risk-hedging flight towards spot trading following greater economic uncertainty and the continuing renegotiation of long-term, oil-indexed contracts spurred by two liquid and lower-priced hubs (National Balancing Point (NBP) in Great Britain and Title Transfer Facility (TTF) in the Netherlands). The majority of traded volumes are still negotiated over the counter.

However, beyond Great Britain and the Netherlands, less liquid and/or uncompetitive wholesale markets, coupled with some congested IPs, still constitute a major hurdle in many MSs. In 2012, limited progress was made in terms of aggregating pools of liquidity by merging cross-border zones and virtual hubs. Most MSs are still adopting national solutions by either creating or repowering purely domestic hubs.

Our analysis points to significant social welfare losses – in the order of several billion euros per year – as a result of imperfect integration and retail market fragmentation throughout the EU. These losses are highest in the gas sectors of Bulgaria, the Baltic ‘energy island’, Slovenia, and Sweden.

#### Cross-border transportation tariffs

Cross-border interconnection tariffs are extremely heterogeneous and only partially transparent. In a number of cases, mainly concentrated in Central and Eastern Europe and in some ‘new’ MSs<sup>3</sup>, costing and pricing methodologies are not fully published by TSOs or NRAs. In the absence of underlying cost data, tariff discrimination in an economic sense cannot be definitively diagnosed, but it can be hinted at, given the extreme differences in interconnection tariffs (either at the same or at adjacent borders) for gas flowing in opposite directions. Important tariff-setting issues at cross-border level are addressed in the Framework Guidelines and ensuing Network Code on Harmonised Gas Transmission Tariff Structures.

The level of efficiency (or lack thereof) in the use of interconnection capacity and the extent to which gas moves in the appropriate direction are linked to the responsiveness of shippers to tariff and capacity auction design. Price responsiveness is hampered by the persistence of long-term contracts, which may give rise to inconsistent gas flows with respect to hub prices. Improved information on tariffs and auction designs/outcomes is needed in order to understand the extent to which such factors constitute a barrier to the efficient functioning of interconnectors, irrespective of the presence of underlying technical constraints. This analysis, already presented last year, is expanded in the present report, both at pan-European level (in terms of ‘wrong-way’ flows) and with special respect to Continent-GB interconnectors.

3 Those MSs which joined the EU in 2004 or later.

GTM and transparency

Consistent with its mandate to promote cross-border trade and EU market integration, the Agency is working on implementing the key principles of the Gas Target Model (GTM) through its Framework Guidelines and the resulting binding Network Codes on Capacity Allocation Mechanisms, Balancing, Harmonised Gas Transmission Tariff Structures, and Interoperability. The Comitology Guidelines on Congestion Management Procedures (CMP) are now in force. These provisions, along with the full transposition of the 3<sup>rd</sup> Package, must ensure that European consumers benefit from an integrated internal gas market.

The Gas Target Model, containing a vision for the efficient integration of the European gas market, is currently under review in order to reflect the new challenges facing the gas sector beyond 2014.

The timely availability of relevant information is a critical element of any well-functioning competitive market. Although full transparency compliance has yet to be achieved in the gas sector, a fairly high degree of accomplishment has been observed at TSO level. Steps are now being taken in those areas where there is still room for improvement, particularly on information 'nearer to real time'. ENTSOG is improving its Transparency Platform with respect to gas interconnection point capacity and price data, including the availability of storable time series on capacity and bookings.

ENTSOG's Transparency Platform should continuously evolve and contain up-to-date and unit-consistent, fully and readily comparable information on cross-border transportation tariffs and on the general terms and conditions of international gas transmission at all interconnection points, including the consistent availability of time-series data.

This report also outlines certain new developments in the biogas sector, in particular its present and future use as a renewable gas source, with certain caveats in terms of quality and safety and the need for a 'cost-benefit' mindset shift. The situation in Germany and Great Britain is described, with elements of both tariff-setting and network access.

## Conclusions

This report illustrates market developments in 2012 in the EU-27's electricity and gas sectors in view of the goal of completing the internal energy market (IEM) by 2014. The report identifies those areas where additional measures (and monitoring) are needed in order to ensure that EU electricity and gas consumers benefit from fully integrated markets.

Particular areas for further action include, similarly to last year:

1. **Transposition** Full transposition and implementation by all MSs of the 3<sup>rd</sup> Package is essential. The European Commission should continue to monitor this closely.
2. **Consumer rights** Regulators must continue to promote the implementation of consumer provisions in the 3<sup>rd</sup> Package, benefiting from CEER's recommendations and advice, along with the Agency's continuous monitoring activities. CEER's 2020 vision for Europe's energy consumers will also promote dialogue and engagement with market players and policy makers to build an energy sector where the European consumer truly comes first.
3. **Market rules and practical implementation** The EU-wide Network Codes envisaged in the 3<sup>rd</sup> Package and their early implementation are important to foster the market integration process. This report points to significant social welfare losses – in the order of several billion euros per year – in both the electricity and gas sectors, as a result of imperfect integration and market fragmentation throughout the EU. The Agency will continue to work with the ENTSOs, the European Commission, NRAs and with market players to deliver a full set of binding market and network rules applicable across the EU, including rules for trading, and to speed up their early implementation. Wholesale energy markets will be monitored to detect manipulation and abusive practices, which should be sanctioned.

Some measures require concerted action by all actors for the benefit of European consumers. The Agency and CEER will continue to support and promote the development of competitive, sustainable and secure electricity and gas sectors in the public interest. Both the Agency and CEER remain committed to open dialogue with all parties and to working with European institutions and MSs in order to deliver and apply the rules necessary to achieve Europe's energy goals efficiently.

# 1 Introduction

- 1 The objective of the Internal Energy Market (IEM) was implicitly set already by the first Directives on the liberalisation of Europe's electricity and gas markets in 1996. The European Council's February 2011 decision to complete the IEM by 2014 is the latest policy step in this process.
- 2 According to Article 11 of Regulation (EC) No 713/2009<sup>4</sup>, the Agency for the Cooperation of Energy Regulators ('the Agency') is charged with monitoring Europe's electricity and natural gas markets, and in particular: the retail prices of electricity and natural gas; network access, including access by renewable energy producers; and the level of compliance with consumer rights as laid down in the 3<sup>rd</sup> Package.
- 3 While significant progress has been made, the objective of full market integration has not yet been achieved and many barriers to the IEM persist. For instance, at the wholesale level, pan-European technical rules (network codes developed on the basis of framework guidelines) must deliver further improvements in terms of efficient use of the network and network security. Suppliers and users should gain easier access to infrastructure and take advantage of lower transaction costs for cross-border trade.
- 4 The objective of this Market Monitoring Report (MMR) is to assess how energy markets can work more efficiently for the benefit of European energy consumers. Moreover, this report aims to identify any possible barriers to the completion of the IEM by 2014 and to suggest to the European Parliament and Commission how to remove them.
- 5 This MMR<sup>5</sup> was prepared jointly by the Agency and by the Council of European Energy Regulators (CEER). In addition to analysis undertaken specifically for this report, information from other documents produced by the Agency and by National Energy Regulatory Authorities (NRAs) has been used.
- 6 It is worth noting that this MMR is based on publicly available information and on information provided by NRAs on a voluntary basis. The reporting activities mandated by Article 11 of the above-mentioned Regulation are not complemented with data collection powers.

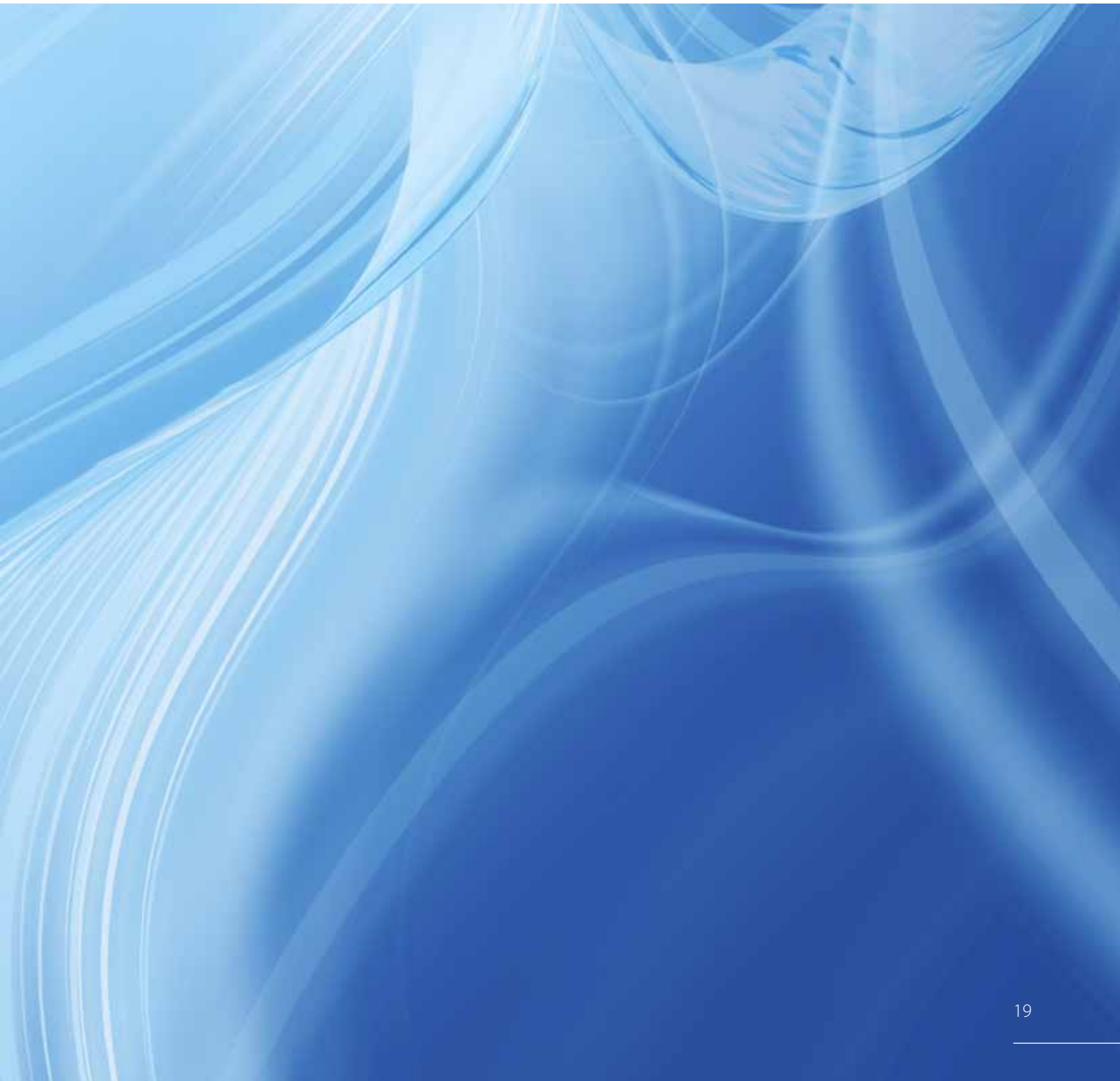
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4 Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing the Agency for the Cooperation of Energy Regulators, OJ L 211/1, 14/8/2009.

5 Norway is included in the data reported in parts of this report when information about the EU and EEA is discussed. From next year, this report will also cover Croatia, which joined the EU on 1 July 2013.

# PART I

## The electricity sector



## 2 Retail electricity markets

### 2.1 Introduction

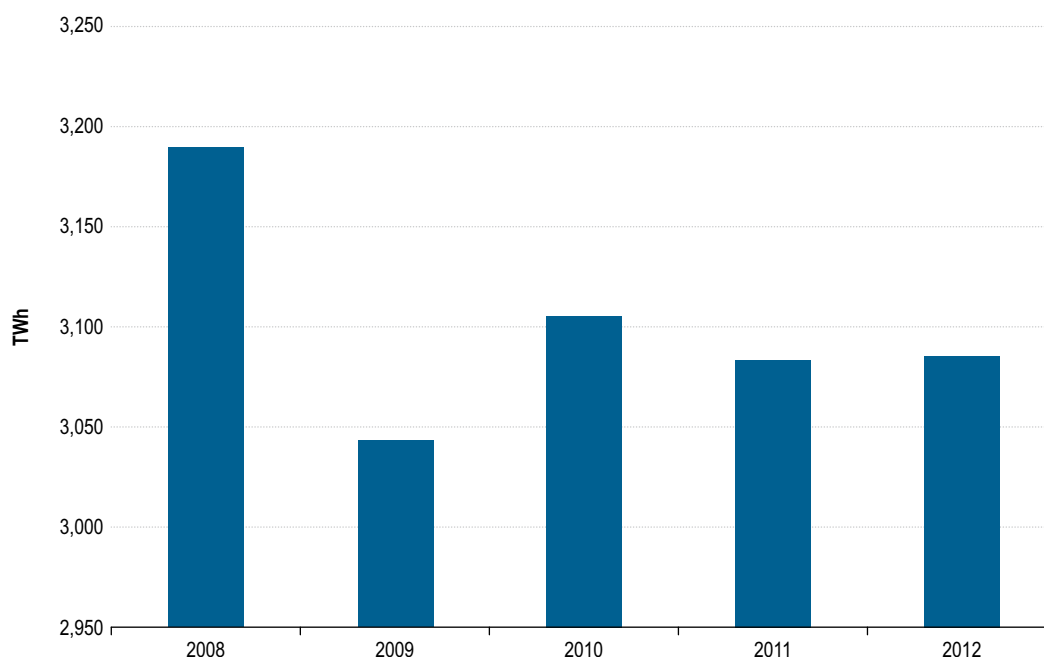
7 This chapter describes, in Section 2.2, the key electricity demand and price developments for households and industrial consumers in 2012. Section 2.3 explores the concept of EU-wide integration in retail markets. In Section 2.4, the focus is on barriers to retail market entry, including switching behaviour and price regulation. The features of price regulation across the European Union and Norway are presented in Section 2.5. Section 2.6 ends this chapter with a conclusion.

### 2.2 End-user demand

#### 2.2.1 Demand for final consumers

8 Compared to 2011, the European electricity demand by final consumers<sup>6</sup> remained almost unchanged at 3,086TWh in 2012 (Figure 1). In the years running up to the economic crisis (2004–2008), electricity demand rose steadily, and fell significantly by 4.6% between 2008 and 2009.

Figure 1: Electricity demand in Europe – 2008 to 2012 (TWh)

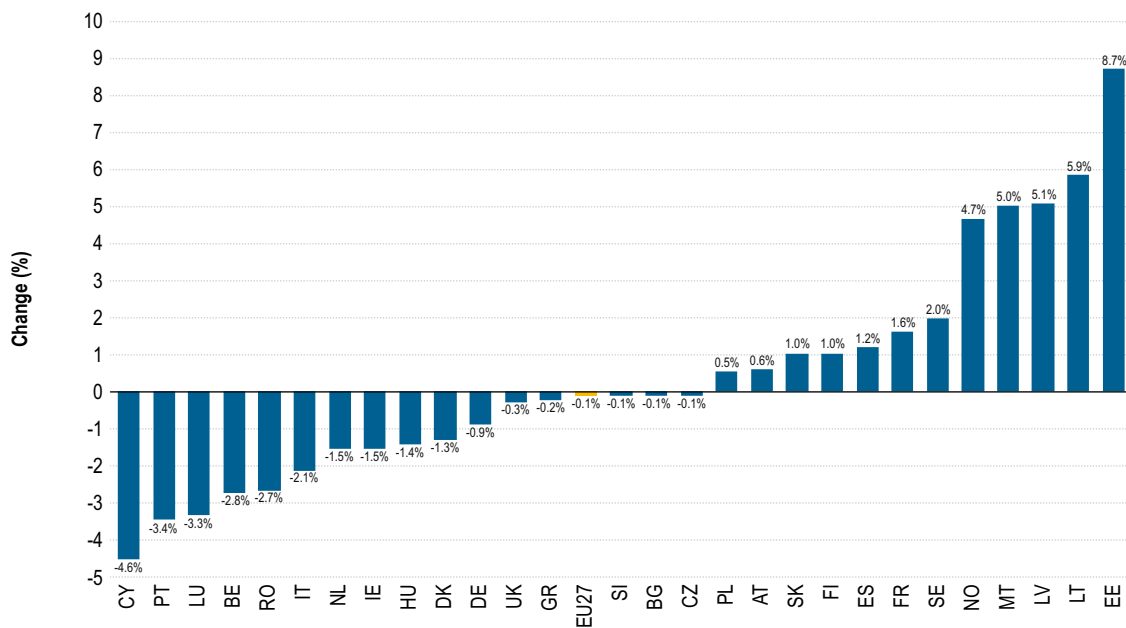


Source: ACER, based on Eurostat (8/8/2013)

6 Due to data constraints, only Eurostat supply data was used. As demand and supply for electricity have to be the same all the time, supply is a good proxy for demand. The Eurostat supply category used is called 'electricity available for the internal market', i.e. amounts of electricity to be sold and supplied for the domestic market, including all losses emerging during transportation and distribution and amount of electricity consumed in the energy sector for commercial needs. Data for Germany is provisional.

- 9 Figure 2 shows the change in electricity demand between 2011 and 2012 by country. Demand increased the most in Estonia (8.7%), Lithuania (5.9%), Latvia (5.1%) and Malta (5.0%). These MSs, with the exception of Malta, also witnessed significant increases in gross domestic product (GDP); by 3.2%, 3.7%, 5.6% compared to 2011 respectively<sup>7</sup>. In Malta, the increase in consumption is most likely due to temperature i.e. a colder winter and a hotter summer. Since Malta has no gas, electricity is the main source for heating and air conditioning. Demand increased by between 1% and 2% in Finland, France, Slovakia, Spain and Sweden.
- 10 The MSs with the most pronounced decline in electricity demand in 2012 compared to 2011 were Cyprus (-4.6%), Portugal (-3.4%), Luxembourg (-3.3%). In Cyprus and Portugal lower consumption is in line with their GDP fall i.e. by 2.4% and 3.2% compared to 2011 respectively. In Luxembourg the demand fell due to decreased industrial activity in the Sotel zone. In other ten MSs, namely Belgium, Bulgaria, the Czech Republic, Denmark, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Romania, Slovenia and the United Kingdom, electricity demand fell in 2012, but by less than 3%.

Figure 2: Change in electricity demand in Europe – 2011 to 2012 (%)



Source: ACER, based on Eurostat (8/8/2013)

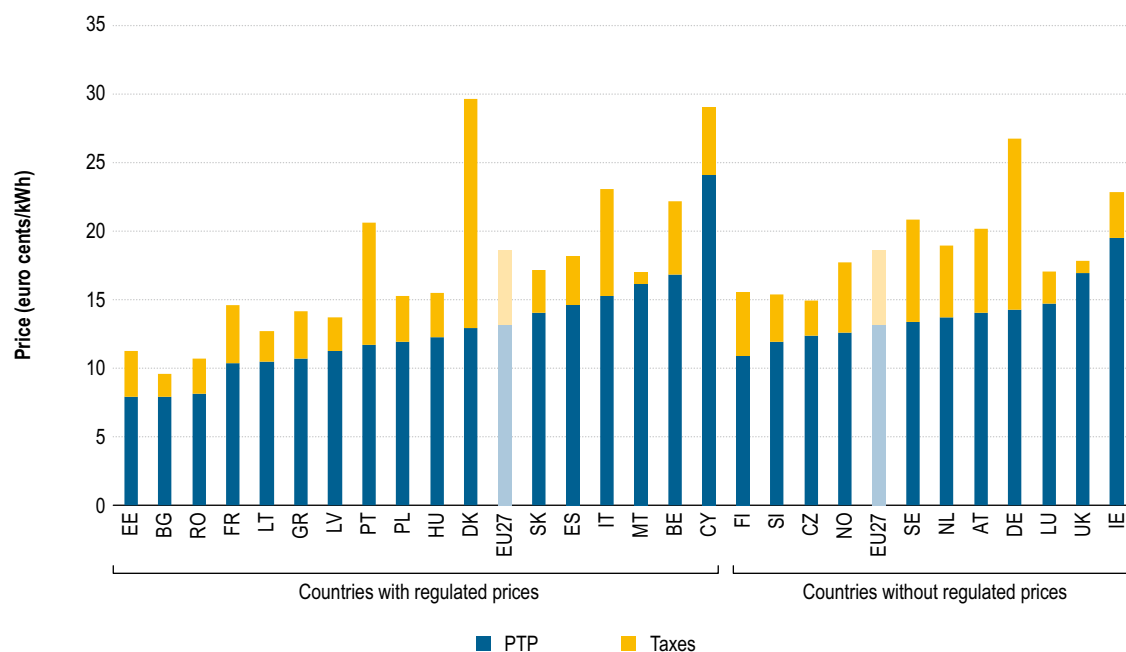
Note: The information is based on Eurostat estimates for electricity demand, although it represents the supply of electricity to end users in the EU. Data for Germany were not validated yet by Eurostat at the time when this report was printed. The Eurostat data for this Figure were cross-checked with other sources, specifically ENTSO-E and for some cases, NRAs. These sources confirm the changes between 2010 and 2011 shown in the Figure and based on Eurostat data with the exception of Estonia, Hungary, Lithuania, Poland, Slovenia and Spain. This is due to differences in methodologies applied by the reporting sources i.e. statistical offices, NRAs or TSOs.

7 In Malta, GDP increased by 1.0% between 2011 and 2012.

## 2.2.2 Developments in retail electricity prices and retail price break-down

- 11 Substantial differences in Post-Tax Total Price (POTP)<sup>8</sup> and Pre-Tax Total Price (PTP)<sup>9</sup> persist across Europe. In 2012, on average<sup>10</sup>, the POTP for households<sup>11</sup> in Denmark (the MS with the highest price) was more than three times higher than in Bulgaria (MS with the lowest price) – see Figure 3. Furthermore, the lowest PTP (in Estonia) stood at a mere third of the highest PTP (in Cyprus).

Figure 3: Electricity POTP and PTP for households – Europe – 2012 (euro cents/kWh)



Source: ACER, based on Eurostat (25/5/2013), DC: 2,500-5,000kWh

Note: Within each group, MSs are ranked according to the PTP level.

- 12 The proportion of taxation – including VAT – in the total retail price differs among countries. In Denmark, it makes up to 54% of a household's total electricity bill, whereas in Malta and the United Kingdom taxes account for 5% of the final price. The reasons for these differences will be analysed in detail later in this section.
- 13 Figure 3 shows that the PTP was set at significantly lower levels than the EU-27 average in the countries where price regulation is applied to at least 90% of all household consumers (see Table 4), with Cyprus, Malta and Slovakia as exceptions. As regulated prices are sometimes set equal to or below cost, there is a risk that in these MSs, investments (in generation and/or network) will be hindered and market entry will be hampered. The Czech Republic, Finland, Norway and Slovenia are the countries without regulated prices in which PTP prices were below the EU-27 PTP average.

8 The Post-Tax Total Price (POTP) is defined as the sum of the commodity price, regulated transmission and distribution charges, and retail components (billing, metering, customer services and a fair margin on such services) plus VAT, levies (as applicable: local, national, environmental) and any surcharges (as applicable).

9 The Pre-Tax Total Price (PTP) is defined as the sum of the commodity price, regulated transmission and distribution charges, and retail components (billing, metering, customer services and a fair margin on such services).

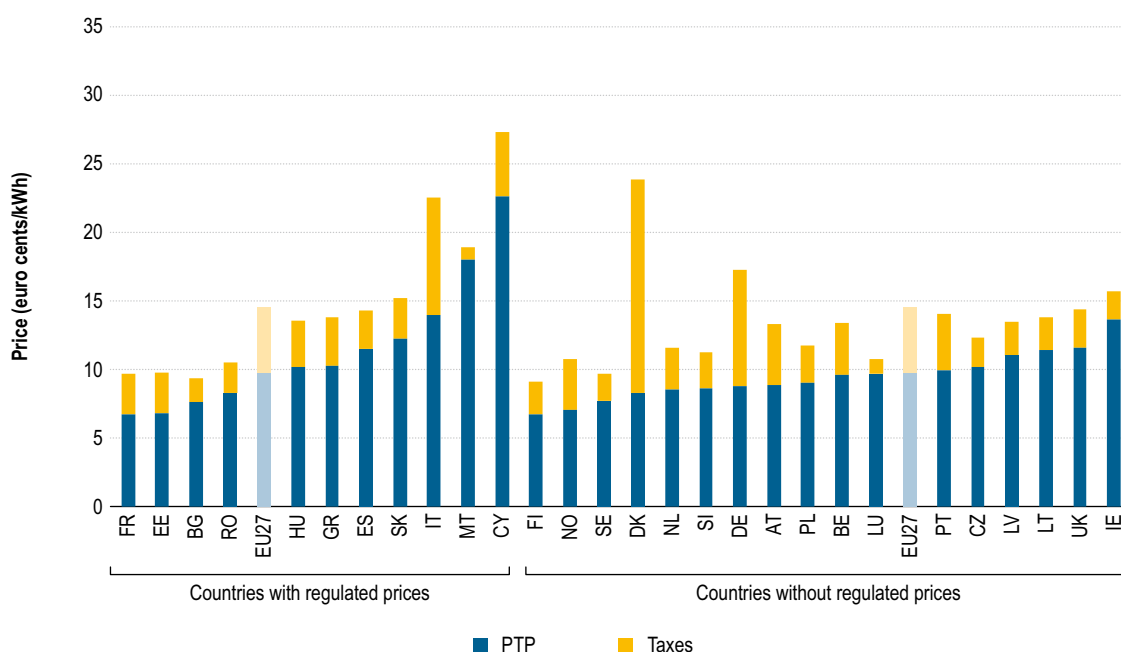
10 The average of the first and second semester prices was used.

11 Eurostat Band DC: 2500-5000 kWh. The choice of the Eurostat classes is representative at the EU level, but might be different at national level due to differences in the national characteristics of markets.



14 Figure 4 shows that, in 2012, the POTP and the PTP price differences for industrial consumers were smaller<sup>12</sup> (ranging from 9.15 to 27.32 euro cents per kWh), compared to household consumers (ranging from 9.55 to 29.72 euro cents per kWh). These differences, which are even more apparent if the outlying countries are excluded<sup>13</sup>, reflect – in addition to different costs for generation – the more developed role of retail liberalisation in the industrial segment in which consumers benefit from market dynamics, including lower prices. In addition, in some countries, such as Germany, some energy-intensive industrial segments, depending on the level of consumption, are exempted from certain tax and levy components added to the total price.

Figure 4: Electricity POTP and PTP for industrial consumers – Europe – 2012 (euro cents/kWh)



Source: ACER, based on Eurostat (25/5/2013), DC: 2,500-5,000kWh

Note: Within each group, MSs are ranked according to PTP.

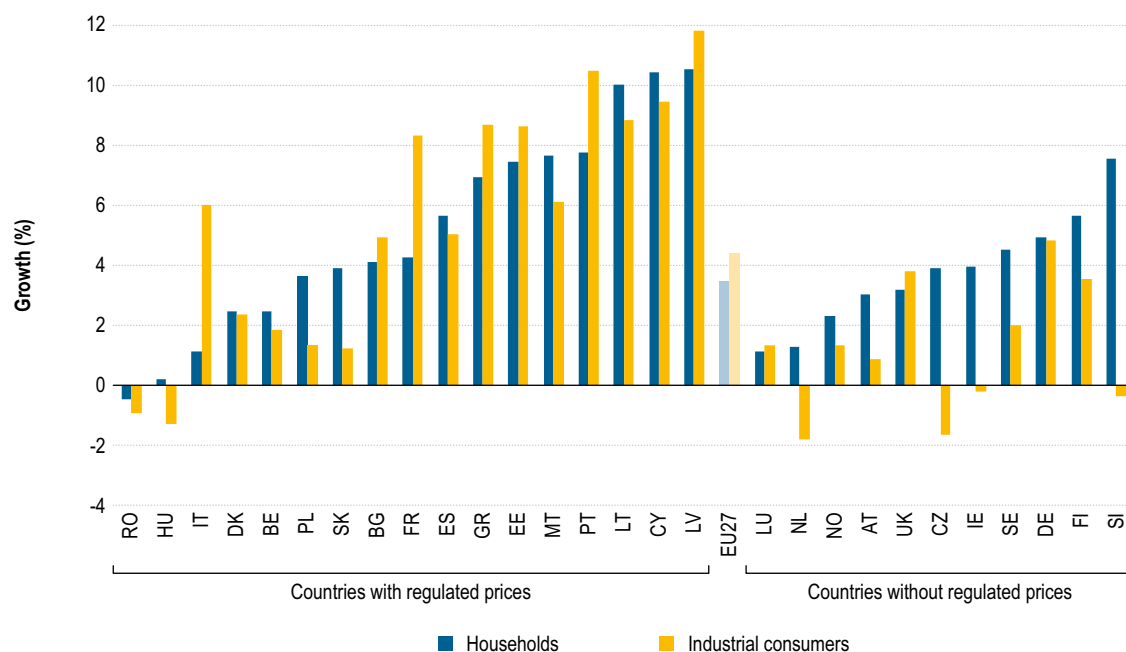
15 In addition, in 26 out of 28 countries, the POTP for households exceeded prices charged to industry. The differences between the total prices for household and industrial consumers in PTP terms were the highest in Sweden (11.1 euro cents), followed by Belgium (7.2 euro cents) and Ireland (5.9 euro cents). Austria, Luxembourg, Germany, the Netherlands, Norway and the United Kingdom recorded PTP differences of more than 5 euro cents/kWh.

16 Figure 5 presents the average POTP growth rate between 2008, the first full year after the liberalisation of retail electricity markets according to European law, and 2012. It shows that the average change in the POTP for MSs without price regulation was 1% for industrial consumers and 4% for household consumers. For MSs with price regulation, the change in the POTP was 5% for both, household and industrial consumers.

12 Eurostat Band C: 500-2000MWh. The choice of the Eurostat classes is representative at the EU level, but might be different at national level due to the structure of the national industry.

13 The 2012 POTP range then runs from 9.35 to 23.91 euro cents/kWh for industrial consumers, and from 10.75 to 29.09 euro cents/kWh for household consumers.

Figure 5: POTP compounded annual growth rate (CAGR) – Europe – 2008 to 2012 (%)



Source: ACER, based on Eurostat (25/5/2013), DC: 2,500-5,000 kWh; CAGR: The Compound Annual Growth Rate is calculated by taking the 4th root of the total percentage of the year-on-year growth rate for the analysed period (2008 to 2012,) i.e. as follows:  $\{(Ending\ Value/Beginning\ Value)^{(1/4)} - 1\}$ .

- 17 The price changes were significantly different from country to country, even though, year on year, electricity prices rose in the majority of them. Some MSs, (e.g. Bulgaria, Estonia, France, Greece, Latvia, Lithuania, Malta and Spain), which started from a low price level in 2008, increased their prices faster than the EU-27 average.
- 18 Between 2008 and 2012, prices for household consumers rose on average in all European countries. Similarly, electricity prices for industry rose between 2008 and 2012, except in the Czech Republic, Ireland, the Netherlands and Slovenia, where prices decreased on average by 1%. In 2012, the average EU-27 POTP increased by 4.6% for households and by 5.2% for industrial consumers, compared to 2011.
- 19 In MSs without price regulation, there are significantly larger differences between the evolution of prices for household and industrial consumers (see right-hand part of Figure 5). For instance, in all countries except Luxembourg and the United Kingdom, the price increase for household consumers was higher than that for industrial consumers. This reflects different levels of competition and market maturity between the household and the industrial retail segments, with the latter having progressed further. As a result, industrial consumers are exposed to prices that are often more directly linked to wholesale prices and, as mentioned above, in some cases, exempt from certain taxes and levies.
- 20 In the case of dual-fuel offers, which currently account for a large share of offers in the retail market in some MSs, final prices are mostly lower compared to the separate purchase of electricity and gas, as they often include a rebate, which would not be granted if electricity and gas were bought separately. At the same time, dual offers may render lower consumer management costs for suppliers, which they can, at least partly, pass on to consumers through lower prices, provided there is sufficient competition. Further details on dual-fuel offers are provided in section 4.2.3 of this report.

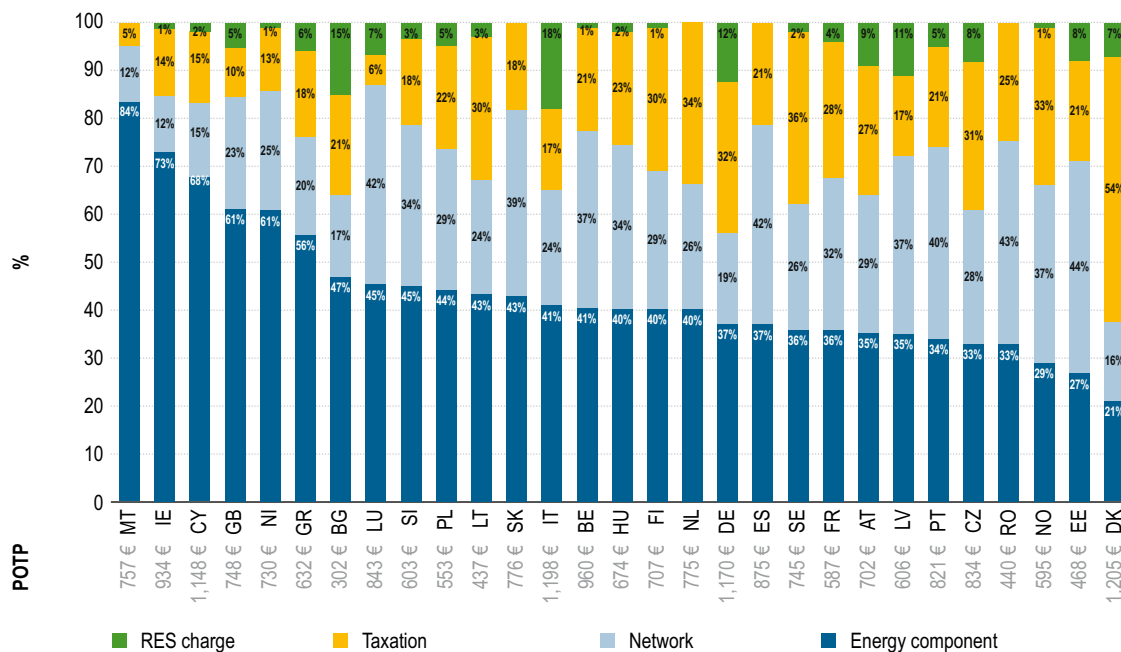
- 21 In order to understand the price differences and the evolution of prices, in addition to the Eurostat data presented above, the household POTP break-down as of December 2012, based on the incumbent standard offer in the capital cities of the EU-27 MSs, Norway and Northern Ireland (Figure 6), was analysed<sup>14</sup>. Figure 6 shows the significant heterogeneity in price structure between countries, with striking differences in the energy component, renewable energy sources' (RES) charges, network tariffs and taxes. In fact, it mirrors wide differences in national energy policies across the EU. Moreover, with the exception of the energy component, the energy bill is mostly comprised of charges that are not directly linked to the supply of electricity.
- 22 The energy component<sup>15</sup> is not the most significant part of the energy bill in a large majority of countries. In some MSs the energy component is up to 84% (Malta) of the consumer bill, while in others it is merely 21% (Denmark). Only in six out of 29 countries does it account for more than half of the consumer bill. It is clear that even if consumers are willing to switch, the part of the final bill that they can potentially influence by switching supplier is often not the one with the highest impact on the total bill.
- 23 Figure 6 also illustrates the role of the RES charges in Europe on the total price, as a separate component, in 2012. The RES charge can make up to 18% of the total price (e.g. Italy), whereas in Northern Ireland it is only 1% of the total price. Austria (9%), Bulgaria (15%), the Czech Republic (8%), Denmark (7%), Estonia (8%), Germany (12%), Latvia (11%) and Luxembourg (7%) also report significant RES charges. Moreover, in several MSs, the cost of RES support, through non-contestable charges, appears to have increased substantially in recent years (e.g. in Austria from 3% in 2009 to 9% in 2013, in Germany from 5% to 18%, respectively, and in Italy from 9% in 2009 to 18% in 2012 and 19% in 2013).
- 24 Some countries show no RES charge. However, it is worth mentioning that charges for RES support may appear in different parts of the bill and cannot always be abstracted for the purpose of Figure 6. The RES charge can be included in the network or energy component (e.g. Romania, Spain), or bound to other charges (e.g. the Public Service Obligation levy in Ireland or the Combined Heat and Power charge from natural gas). In Malta, these costs are socialised through general taxes and hence do not appear on the energy invoice, although consumers do contribute to them as taxpayers.
- 25 This assessment shows there is scope to improve the transparency of reporting of support for RES in the energy bill for consumers, which calls for guidelines to be provided by NRAs or any other independent authority. Some NRAs have already issued such guidelines: in Belgium, the 'Charter of good practice for online price comparisons for electricity and gas offers'<sup>16</sup> was published by the NRA in order to raise consumer trust in independent, reliable and accurate information provided through the price comparison tool.

14 The incumbent standard offer in the capital is representative of the situation in most MSs. The results for the UK are presented separately for GB (London) and Northern Ireland (Belfast).

15 The energy component includes a margin, costs for marketing, billing and other related costs to run the business.

16 For the Charter, please see: [http://www.creg.info/pdf/Faq/charte\\_bonnes\\_pratiques.pdf](http://www.creg.info/pdf/Faq/charte_bonnes_pratiques.pdf)

Figure 6: POTP break-down – incumbents’ standard offers for households in capital cities – December 2012 (%)



Source: ACER retail database<sup>17</sup> (December 2012) and information from the NRAs (September 2013)

Note: In Malta, a charge for the support of RES is not included in the electricity tariff, as the support for RES is financed through national taxes in the national budget. For the Republic of Ireland, where the numbers in the figure are estimates, the main form of support to renewable energy since 2006 has been a renewable feed-in tariff. In Spain, RES support is included in the grid tariff set by the government, and cost allocation for this item is not known to the NRA. In the Netherlands, an explicit RES charge has appeared on the electricity bill since 1<sup>st</sup> January 2013 and is expected to amount to approximately 4.5 euros per year. Applying this charge to the 2012 data would show a 0.6% RES charge on the bill of the incumbent standard offer in Amsterdam. In Romania, the RES charge is included in the energy component. However, the obligation to record the RES charge separately on the electricity bill for final consumers was introduced in July 2012. The NRA has been obliged to monitor the evolution of the RES charges in the bills since January 2013, when the RES charge was introduced. In Luxembourg, the RES charge also includes the CHP charge. No data on the RES charge was provided for Slovakia.

26 The share of network charges in the total electricity bill across Europe (Figure 6) ranges from 12% in Malta and Ireland to 44% in Estonia. In Spain, the RES charges are included in the network component; however, it is questionable to what extent these costs are related to electricity transmission and distribution and therefore should be reported separately. For transparency reasons, therefore, it is better to systematically detail all the costs not related to electricity transmission and distribution, but nevertheless included in the bill under this component.

17 ACER retail database is based on information from price comparison tools, NRAs and suppliers. It refers to offers for annual consumption of 4,000kWh, which has been calculated as the average consumption for European household consumers based on Eurostat data. National consumption profiles might differ from the consumption pattern used. Only fixed-, variable- and mixed-price offers are included in the comparison.

- 27 Regarding the overall taxation<sup>18</sup>, very different regimes exist across Europe. The VAT rates for electricity range from 5% in Great Britain<sup>19</sup> to 25% in Norway and Sweden. Some MSs have local or federal taxes or include a charge for public service obligations. As a consequence of the large differences in taxation, the overall tax is between 5% (in Malta) and 54% (in Denmark) of the consumer bill.
- 28 In summary, supply has remained virtually at the same level over the last few years. Since 2008, with a few exceptions, industrial consumers have paid less than households and tend to have benefited more from the positive effects of liberalised retail markets. The differences in retail prices across countries are to a large extent explained by the retail price regulation regime, competition levels in the retail markets, network charging methodologies in use by the NRAs at the Transmission System Operator (TSO) and/or Distribution System Operator (DSO) level and by taxation regimes. In most cases, the energy component represents less than half of the bill, with taxation and network costs accounting for the remainder. Over the last few years these so-called non-contestable components appear to have significantly increased in many MSs, particularly due to the costs of the RES support schemes.

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18 Taxation includes VAT and other local taxes.

19 Here and throughout the whole report, Great Britain (GB) means England, Wales, and Scotland. These are the constituent countries regulated by Ofgem. Northern Ireland (NI) is regulated separately. Unless Eurostat data are used, in this report, UK data always refers to GB only. Eurostat data obviously consider the UK as a whole, as the country is the sum of GB and NI. Regulators do not generally consider it in the same way, because of the different regulatory regimes applying to NI (which is not under Ofgem's competence, but under the regulatory powers of a multi-utility authority called UREGNI or NI Utility Regulator for Electricity, Gas, and Water).

## 2.3 Market integration

- 29 Last year's MMR analysed developments and the status in electricity and gas market integration and pointed to its benefits, including significant price convergence in electricity (due to market coupling) and at gas hubs. In the long run, network access and wholesale market integration should cascade to retail markets, because integration at wholesale level contributes to serving total demand at least cost. Consumers at retail level will benefit from this, provided there is sufficient competition in the retail market. Moreover, wholesale market integration is expected to increase liquidity, which may contribute to enhancing competition in the retail market. Therefore, it is important to begin monitoring the impact of network and wholesale market integration on retail markets and to understand how upstream integration can eventually foster retail market integration.
- 30 The fact that retail electricity (and gas) markets are currently national or local in scope does not mean that supply cannot play a role in the harmonisation process and that, in the longer run, some retail markets will not achieve broader geographical scope. Supply substitution is an effective competitive constraint when suppliers in one geographical market<sup>20</sup> are in a position to enter another market with immediacy and at low cost<sup>21</sup>. However, for the supply side to play a role in the retail market integration process, barriers to entry into retail markets must be tackled to ensure that these markets are made contestable<sup>22</sup>. The first step, before discussing the impact of supply side substitution on market integration, is to understand the level of market openness in different MSs. The estimated household market share of the incumbent in capital cities provides an indication of this level. In those MSs in which the incumbent player still retains a very high share of the market (for the sake of reasoning, in excess of 50%), the presumption will be low market contestability and a limited role for supply-side substitution.
- 31 If no significant barriers to entry exist and markets have a greater degree of openness (measured as an incumbent market share below 50%), one would expect supply side substitution to play a stronger role in promoting market integration. Arguable candidates for retail entry might be either incumbent suppliers of the other fuel from the same country, retailers with a strong brand and large customer base, or experienced players from one or more neighbouring countries. As a result, analysing cross-border entry is relevant to understanding the retail market integration process<sup>23</sup>. Table 1 provides a general overview of the incumbent's market share<sup>24</sup> and the level of foreign presence in national retail markets.

20 The relevant geographical market 'comprises the area in which the undertakings concerned are involved in the supply and demand of products and services in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different'. See: 'Commission notice on the definition of the relevant market for the purposes of Community competition law (97/C 372/03)'.

21 This, in turn, depends on whether the firms operating in other markets own (or can readily access) the assets required. On the contrary, if market entry implies the need to acquire new assets and take significant strategic decisions, players entering on such a basis will not be considered at the 'market definition' stage.

22 Article 3 of Directive No 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity sets the legal obligation for operation of electricity undertakings with a view to achieving a competitive, secure and environmentally sustainable market in electricity. Directive 73 sets analogous requirements for the gas sector.

23 For the purpose of this report, both foreign take-overs of nationally-owned companies and entries of foreign companies into a retail market are taken into account.

24 Market shares for the capital cities of Italy, Northern Ireland, Portugal and Sweden were not available and instead market shares for the country were used as a proxy. The market share for the incumbent in Finland is estimated. Differences exist in the analysis between electricity and gas. For instance in gas, Stockholm might arguably be less relevant than the Malmö-Gothenburg conurbation in Sweden. This will be taken into account in future analyses.

Table 1: An overview of incumbents' presence and foreign supply side substitution to promote retail market integration – December 2012 (capital cities in Europe)

		Estimated incumbent market share in the household market – December 2012 (capitals)		
		>90%	Between 50 and 90%	Less than 50%
Presence of foreign players (capital city)	>50%	BG (1/1); HU (1/2); RO (1/1)		
	Between 20 and 50%		CZ (5/24); ES (4/16); NL (6/18); PT (2/4); BE (2/6)	GB (4/14)
	Between 0 and 20%	NI (1/4); SK (6/16)	DE (1/14); FI (2/37); IE (1/4); IT (2/7)	SE (4/41)
	0%	CY (0/1); MT (0/1); GR (0/1); LT (0/1); LU (0/6); LV (0/1); EE (0/1); PL (2/7); FR (1/9)	AT (0/18); DK (0/19); SI (0/8)	NO (0/11)

Source: ACER, based on ACER retail database (December 2012) and National Reports from NRAs (2013).

- 32 In Table 1, the figures beside country codes represent, respectively, the number of foreign retailers active in the capital and the overall number of retailers active in the capital (household segment). As the number of suppliers shown takes into account only the number of suppliers with active offers in the capital city known to the Agency, the conclusions drawn on this basis might not be representative for the whole country. According to the CEER database, there are over 100 suppliers to the retail household consumers in Sweden in 2011; however, due to a large number of offers available online, a representative sample was captured for the December 2012 offers to electricity consumers. Hence, only 41 have been included in our analysis of offers in Stockholm. A large majority of those are municipal-owned and Swedish-based, offering different types of contract, of which several are spot-market based. The same is true for the Finnish and German market. Small suppliers are also excluded in analysis of offers in London, because the retail electricity market in London is dominated by six large suppliers which hold about 99% of the household market. A comprehensive analysis of the evolution in the number of active nationwide suppliers can be found in subsections 2.4.1 and 4.4.1. London shows a limited role of the incumbent and relevant foreign presence to promote retail markets' integration; this is for several reasons, but primarily due to the early opening of the market, low administrative burden for domestic and foreign entrants to enter the market, a 'light touch' policy of government involvement in takeovers of British companies (i.e. it is not the business of government to decide who owns suppliers). The British retail electricity market is currently dominated by six suppliers (i.e. British Gas, EDF Energy, E.ON, RWE npower, Scottish Power and SSE), of which four are foreign-owned (i.e. EDF Energy, E.ON, RWE npower and Scottish Power).
- 33 The capitals of Belgium<sup>25</sup>, the Czech Republic, the Netherlands, Portugal and Spain show a moderate role of incumbent and of foreign market entry to promote retail markets' integration.

25 The assessment is based on the city of Brussels, where the situation on the supply side in retail is different from the rest of the country.

- 34 The opening of the market in the Netherlands led to a significant entry of foreign supply companies and the emergence of domestic suppliers, currently controlling less than 20% of the retail market in total, thus somewhat reducing the dominance of the four incumbent suppliers (i.e. Nuon, Essent, Eneco and Delta). Of 18 suppliers in Amsterdam, six are headquartered abroad. Nationwide, the market share of 18 home-grown recent entrants has reached 10% of the retail market, with only a few growing successfully. According to the Dutch NRA (ACM), foreign entrants over the years have not significantly increased their market shares, but none has yet exited the market.
- 35 In Portugal, market entry by foreign suppliers is mostly attributable to Spanish utilities entering the market (i.e. Iberdrola and Endesa<sup>26</sup>) in the past. Still, the Spanish market is becoming less concentrated due to the suppliers' diversification strategies in the household sector and due to new entrants in the industrial sector.
- 36 The capitals of Germany, Finland, Ireland and Italy show moderate incumbent presence and limited foreign presence. In the capitals of Austria, Denmark and Slovenia, the incumbent presence is also moderate, though presence of foreign players is non-existent. It is worth mentioning that some of these MSs are displaying a relatively large number of suppliers, which contributes to competition. In Denmark, Norway and Sweden, the number of suppliers and diversification of offers are high and firms are locally-owned.
- 37 The capitals of Bulgaria, Cyprus, France, Greece, Hungary, Luxembourg, Northern Ireland, Malta, Poland, Romania, Slovakia and the Baltic States show the extremely relevant role of the incumbents and therefore absence of a foreign presence. The incumbent supplier in Paris, for example, holds 93% of the national household retail market. Cyprus, Greece, Luxembourg, Malta and the Baltic States could be characterised as small markets or peripheral markets and, as such, not interesting to foreign market players. In Bulgaria and Romania, one incumbent supplies almost 100% of all households in the respective capitals; however, both suppliers are foreign-owned.

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26 Now owned by Enel, an energy utility with headquarters in Italy. The supplier Gas Natural Fenosa is also foreign-owned, but as its offers did not appear for the analysed consumer profile, it has not been included in the ACER database.



## 2.4 Barriers to completing the internal market

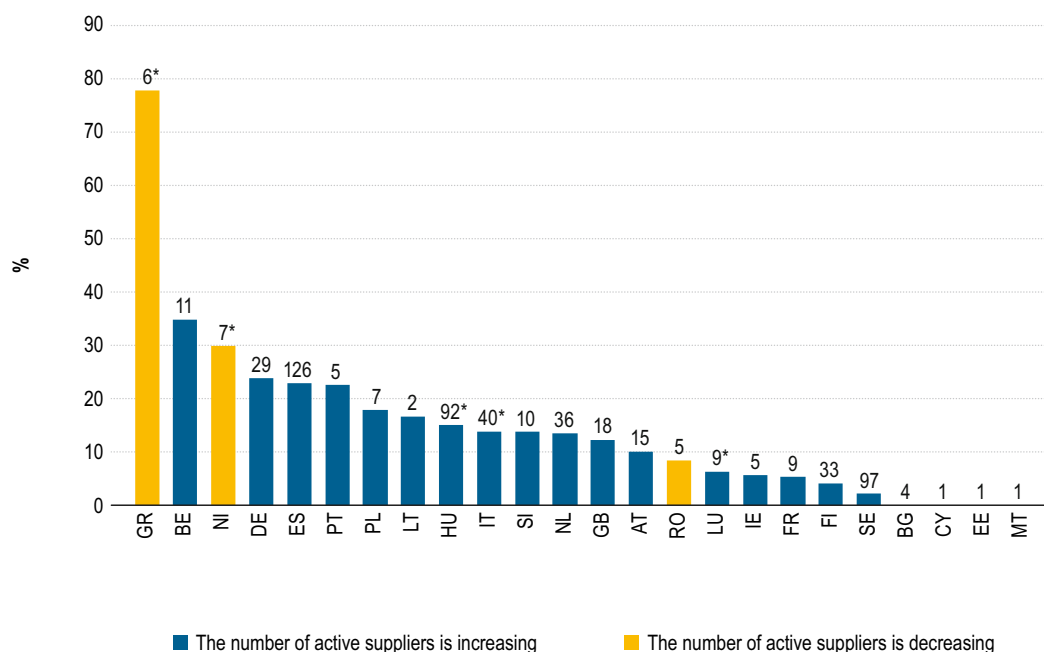
### 2.4.1 Level of barriers to entering retail markets

- 38 No single indicator can measure the overall level of barriers to entry in a specific country. However, a combination of indicators, such as entry/exit rates, regulated tariffs and consumer switching behaviour can provide an insight into the level of barriers to entry. Moreover, the latter two indicators help measure the dynamics in retail markets, which is the focus of this section.
- 39 The history of entry and exit to and from a market can provide useful information about the level of barriers to entry. Markets with higher barriers to entry are not likely to observe high levels of entry and exit. Significant entry and exit may be associated with lower barriers which discipline profit margins of active suppliers. Market exit is just as important as entry. In competitive markets less competitive (i.e. inefficient) companies will exit the market, and more competitive ones will enter or expand their size in the market.
- 40 However, if the industry is not attractive to new entrants due to low profitability, low levels of entry may not necessarily imply the existence of significant structural or behavioural barriers to entry. Still, due to the dynamic nature of the competitive process, over time, initially competitive companies may become less competitive and trigger new entry.
- 41 Figure 7 shows market activity expressed in the percentage of net new nationwide suppliers in the market in a given year. The absolute value<sup>27</sup> of this percentage for each year is then averaged to calculate the indicator on a four-year average basis.

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27 Absolute values were used to avoid the smoothing effect that the use of the net entry variable could create (for example: if in one country the increase in the number of suppliers in two years was 50% a year and the decrease in the number of suppliers in the two following years was 50% a year, then the average change over a 4-year period would be 0%, which would not reflect the entry/exit dynamics at all. Averaging absolute change values reflects much more closely the entry/exit dynamics of the retail market (in this particular case, the average would be 50%).

Figure 7: Entry/exit activity in the household retail market – 4-year average – 2009 to 2012 (%)



Source: ACER analysis based on National Reports, NRAs' Reports and CEER National indicators database (2013)

Note: Entry/exit activity calculated as a percentage of the average number of active suppliers in the market. The number at the top of the bars shows the number of nationwide suppliers in the EU MSs in 2012. Data were not available for Denmark and Norway. For Italy, Luxembourg and Northern Ireland, numbers with asterisks include all active suppliers in the MS. The 2012 numbers for Northern Ireland are not available; hence the 2011 number is shown. For the Czech Republic, data on active suppliers to households were not available, as the NRA tracks only the number of supply licence holders (360 in 2012). The 92 suppliers in 2012 active nationwide in Hungary include suppliers selling electricity to other traders, industrial firms that founded their own electricity supply company and other suppliers selling electricity to consumers. In Latvia, no active energy supplier sells electricity to household consumers, but six active electricity traders in the free energy market sell electricity according to a bilateral agreement. If these numbers were taken into account, the rate for Latvia in the above chart would have been 27%, with the number of active suppliers increasing. Slovakia reported no nationwide active suppliers for the years 2008, 2009 and 2010, while for the years 2011 and 2012, 24 and 29 suppliers, respectively, were reported. If these numbers were taken into account, the rate for Slovakia in the above chart would have been 55%, with the number of active suppliers increasing.

- 42 The analysis shows that the Greek market experienced the most activity with regard to the number of household suppliers in the market. However, following steady growth from one in 2008 to 12 household suppliers in 2011, the number was halved in 2012 due to the suspension of participation of four retail suppliers incurring overdue debts to the system and market operators. The other retail suppliers decided to withdraw from the retail market.
- 43 The Belgian market experienced the second highest rate of entries and exits between 2008 and 2012. Most entries occurred in 2012, when five new suppliers entered the market. Belgium had a price freeze between April and December 2012, which the biggest companies were not willing to accept. This resulted in price increases until the last day before the price freeze, leading, as a consequence, to significant media attention. Besides this, the government ran a very intensive campaign to better inform consumers about prices and the possibility of switching, resulting in an increase in consumer willingness to turn away from the big players in the market and seek alternatives. These factors made the Belgian market more attractive to small, new suppliers, which have generated substantial customer portfolios over the last year and continue to do so<sup>28</sup>.

28 More details on the methodology of price regulation in Belgium can be found in section 2.5.2, which includes a detailed case study.

- 44 The number of suppliers in Spain is among the largest (126 in 2012), although prices are regulated. Moreover, preparing for full liberalisation later, Spain shows relatively high levels of supplier activity between 2008 and 2012. In 2009, the increase was due to the majority of local distributors creating their own supply companies, as distributors stopped selling electricity to the market. In 2012, new suppliers were created as a result of the highly competitive market and consumer responsiveness.
- 45 Over the years, the number of nationwide suppliers in Sweden has remained relatively constant; however, in 2011, due to the division of the Swedish market into four price areas (on 1 November 2011), it dropped from 104 to 97 nationwide suppliers.
- 46 In Bulgaria, Cyprus, Estonia and Malta the number of nationwide suppliers did not change at all in the observed period. The retail markets in these MSs, including the market in Lithuania, remain monopolistic.
- 47 In summary, MSs showing relatively high retail market dynamics and a considerable number of suppliers include Belgium, Germany, Hungary and Spain, whereas the opposite is shown for Bulgaria, Cyprus, Estonia, Malta and to some extent also Lithuania, where markets appear to have high levels of entry barriers to retail markets.

## 2.4.2 Main barriers to entering retail markets

- 48 With regard to retail electricity markets, the main barriers identified by NRAs<sup>29</sup> across Europe were: (i) consumer switching behaviour; (ii) retail price regulation (energy component and/or retail margin); (iii) regulatory framework; and (iv) lack of adequate unbundling.

### 2.4.2.1 Consumer switching behaviour

- 49 Switching reflects the competitive process between different companies/groups in the market. It provides useful information on the level of competition in the market. High switching rates could be interpreted as a sign of adequate consumer awareness and competition in the market, and vice versa, even though low switching rates may point to sound competition equalising prices.
- 50 Switching rates in Europe vary widely as shown in Table 2. In 2012, Belgium, Portugal, Norway, Great Britain, Spain, Ireland and Sweden had the highest switching rates among the EU-27 MSs and Norway. The Netherlands show a switching rate of 12.6% for 2012; however, this number refers to all segments of the retail market, including industrial consumers and small- and medium-size enterprises (SMEs), and the number is therefore not fully comparable with those of the other countries. Austria, France, Denmark, Greece, Hungary, Northern Ireland and Poland recorded low switching rates for household consumers, while in Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Luxembourg and Romania, electricity consumers switch very minimally or not at all. This can partly be explained by the application of regulated prices for household consumers.

29 On 30 and 31 May 2013, the Agency and CEER held the Workshop on Barriers to Entry to Retail Markets. This section draws on the conclusions of this workshop and on a survey among the NRAs, which the Agency conducted earlier in 2013.

- 51 In 2012, consumers in countries with regulated prices switched (Table 2) on average less often than those in the fully liberalised countries. The average switching rate<sup>30</sup> in the fully liberalised countries was 8.0%, whereas it was 6.5% in the MSs with at least partial household price regulation in place. This suggests that the reduction in the number of households exposed to regulated prices could contribute to switching.
- 52 Compared to 2011, the largest increase in switching rates occurred in Portugal (+12.1%), Belgium (+5.1%), Slovakia (+3.6%) and Greece (+2.2%). The increase in Portugal follows the introduction of frequent changes in the transitory regulated tariffs<sup>31</sup>. According to this, prices are set quarterly, as opposed to annually, in order to track wholesale price changes more closely. The Portuguese NRA assessed this to be a measure to encourage switching. This could be identified as a good practice to be applied by other MSs with regulated prices to ensure that regulated prices remain cost-reflective and therefore do not dampen competition.

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30 Throughout this report, we refer to the annual switching rates as a percentage of household consumers who have changed supplier out of all household consumers (by number of eligible meter points). Source: CEER National Indicators.

31 The transition period is defined until the end of 2015. After 2015, only vulnerable consumers continue to have access to regulated prices.

Table 2: Switching rates for household consumers in Europe – 2011 and 2012 (ranked according to change between 2011 and 2012)

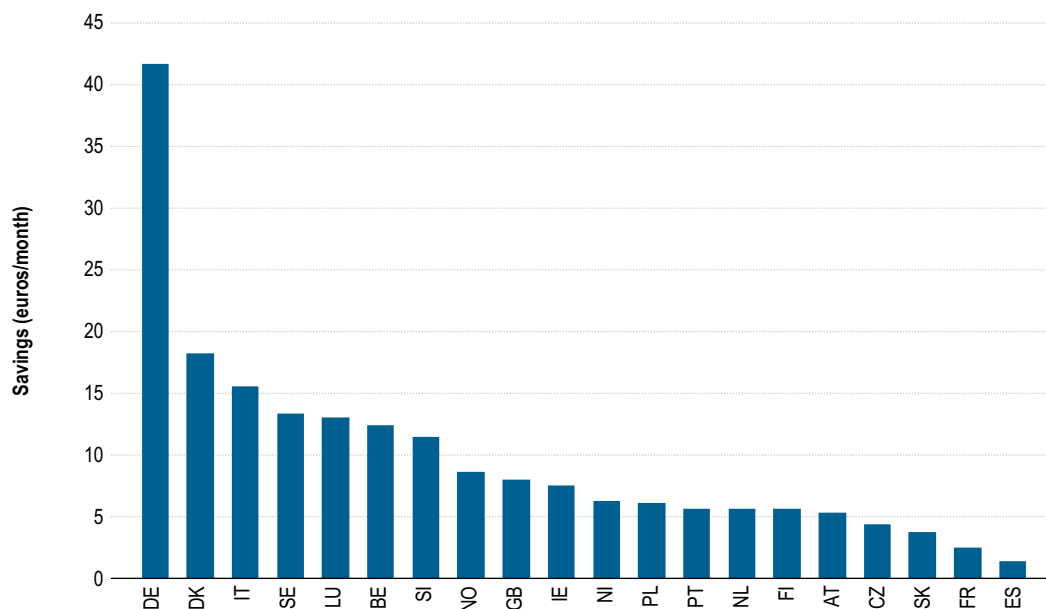
Country	Switching rates 2012	Switching rates 2011	Difference 2012-2011
Portugal	13.2	1.1	12.1
Belgium*	14.8	9.7	5.1
Slovakia	5.0	1.4	3.6
The Netherlands**	12.6	9.7	2.9
Greece	4.0	1.8	2.2
Slovenia	5.9	4.0	1.9
Denmark	3.7	1.8	1.9
Norway	13.0	11.3	1.7
Spain	11.6	10.0	1.6
Hungary	1.6	0.3	1.3
Sweden	9.9	8.9	1.0
Italy	6.4	5.8	0.6
Czech Republic	7.6	7.4	0.2
Bulgaria*	0.0	0.0	0.0
Cyprus	0.0	0.0	0.0
Estonia	0.0	0.0	0.0
Germany	7.8	7.8	0.0
Latvia*	0.0	0.0	0.0
Lithuania	0.0	0.0	0.0
Northern Ireland*	2.0	3.0	0.0
Romania	0.0	0.0	0.0
Luxembourg	0.1	0.2	-0.1
France	3.6	3.9	-0.3
Austria	1.0	1.4	-0.4
Finland	7.5	8.6	-1.1
Great Britain	12.1	15.4	-3.3
Ireland	10.6	15.1	-4.5
Malta	NA	NA	
Poland	0.6	NA	

Source: ACER, based on CEER national indicators database (12/9/2013)

Notes: \* For Belgium, the 2012 switching rate for the country was not available. The 14.8% switching rate listed for 2012 refers to a weighted rate for the Flanders and Brussels regions only. \*\* Data for the Netherlands refers to all segments of the retail market. In Malta, there is only one supplier, hence NA.

- 53 If consumers are price sensitive and a price differential exists between offers, they will tend to switch supplier. When this is the case, more competitive suppliers could enter the market by undercutting existing (incumbent) offers.
- 54 Accordingly, one would expect that the difference between the incumbent standard price and the minimum price influences switching, as it represents the saving potential that a consumer can gain when switching from the incumbent to the cheapest supplier. Figure 8 shows for capital cities the monthly saving potential from switching from the incumbent standard prices to the cheapest available offer. It varies between 2 euros per month in Spain (Madrid) and 43 euros per month in Germany (Berlin). Countries with regulated end-user prices are also included in Figure 8, as consumers can switch to a cheaper offer if regulated and non-regulated prices co-exist.

Figure 8: Average monthly saving from switching from the incumbent’s standard offer to the lowest-priced offer on the market – capital cities – December 2012 (euros/month)



Source: ACER retail database (December 2012)

Note: Calculations for a consumption profile of 4,000kWh/year (i.e. monthly consumption of 333kWh). The monthly saving potential is calculated by the price difference between the standard incumbent and the minimum price. Rebates are considered proportionally for the first year of delivery. In Germany, the high number can be explained by high discounts offered to consumers in the first year of delivery.

- 55 Based on the available data, no clear pattern can be found in the relation between consumers’ switching behaviour and the saving potential<sup>32</sup>, indicating that other, non-price elements, motivate consumers to switch or disengage them from switching. For example, Spain recorded one of the highest switching rates, despite one of the lowest observed saving potentials in Europe.

- 56 Where regulation imposes prices below costs or negative margins, the majority of consumers benefit from the best price (i.e. subsidised electricity consumption) in the short term<sup>33</sup>. For instance, household consumers in Bucharest have the option to switch suppliers – at national level, 62 suppliers are active, while Bucharest has only one; but due to the negative or slim margins allowed by regulation, suppliers are discouraged from making offers outside their supply areas. Obviously, this contributes to the explanation of low switching rates in Romania.
- 57 Non-economic factors are also increasingly influencing market competition and consumer switching behaviour. They include non-price elements, such as additional services of suppliers and the convenience of joint billing for electricity and gas in the case of dual-fuel offers, which help suppliers differentiate their products. Such offers influence switching, as they tend in the long term to ‘lock’ consumers to one supplier for both fuels.
- 58 Another non-economic factor disengaging consumers from switching might be their loyalty to local, publicly-owned suppliers. This might, among other factors, contribute to the low switching rates in France, Austria and rural areas in Germany<sup>34</sup>, especially when the incumbents offer a broad variety of other non-energy related services. The available savings are the highest in Germany. However, the lowest offers on the market attract consumers with generous discounts and long-term contracts that suppliers in the market may then be unable to maintain. Two German suppliers (Teldafax in 2011 and Flexstrom in 2013), for example, became insolvent and were liquidated because of their excessively aggressive commercial strategies, deterring other consumers from switching on the basis of a bad past experience with a supplier. The Danish NRA DERA also reports on ‘barriers related to the low mobility of consumers’<sup>35</sup>.

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33 In this case, it is unlikely that the alternative suppliers will be able to undercut the incumbent, and in the long run, due to the lack of profit margins, investments in networks and generation may fall behind and, as a result, the quality of supply may decline.

34 Bremer Energie Institut, Brunekreeft et al. ‘European internal electricity market for consumers: opportunities and barriers to cross-border trade between Germany and Austria’, 2012.

35 DERA National Report 2013, see: [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/NATIONAL\\_REPORTS/National%20Reporting%202012/NR\\_En/C12\\_NR\\_Denmark-EN\\_v2.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National%20Reporting%202012/NR_En/C12_NR_Denmark-EN_v2.pdf)

- 59 The lack of information and transparent comparison of offers might also have a detrimental effect on consumer choice. Consumers do not know that they can switch or are unaware of how much they can save by switching and which suppliers would be available to them. In France, for example, the NRA CRE estimated that 50% of consumers are unaware that they can change suppliers<sup>36</sup>. In addition, consumers are very often confused about the incumbent supplier (EDF) and their main competitor (GDF Suez), believing it is the same company and they are therefore discouraged from switching. In the Netherlands, consumers are willing to switch if they can save slightly under 200 euros per year on the total energy bill. They subjectively believe that they can save merely 100 euros per year, while, in practice they could save up to 400 euros per year when purchasing dual-fuel offers<sup>37</sup>, which the vast majority of Dutch consumers do. Actual savings on mono-fuel offers (only electricity) are much lower. Moreover, according to a survey conducted by Ofgem, the complexity of tariffs is a major reason for consumer disengagement. There are currently 500 different tariffs in the British market, with suppliers offering complex discount structures and several non-price features bundled in with energy supply. Despite Britain recording one of the highest switching rates in the EU, the share of so-called sticky consumers is high – about 70-75% are on standard tariffs and a large proportion of them have not changed their suppliers in the past 10 years. If complex tariffs are offered, transparent and easy accessible information is needed to create the basis for active consumer behaviour.
- 60 Lastly, if the switching procedures are perceived to be complex or if switching is perceived as insecure and time-consuming, the propensity to switch declines significantly. In Austria, consumers perceive the process of collecting supplier- and offer-related information as very time-consuming and the saving potential from switching as limited. In addition, when switching from the incumbent, consumers expect security of supply to decrease.
- 61 In the case where switching is indeed complex, countries can facilitate switching procedures and speed up the switching process. Good practice examples are France and the Netherlands, where a switch takes one day and three to four days respectively, compared to one or two months in many other countries<sup>38</sup>. Promoting collective switching can also help facilitate switching, although systems have to be prepared (e.g. consumer-centric model), otherwise a bad switching experience may have a detrimental effect on the perception of consumers about switching and its benefits. Making tariffs easily comparable and offering standards that allow homogenous price comparison for consumers and reduce the perceived risk for consumers is another important aspect. Guidelines for price comparison tools designed by an independent authority such as an NRA tend to establish trust among consumers. Some NRAs already have a set of guidelines to be followed by providers, or provide price comparison tools (e.g. Austria, Belgium, Great Britain, Italy, Portugal, Slovenia and Spain).

#### 2.4.2.2 Retail price regulation

- 62 Price regulation, regardless of the differences between existing regimes, can have a relevant impact on market entry. When regulated prices are set below costs, they act as an absolute barrier to entry. As a result, regulated prices tend to cause more distortions in the market than necessary. The concerns that some countries have attempted to tackle through regulated prices, such as consumer

36 Survey of the NRA CRE and the National Ombudsman, see: <http://www.cre.fr/documents/publications/etudes/6eme-barometre-annuel-energie-info-sur-l-ouverture-des-marches/consulter-la-synthese>

37 Dutch NRA's calculations.

38 In France, switching is done in 24 hours by an exchange of consumer data between the supplier and DSO via an electronic platform. In the Netherlands, however, where switching can technically be performed in one day at the latest, despite shorter switching periods and higher switching rates, the percentage of consumers reluctant to switch due to the expected time taken and the difficulties involved has remained the same over the years. According to the Dutch NRA, ACM, the main reason Dutch consumers do not switch is in fact positive: they state they are satisfied with their current supplier.



protection and security of supply, can be addressed with other measures that create fewer distortions to retail markets. Moreover, it has been already indicated in the previous sections, that price regulation tends to deter consumers from switching.

- 63 Also, dependent on government interference, price regulation could create uncertainty for suppliers, as regulated prices can oscillate depending on government priorities and the electoral cycle. Price setting rules may also change over time, and what is today a profitable market may suddenly (with an ad-hoc administrative/political decision) become unprofitable. Frequent regulatory changes in the price setting mechanism (where regulated retail prices still exist) can be a relevant deterrent to entry.
- 64 In one way or another, retail price regulation affects most of European countries, with the exceptions of Austria, the Czech Republic, Finland, Germany, Great Britain, Ireland, Luxembourg, the Netherlands, Norway, Slovenia and Sweden. In 2012 Cyprus, Estonia, France, Malta and Romania have regulated prices in all segments, from households to large industrials. Table 2 summarises the differences between countries.

Table 3: Categorisation of customer groups supplied under regulated prices in Europe – 2012

Country	Markets supplied under regulated prices			
	Households	Households with special needs	SMEs	Industry
Austria				
Belgium		x		
Bulgaria	x		x	
Cyprus	x	x	x	x
Czech Republic				
Denmark	x	x		
Estonia	x	x	x	x
Finland				
France	x	x	x	x
Germany				
Great Britain				
Greece	x	x	x	
Hungary	x		x	
Ireland				
Italy	x		x	
Latvia	x			
Lithuania	x	x		
Luxembourg				
Malta	x	x	x	x
Netherlands				
Northern Ireland	x		x	
Norway				
Poland	x	x		
Portugal	x	x		
Romania	x	x	x	x
Slovakia	x		x	
Slovenia				
Spain	x	x	x	
Sweden				

Source: ACER questionnaire on end-user price regulation (2013), CEER National Indicators and Annual Reports.

Note: The Netherlands do not regulate prices, but apply ex-post price setting powers for household consumers and SMEs, intervening in cases where prices are assessed as unreasonable. Belgium applies a price freeze between April and December 2012, which is not considered in this table. In 2012 in Poland, a segment of 'households with special needs' did not exist; however, all households (except for those who switched supplier), including those later defined as consumers with special needs, were supplied under regulated prices. In January 2013 in Estonia, price regulation for all consumer segments was abandoned. In the first half of 2012, Portugal regulated prices for all households. Transitory tariffs for households with contracted power equal to or greater than 10.35 kVA were introduced in July 2012. Throughout the year, regulated social tariffs were available to vulnerable customers i.e. economically vulnerable consumers. Other consumers were subject to transitory tariffs.

- 65 The differences in the scope (i.e. the number of consumers covered) and the level of the regulated price (i.e. affecting the scope for competitive offers) across the EU-27 MSs may, however, determine the impact of price regulation as a barrier. In some countries, not only household consumers, but also other segments (small and large companies) are regulated. More details on the regulatory regimes in retail prices can be found in Section 2.5.

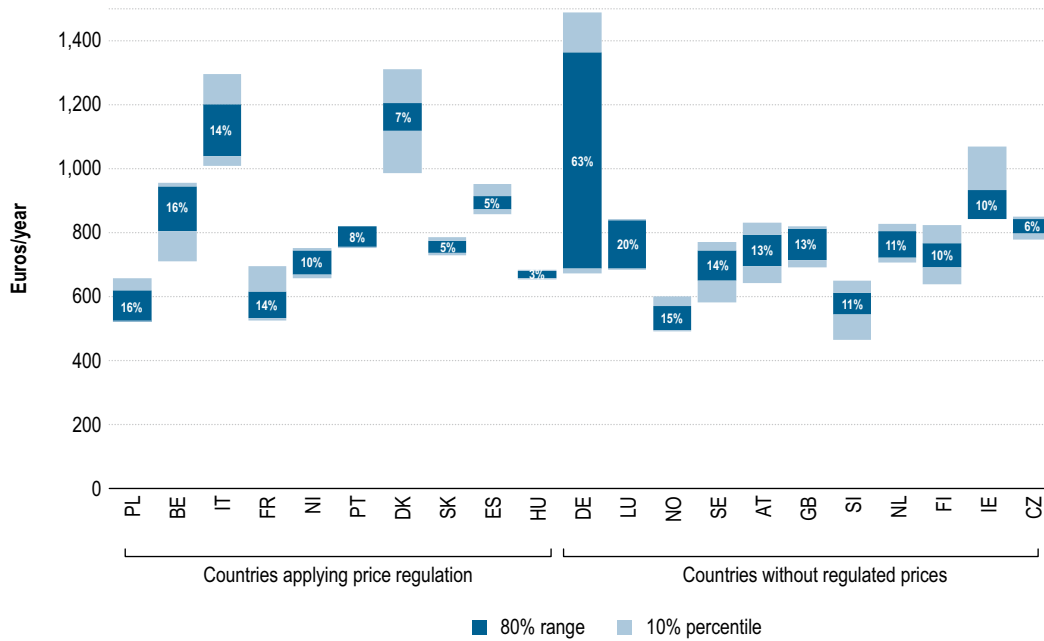
### 2.4.2.3 Regulatory framework

- 66 In some countries, entering retail markets is either impossible, extremely difficult due to national legislation (including for example, complex licensing processes or non-accredited licenses between countries<sup>39</sup>, price regulation), or simply unappealing due to burdensome non-contestable charges (i.e. network, non-cost-reflective regulated charges and taxation) that impact the suppliers' level playing field when competing on the price of the energy component only.
- 67 As already presented in Figure 6, the different regulation and legislation regimes across the MSs contain different network charges and taxes. Moreover, their share in the majority of countries exceeds half of the energy bill. Thus, the reduced scope for the final price differentiation on the basis of the energy component only (including a profit margin) could turn out to be so minimal that it discourages a supplier from entering that market. Furthermore, in countries where non-contestable charges have a greater impact on final prices and where the ability of suppliers to compete on price is thus reduced, price dispersion – other things being equal (see Figure 9) – is expected to be relatively low, although high levels of competition may also reduce price dispersion.
- 68 Based on data underlying Figure 6, the assessment of the effect of non-contestable charges on price dispersion<sup>40</sup> across Europe showed no clear pattern. For example, the Czech Republic, Denmark, Estonia, Norway and Romania, the MSs countries with a heavy share of taxation and network charges, show price dispersion ranges from 6% to 15% (see Figure 9), while Great Britain, Ireland and Northern Ireland, with a relatively low share of the non-contestable charges, show similar price dispersion, ranging from 10% to 13%. This indicates that other factors have a greater effect on price dispersion.
- 69 One of these might be the application of price regulation in a MS and the degree to which it is applied. Figure 9 shows that price dispersion is higher in liberalised countries (17% on average) than in MSs applying regulated prices (10% on average). Furthermore, with the exception of Poland and France, MSs that apply a lighter form of price regulation covering lower numbers of household consumers (see Table 5), i.e. Belgium and Italy, have the highest rates of price dispersion among the MSs with household regulated prices (16% and 14% respectively).
- 70 In Germany, price dispersion is extremely high (80% of all offers had a maximum price difference of 63%). This is a particular case, as the high price dispersion can be explained by significant one-off rebates granted in the first year of delivery.

39 For example, Spain and Portugal accredit each others' licences, facilitating market entry in each other's markets.

40 Price dispersion is calculated as the price range between the most expensive and the cheapest offer in the capital cities, excluding the 10% most expensive and cheapest offers.

Figure 9: POTP dispersion for households in the capital – 4,000kWh/year consumption profile – December 2012 (euros/year)



Source: ACER retail database (December 2012)

Note: Bulgaria, Cyprus, Estonia, Greece, Latvia, Lithuania, Malta and Romania do not have price comparison tools, or only one offer was obtained for the capital city.

- 71 Vulnerable consumers in a number of MSs are supported by ‘social tariffs’<sup>141</sup> instead of direct financial support. Such support could be a more adequate tool to support vulnerable consumers, as it does not affect competition. Moreover, the scope for competition can be reduced more than is strictly necessary when a significant segment of all consumers in a country is defined as vulnerable and the social regulated tariffs are set equal to or below cost (i.e. no profit margin).
- 72 In summary, liberalising retail markets and relieving the burden of non-contestable components on the final price allows suppliers to compete on price and should increase their desire to enter new markets.

#### 2.4.2.4 Lack of adequate unbundling

- 73 The 3<sup>rd</sup> Package calls for European energy networks to be subject to unbundling requirements and for the separation of the various stages of energy supply (generation, transmission, distribution and supply). The aim is to ensure that an infrastructure company providing essential facilities to a market guarantees equal treatment to all market participants, and that companies belonging to a group do not benefit from the group's infrastructure business despite the potential incentive to do so. Today unbundling is supposed to clearly separate the competitive from the network businesses. However, in order to avoid discriminating behaviour against alternative market participants, new and existing market players should benefit from equal treatment. The 3<sup>rd</sup> Package also envisages separate corporate entities, which helps assuring that consumers perceive a DSO as a different company from a supplier<sup>42</sup>. Separate branding helps underline the differences in the roles of the two operators. Security of supply always remains the responsibility of a DSO, irrespective of market entries or switching of suppliers.
- 74 If unbundling is not applied correctly or fully implemented across MSs, this might result in the unequal treatment of market participants, including easier access to infrastructure or the better treatment of consumers of an affiliated company, and creating barriers to entry for new suppliers in the retail market.
- 75 According to CEER's report, which monitors the status and implementation of the DSO unbundling requirements<sup>43</sup>, even though a vast majority of MSs have already transposed the 3<sup>rd</sup> Package into their national law, the level of DSO unbundling is still insufficient in many cases. In many MSs, the rebranding of DSOs is the main outstanding issue (i.e. all electricity DSOs have been rebranded in only five MSs), which leaves scope for improvement and which have to be addressed further.

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42 See: Article 26 of Directive 2009/72/EC, of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC (OJ 2009 L211/55).

43 For a detailed overview of unbundling activities in 2011, please refer to the 'CEER Status Review of the Transposition of Unbundling Requirements for DSOs and Closed Distribution System Operators', see: [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Cross-Sectoral/Tab/C12-UR-47-03\\_DSO-Unbundling\\_Status%20Review\\_Public.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Cross-Sectoral/Tab/C12-UR-47-03_DSO-Unbundling_Status%20Review_Public.pdf)

## 2.5 End-user price regulation

- 76 This section is devoted to explaining the differences in retail regulatory regimes across the EU. It is based mainly on the 2013 ACER questionnaire on end-user price regulation<sup>44</sup> and the outcomes of the ACER-CEER workshop on barriers to entering retail markets<sup>45</sup>. An expansion of the analysis covering additional countries was included on the basis of information from the National Reports.
- 77 While the 3<sup>rd</sup> Package calls for end-user prices that are solely determined by supply and demand and do not include any regulated component besides network and taxes, price regulation is still applied in 18 MSs<sup>46</sup>. The process of abandoning regulated prices is too slow. Only minor changes in the number of consumers supplied under regulated prices can be observed during recent years. However, some MSs have committed to phasing out retail price regulation (see Section 2.5.6) and, in some instances, price regulation at retail level might not have much of a distorting effect, due to non-functioning wholesale markets in the light of geographical isolation (e.g. Cyprus and Malta).
- 78 In 2008, 58% of household consumers in Europe were supplied under regulated prices (i.e. 132 million out of 229 million). This share decreased only to 49% four years later, in 2012 (i.e. 121 million out of 248 million) – see Figure 10. Spain, which is gradually reducing the number of consumers supplied under regulated prices, and Ireland, which abandoned price regulation in April 2011, contributed most to this decrease. While in several MSs, regulated and non-regulated prices co-exist, the tendency for household consumers to switch from regulated to non-regulated prices is rather low.

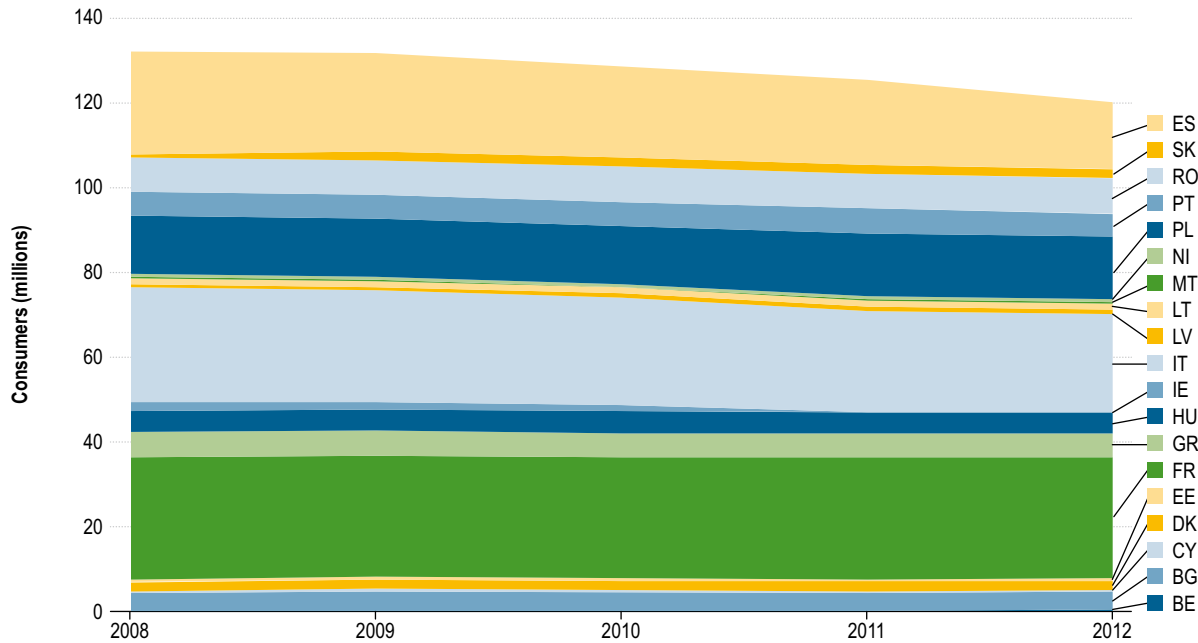
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44 The ACER questionnaire on end-user price regulation was sent to NRAs in March 2013. Twenty-one countries replied to the questionnaire, of which 11 still have price regulation in place. Information on other countries with price regulation was taken from the National Reports, CEER national indicators or NRAs.

45 Held on 30 and 31 May 2013 in Milan.

46 Price regulation is applied in the following 18 countries: Belgium, Bulgaria, Cyprus, Estonia, Denmark, France, Greece, Hungary, Italy, Latvia, Lithuania, Malta, Northern Ireland, Poland, Portugal, Romania, Slovakia and Spain. Austria, the Czech Republic, Finland, Germany, Ireland, Luxembourg, the Netherlands, Norway, Slovenia, Sweden and Great Britain do not apply price regulation.

Figure 10: Number of electricity household consumers supplied under regulated prices in the EU-27 – 2008 to 2012 (millions)



Source: ACER, based on CEER national indicators database (12/9/2013)

Note: For Latvia, Malta and Northern Ireland, 2011 data are used in this figure for 2012.

- 79 The different price-setting rules and methodologies across countries with price regulation affect retail market conditions in different ways. Therefore, these differences have to be taken into consideration when drawing conclusions about the impact of price regulation on market developments and when making recommendations to improve retail market design.
- 80 The remainder of this section presents the application of price regulation to different customer segments, the methodologies applied by the MSs, the different regimes in place with regards to switching in and out of regulated prices and the level of regulated prices compared to market prices. Finally, it assesses proposed roadmaps in line with which regulated prices should be abandoned.

### 2.5.1 Application of price regulation

- 81 The various customer groups that are eligible to be supplied under regulated prices differ substantially across MSs.
- 82 In all MSs applying price regulation in 2012, except for Belgium, more than 50% of all household consumers were supplied under regulated prices (Table 4). In most MSs, this degree of coverage remained mostly unchanged compared to 2011. However, in addition to Ireland, where price regulation was abandoned, in Spain, Denmark, Italy, Northern Ireland and Portugal, the number of consumers supplied under regulated prices decreased by 15%, 5%, 5%, 7% and 4%, respectively.
- 83 The definition of household consumers with special needs differs widely across MSs, which implies that the percentage of consumers with special needs in the total number of household consumers also shows significant differences. In 2012 in Malta, 12% of all household consumers were defined as consumers with special needs, while in Spain they represented 10% of all household consumers supplied under regulated prices. In France, Greece and Italy, they represent 4%, and in Cyprus 3% of consumers under regulated prices (Table 4).



Table 4: Retail electricity price regulation for household consumers across Europe – 2011 and 2012

Country	% of households with regulated prices		% of households with social tariffs	
	2011	2012	2011	2012
Belgium	7.6%	8.4%	7.6%	8.4%
Bulgaria	100.0%	100.0%	0.0%	0.0%
Cyprus	100.0%	100.0%	5.6%	3.4%
Denmark	85.0%	80.0%	0.0%	0.0%
Estonia	100.0%	100.0%	0.0%	0.0%
France	94.0%	93.0%	2.2%	3.9%
Greece	98.7%	99.9%	4.3%	4.4%
Hungary	99.6%	98.3%	0.0%	0.0%
Italy	83.4%	80.0%	3.5%	3.3%
Latvia*	97.4%	97.3%	9.6%	9.7%
Lithuania	100.0%	100.0%	0.0%	0.0%
Malta*	100.0%	100.0%	13.2%	12.4%
Northern Ireland*	97.4%	89.8%	0.0%	0.0%
Poland	99.9%	99.5%	0.0%	0.0%
Portugal	94.5%	90.2%	1.5%	1.4%
Romania	100.0%	100.0%	14.0%	13.3%
Slovakia	100.0%	100.0%	0.0%	0.0%
Spain	74.4%	59.4%	10.2%	9.5%

Source: The CEER national indicators database (2013)

Note: \* refers to the previous year. For Belgium, price regulation for households under social tariffs in place from April to December 2012 is considered in the figure.

## 2.5.2 Types of price regulation

- 84 All NRAs that replied to the questionnaire and provided information in the CEER database mentioned a market-reference price in their calculation methodology for all customer groups supplied under regulated prices. The exceptions to this are so-called vulnerable consumers and/or those supplied under social tariffs. Most of the regulated prices of these consumers are not linked to any market references.
- 85 Although all MSs use a link to market references in their methodologies, the application and details of what is included differs between MSs.

### Types of price regulation and length of the regulatory period

Under price regulation, prices offered to end users are subject to regulation or control by a public authority (e.g. government or NRA) rather than determined exclusively by supply and demand. Although price regulation can take different forms, most EU MSs apply a price cap, revenue cap or rate of return price regulation. Also, different lengths of the regulatory period between each revision of tariffs are applied.

**Price cap** regulation sets a cap on the price that regulated companies can charge. The cap is set by taking into consideration the rate of inflation and expected efficiency savings (i.e. X). Price cap regulation is sometimes called 'CPI – X' or 'RPI - X' after the basic formula applied to set price caps measured by the Consumer Price Index (CPI) or Retail Prices Index (RPI). It is designed to provide incentives to regulated companies to increase their efficiency.

**Revenue cap** regulation seeks to limit the amount of total revenue received by a regulated company. Like price cap regulation, revenue cap regulation is determined according to inflation (CPI or RPI) and the efficiency savings factor. It too is designed to provide incentives to regulated companies to increase their efficiency.

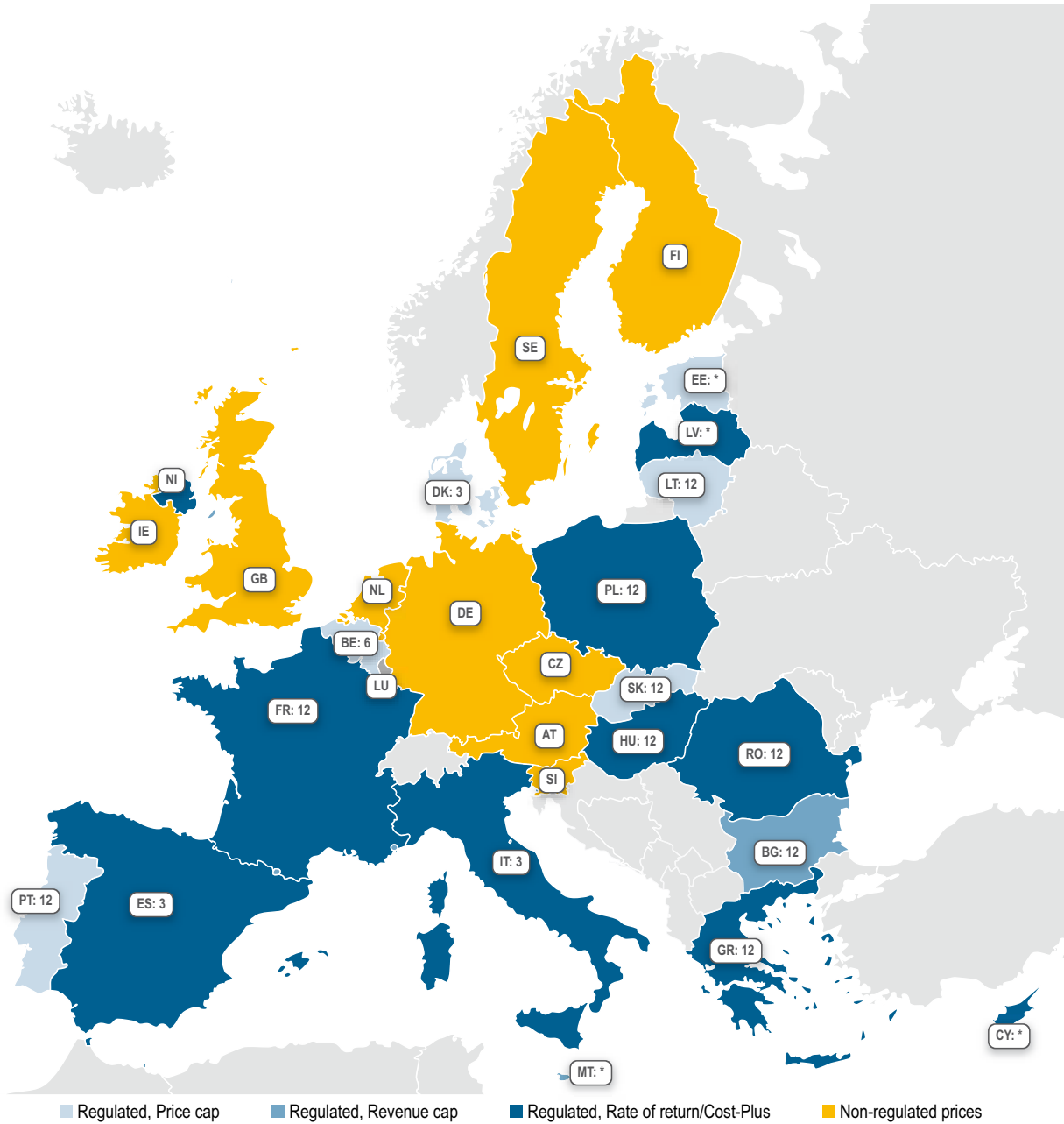
**Rate of return/Cost plus** regulation aims to set a price which allows the regulated company to cover all its costs and earn an adequate return for its owners. In these schemes, the regulated company does not earn more if costs are reduced.

**The regulatory period** can be defined as the period over which the parameters of the price control formula are fixed and therefore tariffs remain unchanged or follow a predefined path. At the end of each regulatory period, the relevant public authority will determine the appropriate change for the price control formula.

In general, when deciding on the length of the regulatory period, a trade-off must be made between objectives of productive efficiency and allocative efficiency.

- 86 Figure 11 shows that 11 out of the 18 MSs with the regulated energy component in electricity prices apply a rate of return/cost plus regulation (i.e. Cyprus, France, Greece, Hungary, Italy, Latvia, Malta, Northern Ireland, Poland, Romania and Spain). Price cap regulation is applied in five out of 18 MSs (i.e. Denmark, Estonia, Lithuania, Portugal and Slovakia). Bulgaria regulates end-user prices by applying the revenue cap regulation for end suppliers and distribution companies.

Figure 11: Price regulation method and frequency of energy component updates (months) in Europe – 2012



Source: CEER national indicators database and ACER questionnaire on regulated prices (2013)

Note: The frequency with which MSs update the prices is presented in months next to the country code. For example, in France, prices are updated annually. \* Cyprus, Latvia and Malta update on an ad hoc basis and Estonia whenever the supplier seeks a new price. In Portugal, transitory tariffs introduced in July 2012 for households with contracted power equal to or greater than 10.35 kVA, are updated quarterly.

- 87 It is worth noting that there are methodologies that may not qualify as price regulation, but might have an effect on prices in retail markets. For instance, in the Netherlands, ACM does not ex-ante approve regulated prices, but assesses ex-post whether prices are 'reasonable' by using an undisclosed model. Whenever tariffs are judged unreasonable, ACM is legally competent to intervene and set the price at a particular level. ACM has never set prices, although in some cases (i.e. in less than 1% of all retail offers) it has challenged new supply offers. In those cases, suppliers chose to revise the price voluntarily, so ACM did not need to set any retail prices directly.
- 88 MSs update sourcing costs (i.e. energy purchased in the wholesale market to fulfil the contractual obligations of the retail consumers) of the regulated retail prices regularly, based on wholesale market prices (Figure 11). A MS striving for cost-reflective regulated tariffs and higher consumer engagement might decide to align the energy component in the regulated tariff with the wholesale market price more frequently. By doing so, the chance that consumers will remain with a regulated tariff will be reduced, as it will no longer be perceived as more stable than non-regulated prices. Moreover, the regulated tariff will become more reflective of the wholesale market energy price, reducing the possibility of a subsidised price.
- 89 Belgium, Denmark, Italy and Spain adjust their prices every quarter. France Greece, Hungary, Lithuania, Poland, Portugal, Romania and Slovakia update them annually. In Cyprus, sourcing costs are updated on an ad hoc basis whenever the wholesale market shows significant changes. In Estonia, Latvia and Malta, prices are updated as often as needed, meaning 'when the company or NRA requests it'. In Belgium, the social tariff is regulated by the NRA CREG for six months. On the one hand, regulated social tariffs are applied for 'eligible' final consumers, and on the other hand, a different regulated tariff is applied for consumers in default of payment or 'dropped consumers'<sup>47</sup>.

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47 Dropped consumers are consumers that are, for example, not able to pay their bills and are therefore dropped by their supplier. As a consequence, they are typically supplied by the supplier of last resort.

## Case Study 1: Monitoring retail energy prices in Belgium

In 2012, CREG increased its focus on the retail energy market by extensively expanding its monitoring activities.

The main objectives of this extensive monitoring task were to:

- Increase transparency in both retail gas and electricity prices;
- Make consumers aware of the potential benefits to be reaped in the retail energy market; and
- Improve the link between the expectations of suppliers with regards to price developments and reality.

Based on a study<sup>48</sup> by CREG on the levels and evolution of electricity and gas prices in Belgium and an international benchmarking study<sup>49</sup> comparing energy prices in neighbouring countries, it appeared that Belgian end users, particularly households, were, in general exposed to higher prices than those observed in neighbouring countries, especially with regard to the commodity component (both electricity and gas). This was mainly due to the fact that most suppliers were still using indexation parameters which were no longer relevant (e.g. gas retail prices linked to oil prices) and lacked transparency (e.g. highly complicated formulas in retail contracts). Overall, price formation in the retail market was dysfunctional, giving rise to high margins.

In view of the above-mentioned study and other CREG monitoring reports, the Belgian government decided to introduce a 'safety net' regulation<sup>50</sup>, including a temporary nine-month price freeze (April 2012–December 2012). This freeze gave CREG time to organise, scrutinise all retail offers and contact market participants. On 1 January 2013, the price cap was removed and detailed monitoring of retail prices was introduced. CREG's monitoring powers have been strengthened and market transparency has improved.

Two distinct categories of tariff formula are used in Belgium: variable pricing and fixed pricing. The specificity of pricing formulas for variable pricing is that they are based on indexation parameters adjusted on a monthly basis. Until December 2012, variable energy prices in Belgium were adjusted every month and, as a result, end-consumers saw prices change on a monthly basis within the same contract.

From 1 January 2013 to 31 December 2014<sup>51</sup>, the retail energy market in Belgium will be subject to safety net regulation. The latter not only tackles the issue of price volatility, but also the complexity of pricing formulas through the following:

- Indexation is now subject to CREG supervision. Indexation is limited to four times a year (at the beginning of each quarter) and, as such, is no longer possible every month.

48 <http://www.creg.info/pdf/Studies/F1134NL.pdf> - <http://www.creg.info/pdf/Etudes/F1134FR.pdf>

49 Frontier Economics, 'International comparison of electricity and gas prices for households', prepared for CREG, October 2011, see: [http://www.creg.be/pdf/NewsOnly/111026-Frontier\\_Economics-International\\_Comp\\_HH\\_Energy\\_Prices.pdf](http://www.creg.be/pdf/NewsOnly/111026-Frontier_Economics-International_Comp_HH_Energy_Prices.pdf)

50 Safety net regulation became part of legislation on 8 January 2012 and was then adapted through a series of modifications in March and August 2012.

51 As provided in the law on safety net regulation, CREG and the National Bank of Belgium have to draft an evaluation report regarding the safety net regulation by 30 June, 2014 at the latest. Based on this report, the government can decide to extend the safety net regulation for a period of three years.

- Checking the indexation formulas used by suppliers against a list of criteria set by royal decree to obtain transparent parameters linked to energy exchanges instead of those developed by suppliers, which were often linked to their own production and operational criteria. With the introduction of market-based variables for pricing electricity and gas, the decoupling of gas prices from oil prices was also introduced. CREG approves both the parameters and their values.
- Enabling on-going comparison of energy prices in Belgium with prices applied in neighbouring countries (i.e. the Netherlands, Germany and France). This comparison is carried out by CREG and is used to analyse price increases announced by suppliers. All planned price increases which are not directly linked to the evolution of indexation parameters have to be motivated by the supplier in an ex-ante procedure. CREG checks that the announced price increase is justified, taking into account the justifications provided by the supplier and a comparison of the announced price with energy prices in neighbouring countries. CREG can ultimately reject the announced price increase.

Based on the database of all tariff formulas offered by suppliers to household consumers and SMEs, CREG publishes a monthly report that provides an overview of all electricity and gas prices, and all relevant changes in the previous month. This report receives monthly press coverage.

In addition to the above-mentioned changes in pricing formulas, other legislative measures were implemented in order to eliminate barriers to consumers actively participating in the retail market. These measures include:

- a The contract termination period is limited to a maximum of one month for all consumers and all contracts;
- b Suppliers are no longer allowed to charge exit fees for contract termination;
- c The final (yearly) bill is not payable by direct debit. Payment has to be explicitly approved by the customer; and
- d Suppliers must provide explicit communication to consumers about all changes in contract conditions.

According to CREG, these measures should contribute to more positive consumer perception of retail energy markets.

Furthermore, in 2012 several media campaigns were launched to raise consumer awareness of the opportunity to become more active in the retail energy market, to encourage them to use price comparison tools, and to be aware of potential savings from switching.

The increasing consumer awareness, coupled with the above-mentioned changes to the legislation, have led over the past year to a significant increase in switching rates, and resulted in the loss of incumbent market share (up to 10% loss in market share for Electrabel in 2012) to smaller and new suppliers.

### 2.5.3 Body responsible for setting regulated price

- 90 Based on the eleven responses to the questionnaire and additional CEER data, NRAs are responsible for setting and/or approving regulated prices in the following MSs: Bulgaria, Cyprus, Denmark, Estonia, Italy, Latvia, Lithuania, Malta, Poland, Portugal, Romania and Slovakia. This is the responsibility of the government or ministry in the other five MSs in which price regulation is applied (i.e. Belgium, France, Greece, Hungary and Spain). In the case of Italy, the NRA is also responsible for monitoring.
- 91 Even where NRAs do not set prices, they monitor regulated prices and report on the level of prices in many MSs (Belgium, Greece, Latvia, and Lithuania). In three MSs, France, Greece and Spain, the NRA provides a consultative opinion only. In Spain, the NRA gives a consultative opinion after receiving a proposal from the government regarding the access and energy components of the end-user regulated price. It computes the cost of energy according to the rate-of-return methodology and sends it to the government, which publishes the energy component to be included in end-user regulated prices. In Hungary, the role of the NRA in 2012 was limited to making a non-binding proposal to the price-setting authority price levels<sup>52</sup>.
- 92 The NRA decides on the removal of regulated prices only in Cyprus and Poland. In all other MSs, this is the responsibility of the ministry or parliament and, therefore, remains a political decision.

### 2.5.4 Switching in and out of regulated prices

- 93 The possibility for consumers to switch in and out of regulated prices as often as they wish can affect their switching behaviour. When consumers perceive regulated prices as more stable, fair and safe compared to market offers, their willingness to switch away from regulated prices may be low if they are not allowed to switch back in, after switching out of regulated prices.
- 94 Allowing consumers a free choice of alternative supplier is a precondition for switching. Furthermore, a typical measure that an MS with regulated prices could take to increase the willingness to switch is to issue a measure that allows unlimited switching in and out of regulated tariffs.
- 95 Table 5 shows different regimes in the 18 MSs with regulated prices, based on the possibility of unlimited switching in and out of regulated prices. Countries are grouped on the basis of the formally established possibility for consumers to move away from and back into the regulated price against: (i) the MSs 2012 household switching rates; (ii) proportion of household consumers covered by regulated prices; and (iii) the frequency of updates of the regulated price, all of which were analysed above. These three dimensions are a measure of the gravity of the level of price regulation applied in the 18 MSs. Four stages of gravity are shown in different colours in the table below.

52 These prices, set by ministerial decree, comprise the energy component of the total price. Since April 2013, the Hungarian NRA has had the right to issue a decree on network charges. Prior to that, the network charges were set by an NRA resolution.

Table 5: Focus on price regulation regimes – switching in and out of regulated tariffs, scope, coverage, price update frequency and switching rates for household consumers – 2012

MS	Switching in and out allowed	% of household customers under regulated prices in 2012	Customer segments covered by regulation	Frequency of price updates (months)	2012 switching rate for household consumers
Belgium*	✓	8%	1/4	6	14.8%
Portugal	✓	90%	2/4	12	13.2%
Spain	✓	59%	3/4	3	11.6%
Denmark	✓	80%	2/4	3	3.7%
Italy	✓	80%	2/4	3	6.4%
Northern Ireland	✓	90%	2/4	NA	2.0%
France	✓	93%	4/4	12	3.6%
Poland	✓	99%	2/4	12	0.6%
Greece	✓	100%	3/4	12	4.0%
Slovakia	✓	100%	2/4	12	5.0%
Latvia	✓	97%	1/4	Whenever needed	0.0%
Hungary	✓	98%	2/4	12	1.6%
Bulgaria	✓	100%	2/4	12	0.0%
Lithuania	✓	100%	2/4	12	0.0%
Romania	Only switch out	100%	4/4	12	0.0%
Estonia	Only switch out	100%	4/4	Whenever a supplier seeks a new price	0.0%
Malta	X	100%	4/4	Whenever needed	NA
Cyprus**	X	100%	4/4	Ad hoc	0

Source: ACER, based on CEER national indicators database (2013) and ACER questionnaire on regulated prices (2013)

Notes: \* The information on Belgium refers to consumers under social tariffs. \*\* In Cyprus, consumers can switch only between regulated prices.



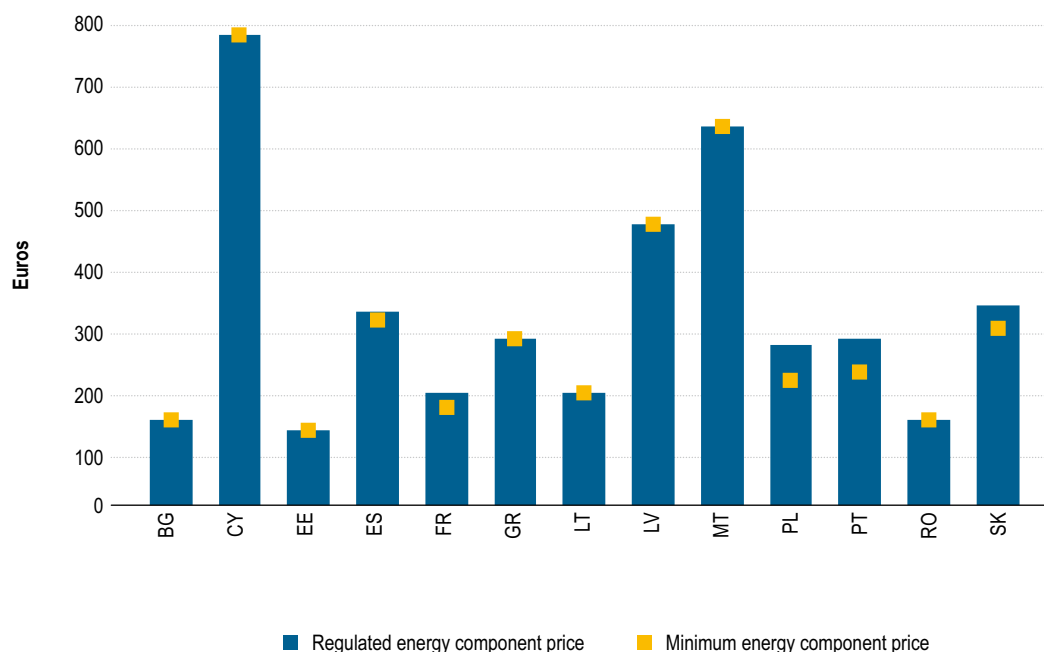
- 96 In all but four MSs (e.g. Cyprus, Estonia, Malta and Romania) consumers are allowed to switch in and out of regulated prices as often as they wish. Malta and Cyprus offer no choice to opt out of the regulated price. Estonia and Romania allow only switching out, not switching back; this clearly creates concerns among the consumers resulting in 0% switching rates. In Portugal, high switching rates coincide with the introduction of transitory tariffs introduced partially to households in the second half of 2012. In the first half of the year, all consumers were able to switch in and out of the regulated prices, whilst from July 2012 onwards, consumers with contracted power equal to or greater than 10.35 kVA were automatically transferred to transitory tariffs and may only switch out. In Latvia, Hungary, Bulgaria and Lithuania switching in and out is allowed, but the regulated price is either set below cost or simply so low that consumers see no benefit from switching. In countries where all preconditions for consumer switching are met (i.e. the top group) switching rates are higher. These ten MSs recorded an average switching rate of 6.5% for electricity household consumers. Allowing consumers to switch in and out of the regulated price as often as desired and not demotivating consumers with a regulated price that does not cover the costs of electricity supply is therefore a prerequisite for switching.
- 97 An example of improving switching rates by removing limitations on opting in and out is France. In the past, France allowed switching back to the regulated price only under certain conditions. Currently, only households and small industrial consumers (lower than 36 kVA) can switch in and out of regulated tariffs at any time and as often as they wish. For bigger industrial consumers (above 36 kVA) this is only possible under certain conditions<sup>53</sup>
- 98 It is recommended that MSs which wish to open their markets and increase consumer engagement allow opting in and out of the regulated prices, and set their prices at least equal to or above cost.

### 2.5.5 Level of regulated prices compared to market prices

- 99 Eight MSs (Denmark, France, Greece, Hungary, Italy, Latvia, Lithuania and Spain) reported that the level of regulated prices is similar to that of market prices (ranging between plus and minus 5% of the market price). In Poland, the regulated price is higher than the average market price. The same applies to the regulated price for 'dropped consumers' in Belgium.
- 100 In the majority of the MSs, market prices tend to settle near the regulated price, which clearly shows the influence of regulated prices on market prices. As an illustration, Figure 12 shows that the price spread between the regulated price and the cheapest offer for household consumers in the market is very low. The price spread is zero in Bulgaria, Cyprus, Estonia, Greece, Latvia, Lithuania, Malta and Romania. The highest price spread can be observed in Poland (61 euros per year or 23% of the incumbent offer) and Portugal (56 euros per year or 20% of the incumbent offer). Figure 12 implies that, in most cases, the lowest market price is set close to the regulated price, which might also reflect the cost of supply. As a consequence, the propensity to switch from regulated prices to market prices is typically low, as the saving potential is limited. This might hinder the development of competition.

53 For industrial consumers with contracted power of over 36 kVA, the conditions are different and the available options depends on the customer's situation: (i) if industrial consumers were supplied under a contract at a market-based price before the NOME law (7 December 2010), they can no longer switch back to regulated prices; (ii) if industrial customers were under a contract at a market-based price after the NOME law, until December 2015 and on condition that they stay at a market-based price contract for one year, they can switch back to regulated prices, but on condition that they stay for a minimum of one year; (iii) if the industrial consumer is currently supplied under the regulated tariff, he/she can either keep contract until December 2015, or change it to a market-based price contract, and switch back to regulated prices, but after having stayed for a minimum period of one year under the market-based price contract.

Figure 12: Energy component spread for a selection of countries with regulated prices – 2012 (euros)



Source: ACER retail database (December 2012)

### 2.5.6 Roadmaps for abandoning price regulation

101 As previously indicated, end-user price regulation might impact retail market competition. The 2<sup>nd</sup> Package<sup>54</sup> foresaw open markets for all consumers. This is why, in the long term, prices that are solely determined by supply and demand should be the aim for every MS. However, even six years after liberalisation, retail markets across Europe are still held back by end-user price regulation. Merely six (Denmark, Latvia, Lithuania, Poland, Portugal and Romania) out of the 18 MSs which are still applying price regulation in the household sector reported to have a roadmap for abandoning price regulation for household consumers. Estonia abandoned price regulation for all customer segments in January 2013.

102 In Lithuania, the roadmap approved by the government envisages the removal of price regulation for all consumers, except vulnerable consumers, by 2015. Portugal gradually abandoned regulated prices for domestic consumers between July and December 2012, even though transitory regulated tariffs will be set until the end of 2015. After 2015, only vulnerable consumers will be supplied under regulated prices. In Romania, the roadmap for phasing out regulated tariffs was approved in March 2012. The regulated tariff phase-out for non-household consumers began in September 2012. The same process started in July 2013 for households. By the end of 2013, regulated prices will be entirely abandoned for non-household consumers, while this will be done for household consumers by the end of 2017. Although there is no roadmap currently in place in Cyprus and Greece, these MSs are supposed to remove regulated prices when 'a sufficient level of competition is achieved'.

## 2.6 Conclusions and recommendations

- 103 The demand for electricity in the EU in 2012 remained almost at the 2011 level.
- 104 Substantial disparities in price levels persisting across the EU MSs and Norway are relatively smaller for industrial consumers compared to households. The trend in rising prices for household and industrial consumers since 2008 continued in 2012.
- 105 The differences in retail prices across countries are to a large extent explained by the retail price regulation regimes, competition levels in the retail markets, network charging methodologies in use by NRAs at the TSOs and/or the DSOs level and taxation regimes. In most countries, prices are driven by taxation and network charges. Over the last few years, non-energy-related charges have significantly increased in many MSs, particularly as a result of costs related to RES support schemes. As high non-contestable charges reduce the suppliers' playing field and thus disengage them from entering a market, these charges should be set at appropriate levels.
- 106 No harmonised approach in retail markets could be found across Europe. In any case, transparency of all components included in the total price should be enhanced to increase consumer awareness and foster switching. Especially in the case of RES charges, significant scope for improvement exists, as the RES charges are not always identified as a separate component on energy bills and are often hidden in taxation, the network or the energy component.
- 107 In 2012, the European retail markets show limited signs of foreign supply-side presence, and in many MSs the incumbent presence in the market remains dominant, after half a decade or more of opening the market.
- 108 The main barriers to the integration of retail electricity markets are consumer switching behaviour, retail price regulation (energy component and/or retail margin), regulatory frameworks and the lack of adequate unbundling, with consumer behaviour playing the most important role. To enhance consumer empowerment and trust, and consequently consumer switching, tools for easily accessible and reliable comparisons of offers should be made available, following guidelines designed by an independent authority such as NRAs. Despite the significant consumer savings potential in MSs, switching rates remain low on the whole, especially in countries with price regulation. This is further exacerbated by the comfort-zone which regulated prices are perceived to provide. Lastly, the CEER report<sup>55</sup> shows that unbundling at DSO level remains insufficient.
- 109 To improve consumer switching behaviour and awareness, NRAs should be actively involved in setting up and enforcing the prerequisites for switching, such as transparent and reliable online price comparison tools, guidelines for preparing suppliers' offers, screening of abuses and corrective measures. Furthermore, NRAs should proactively advocate the establishment of switching procedures with a view to creating consumer awareness of switching.
- 110 A majority of European countries (18 out of 28) still apply regulated prices to household consumption, keeping about half of EU households under regulated prices since 2008. In these countries, market prices tend to settle near the regulated price.

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55 See footnote 43.

- 111 In order to promote market entry further, which will have an effect on competition and price levels in the market, MSs should follow good practices by: (i) allowing free opting in and out of regulated prices; (ii) setting the regulated price at least equal to or above cost; and by (iii) updating the regulated price to reflect the sourcing cost as much and as frequently as possible. In this way, they can facilitate the development of retail competition, which will in turn create the conditions for the removal of regulated prices.

## 3 Wholesale electricity markets and network access

### 3.1 Introduction

- 112 The creation of the IEM requires the full integration of Europe's energy networks and systems with a view to promoting efficient and secure supply, also in the face of the transition to a low-carbon economy. Interconnectors connecting wholesale electricity markets play a vital role in ensuring that the internal European energy market is able to operate flexibly and efficiently (see Section 3.3 on gross welfare benefits of interconnectors).
- 113 However, the assessment of the level of market integration (see Section 3.2.1 on price convergence) and of the level of efficiency in the use of interconnectors (see Section 3.4.1 on interconnector utilisation analyses) show that some barriers to market integration still remain (Section 3.4), for two key reasons. The first reason is the inefficient use of existing transmission networks stemming from inefficiencies in cross-zonal capacity allocation, cross-zonal capacity calculation and the definition of bidding zones. The second is the lack of investments in electricity network infrastructure to support the development of cross-zonal trade between areas with excess supply and areas with excess demand. This chapter looks into the barriers to the efficient use of cross-zonal capacities.
- 114 In order to improve the use of existing capacities it is vital to implement a common, EU-wide cross-zonal approach to capacity allocation. This is the focus of the Agency's work in the areas of Capacity Allocation and Congestion Management for Electricity (CACM) and Electricity Balancing, with the development of binding rules at EU level through the Framework Guidelines/Network Code process and their early implementation through the Electricity Regional Initiatives process<sup>56</sup>. The aim of this work is to implement the so-called Electricity Target Model (ETM) to facilitate cross-border trade, a shared vision to improve the level of market integration between MSs.
- 115 The ETM aims at removing several barriers to market integration, as it envisages:
- a single European Price Coupling for the day-ahead timeframe, which should replace explicit auctions of cross-border capacity;
  - a single continuous trading platform in the intraday timeframe;
  - a single European platform for allocating and nominating long-term transmission rights; and
  - a flow-based allocation method in highly meshed networks.
- 116 In addition, the ETM for balancing envisages the use of a TSO-TSO model based on a Common Merit Order list for the exchanges of balancing energy across control areas. Efficient and liquid intraday markets and fully integrated balancing markets will not only facilitate the integration in the system of energy produced from RES, but also their integration in the market by progressively exposing them to the same responsibilities as conventional generators.

56 ACER (2012), 'Regional initiatives status review report 2012: The regional initiatives and the road to 2014', see: [http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Publication/ACER%20Regional%20Initiatives%20Status%20Review%20Report%202012.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Regional%20Initiatives%20Status%20Review%20Report%202012.pdf)

- 117 Cross-zonal capacity calculation and the appropriate definition of bidding zones are other important elements of an efficient electricity market. The CACM Framework Guidelines and the respective Network Codes provide for clear objectives in this area: (i) full coordination and optimisation of capacity calculation within regions; (ii) the use of flow-based capacity calculation methods<sup>57</sup> in highly meshed networks; and (iii) regular review of bidding zones. These processes aim to optimise the utilisation of the existing infrastructures and to provide the market with more cross-zonal capacity, enabling the cheapest supply to meet demand with the greatest willingness to pay in Europe, subject to the capability of the existing network.
- 118 In view of the above, this chapter assesses: (i) the level of market integration; (ii) the benefits stemming from the use of cross-border capacity; (iii) barriers to market integration, including the issue of loop flows; and (iv) network access for RES. This chapter also refers to the different features of the ETM in order to illustrate how it can contribute to removing the identified barriers to further the integration of the IEM.

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57 In the flow-based capacity calculation method, exchanges between bidding zones are limited by the maximum flows on the critical network elements and power transfer distribution factors.

## 3.2 Market integration

119 This section reports on the level of wholesale market integration. It presents price convergence and the evolution of Net Transfer Capacity (NTC) values<sup>58</sup>.

### 3.2.1 Wholesale price convergence

120 The convergence of wholesale electricity prices can be regarded as an indicator of market integration, even though the optimal level of market integration does not necessarily require full price convergence. This section focuses on day-ahead price convergence<sup>59</sup> for the period between 2008 and 2012. The scope of the analysis includes all bidding zones in the EU MSs<sup>60</sup>, Norway and Switzerland. It also assesses electricity forward prices for a limited number of forward products in the CWE region for the same period. For the purpose of the analysis, the countries were grouped into regions and price convergence was assessed both within each region and across the regions. Regions are defined in accordance with Annex I of Regulation (EC) No 714/2009 (OJ L 211, 14/8/2009), but have been modified<sup>61</sup> to facilitate the analysis<sup>62</sup> of price convergence (i.e. MSs and bidding zones belonging to different regions were included in one region only).

#### Price convergence within regions

121 Figure 13 provides an overview of the development of hourly price convergence within EU regions over the last five years. Most noticeable is the decline in full price convergence in the CWE region from 68% in 2011 to 50% in 2012 following the important increase in 2011 compared to 2010, due to the expansion of the CWE market coupling to Germany in November 2010. In addition, the number of hours with high price differentials (more than 10 euros/MWh) was considerably higher in 2012 (27%) compared to 2011 (16%).

58 NTC is the maximum exchange programme between two areas compatible with security standards applicable in both areas and taking into account the technical uncertainties on future network conditions.

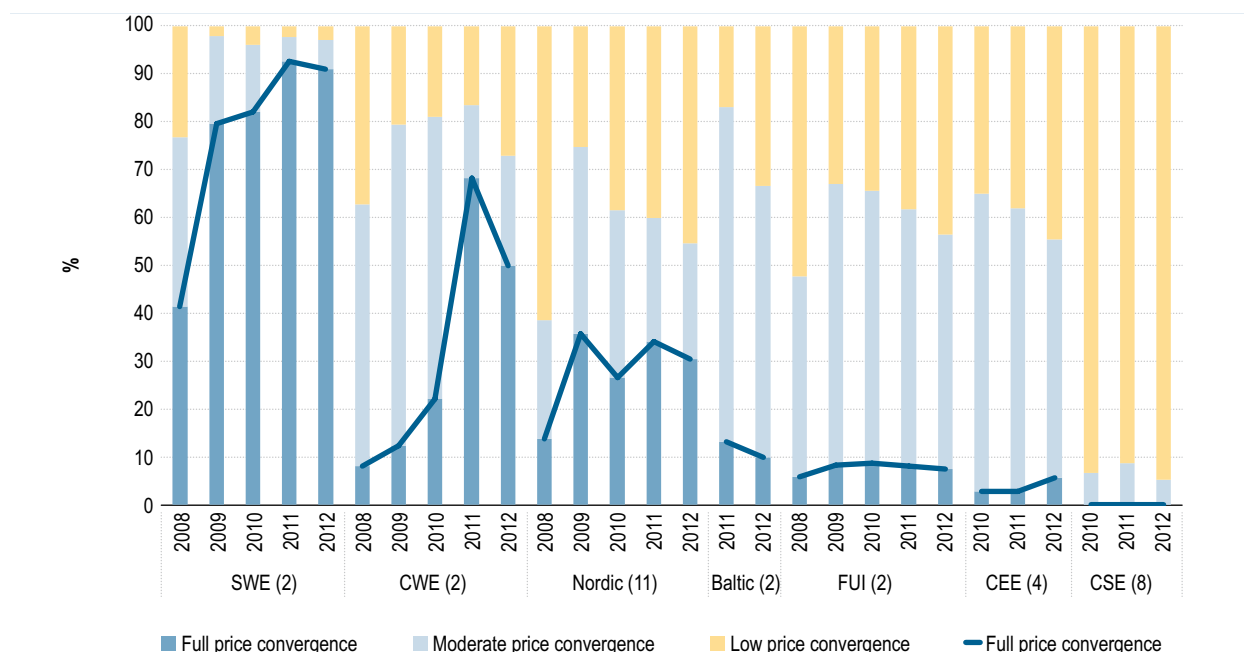
59 To assess the price convergence between GB and the Irish market half-hourly spot prices were used.

60 All EU MSs, excluding Malta, Cyprus, Bulgaria and Latvia, since day-ahead prices were not available in those MSs in 2012.

61 The definition applied in this section is therefore as follows: The Baltic region (Estonia and Lithuania), the CEE region (the Czech Republic, Hungary, Poland and Slovakia), the CSE region (Greece, Italy, Slovenia and Switzerland), the CWE region (Austria, Belgium, France, Germany, and the Netherlands), the FUI region (United Kingdom and the Republic of Ireland), Nordic (Denmark, Finland, Norway and Sweden) and the SWE region (Portugal and Spain). The SEE region was not included in the analysis, although the price convergence between Romania (SEE region) and the trilateral market coupling of the Czech Republic, Hungary and Slovakia (CEE region) is assessed in this report.

62 Price differentials are calculated as the hourly difference between the maximum and the minimum price of the assessed bidding zone prices. The results are presented as a percentage of all hours in three categories: the number of hours with a price differential: (i) of less than 1 euro/MWh (i.e. 'full price convergence'); (ii) from 1 to 10 euros/MWh (i.e. 'moderate price convergence'), and (iii) of more than 10 euros/MWh (i.e. 'low price convergence'). Note that the results are affected by the number of bidding zones in a given region (i.e. price convergence is easier to achieve in regions with fewer bidding zones).

Figure 13: Price convergence in Europe by region (ranked) – 2008 to 2012 (%)



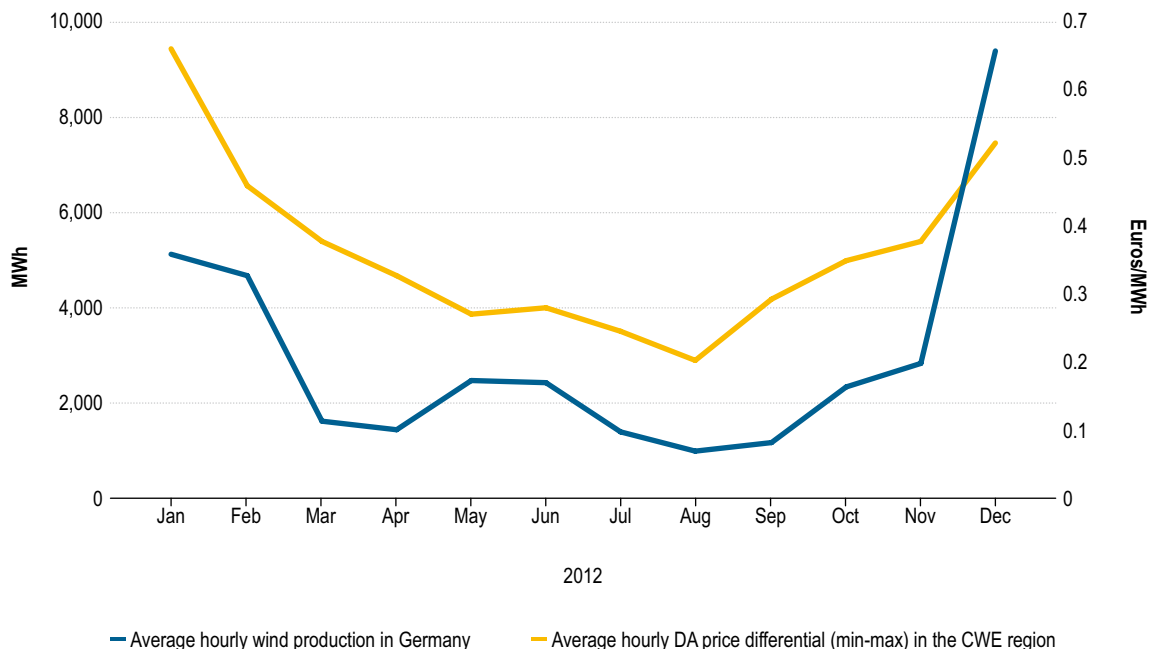
Source: Platts, PXs and data provided by NRAs through the Electricity Regional Initiatives (ERI) (2013) and ACER calculations

Note: The numbers in brackets, e.g. SWE(2), refer to the number of bidding zones per region included in the calculations.

122 The decreasing degree of price convergence in the CWE region in 2012 can be explained by a combination of factors. First, lower than usual prices were observed in the German market due to abundant wind and solar power generation in combination with competitive coal-fired generation (i.e. increasingly unfavourable spark spreads compared with dark spreads). The relation between wind production in Germany and price divergence in the CWE coupled area for the year 2012 is shown in Figure 14. Second, lower regional nuclear availability compared to 2011 in France and Belgium yielded more frequently higher prices in these two markets compared to Germany. For example, in the third quarter of 2012, the amount of nuclear power generation in France and Belgium was lower – by 10% and 20%, respectively – than in the same period in 2011. This contributed to a premium on French and Belgian prices compared to German prices. Finally, it is worth noting that the decrease in the degree of price convergence cannot be explained by the inefficient use of interconnections. Indeed, in 2012, the interconnectors within this region continued to be used efficiently (see Section 3.4.1 on the utilisation of the interconnectors).



Figure 14: Monthly average hourly wind production in Germany compared to price differentials in the CWE region – 2012 (MWh and euros/MWh)



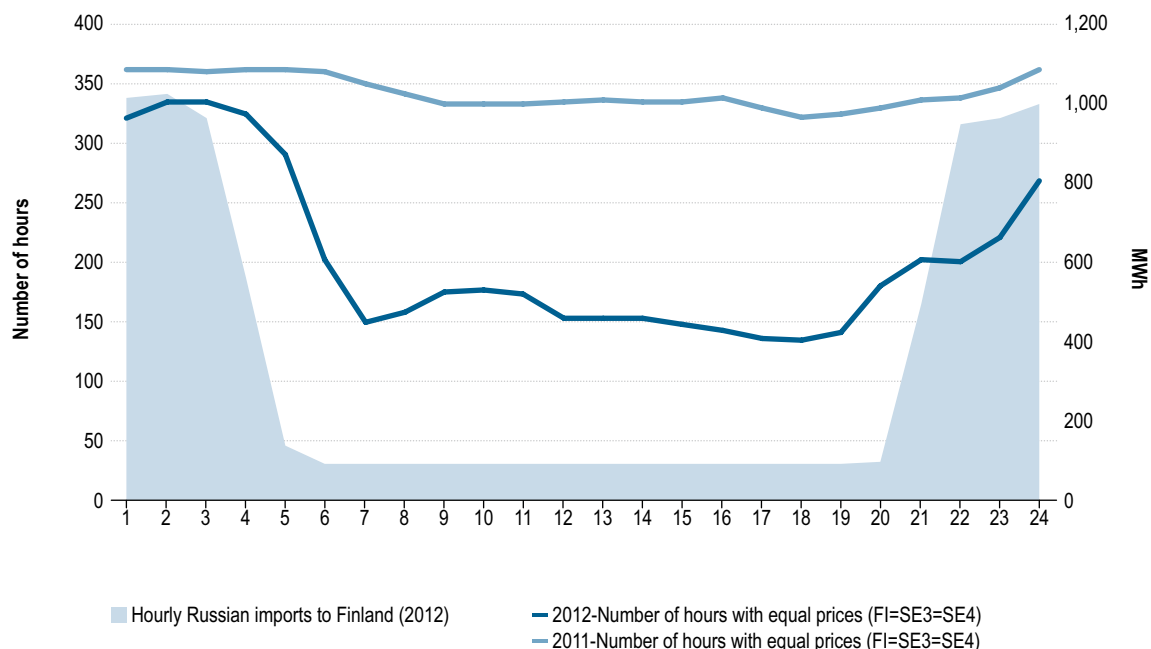
Source: Platts and German TSOs (2013) and ACER calculations

Note: The price differentials are calculated as the hourly difference between the maximum and minimum price of the bidding zones of the CWE region. In 2012, the lowest price was recorded in Germany for around 70% of the periods.

- 123 Forward price convergence in the CWE region seems to follow the same trend as day-ahead prices. For instance, following the inclusion of Germany in the CWE market coupling, the average price spread between the French and German year-ahead over-the-counter (OTC) contract decreased (on average) by more than 1.2 euros/MWh in 2011 compared to 2010, but increased by nearly 0.25 euros/MWh in 2012 with respect to 2011.
- 124 In the Nordic region, full price convergence decreased slightly from 34% in 2011 to 31% of all hours in 2012 (see Figure 13). Moreover, since 2009, the number of hours with a price differential exceeding 10 euros/MWh (low price convergence) has increased from 25% to 45% in 2012. The latter represents the highest value since 2008.
- 125 The reduced price convergence in the Nordic region is partly caused by developments in the Russian wholesale market. This impacted cross-border trade through the 1,400MW interconnector between Russia and Finland, in combination with insufficient transmission capacity to Finland from Norway and Sweden. Before 2011, prices in Finland ‘benefited’ from relatively low-priced Russian imports. However, these imports declined at the end of 2011, when Russia imposed export fees during peak hours. This led to an increase in Finnish prices, causing them to decouple from the prices in neighbouring Nordic zones during peak hours in 2012. The opposite was observed during most off-peak hours. Figure 15 illustrates the number of hours with equal prices between Finland and two bidding zones in Sweden (SE-3, SE-4<sup>63</sup>) in 2011 and 2012 compared to imports from Russia. During off-peak hours, prices converged while this was less the case during peak hours.

63 The largest interconnectors between Finland and Sweden are in the south, which is why price bidding zones SE-3 and SE-4 are included.

Figure 15: Representative hourly imports from Russia to Finland and the number of hours with full price convergence between Finland and Sweden (SE-3, SE-4) – 2011 and 2012 (hours and MWh)



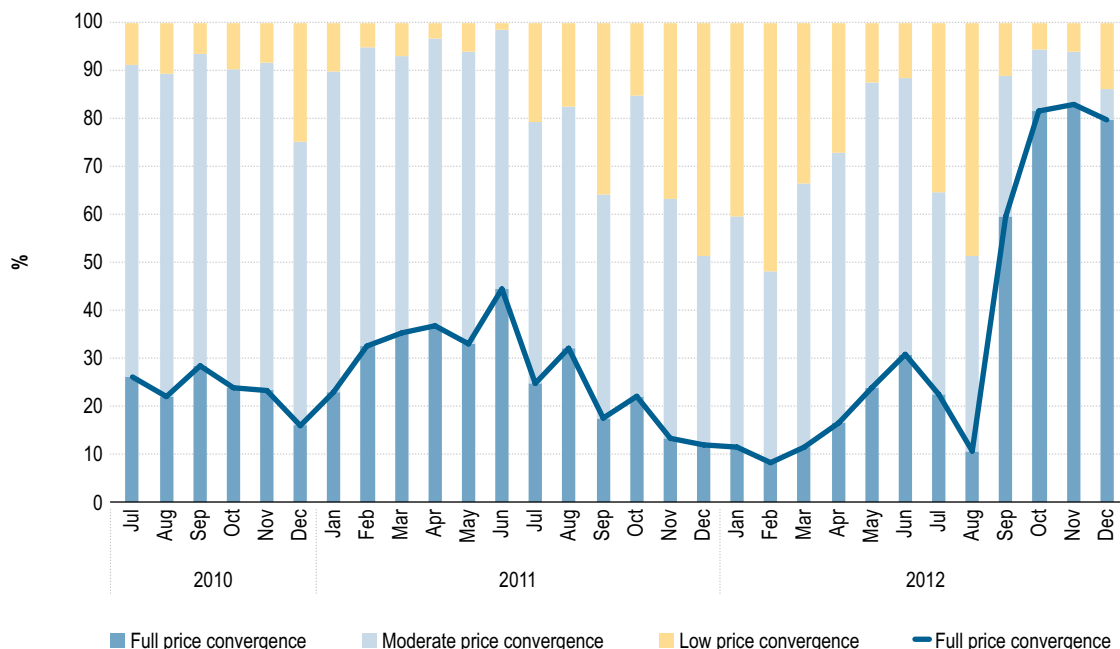
Source: Platts and Nord Pool Spot (2013) and ACER calculations

Note: A monthly assessment of the need for capacity in the Russian market is made by the system operator. In this assessment, peak load hours are forecast for the entire month, and the hours subject to the export capacity fees are set. As a consequence, the import patterns from Russia to Finland may change from one month to the other. The hourly imports shown in the figure were selected from a representative day, i.e. with a frequently observed import profile in 2012 (10 May).

- 126 The decoupling of Finnish and Swedish prices in 2012 was also caused by frequent outages of the FennoSkan1-line, a 1,350MW capacity interconnector between Finland and Sweden. Lastly, in 2012, hydropower production in Norway and Sweden exceeded average levels, which also contributed to the decoupling of the Finnish bidding zone in the Nordic region in 2012.
- 127 In the CEE region<sup>64</sup>, two cases should be distinguished: (i) the price convergence between the Czech Republic, Hungary and Slovakia, which increased from 11% to 82% after the extension of market coupling to Hungary on 12 September 2012; and (ii) the price convergence between the three coupled countries and Poland or Romania, recording, respectively, equal prices for merely 6% and 2% of all hours in 2012. The future extension of the trilateral market coupling to Romania should contribute to the increasing price convergence in the region.

<sup>64</sup> As explained above, the analysis for the CEE region is limited to Poland, the Czech Republic, Hungary and Slovakia. The other MSs which constitute part of this region within the Electricity Regional Initiatives are already included in other Regions for the analysis of price convergence.

Figure 16: Price convergence between the Czech Republic, Hungary and Slovakia – July 2010 to December 2012 (%)



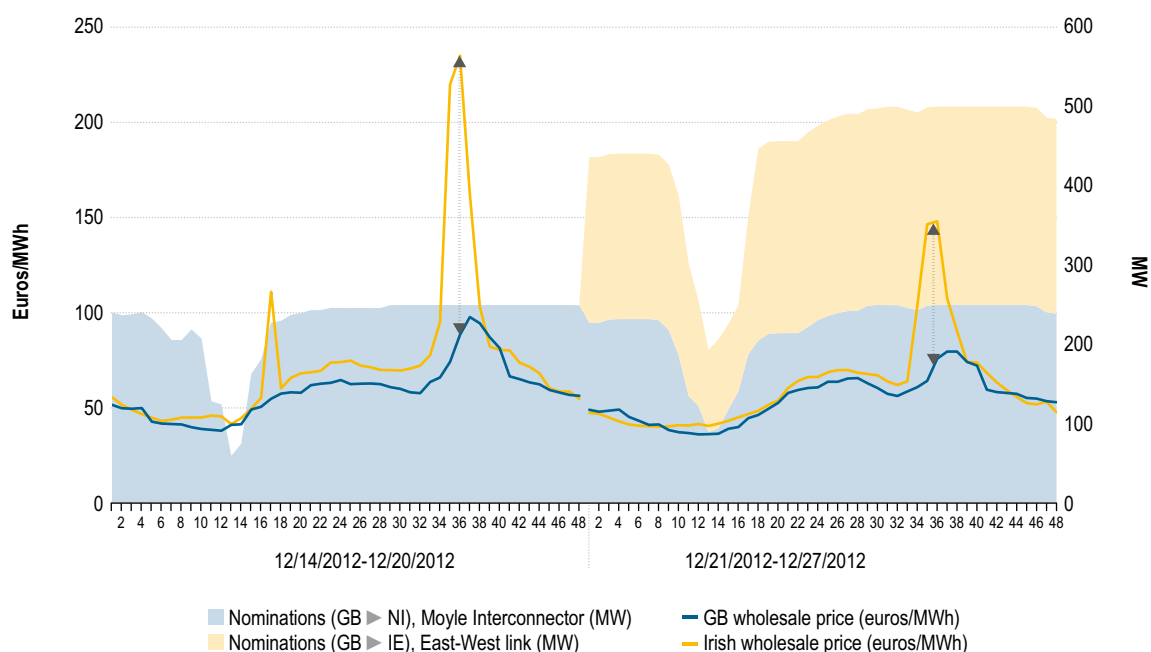
Source: Platts, OKTE and HUPX (2013) and ACER calculations

- 128 Within the SWE, CSE and the Baltic regions, no significant changes were observed in 2012 compared to 2011. The Iberian market featured a similar price convergence level in 2012 and 2011, with full price convergence in 91% of the hours in 2012. In the CSE region, overall full price convergence remained low, especially when Greece and Switzerland are included in the analysis. Implementation of market coupling between Slovenia and Italy (north) in 2010 increased full price convergence from 2% of all hours in 2010 to 20% in 2011. In 2012, full price convergence remained at almost the same level (i.e. 21%).
  
- 129 In 2012, the level of price convergence in the Baltic region remained low due to the lack of interconnection capacity between Lithuania and the other bidding zones covered by Nord Pool Spot (the energy exchange operating in the Baltic and Nordic regions). On 3 June 2013, a new bidding area covering Latvia was launched within Nord Pool Spot, allowing for the transmission capacity between Estonia and Latvia and between Lithuania and Latvia to be implicitly auctioned. The latter should contribute to improving price convergence in the region.
  
- 130 In the FUI region, full price convergence was reached 4% of all hours in 2012, which is comparable to 2011<sup>65</sup>. Since the market in Great Britain is not integrated with the Single Electricity Market (SEM), in the Republic of Ireland and Northern Ireland, the level of price convergence between the two islands has traditionally been low. However, in the last quarter of 2012, a slight reduction in the price spread between these markets has been observed, most probably due to the increased cross-border capacity provided jointly by the two interconnectors between Great Britain and Ireland, Moyle and East West. The first one (a 500MW interconnector) restarted in February 2012 after an interruption of several months as a result of a fault in the sub-sea cable. The second one (a 500MW link) came into operation only on 21 December 2012 and now offers more trading possibilities between Ireland and

65 A half-hourly price reference (i.e. APX-RPD) was considered for Great Britain, since SEM operating in Ireland features half-hourly prices.

Great Britain. Figure 17 shows the impact of the East West interconnector by presenting the average hourly price differences between the two markets during the weeks before and after the cable started to operate. It illustrates how a new interconnector can reduce the price spread between two markets: in the first week of operation, the average price spread during the peak hour (hour 19) dropped by 40 euro/MWh compared to the previous week.

Figure 17: Average half-hourly prices in Great Britain and SEM during the weeks before and after 21 December 2012 (the starting date of East West Link operations) (euros/MWh)



Source: Uregni, Ofgem, SEMO (2013) and ACER calculations

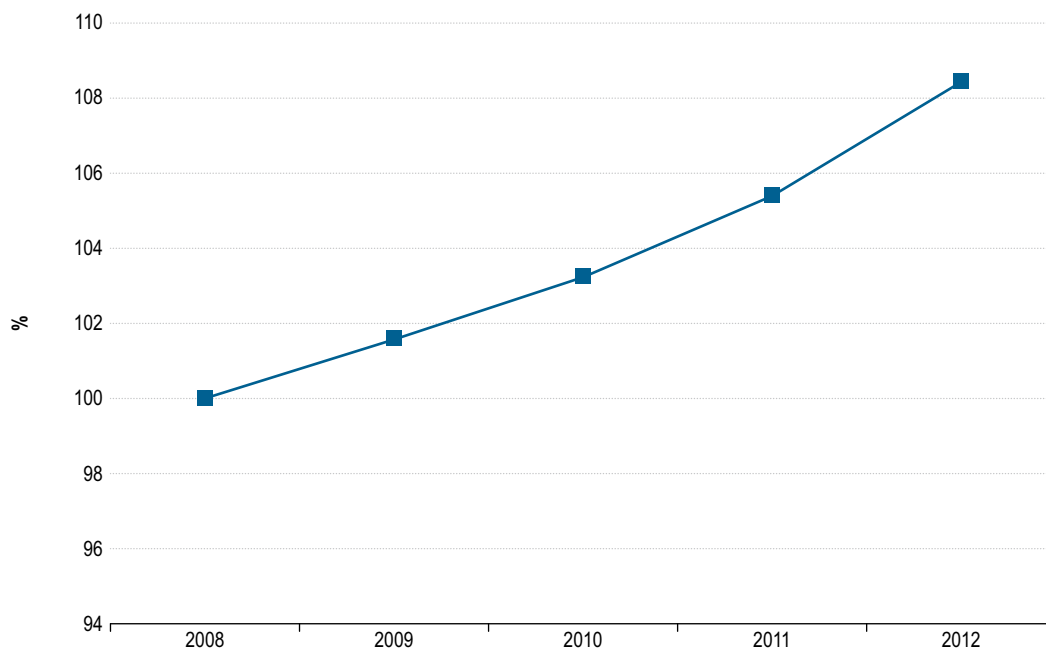
### Inter-regional price convergence

- 131 The pattern of low inter-regional price convergence in 2011 continued in 2012. In fact, in the case of the CWE and Nordic regions, price convergence further decreased in 2012 compared to the previous year. For instance, in 2012, Eastern Denmark (DK2) and Germany achieved full convergence 41% of the time, representing a 16% drop compared to 2011. Also, compared to 2011, price convergence between the Netherlands and Norway (NO-1 and NO-2) dropped by 8% i.e. from 17% to 9%.
- 132 A low level of price convergence is also observed up to and including 2012 between the British Isles and CWE (i.e. between Great Britain and France or the Netherlands), with equal prices in 2012 in less than 4% of the hours. The imminent market coupling of Great Britain with the CWE, Nordic and the Baltic region through the NWE Price Coupling initiative is expected to improve price convergence across all these regions.

### 3.2.2 Net transfer capacity

- 133 This section presents changes in NTC values over time. It indicates the cross-zonal capacity offered to the market for trade which can be regarded as an indicator of the potential for (further) market integration.
- 134 Figure 18 shows an aggregated NTC increase across 23 borders of nearly 9% (from 52.3GW to 56.7GW) since 2008<sup>66</sup>. Since almost half of that increase occurred due to the commissioning of the new cable between Great Britain and the Netherlands (BritNed cable)<sup>67</sup>, the overall evolution can be considered as a modest positive trend. It is worth mentioning that many factors<sup>68</sup> can affect NTC values and, therefore, conclusions about them should be drawn with some caution. Moreover, the increased cross-zonal capacities may render a higher level of market integration only if these extra capacities are utilised efficiently. This is assessed in Section 3.4.1.

Figure 18: Indexed yearly aggregation of hourly NTC values for a selection of 23 interconnectors (2008=100%)



Source: ENTSO-E, data provided by NRAs through the ERI (2013) and ACER calculations

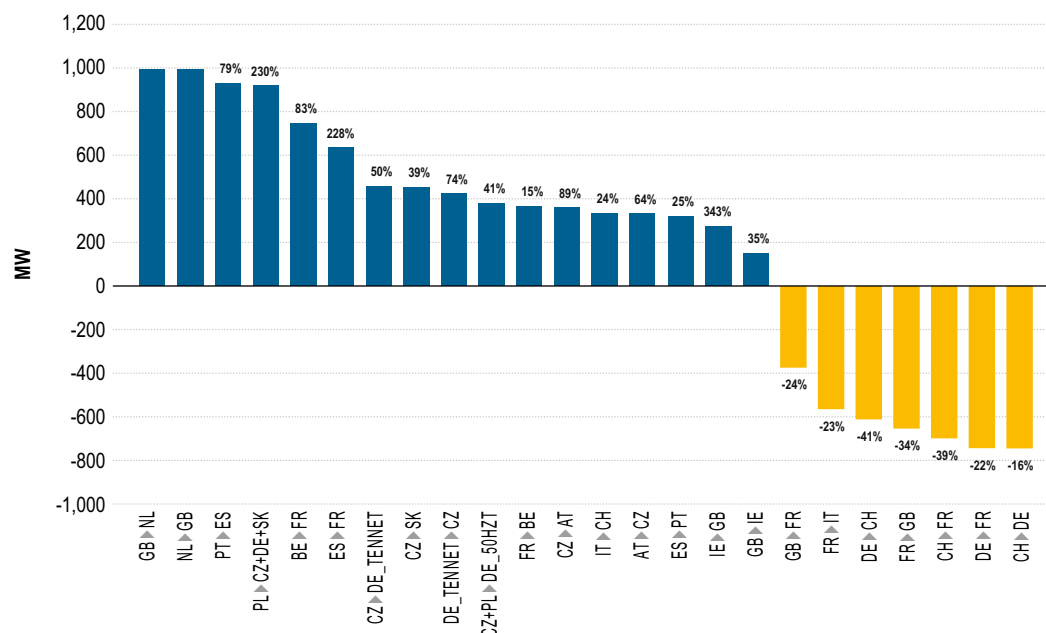
- 135 Figure 19 provides, for the same 23 borders, a border-by-border assessment of NTC changes between 2008 and 2012. Since each border comprises two directions, the results are presented by border direction. The figure displays only those directions which recorded significant changes. Hence, half of the 46 border directions have remained essentially unchanged since 2008.

66 Since the figure shows indexed yearly values, the seasonal variations of available capacity throughout the year cannot be appreciated in the figure. These variations are not relevant for the analysis within this section.

67 The BritNed cable was commissioned in 2011. However, Figure 18 does not show a remarkable increase in 2011. This was due to significant decreases in the NTC values of other borders in the same year (e.g. the IFA cable between Great Britain and France was frequently unavailable).

68 For instance, NTC values fluctuate due to the different expected capacity in summer and winter periods. They also change on a short-term basis as a result of production factors such as changes in wind speed, outages and (unforeseen) maintenance of power plants or internal grid outages. In addition, consumption factors, such as changes in demand, may affect the level of NTC values.

Figure 19: Change of the average hourly NTC values in 2012 compared to 2008 for a selection of border directions (MW)



Source: ENTSO-E (2013), data provided by NRAs through ERI (2013), Regional reporting on electricity interconnection management and use in 2008, and ACER calculations

Note: 46 border directions were initially included in the analysis. This figure shows only those directions where the observed variation was simultaneously higher than 150MW and the increase above 10% of the initial average value in 2008. The vertical axis represents the variation (MW), while the percentage variations are shown above each bar.

136 The most remarkable increases in cross-border capacity have been driven by network expansion investments:

- the BritNed cable between Great Britain and the Netherlands, which became operational on 1 April 2011, contributed with 1,000MW to the increase in cross-border capacity in Europe in the period 2008–2012;
- the East-West link between Great Britain and Ireland added 500MW to cross-border capacity in Europe;
- between the Czech Republic and Austria, a new line was commissioned in November 2008. This allowed for a significant increase in the cross-border capacity between these two MSs. This also had a positive effect on the Czech-Slovakian border, since the commercial exchanges between Austria and the Czech Republic contributed to relieve congestion between Slovakia and the Czech Republic;
- the interconnection between Portugal and Spain has also been significantly reinforced since 2008, allowing for an important increase in the commercial capacity, particularly from Portugal to Spain;
- the commercial capacity from Italy to Switzerland<sup>69</sup> has also increased since 2008, following the commissioning of two merchant lines between the two countries; and

68 69 However, the NTC value from Switzerland to Italy decreased as explained below.

- the increased capacity at the Belgian-French border (in both directions) is due to the completion of the reinforcement works in northern France (for which reason, 2008 was an historical minimum) and by the reinforcement of the interconnection between the two MSs in 2010.
- 137 Some other borders benefited from investments in the national grids, which allowed for additional cross-border capacity to be offered to the market. For example, in Spain, the reinforcement of its network in order to remove internal constraints contributed to the increase in the commercial capacity from Spain to France by 600MW since 2008. Also, reinforcement of the (internal) Czech lines and substations in 2009 resulted in increased capacity from Germany to the Czech Republic.
- 138 An increase in NTC values can also be explained by other factors. For instance, the aggregate export capacity from Poland to its neighbouring electricity systems (exporting technical profile<sup>70</sup>) has increased significantly in the last five years. This increase can be explained by a higher level of generation reserve margin in Poland because reliable installed generation capacity grew faster than demand. The generation reserve margin is indeed an element factored in by the Polish TSO to calculate the NTC values.
- 139 Further, following an improvement in the capacity calculation process, at the end of 2012 the Belgian and Dutch TSOs increased on average the day-ahead capacity (NTC) on the Belgian-Dutch border by 100MW from 1,401MW to 1,501MW and increased the intra-day capacity by an average of 200MW.
- 140 Figure 21 shows a number of borders which experienced a significant decrease in capacity made available to the market since 2008. The underlying reasons are diverse<sup>71</sup>:
- The increasing penetration of intermittent RES generation in the system triggered the reduction of NTC values at some borders. For instance, the average cross-border capacity made available to the market from France and Switzerland to Italy has steadily decreased, especially since 2010. The energy produced from photovoltaic plants has significantly increased in Italy over the last few years (16GW were installed in 2012). At times of high solar output and relatively low demand (e.g. during weekends or public holidays), there might be a limited possibility for the necessary operating reserves to balance the system in Italy. This situation might worsen in the presence of high cross-border flows to northern Italy, since this would reduce the possibility of keeping the minimum required operating reserves running. Therefore, during these critical hours, the TSOs connected to the northern Italian border ('Pentalateral task force') agreed to reduce the NTC to Italy in order to keep the Italian system within operational security standards. The provision of possible alternative measures to reduce the frequency of limitations to power imports to Italy is currently being assessed by the Italian NRA.
  - The presence of loop flows in the CEE, CWE and CSE regions has driven NTC values down in a number of cases. For instance, the level of aggregated imports to Poland has been decreasing steadily since 2009<sup>72</sup>. This will be assessed in more detail in section 3.4.2 on loop flows.

70 The national TSO (PSE SA) calculates the maximum capacity that can be used simultaneously for trade with the synchronously connected control areas of the neighbouring TSOs. These limitations (one value for import and another for export capacity) are known as technical profiles. The referred technical profile in the PSE SA control area covers the borders between Poland and three of its neighbouring MSs considered together (the Czech Republic, Slovakia and Germany).

71 The Agency received contradictory NTC values for 2008 on a few borders. For this reason, the decreases in NTC values on the directions Germany to Switzerland, Germany to France and Switzerland to Germany are not reported.

72 This is not captured in Figure 19, as the aggregated import values to Poland were 0 in 2008.

- In 2011 and 2012, the IFA cable operating between Great Britain and France was frequently unavailable due to the completion of major works on the infrastructure required for the renovation of the converter stations on both sides of the interconnector.
- An important hydro reservoir power plant (Bieudron-Dixence, 1,200MW) came back into service in 2010, causing a reversal in the direction of power flows between France and Switzerland. To avoid the potential endangering of the security of the system (N-1 violations), the NTC was limited in the direction of Switzerland to France.

141 All the examples above refer to interconnectors between neighbouring countries. However, the infrastructure within countries is also relevant for market integration and price convergence, in particular when it connects two different bidding zones. The case study below illustrates the impact of additional cross-zonal capacity (within a country) on the level of price convergence.



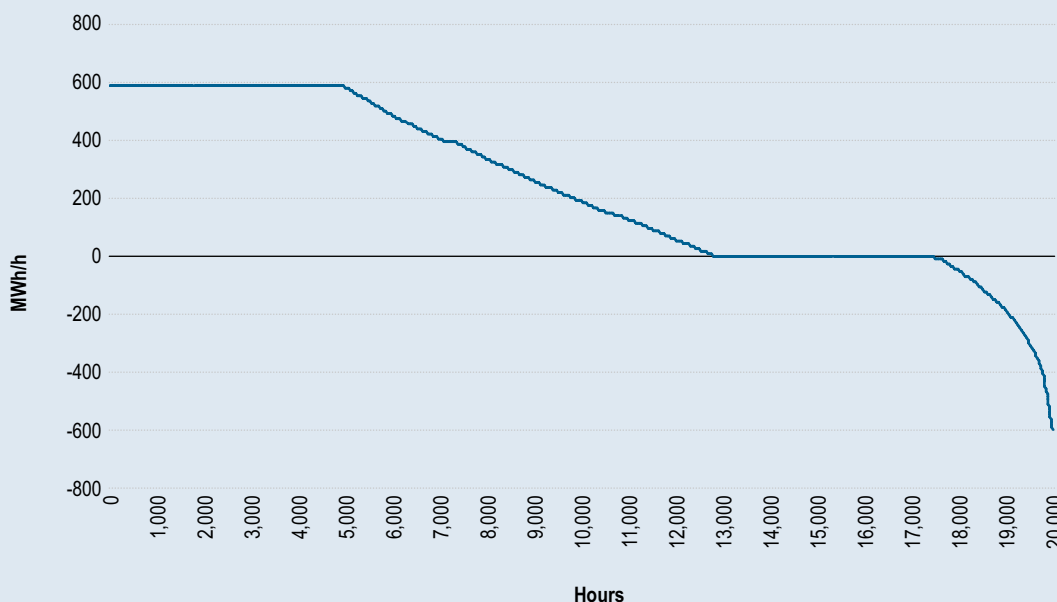
### Case Study 2: The Great Belt Connection – Linking Denmark

The Danish electricity market is divided into two bidding zones, consisting of Western Denmark (DK1), with an average and peak load of approximately 2,300MW and 3,500MW respectively, and Eastern Denmark (DK2) with an average and peak load of approximately 1,600MW and 2,500MW, respectively.

On 20 August 2010, the Great Belt, a link connecting Western Denmark with Eastern Denmark, came into operation<sup>73</sup>.

As illustrated in Figure i, the flows were scheduled in the direction from Western to Eastern Denmark for 14,053 hours (around 68% of the total hours), which is consistent with the expectations of the flow direction made in 2005. The Available Transmission Capacity was saturated (590MW)<sup>74</sup> in the same direction during 5,041 hours over the period between 20 August 2010 and 1 December 2012 (i.e. 24% of the total hours).

Figure i: Scheduled duration flows over the Great Belt connection from Western Denmark to Eastern Denmark – 20 August 2010 to 31 December 2012 (MWh/h)



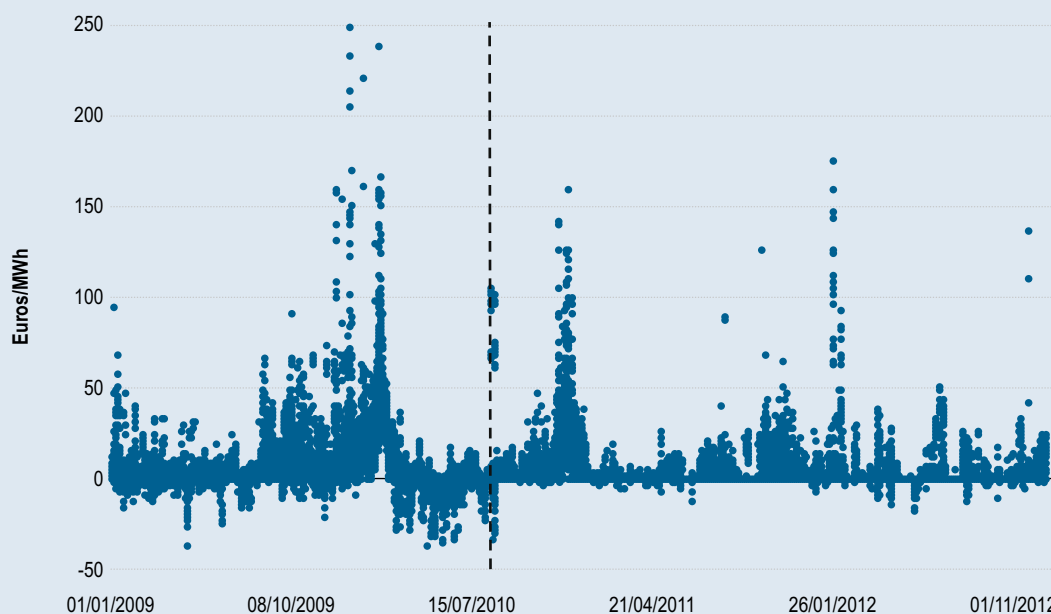
Source: Energinet.dk, Danish Energy Regulatory Authority (2013)

Congestion existed in 1,872 hours of the second half of 2010, which was more than 58% of the time. In the following years, the conditions in Denmark stabilised, reducing the number of hours with congestion to 1,338 hours (15%) in 2011 and to 1,170 hours (13%) in 2012, which was lower than expected.

73 The Great Belt project was effectively completed in 2007 within the budget of 172.1 million euros. The overall time schedule was delayed by a prolonged approval for a substation at Zealand, but the actual construction of the Great Belt connection was carried out faster than expected. There are no other connections between Western and Eastern Denmark.

74 The NTC from Eastern to Western Denmark is 600MW, and 590MW from Western to Eastern Denmark, due to the purchasing of net loss.

Figure ii: Hourly price differences between Western Denmark and Eastern Denmark – 1 January 2009 to 31 December 2012 (euros/MWh)



Source: Energinet.dk, Danish Energy Regulatory Authority (2013)

Note: Hourly price differences between Western Denmark and Eastern Denmark. The dotted line indicates when the Great Belt was taken into operation.

Despite the high price differences observed between Western and Eastern Denmark (see Figure ii) in the second half of 2010<sup>75</sup>, the Great Belt connection has globally contributed to narrowing price differences between the two bidding zones. With the introduction of the link, the price difference was lowered from 6.6 euros/MWh to 2.6 euros/MWh and full price convergence was reached around 80% of the time (as against 50% before the connection came into operation). However, as Denmark is a transit country between the Nordic market and Continental markets, prices in these areas have a vast impact on prices in both Western and Eastern Denmark. As a result, it is quite difficult to isolate the precise effect of the Great Belt connection.

Congestion revenues amounted to more than 17 million euros in the second half of 2010 (i.e. much higher than the expected congestion revenue at 2.7 million euros for a dry year). In the following years, the levels of congestion revenues were lower than in 2010, but remained higher than expected (i.e. around 4 million euros in 2011 and 4.5 million euros in 2012).

The usage of the Great Belt from 2010 has therefore contributed to the equalisation of prices between Western and Eastern Denmark. However, it is too early to draw definite conclusions on the impact of Great Belt, since these should be based on a performance evaluation covering a much longer period.

75 In the evening of December 7, prices reached a technical maximum of 2,000 euros/MWh for two hours caused by a combination of high prices in the Nordic countries due to low water levels in hydro reservoirs, lower nuclear power production, reduced capacity at the Kontiskan interconnector to Sweden and cold weather.

### 3.3 Gross welfare benefits of interconnectors

- 142 Market integration is expected to deliver several benefits. One of them is enhanced economic efficiency, allowing the lowest cost producers to serve demand in neighbouring areas. This section shows the results in terms of this benefit, using the same indicator introduced in last year's MMR, the 'gross welfare benefits' indicator.
- 143 Gross welfare benefit includes, first, 'consumers' and 'producers' surplus gained by consumers and producers who participate in power exchanges (welfare is measured as the difference between the prices bid into the market and the obtained matched prices multiplied by the quantity) and, second, congestion rents. The first component measures the monetary gain that could be obtained by consumers (producers) because they are able to purchase (sell) electricity at a price that is lower (higher) than the highest (lowest) price they would be willing to pay (sell at) as a result of changes in cross-border transmission capacity. The second component corresponds to price differences between interconnected markets multiplied by hourly aggregated nominations<sup>76</sup> between these markets. It is important to note that gross welfare benefits, as opposed to net welfare benefits, exclude all costs incurred by TSOs for making this cross-border capacity available to the market.
- 144 For the purpose of this section, several European Power Exchanges were asked to perform simulations in order to estimate these gross welfare benefits. The algorithm used for the simulations originates from the PCR Project, which is a joint effort between seven Power Exchanges<sup>77</sup>, aiming for the implementation of a single European day-ahead price coupling of power regions.
- 145 There are a few caveats underlying the results presented in this section. For example, the gross welfare benefits include merely the power traded in organised day-ahead exchanges, thus excluding, for instance, forward products such as week-ahead, year-ahead and all OTC trade. As a consequence, the estimated surpluses cannot be considered as the whole welfare benefit in a given country. Moreover, not all borders in Europe are included, which is partly due to the fact that not all markets have been market-coupled, or because not all Power Exchanges in Europe participated in the analysis. A strong assumption underlying these simulations is that bids submitted in each market would be maintained unchanged, irrespective of the analysed scenario in terms of available cross-border capacity (all else being equal). Furthermore, the results refer to one year (2012), and they can change from year to year due to factors such as the amount of wind-based generation and the dynamics of hydro power affected by precipitation levels. Due to timing constraints, the most recent and optimal set-up of the algorithms was not used for these calculations. Finally, market price boundaries as well as (supply and demand bid) curve shapes have a strong influence on the calculated total welfare. This makes it very difficult to compare total welfare between different scenarios in which the cross-border capacity is modified while assuming unchanged order books.

76 Due to mainly ramping constraints on an interconnector, congestion rents are more accurately assessed by means of nominations instead of cross-border capacity.

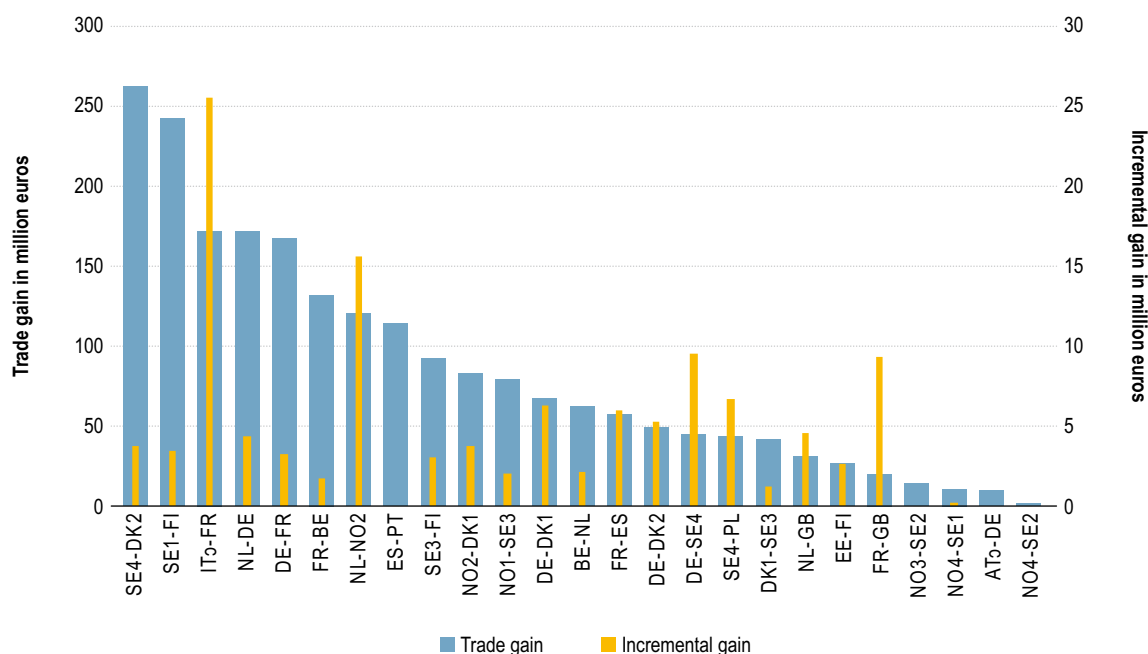
77 APX, BELPEX, EPEX SPOT, Nord Pool Spot, GME, OMIE and OTE. These were the same Power Exchanges which performed the simulations and provided the results shown in this section.

146 The gross welfare benefits for 2012 were computed for three scenarios:

1. Historical scenario: The gross welfare benefit for 2012 calculated on the basis of detailed historical information such as network constraints, the Power Exchange participants' order books (that is, supply and demand bids) and available cross-border capacity. For the latter, the ATC has been used as a proxy for capacity effectively made available for trade on 37 borders;
2. Zero scenario: The same as in the historical scenario, with the ATC values reduced to zero (that is, no cross-border trade). The assumption is that all other elements (market bids, network constraints, market rules, etc.) remain unaltered.
3. Incremental scenario: The same as in the historical scenario, with the ATC values for each border increased by 100MW<sup>78</sup>. Again, all other elements remain unchanged.

Figure 20 shows the welfare gain from trade (that is 'Welfare Trade Gain') by border for 2012, in million euros. This is the difference between the simulated gross welfare benefit stemming from the historical scenario and the Zero scenario. The figure also shows the so-called 'Incremental Gain', which is the difference between the gross welfare benefit from the Incremental scenario and the historical scenario. Note that extra capacity in this context need not be associated with more investments, but should instead be related to more efficient methods of capacity calculation.

Figure 20: Simulation results: gross welfare benefits from cross-border trade and incremental gain per border – 2012 (million euros)



Source: PCR project, including APX, EPEX SPOT, Nord Pool Spot, GME, OMIE

Note: 3 indicates that the zone is a GME zone; DK, NO and SE with a number refer to the different bidding zones in Denmark, Norway and Sweden.

78 It can be argued that the 100MW threshold used is to some extent an arbitrary value. Absolute values allow for comparing borders across the EU, although 100MW is relatively large for some interconnectors and small for others. Secondly, this value is mentioned in Article 9 of Regulation (EU) No 543/2013 of 14 June 2013 as a threshold from which changes in transmission capacity should be reported. See: OJ 2013 L 163/1, 14 June 2013; <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:163:0001:0012:EN:PDF>

- 147 This figure provides an insight into the relation between the incremental and the trade gains by interconnection. For instance, the figure shows that on the interconnectors between Sweden and Denmark, and Sweden and Finland, the trade gain is around 250 million euros per year. The figure also shows which borders would benefit the most from making extra capacity available. For example, the figure indicates that additional capacity between Italy and France would yield almost an additional 26 million euros per year, which is an additional gain of 15%. The case on the Dutch–Norwegian border, which has a percentage extra gain of 13% (16 million euros), is also quite remarkable. Other interesting interconnector candidates for increasing capacity include the following links: France-Spain, Germany-Sweden, Sweden-Poland and France-Great Britain. The results on these borders are in accordance with last year’s results.
- 148 The social welfare indicator presented in this report provides some insight into the gross benefits of market integration. The results are largely consistent with the results last year. This indicator should be further developed to become a monitoring tool which can be used to assess the utilisation of the existing network and track the progress of market integration.

## 3.4 Barriers to completing the internal market

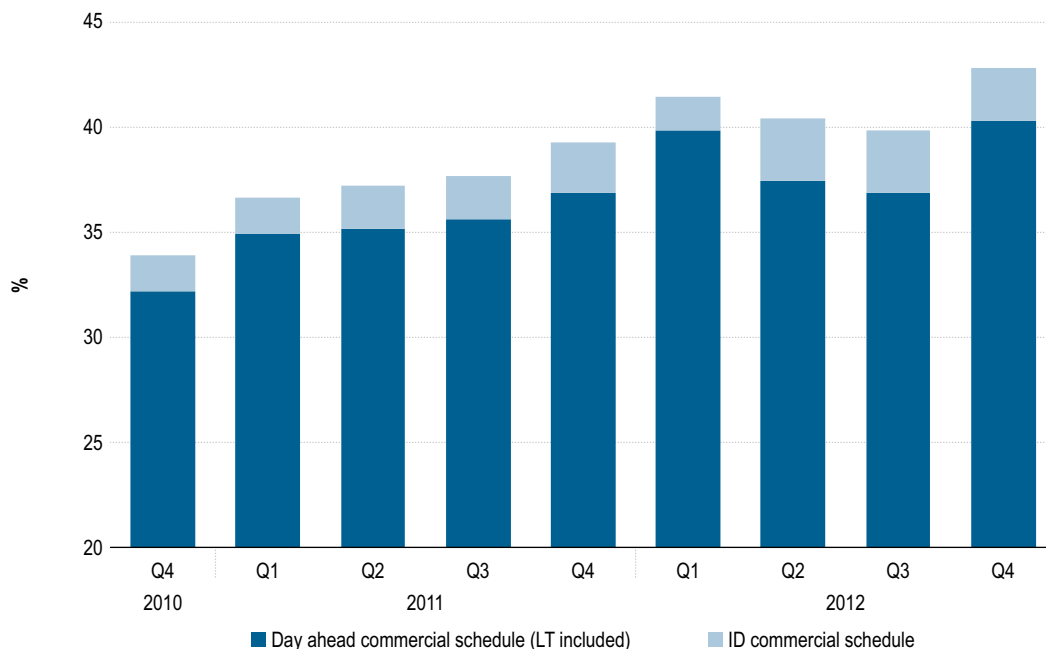
### 3.4.1 Interconnector utilisation analysis

- 149 This section reports on the use of the existing cross-border transmission capacity throughout Europe. Firstly, it assesses the extent to which cross-border capacity made available to the market is actually being used. Secondly, it investigates how efficiently this capacity is being used for day-ahead markets; the economic efficiency of different day-ahead congestion methods is assessed. Thirdly, it explores whether there is room for improvement in the use of the remaining capacity after day-ahead (i.e. the impact of different congestion methods on cross-border intraday trade is analysed).
- 150 Cross-border capacity is traded and allocated in different timeframes, depending on the market design and the different needs of market participants. The day before delivery, long term and day-ahead trades are expressed in day-ahead commercial schedules (also known as day-ahead nominations or day-ahead exchange programmes). Further, cross-border trade takes place within the day (resulting in intraday nominations) or closer to real time, through, for instance, exchange of balancing.
- 151 The level of utilisation of interconnections provides an indication of the increasing interaction across EU bidding zones. Figure 21 shows a perceptible increase in the (commercial) use<sup>79</sup> of overall EU electricity cross-border capacity over the last nine quarters<sup>80</sup>. Moreover, it shows the relatively low utilisation of capacity at the intraday compared with day-ahead timeframe (including long-term), albeit a slightly increased intraday use of capacity since 2010 can be noticed. The increasing use of interconnectors does not necessarily entail more efficient use of the capacity, which requires a detailed analysis, as performed below in this section.

79 The percentages of utilisation of the interconnections are calculated for every border and direction as follows: all the hourly net nominations are added and divided by the total amount of capacity offered to the market (NTC D-1 values). The results are shown in an aggregated way for all the borders.

80 As reported in Section 3.2.2, NTC values have remained essentially unchanged over the last three years. Therefore, the ratio of utilisation of the interconnections has increased mainly because of a higher use of the available capacities.

Figure 21: Evolution of the quarterly level of commercial use of the interconnections (day-ahead and intraday) as a percentage of NTC values for all EU borders<sup>81</sup> – October 2010 to 2012 (%)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2013) and ACER calculations

### Day-ahead capacity utilisation analysis

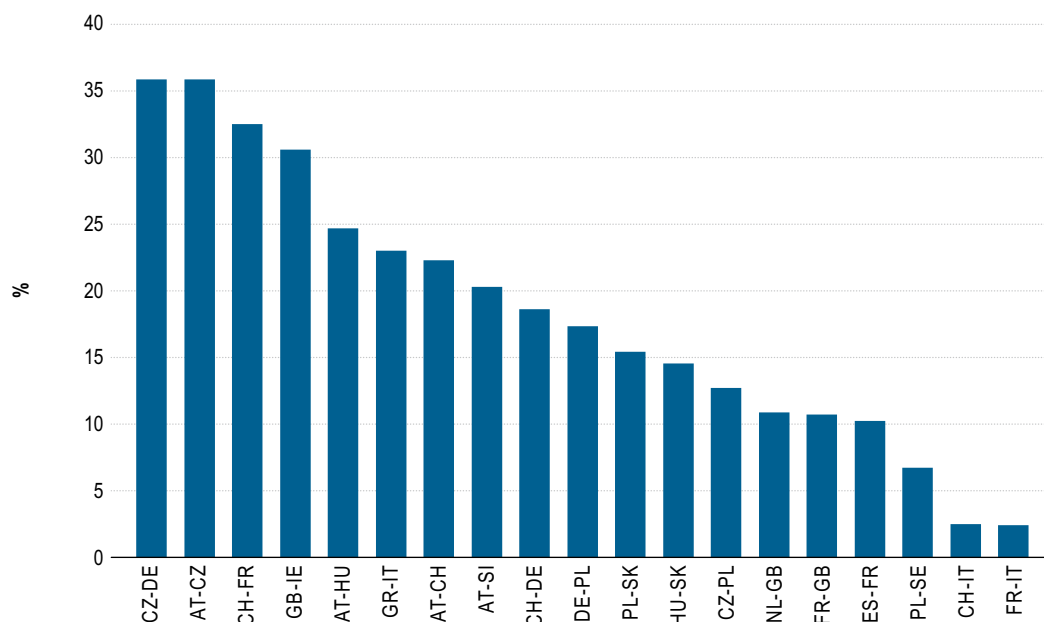
- 152 The consistency of nominations with price differentials is frequently used to identify the efficiency level in the utilisation of interconnections. More specifically, the number of hours with adverse nominations (also known as ‘flows against price differentials’ or ‘wrong-way flows’) is an indicator used to detect inefficiencies. ‘Wrong-way flows’ occur when commercial nominations for cross border capacities are such that power is set to flow from a higher- to a lower-price zone. In the presence of adverse flows, less efficient generation plants are dispatched, leading to a loss of ‘social welfare’. Therefore, ‘wrong-way flows’ should be avoided.
- 153 Figure 22<sup>82</sup> shows those EU borders where ‘wrong-way flows’<sup>83</sup> are still present for more than 2% of the hours. They account for one third of all EU borders.

81 More than 40 EU borders were included in the analysis.

82 The following British price references were used and are presented in the calculation and figures within this section: For the borders between Great Britain and France (IFA cable) and between Great Britain and the Netherlands (BritNed cable), the N2EX hourly products were used due to its higher liquidity compared to UK APX. For the borders with Ireland, the half-hourly APX reference price (APX-RPD) was taken.

83 For the purpose of this calculation, a ‘wrong way flow’ hour was considered as such when nomination took place from the higher- to the lower-price zone, with a difference of at least one euro/MWh.

Figure 22: Percentage of hours with day-ahead nominations against price differentials per border – 2012 (%)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2013) and ACER calculations

E-team note: Only borders with 'wrong-way flows' present in more than 2% of the hours are shown here.

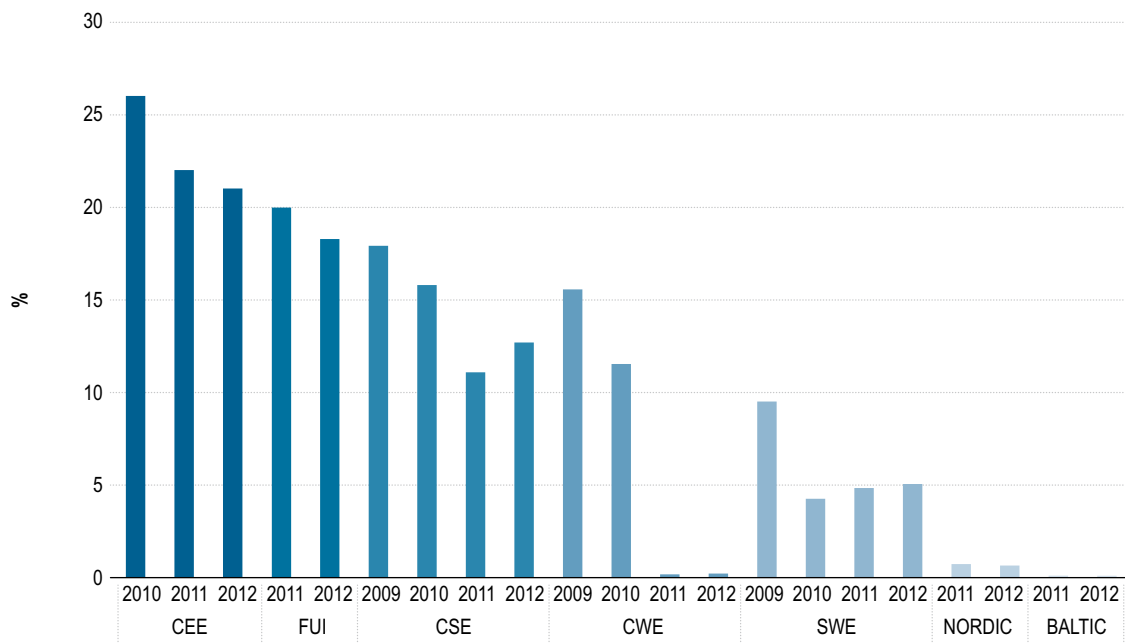
- 154 The ETM for day-ahead market envisages a single European price coupling applied throughout Europe. According to this model, cross-border capacities at the day-ahead stage are allocated implicitly through market coupling. This means that the coupling algorithm should secure such commercial cross-border nominations that enable power flows from the lower- to the higher-price zone (i.e. that 'wrong-way flows' should disappear).
- 155 Figure 23 shows that 'wrong-way flows' have been progressively removed from those regions<sup>84</sup> where implicit day-ahead auctions are in place. 'Wrong-way flows' have virtually disappeared in the Nordic area and the CWE region where market coupling is fully implemented. In the case of the CWE region, the removal of 'wrong-way flows' was achieved following the inclusion of Germany in the CWE market coupling in November 2010. In the SWE region, they occur only at the French-Spanish border, where day-ahead explicit auctions are still in place. In the CSE<sup>85</sup>, CEE and the FUI regions, cross-border flows against price differentials are still present in several borders where day-ahead explicit auctions are still in place.

84 Regions are defined in line with Annex I of Regulation (EC) No 714/2009 (OJ L 211, 14/8/2009). For the analysis in this section, the following borders were included: in the Baltic region (Estonia-Finland), in the CEE region (Austria-the Czech Republic, Austria-Germany, Austria-Hungary, Austria-Slovenia, the Czech Republic-Germany (50Hzt and Tennet), the Czech Republic-Poland, the Czech Republic-Slovakia, Germany-Poland, Hungary-Slovakia and Poland-Slovakia), in the CSE region (Austria-Switzerland, Austria-Italy, France-Italy, Greece-Italy, Italy-Slovenia, Switzerland-France, Switzerland-Germany and Switzerland-Italy), in the CWE region (Belgium-France, Belgium-the Netherlands, Germany-France and Germany-the Netherlands), in the FUI region (Great Britain-Ireland France-Great Britain and the Netherlands-Great Britain), in the Nordic region (Denmark-Norway, Denmark-Sweden, Finland-Sweden, Germany-Sweden, the Netherlands-Norway, Norway-Sweden and Poland-Sweden) and in the SWE region (France-Spain and Portugal-Spain).

78 85 The Swiss borders were included in the CSE region in all calculations in this section.



Figure 23: Percentage of hours with day-ahead nominations against price differentials, per region – 2009 to 2012 (%)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2013) and ACER calculations

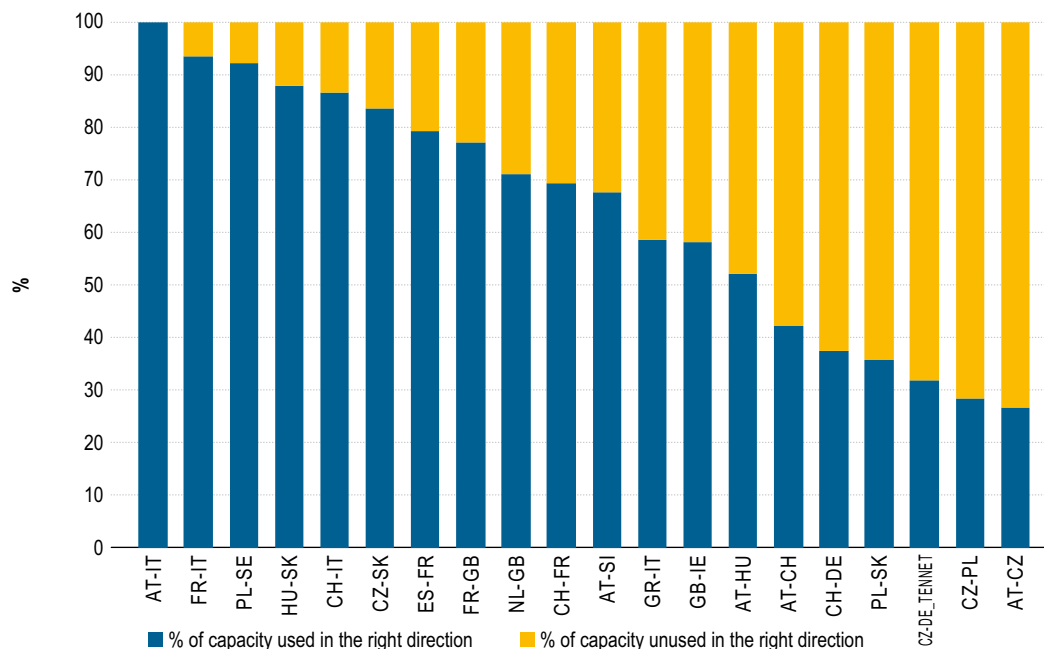
Note: For the purpose of the calculations, the Swiss borders were included within the CSE Region. An analysis by border is shown in Figure 22.

- 156 The absence of ‘wrong-way flows,’ although necessary, is not sufficient to guarantee the efficient use of interconnections in the day-ahead market. When prices diverge across a border, the full utilisation of cross-border capacity in the ‘right direction’ is also essential for achieving the efficient use of an interconnection. Indeed, the utilisation level of an interconnector in the ‘right direction’ in the presence of price differentials is a suitable indicator of the efficient use of cross-border capacities.
- 157 To assess whether electricity interconnections throughout Europe have been efficiently used over the last years, the following calculations were performed: for every hour and border with a significant price differential<sup>86</sup>, the sum of all net day-ahead nominations from a lower to a higher price zone were added and compared with the sum of all the NTC values in the ‘right direction’<sup>87</sup>. The analysis was made for the October 2010 – December 2012 period. With regard to a day-ahead market, the result can be considered as an overall indicator of efficient use of electricity interconnections in Europe. Its value should reach 100% when day-ahead implicit auctions are implemented for all EU electricity borders.
- 158 Figure 24 shows that the overall efficient use of European electricity interconnections has increased from less than 60% in October 2010 to 76% in December 2012. The inclusion of Germany in the CWE market coupling in November 2010 and the implementation of market coupling between the Czech Republic and Slovakia in 2010 (with Hungary joining in 2012) and between Slovenia and Italy in 2011 have significantly contributed to the increase in efficiency.

86 In this respect, a price spread is assumed to be significant if it is greater than or equal to 1 euro/MWh.

87 In the FUI region, capacity payments (euro/MWh) applied to imports/exports to/from Ireland were included in the analysis.

Figure 24: Percentage of the available capacity (NTC) used in the 'right direction' in the presence of a significant price differential, all EU electricity borders – October 2010 to December 2012 (%)

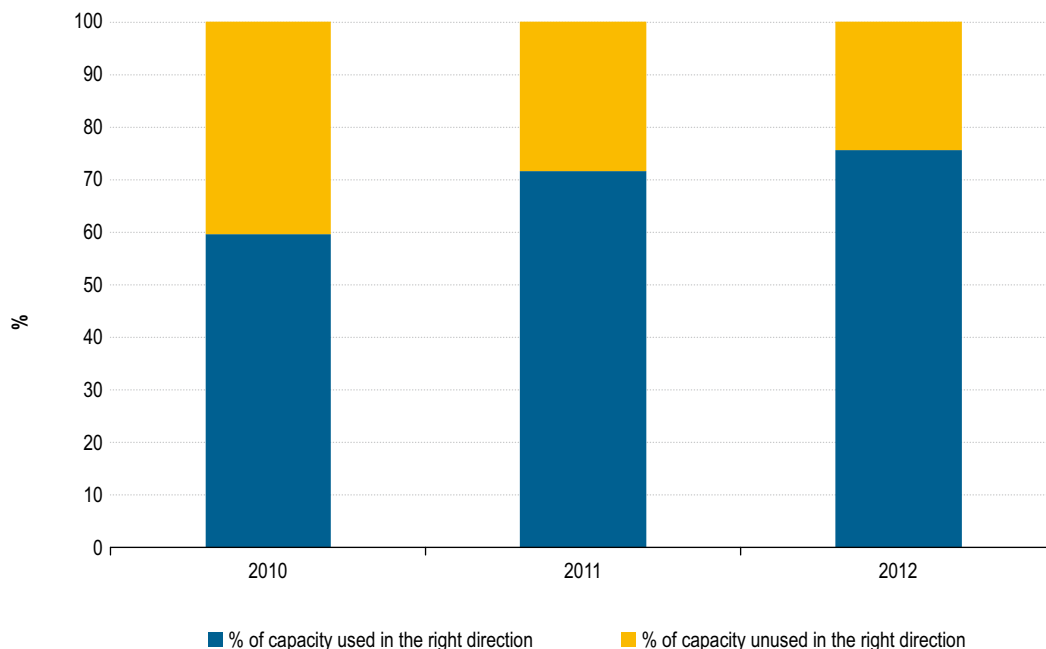


Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2013) and ACER calculations

159 Figure 25 shows the level of (efficient) use of the interconnection for those borders featuring explicit day-ahead auctions<sup>88</sup>. Borders within the CEE region (e.g. between Austria and the Czech Republic) and the CSE region (e.g. between Switzerland and Germany) record the lowest levels of efficient use of cross-border capacity.

<sup>88</sup> The capacity on the borders between Great Britain and the Netherlands and between Poland and Sweden is implicitly auctioned. Since the most liquid day-ahead price references in the British and the Polish markets are different from the prices formed as a result of the respective auctions, the two borders were also included in the analysis of the efficient use of the interconnectors. The N2EX and PolPX day-ahead prices are used for the respective zones of Great Britain and Poland.

Figure 25: Percentage of available capacity (NTC) used in the ‘right direction’ in the presence of a significant price differential, per border – October 2010 to December 2012 (%)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2013) and ACER calculations

Note: The borders within the CEE region with ‘multilateral’ technical profiles (PL-CZ+DE+SK and DE\_50Hz-CZ+PL, see definition in footnote 70) are not included in this figure, since the methodology applied to the other borders is not applicable to this or the following figures based on NTC values. Figure 22 shows that in 2012 on those borders (CZ-DE, DE-PL, PL-SK) capacity was underutilised, as they were affected by ‘wrong-way flows’. ‘DE\_Tennet’ refers to the system control area of Tennet in Germany. DE\_50Hz refers to the control area of 50Hz in Germany.

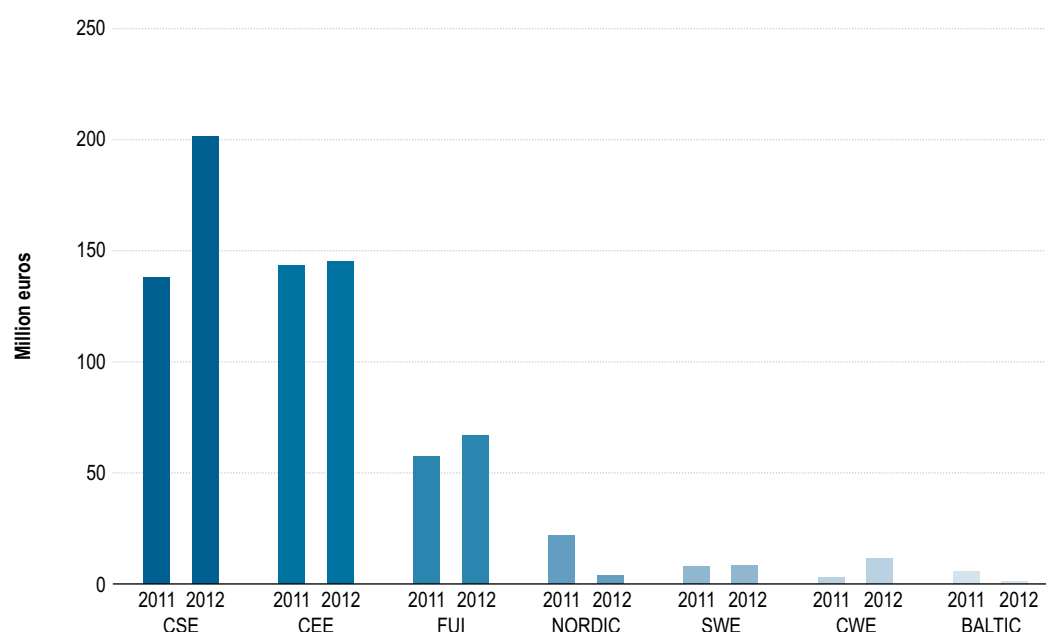
160 As already indicated in this section, the inefficient use of an interconnection combined with persistent price differentials leads to a welfare reduction that could be avoided by market coupling. The analysis of the ‘loss in social welfare’ due to the absence of market coupling enables the ranking of all EU borders according to their losses of total surplus. The ‘loss in social welfare’ associated with the absence of implicit auctions between two bidding zones has been approximated below as the product of the positive price differential<sup>89</sup> across the border between those two zones and the daily capacity that remains unused or is used in the opposite direction. This approximation should be considered with caution<sup>90</sup>, as it probably overestimates the results due to the absence of implicit methods, although it provides an indication of the scale of this loss of social welfare on each border.

89 A threshold of one euro/MWh, i.e. only hours with significant price differentials have been considered.

90 The estimate assumes ‘all else being equal’ and does not, in particular, consider the impact on the behaviour (their bids and offers) of the market participants in the organised markets following the introduction of market coupling. In addition it does not take account of market resilience, i.e. the impact on prices of altering the volumes exchanged, as better use of daily capacities would lead to higher price convergence. Therefore, figures obtained are the upper bound of the actual loss of social welfare, which can be estimated precisely only by applying aggregated curves of supply and demand in each market.

161 Since 2008, the EU has made progress in terms of social welfare gains at interconnections. For instance, around 180 million euros of surplus losses were reported in 2008 for the borders within the CWE region<sup>91</sup>, while in 2012, this amount was almost zero, as shown in Figure 26. This figure further depicts that, in 2012, the highest ‘losses in social welfare’ were observed in the CSE, CEE and FUI regions. Between 2011 and 2012, the CSE region experienced a significant increase in ‘loss in social welfare’, which was mainly caused by the soaring losses on the border between France and Switzerland. Between these two bidding zones, price differentials narrowed, but the number of hours with ‘wrong-way’ cross-border flows more than doubled, causing an important increase in the ‘loss in social welfare’.

Figure 26: Estimated ‘loss of social welfare’ due to the absence of implicit day-ahead methods, per region – 2011 to 2012 (million euros)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2013) and ACER calculations

Note: For the purpose of the calculations, the Swiss borders were included within the CSE Region. An analysis by border is shown in Figure 25.

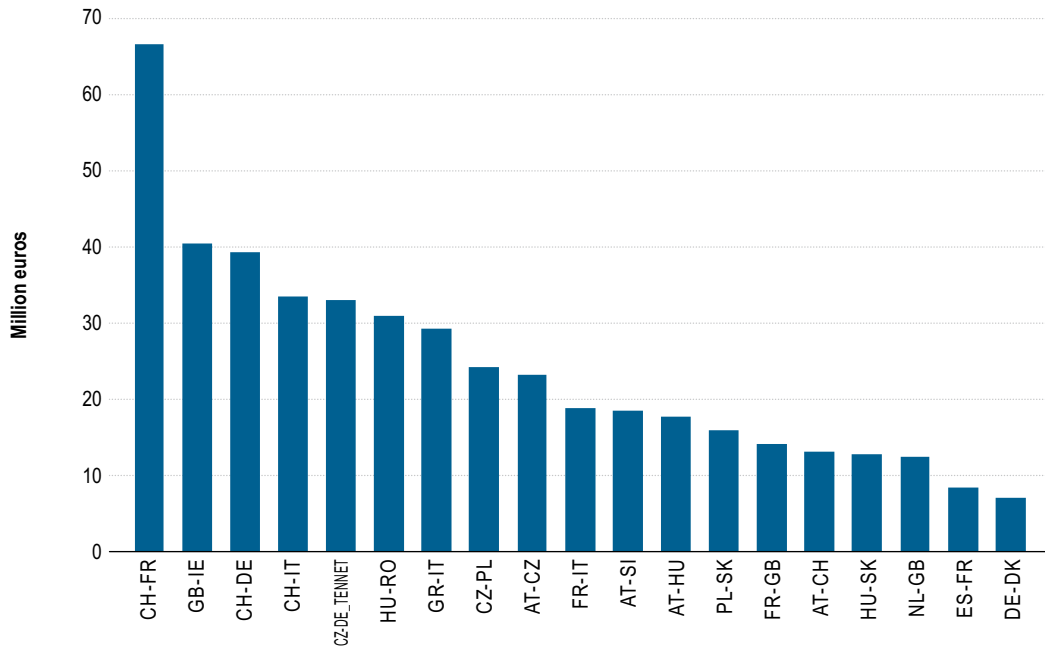
162 In Figure 27, the EU electricity borders are ranked by ‘loss in social welfare’ due to the absence of implicit day-ahead auctions in 2012. The French-Swiss border is noticeably the border affected by the highest loss in total surplus, with a loss of almost 70 million euros. In 2012, all Swiss borders together contributed to almost 30% of the total surplus losses. According to NRAs<sup>92</sup>, this is explained by the priority access still granted to long-term contracts, which still use a significant share of the available capacity. The use of the interconnection by holders of these contracts is frequently not correlated with price differentials. The manner in which these contracts are managed does not allow for the netting of capacity before day-ahead auctions, i.e. that the capacity previously nominated is not offered in the opposite direction in order to make efficient use of the interconnection. Implementing market coupling (together with netting capacity before day-ahead auctions) between the Swiss and neighbouring bidding zones would result in a welfare gain in this market and beyond.

91 CWE: Regional reporting on electricity interconnection management and use in 2008, see [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_ACTIVITIES/EER\\_INITIATIVES/ERI/Central-West/Final%20docs/Report%20on%20electricity%20interconnection%20-%20CWE%20region%20-%202008.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_ACTIVITIES/EER_INITIATIVES/ERI/Central-West/Final%20docs/Report%20on%20electricity%20interconnection%20-%20CWE%20region%20-%202008.pdf)

92 See: ‘Cross-border electricity exchanges: use and management of interconnections in 2012’, at <http://www.cre.fr/en/documents/publications/thematic-reports/report-on-use-and-management-of-interconnections-in-2012>

163 In addition, Figure 27 shows that the British borders registered moderate losses in social welfare<sup>93</sup>. The ongoing NWE initiative to couple Great Britain with the CWE, Nordic and Baltic regions, however, should allow for the complete removal of these losses.

Figure 27: Estimated ‘loss of social welfare’ due to the absence of implicit DA methods, per border – 2012 (million euros)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2013) and ACER calculations

Note: The borders within the CEE region featuring ‘multilateral’ technical profiles are not included in this figure; see note under Figure 25.

164 At the end of 2012, day-ahead implicit auctions were already implemented in 23 out of 40 borders in Europe. The value of losses due to inefficient day-ahead allocation systems shown above illustrates the urgent need to finalise the implementation of the ETM. More than 400 million euros<sup>94</sup> per year could be additionally gained after full implementation of market coupling across the EU.

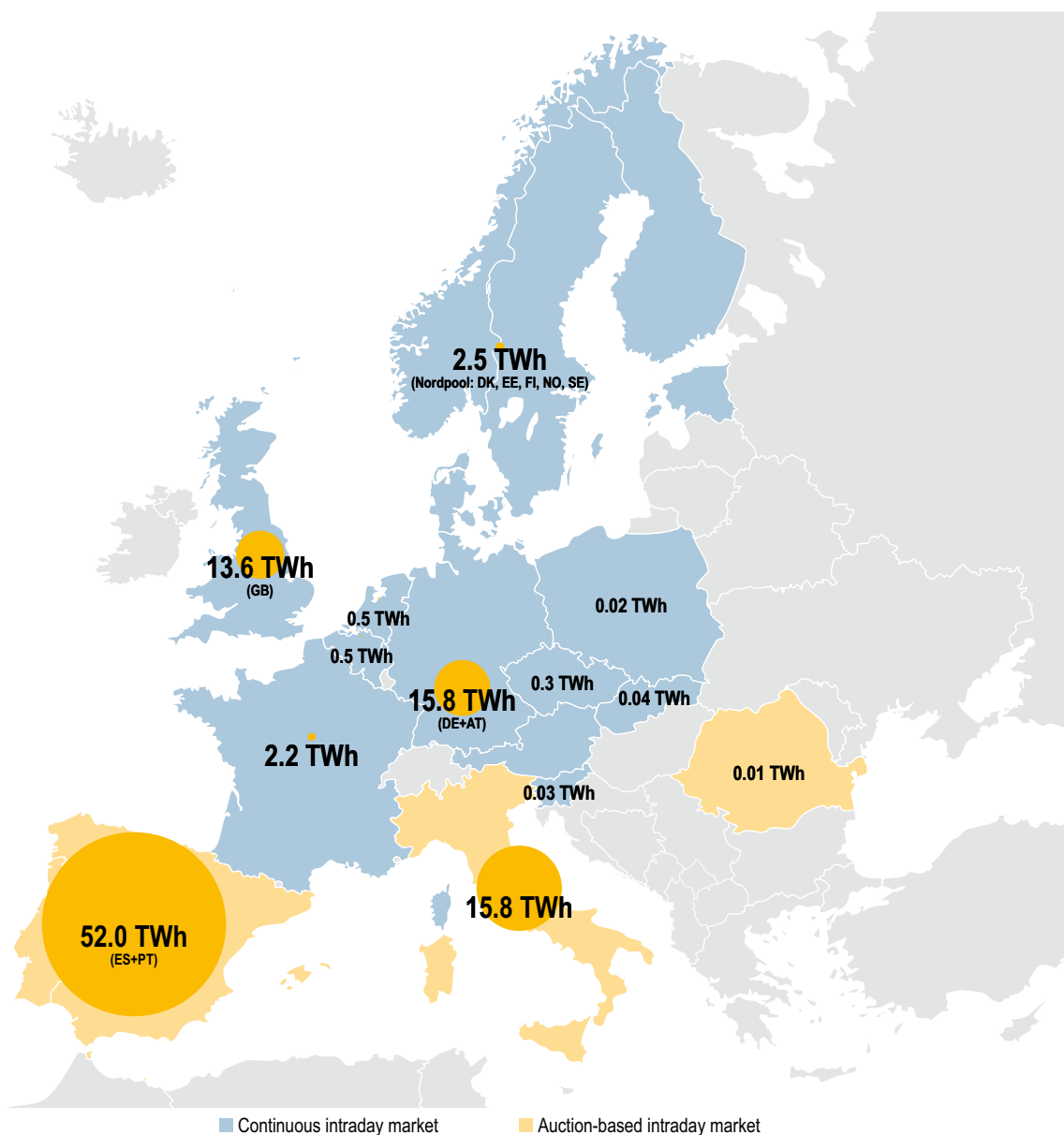
93 The loss in social welfare on the British-Dutch border is explained by the coexistence of two day-ahead hourly prices (N2EX and APX prices) within Great Britain. The capacity on the border between the Netherlands and Great Britain (BritNed cable) is allocated on a day-ahead timeframe through implicit auctions. Those auctions define the APX day-ahead prices on both sides of the border; however, they do not directly intervene in the N2EX price formation. Since the analysis of the loss of social welfare made use of the N2EX day-ahead price (the most liquid spot day-ahead reference in the British market), the loss of total surplus is higher than expected (it usually equals zero at borders featuring implicit auctions).

94 This figure is a conservative value compared to the estimates delivered by Booz&Co for the European Commission, see [http://ec.europa.eu/energy/infrastructure/studies/doc/20130902\\_energy\\_integration\\_benefits.pdf](http://ec.europa.eu/energy/infrastructure/studies/doc/20130902_energy_integration_benefits.pdf). For instance, the amount of intermittent generation or specific needs of market participants, such as the adjustment of infeasible schedules resulting from spot (day-ahead) markets.

### Intraday capacity utilisation

- 165 An intraday market is a market that is operating between the gate closure of the day-ahead market and the physical gate closure (i.e. the time after which schedules submitted to the system operator may no longer be changed).
- 166 Market liquidity is a key factor in achieving a well-functioning intraday market. Liquidity on the intraday market is dependent on market structure<sup>95</sup>, market design and the resulting attractiveness for the market participants to enter the intraday market. Figure 30 provides an overview of the liquidity level in national intraday markets and their designs in 2012.

Figure 28: Intraday liquidity and design in national markets – 2012 (TWh)

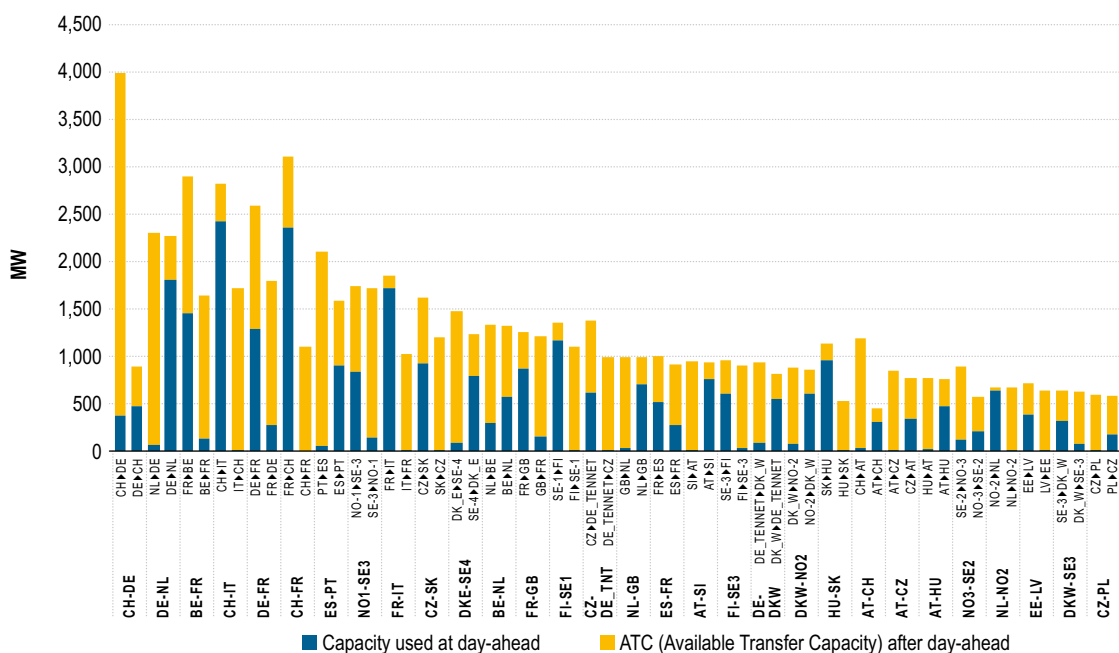


Source: The CEER national indicators database (2013)

95 For instance, the amount of intermittent generation or specific needs of market participants, such as the adjustment of infeasible schedules resulting from spot (day-ahead) markets.

- 167 Intraday cross-border trade is a key element in achieving further market integration in Europe. However, Figure 29 shows that virtually all borders are underutilised after day-ahead. The available capacity unused after intraday gate closure is on average around 60% of the available capacity (NTC) for all EU borders. This shows that on most borders the available transfer capacity is not currently an impediment to developing cross-border intraday and balancing exchanges. However, the unused capacity may remain idle if the intraday or balancing prices on the two sides of a border are the same. To further assess this more research is required using prices from the intraday and balancing time frame.
- 168 Furthermore, it should be noted that intraday and balancing needs and prices are not always correlated with day-ahead trades. When the interconnection is congested in one direction in the day-ahead timeframe, the needs of cross-border intraday or balancing trade might well be in the opposite direction. This could be the case at borders like France-Italy, Germany-the Netherlands or Norway-the Netherlands, frequently congested in one direction in the day-ahead timeframe.

Figure 29: Available transfer capacity after day-ahead gate closure for a selection of EU borders – 2012 (MW)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2013) and ACER calculations

Note: Only borders with an average NTC higher than 500MW are shown.

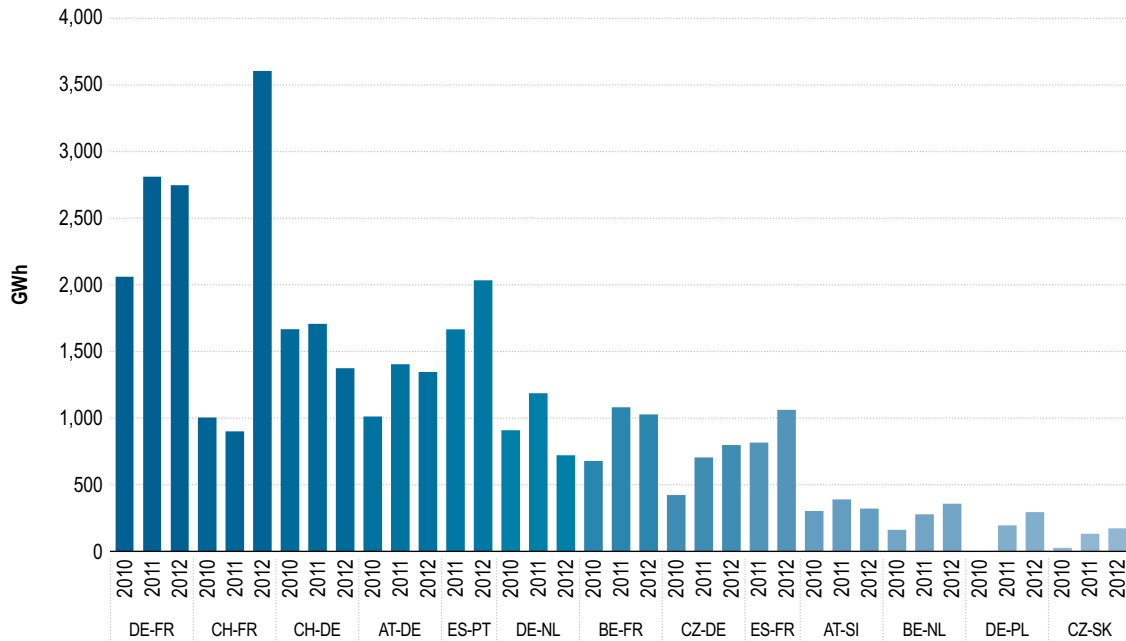
- 169 For the intraday timeframe, the ETM envisages an implicit cross-border capacity allocation mechanism using continuous trading on electricity markets, with reliable pricing of intraday transmission capacity reflecting congestion. Such a model can enable market participants to balance their portfolio, especially relevant in the context of growing intermittent generation, before the closure of the market and, possibly, allow for short-term arbitrage<sup>96</sup>.

96 The expected important benefits from the intraday Target Model should further urge its implementation, which was unfortunately delayed in 2012 by nearly a year. Power Exchanges were not successful in reaching a common ground about which intraday platform to choose. However, with support of the Agency a selection was made in June 2013, and to date the Power Exchanges have started negotiations with the vendor on the details of the IT system. See footnote 56 for more details on the implementation process.

- 170 Continuous implicit intraday capacity allocation has the benefit of simplicity, as it allows market participants to trade at any time during the intraday timeframe and adjust their position as soon as their situation changes. It also avoids the rather complex and time-consuming processes to perform auctions, which would need to be run very frequently to achieve similar trading possibilities for market participants. Until the problem of efficient capacity pricing within continuous allocation is solved, the intraday capacity is allocated for free and on a first-come-first-served basis. It has to be noted that this approach may not be efficient when the capacity left over from the day-ahead market coupling becomes valuable in the intraday timeframe due to, e.g. significant changes in supply and demand or due to a sudden increase in transmission capacity following a recalculation of capacity in the intraday timeframe. However, the Agency expects that the future development of an efficient capacity pricing methodology, as foreseen in the draft Capacity Allocation and Congestion Management (CACM) network code, will improve the overall functioning and efficiency of the intraday market.
- 171 An efficient intraday cross-border trade should contribute to improving intraday liquidity as market participants are keener to participate if they have access to a wider selection of counterparts with complementary balancing needs. The volumes exchanged at the borders within the intraday timeframe can be used to benchmark the level of interaction between different intraday markets.
- 172 Figure 30 illustrates the yearly energy volumes (i.e. net intraday nominations) that were traded at the intraday timeframe for a set of the EU borders since 2010. The borders between Germany and France and between France and Switzerland show the most significant progress over the last three years.
- 173 On the French-Swiss border an important increase in traded volumes was observed in 2012 compared to 2011, following the introduction of continuous explicit trading instead of a pro-rata mechanism in January 2012. Since June 2013, the intraday capacity allocation model at this border includes both continuous implicit and explicit allocation. This is considered as an interim step towards the full implementation of the intraday Target Model.



Figure 30: Level of intraday cross-border trade: absolute sum of net intraday nominations for a selection of EU borders – 2010 to 2012 (GWh)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2013) and ACER calculations

Note: Only borders with aggregated intraday nominations above 100GWh in 2012 are shown.

174 On the French-German border, a significant improvement in liquidity was observed in 2011 immediately after the implementation of continuous implicit intraday trading. The case study below provides a more detailed analysis of the benefits of the intraday Target Model implementation on the French-German border.

### Case Study 3: The French-German intraday trade – results of a new trade mechanism

On 14 December 2010, a new mechanism was implemented on the French-German border to facilitate trade within the intraday timeframe. This mechanism is consistent with the ongoing implementation of a pan-European intraday Target Model for continuous implicit intraday trading.

Prior to December 2010, intraday trading on the French-German border was not coordinated. From France to Germany, the capacity was allocated using the pro-rata principle. From Germany to France, a trading platform enabled continuous capacity allocation. The intraday model implemented in December 2010 allowed for the harmonisation of the intraday cross-border mechanisms and the implementation of an integrated French-German intraday market.

The new mechanism provides implicit interconnection capacity allocation and continuous exchanges on the electricity markets. Furthermore, it couples intraday markets operated by the Power Exchange in France and Germany and aggregates the liquidity in these markets in a single Shared Order Book (SOB).

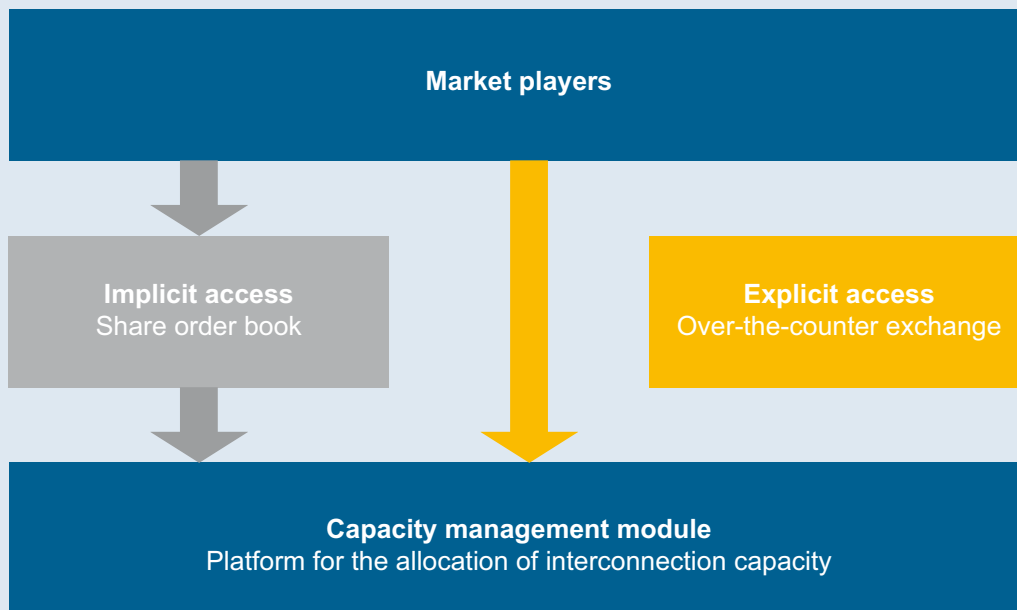
The aim of this new mechanism is to simplify cross-border trading on this border during the intraday timeframe and hence to better use the existing cross-border available capacity. The key elements of the new intraday model are the Capacity Management Module (CMM), the already-mentioned SOB and a clearing house. The Power Exchange's continuous cross-border trading is done through accepting and matching bids in the SOB. The latter is connected to the CMM, which keeps the data on available capacity continuously updated. Finally, the clearing and cross-border shipping of the energy traded is performed by a clearing house<sup>97</sup>. In this way, market players can access intraday cross-border capacity directly through energy trading, simplifying cross-border trading and settlement operations.

Further, the implicit capacity allocation mechanism allows for the full optimisation of the cross-border intraday capacity, due to the continuous matching of local and cross-border energy bids sent to the SOB. Subject to the availability of interconnection capacity, any market player can access the least expensive offer. Moreover, this mechanism enables market players to request capacity close to the real time for each hour of delivery. This aspect is essential to better and more efficiently integrate RES. In fact, intraday continuous trading facilitates balancing of the intermittent RES generation.

The solution (illustrated in Figure i) chosen for the French-German border has the feature of giving players (in addition to and at the same time as implicit access to interconnection capacity via the Power Exchange) explicit access to interconnection capacity, therefore allowing OTC exchanges between players in France and players in Germany. This explicit access is used by market players who want access to cross-border capacity to execute OTC contracts (i.e. not offered on the Power Exchange). The explicit access has been requested by market players to meet their needs, since sophisticated products are not yet available through the implicit system. This is consistent with the Framework Guidelines on Capacity Allocation and Congestion Management which allow for this solution as a transitional arrangement. However, the interim solution should be replaced by sophisticated products after public consultations and regulatory approval. The explicit access can also be used by German generators who want to participate in the French TSO's balancing mechanism.

<sup>97</sup> Financial institution that provides clearing and settlement services for the transactions resulting from the matching process, including the transfer of net positions resulting from capacity allocation.

Figure i: Illustration of intraday allocation mechanism on the French-German border as of December 2010



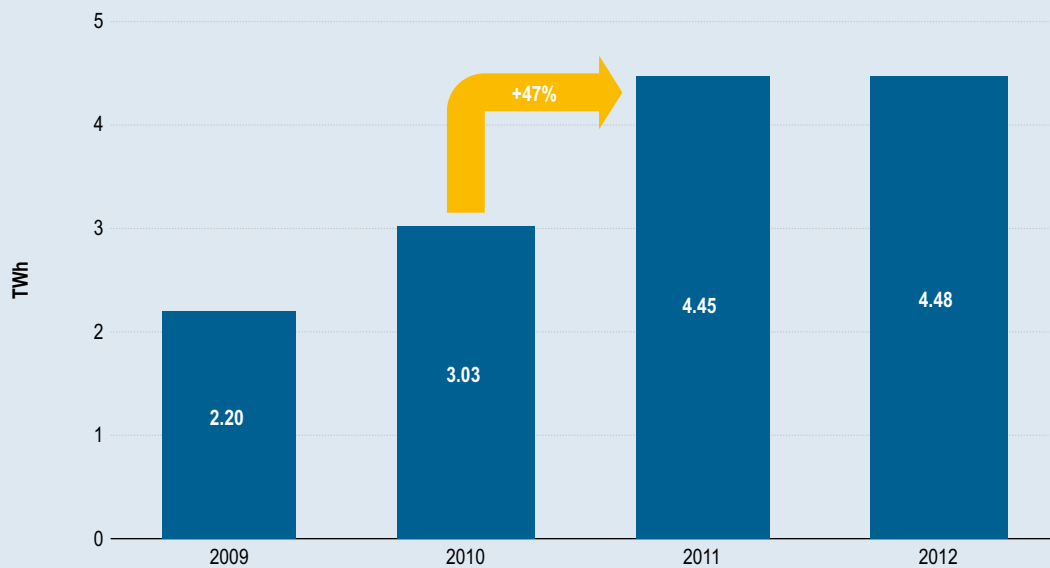
Source: CRE (2013)

The principles of intra-day trading are: first come, first served; obligatory use of the capacity, and capacity request submitted no later than one hour before the hour of delivery. The acknowledgement and allocation of interconnection capacity is carried out transparently and automatically by the CMM in parallel for implicit and explicit access. The CMM may also be used to balance exchanges until half an hour before real time.

### Traded volumes

Figure ii shows the intraday traded values on the Power Exchange in France and Germany, which have nearly tripled between 2009 and 2012. This is partly due to the increasing share of power from renewable energies in Germany and also to the positive effects of simplified intraday trading between the two MSs with continuous implicit cross-border trading.

Figure ii: Intraday volumes traded in France and Germany, 2009 to 2012 (TWh)

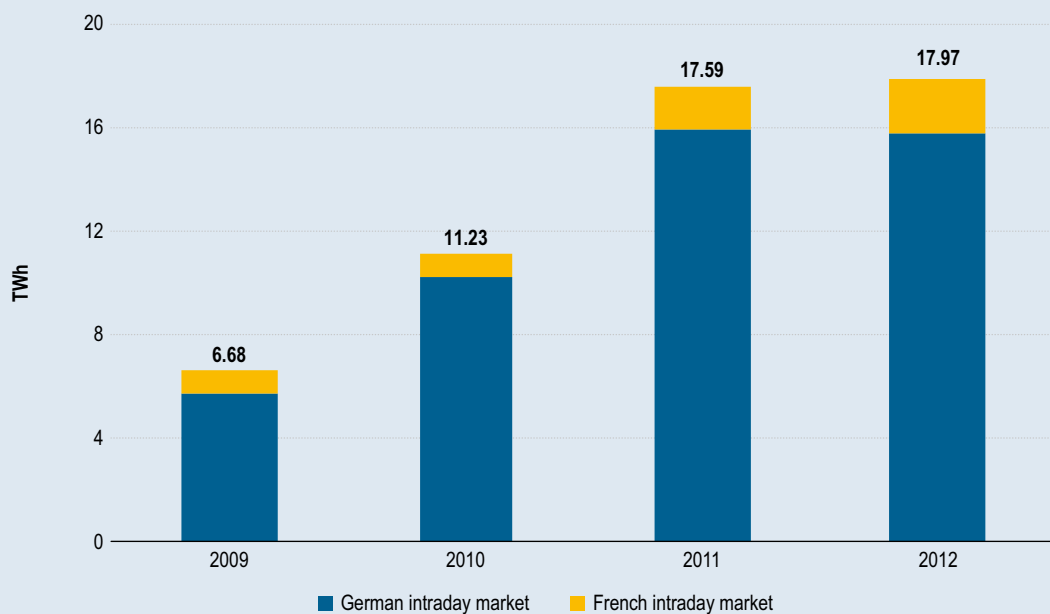


Source: EPEX Spot (2013)

Figure iii shows that the volume exchanged through implicit and explicit access between France and Germany increased from 3.03 TWh in 2010 to 4.45 TWh in 2011 (+47%). This growth can be explained by the setting up of the implicit mechanism in December 2010, which noticeably contributed to the increase in overall liquidity of the French-German intraday market.

No evolution of the mechanism was implemented between 2011 and 2012 and volumes remained stable.

Figure iii: Intraday trade volumes on the French-German border; 2009 to 2012 (TWh)



Source: RTE (2013)

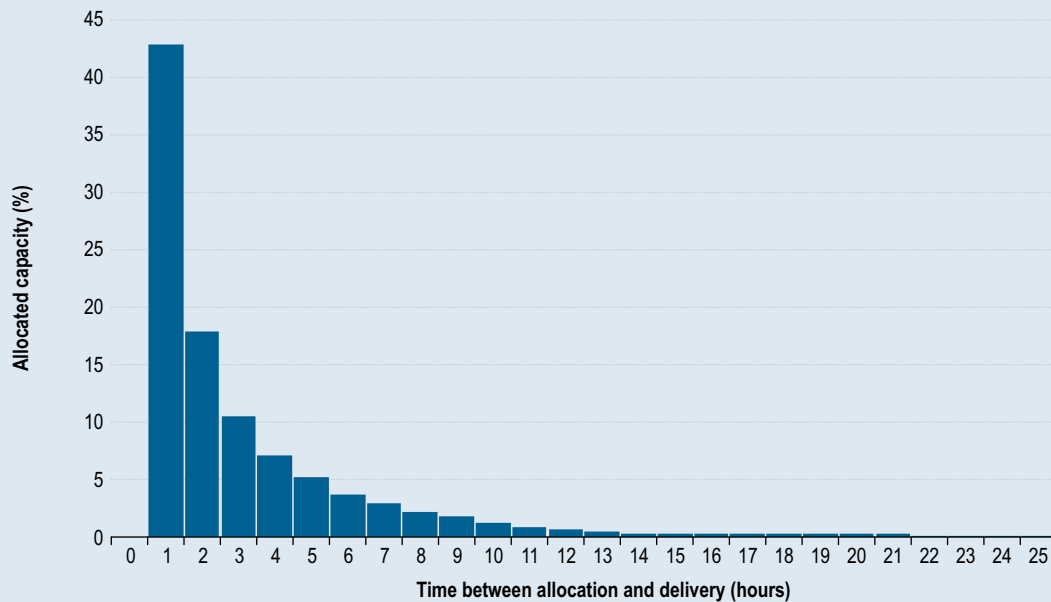
Note: The capacity linked to cross-border intraday trades in 2012 was allocated implicitly 45% of the time and through explicit trading the remaining 55%.

### Cross-border capacity utilisation

Figure iv shows when capacity is requested and allocated according to the time remaining to delivery. It shows that most of the intraday capacity (61%) is requested and allocated between one hour and three hours before the time of delivery. It illustrates that market players ask for capacity close to real time, underscoring the suggestion that it serves their balancing needs related to RES.

On the other borders where allocation is not effected through continuous trading, market players do not have access to capacity as close to real time. For instance, on the French-Spanish border, with explicit auctions in place, gate closure time in the best case is no closer than three hours before real time. For the border between France and Belgium, capacity is allocated according to the pro-rata principle, with nomination gates two hours before delivery at the latest. The importance of trading closer than two hours to real time is illustrated in Figure iv.

Figure iv: Capacity allocation on the French-German border in 2012<sup>98</sup> (%)



Source: EPEX Spot (2013)

Table i below shows the use made by market players of the available capacity in the intraday time-frame.

In 2012, the French-German border – where there is a continuous implicit mechanism – has the highest utilisation rate, ranging from 10.3% to 14.6%. The utilisation rate is lower (less than 10%) for the borders France-Spain and France-Belgium, where the allocation is done through auctions (for France-Spain) or according to the pro-rata principle (for France-Belgium). As indicated above, these mechanisms do not offer the same flexibility as the continuous mechanism.

98 This figure does not take into account the volume allocated for the balancing exchanges which can occur until half an hour before real time.

Table i: Utilisation of capacity in the intraday timeframe in 2012

	Capacity available after Day-Ahead in average (MW) <sup>99</sup>	Capacity used in Intraday timeframe in average (MW)	Utilisation rate
France -> Germany	2563	263	10.3%
Germany -> France	1692	247	14.6%
France -> Belgium	1579	106	6.7%
Belgium -> France	2738	7	0.2%
France -> Spain	760	71	9.4%
Spain -> France	1148	93	8.1%

Source: RTE (2013)

### Conclusion

The implementation of continuous implicit intraday trading at the French-German border has noticeably contributed to increased liquidity within both intraday markets. Cross-border intraday trade and the utilisation rate of cross-border capacity have also improved.

The case study has shown that an important share of the intraday trade at the German-French border is done closer than two hours to real time, enabling market participants to keep their position in balance close to delivery, hence contributing to the more efficient integration of intermittent RES generation.

99 The capacity available after Day-Ahead for export is the export NTC D-2 minus the long-term and Day-Ahead export nominations plus the long-term and Day-Ahead import nominations.

### 3.4.2 Loop flows, re-dispatching and counter-trading

- 175 Loop flows pose a threat to the efficient functioning of the IEM and to secure grid operation. This is due to the fact that in highly meshed and synchronously connected grids, electricity flows do not necessarily follow contractual paths. Instead, they are flowing to a certain extent through grids operated by neighbouring TSOs which are not directly notified to execute physical flows resulting from commercial transactions outside their control areas. This is because loop flows are not captured by the cross-border congestion management mechanism<sup>100</sup>.
- 176 While facilitating cross-border wholesale trade is one of the key objectives of the IEM, the negative impact of loop flows is twofold: (i) since the TSOs cannot control loop flows with capacity allocation, they may reduce the capacity available for cross-border trade in order to ensure that the total physical flow on the network elements remains within security limits; and (ii) the TSOs have to keep applying more remedial actions (bearing higher costs) in order to ensure secure grid operation in the TSOs' own control areas while transporting 'foreign' electricity flows. The first impact leads to a loss of social welfare, which corresponds to the foregone added-value with respect to the situation in which this cross-border capacity were available for cross-border trade. This loss of social welfare needs to be assessed by comparing the benefits delivered by the available cross-border capacity with and without the presence of loop flows. The second impact relates to network security and the efficiency of the market in general, and may induce re-dispatching, counter-trading and curtailment costs. The high volatility and limited predictability of loop flows create a challenge for operational planning. If remedial measures are not available (e.g. due to insufficient coordination among TSOs), loop flows may lead to insecure grid operation.
- 177 Loop flows are inherent to the zonal market design; however they depend on the physical properties of the network. The negative effects of loop flows on the efficiency of the European market can be traced back to the very beginning of market opening and have increased in recent years. However, the high impact of loop flows on network security is a relatively new phenomena arising only in recent years. Since the consequences of insecure network operation might have far-reaching implications for the EU economy, the problem of loop flows, which could be resolved with better market design in the mid- to long-term timeframe, has become an urgent problem that needs to be addressed as soon as possible.
- 178 This section is structured as follows. First, it defines the problem and proposes definitions of the loop, transit, unscheduled, scheduled, planned and unplanned flows to be applied in this report, as these concepts are, often inappropriately, used interchangeably. Second, it shows the evolution of unscheduled flows between 2008 and 2012 and presents the correlation of unscheduled flows with electricity generation in Germany. Third, it assesses the impact of unscheduled flows on cross-border trade, taking into account the relation between unscheduled flows and maximum physical flows, as well as the potential limitation of NTC values and resulting loss of social welfare. Finally, it presents curative remedial actions applied by the TSOs on selected borders to ensure secure network operation.

<sup>100</sup> In this section, cross-border trade/exchange is always understood as cross-zonal trade/exchange. This is because future bidding zones' borders may be different from national borders.

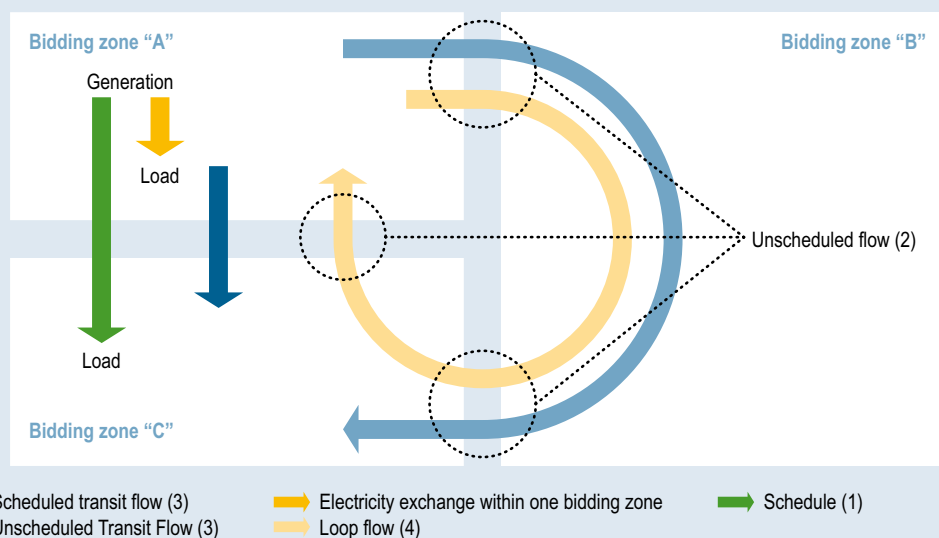
### 3.4.2.1 Problem definition

179 On 21 June 2013, the externalities and an appropriate regulatory framework for loop flows were discussed among the Agency and NRAs at a Loop Flows Workshop in Ljubljana<sup>101</sup>. A set of definitions was discussed between the Agency and ENTSO-E and some preliminary definitions are used for the purpose of this MMR<sup>102</sup>. They distinguish between the different types of flows.

#### Definitions

1. Schedule: a declared flow resulting from a scheduling process, subject to an electricity exchange between two different control areas and/or bidding zones.
2. Unscheduled Flow: the difference between a schedule and a physical flow. It is also the sum of unscheduled transit flows and loop flows over a border.
3. Transit Flow: the physical flow resulting from an electricity exchange between two bidding zones. Part of a Transit Flow results in a Schedule; the part which does not result in a Schedule is called an Unscheduled Transit Flow.
4. Loop Flow: a physical flow caused by an electricity exchange within one bidding zone.
5. Planned Flow: an expected physical flow, calculated on the basis of a congestion forecasting process. A planned flow can be either a transit flow or a loop flow.
6. Unplanned Flow: an unexpected physical flow calculated as the difference between a planned flow and a physical flow. An unplanned flow can be either a transit flow or a loop flow.

Figure i: Illustration of schedule, unscheduled flow, transit flow and loop flow



Source: ACER (2013)

101 For the high level conclusions see: [http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Publication/20130621\\_High\\_Level\\_Conclusions\\_final.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/20130621_High_Level_Conclusions_final.pdf).

102 Precise definitions are still under discussion among TSOs (ENTSO-E) and can be further updated. Note that a transit flow, according to the definition proposed in the box below, does not mean the same as a 'transit' defined in Commission Regulation (EU) No 838/2010 of 23 September 2010 (OJ 2010 L250) on laying down guidelines relating to the inter-transmission system operator compensation mechanism and a common regulatory approach to transmission charging.



- 180 As far as unplanned flows are concerned, they originate from the uncertainty of network topology and positions of market participants (generation or load) in the planning timeframes. Thus, unplanned flows can be significantly reduced with accurate planning procedures applied by TSOs, and with sufficient and prompt availability of accurate information to TSOs, as well as the exchange of this information among TSOs. In this respect, the correct implementation of the forthcoming Operational Planning and Scheduling Network Code should help to reduce the amount of unplanned flows. If complemented by efficient congestion management methods, especially in the intra-day and balancing timeframes, the negative effects of unplanned flows could be mitigated. This is because the negative impact of unplanned flows, in e.g. the day-ahead timeframe, can be reduced with better information and planning accuracy in intraday timeframes, which would result in more capacity being available in timeframes closer to real time.
- 181 The problem of unscheduled flows is also complex, because it includes two types of flows (i.e. transit flows and loop flows) which are difficult to disentangle. As a consequence, the possible remedies for each type of flows may be quite different and the negative impact (i.e. costs and loss of welfare) induced by unscheduled flows may be difficult not only to quantify, but also to allocate.
- 182 Transit flows are the result of cross-border exchanges. The unscheduled part of transit flows is the result of the scheduling processes currently applied by the TSOs, where cross-border commercial schedules on a given border are not aligned with the transit flows. This creates unscheduled transit flows, which means that part of the transit flow is not scheduled. Adequate transparency as regards transit flows and, in particular, the unscheduled part of transit flows should be developed by the TSOs. A possible methodology to monitor and enhance transparency on transit flows and to align cross-border schedules with resulting physical flows was discussed at the Loop Flows Workshop in Ljubljana and is presented in the box below. If cross-border schedules are aligned with physical flows resulting from these exchanges (i.e. transit flows), the sharing of congestion rents among TSOs, based on these schedules, could be considered as an option to compensate for transit flows.

### A possible methodology to monitor and enhance transparency on transit flows

Adequate transparency on transit flows could be provided by calculating the share of physical flows on different network elements that result from cross-border exchanges. Further, the calculation would allow the alignment of cross-border schedules with resulting physical flows (i.e. transit flows). This would mean that all unscheduled transit flows would end.

One possible way to calculate the flow on a particular border that results from cross-border exchanges is to calculate the Power Transfer Distribution Factors (PTDFs) for all interconnectors on it. A PTDF provides information on how much power flow is flowing through a given network element (e.g. interconnector) because of a cross-border exchange between two bidding zones. It is expressed as a percentage and is always defined with two parameters, i.e. the relevant network element and the considered cross-border exchange. Multiplying the actual cross-border exchange with the PTDF for a given interconnector yields the physical flow on a given interconnector that results from this cross-border exchange. By analogy, multiplying all cross-border exchanges with associated PTDFs and summing these products for a given interconnector provides a share of physical flows that result from all cross-border exchanges on this network element (i.e. transit flow).

The implementation of such a methodology would first require the calculation of PTDFs for all cross-border exchanges, all interconnectors and all hours. Second, all cross-border exchanges should be multiplied by the associated PTDFs in order to obtain the share of physical flows that result from all cross-border exchanges.

The calculation of the PTDFs on interconnectors is already being performed in testing phases in some regions for the purpose of implementing Flow Based Market Coupling and related processes. To implement this methodology, a similar exercise would be needed at EU level, which would imply the use of an EU-wide Common Grid Model (CGM) and the use of a Generation Shift Key (GSK). This defines the generators and loads that participate in a simulated exchange between two bidding zones when a PTDF is calculated. The draft Network Code on CACM envisages the creation of EU-wide CGM, as well as the creation of a GSK for each bidding zone for the purpose of capacity calculation. Hence, the implementation of this methodology would not place any additional burden on TSOs in terms of data requirements.

Finally, the draft CACM Network Code foresees the development of a methodology to calculate scheduled exchanges by all TSOs. Applying the methodology presented here will be considered an option for calculating the above-mentioned scheduled exchanges.

- 183 Once the unscheduled transit flows are identified and, later on, possibly eliminated by aligning cross-border schedules with resulting physical flows, the remaining part of unscheduled flows will consist of loop flows only. This part of physical flows results from commercial exchanges inside bidding zones, and causes externalities such as costs in other zones related to remedial actions and the loss of social welfare due to the reduction of cross-border capacity offered to market participants.
- 184 While the problems related to transit flows can be handled by efficient capacity calculation and allocation, as well as sharing the congestion rent, the remedies for problems related to loop flows may be quite different. As far as the costs related to remedial actions are concerned, the Agency and NRAs, in cooperation with ENTSO-E, are currently working on: (i) an appropriate method to identify origins of loop flows (i.e. a flow decomposition method); and (ii) adequate mechanisms to compensate for their negative impact<sup>103</sup>. With respect to the potential loss of social welfare due to the negative impact of loop flows on cross-border capacities on some borders, avoiding the negative impact on cross-border capacities (through, e.g. the setting of a minimum amount of cross-border capacities either on affected borders or critical network elements) would be a preferable option to a financial compensation mechanism. Further work by the Agency and NRAs, in cooperation with ENTSO-E, to address this issue is needed.
- 185 As in previous years, the phenomenon of unscheduled flows was addressed and debated at different fora in 2012, proving the urgency and complexity of the problem<sup>104</sup>. In addition, a range of studies have assessed this phenomenon and provided possible solutions<sup>105</sup>. The first assessment of unscheduled flows by the Agency was published in the first MMR<sup>106</sup>. While a more adequate methodology is currently under development, this MMR applies the same indicator. Note that this provides information on unscheduled flows which are the sum of both transit and loop flows. Figure 31 illustrates the methodology applied in this MMR for calculating unscheduled flows at a given hour and border. The blue curve represents hourly physical flows on a given border, while the yellow curve represents cross-border schedules submitted both on the day-ahead and the intraday timeframes<sup>107</sup>. The total absolute value of unscheduled flows across this border is calculated as the sum of the absolute hourly differences between the physical flow and the cross-border schedule.

103 Three options are currently under discussion: (i) the requester pays principle, (ii) the socialisation principle, and (iii) the “polluter” pays principle.

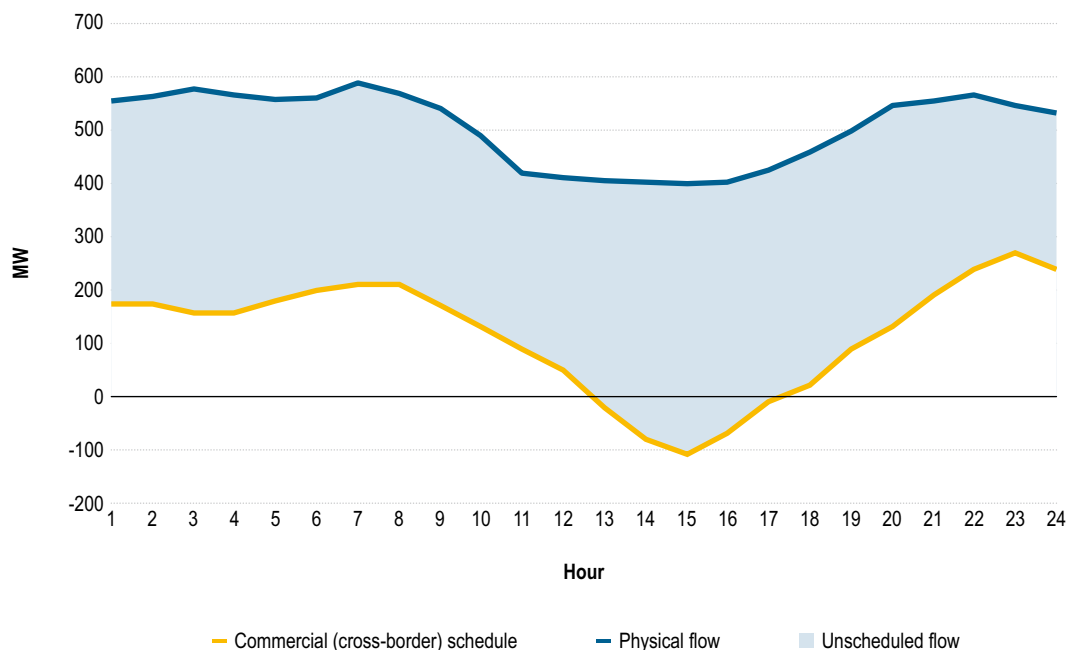
104 The EC High Level Conferences on 19 March 2012 and 31 October 2012, the Florence Forum in May 2012 and November 2012, The Agency Workshop on 28 June 2012 and the Bundesnetzagentur Workshop on 25 July 2012.

105 In 2012 and 2013, the Agency already received relevant information, including: the proceeds of the high-level conferences on loop flows in Brussels organised by the European Commission/DG ENER (19 March 2012 and 31 October 2012), a joint response to the Bundesnetzagentur study by 4 Central Eastern European TSOs (March 2012 and January 2013), the proceeds of a workshop on unplanned power flows organised by the Bundesnetzagentur and BWI (25 July 2012), a study conducted by the largest Austrian TSO (APG) and RWTH Aachen University on the impact of a German/Austrian market splitting on the electricity markets and the transmission grid in CEE (3 September 2012), a report by Monitoring Analytics LLC on interchange transactions in the PJM market in 2012 ‘State of the Market Report for PJM. Volume 2: Detailed Analysis’ (14 March 2013).

106 In Market Monitoring Report 2012 the term ‘unplanned flow’ was used instead of ‘unscheduled flow’, see: [http://www.acer.europa.eu/Official\\_documents/Publications/Documents/ACER%20Market%20Monitoring%20Report.pdf](http://www.acer.europa.eu/Official_documents/Publications/Documents/ACER%20Market%20Monitoring%20Report.pdf) (p.71).

107 Day-ahead schedules cover both long-term and day-ahead nominations.

Figure 31: Graphic representation of methodology for calculating unscheduled flows (MW)



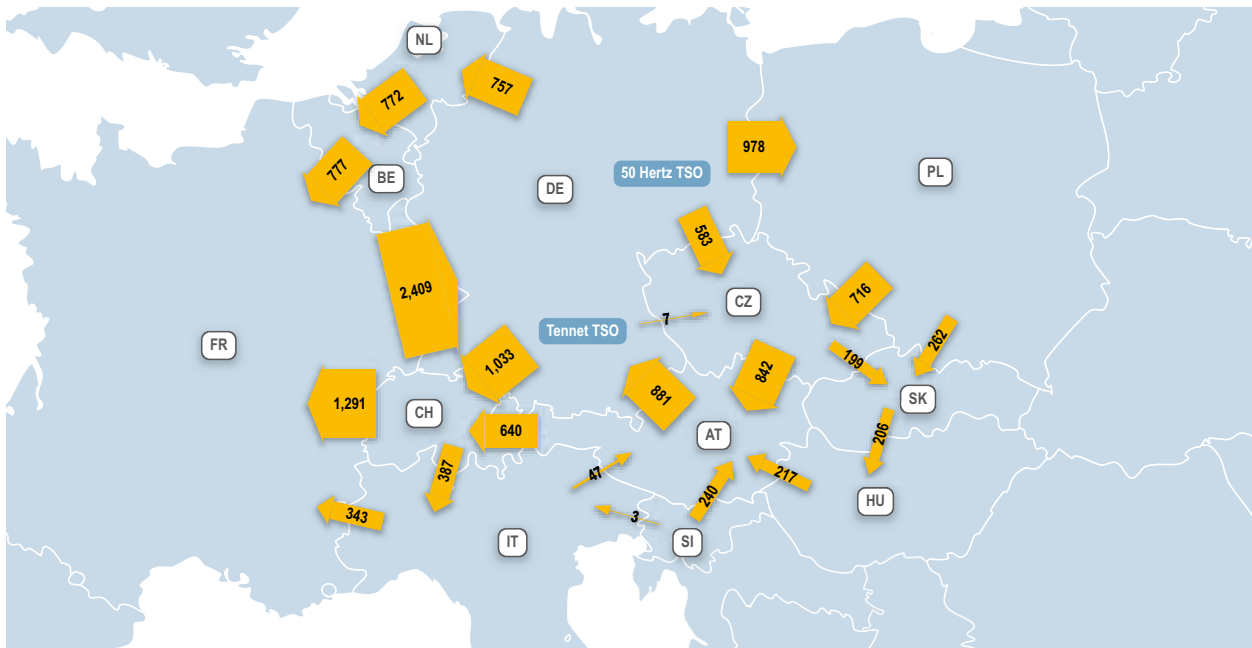
Source: ACER (2013)

### 3.4.2.2 Evolution of unscheduled flows

186 Figure 32 shows the average hourly unscheduled flows in 2012 within the three regions representing a major part of continental Europe. The level of this indicator on each border is expressed by the width of the arrow<sup>108</sup>. Note that the highest average unscheduled flow is observed on the French-German border.

108 The direction of the unscheduled flow is the same as that of the physical flow if the physical flow exceeds the cross-border schedule, or if both run in opposite directions. Further, the unscheduled flow flows opposite the physical flow if the cross-border schedule exceeds the physical flow.

Figure 32: Average unscheduled flow indicator for three regions – 2012 (MW)



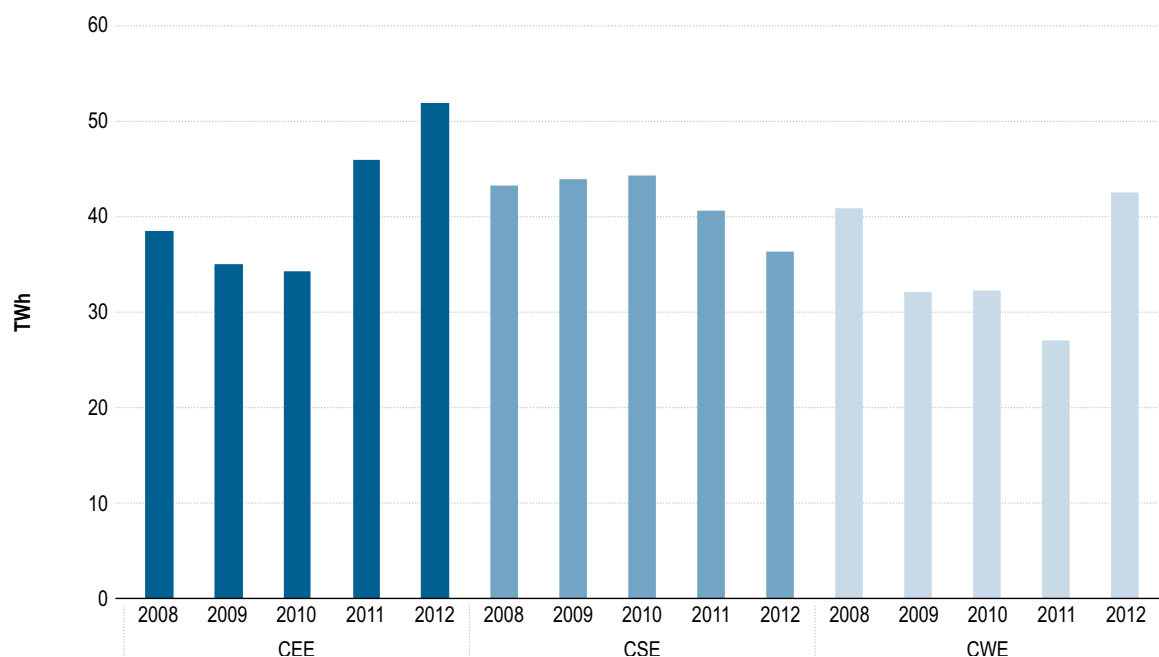
Source: Vulcanus, ENTSO-E (for the Czech Republic and the German border only), ACER calculations

Note: Average unscheduled flows are average hourly values in 2012. Furthermore, in order to ensure consistency of results, the Agency relied on ENTSO-E data to calculate an average unscheduled flow indicator. However, based on data available on the Czech TSO website (ČEPS), the unscheduled flow indicator calculated for the border between the Czech Republic and the German TSO Tennet would equal 277MW in the direction of Germany.

187 Figure 33 presents the evolution of unscheduled flows in three regions<sup>109</sup> i.e. the CEE, the CWE and the CSE from 2008 to 2012. The unscheduled flows are calculated with an hourly frequency. The absolute values are then summed across the hours and aggregated for borders belonging to the relevant region. Note that the number of borders differs per region, which may affect the results. Nevertheless, each border is assigned to one region only.

109 See definition in footnote 84. In addition, please note that the analysis performed in this section excludes the border between Greece and Italy, since on that border a direct current interconnector allows for physical flows to be controlled.

Figure 33: Absolute aggregate sum of unscheduled flows for three regions – 2008 to 2012 (TWh)



Source: Vulcanus, ENTSO-E (for the Czech Republic and the Germany border only) and ACER calculations

- 188 The total amount of unscheduled flows in the three regions reached 131TWh in 2012 (114TWh in 2011). While the CSE region shows a decrease in the total amount of unscheduled flows since 2010, there has been a significant increase in the CEE region in the respective period. In the CWE region, the total amount of unscheduled flows decreased in 2011 and then rapidly increased the following year.
- 189 Since 2010, there has been a significant increase in unscheduled flows on almost all borders of the CEE region. This was not the case for the Slovak borders with the Czech Republic and Hungary, where unscheduled flows decreased in 2011, although they increased slightly in 2012. An opposite pattern was observed on the Austrian-Slovenian border. The highest value of unscheduled flows occurred on the Austrian borders with the Czech Republic and Germany, and on the border between Germany and Poland. Significant unscheduled flows can also be observed on the Czech borders with both German TSOs (50Hertz and Tennet) and Poland.
- 190 A different situation (i.e. a decreasing trend in unscheduled flows since 2010) can be observed in the CSE region. On the Swiss borders with Germany and France, as well as on the border of Austria and Italy, unscheduled flows increased slightly in 2011 compared to 2010, but then decreased in 2012. On the border between France and Italy, unscheduled flows decreased in 2011, but increased slightly in 2012. Note that the highest value of unscheduled flows occurred on the Swiss borders with Germany and France. Significant unscheduled flows can be observed on the Swiss borders with Austria and Italy, and on the border between France and Italy. The unscheduled flows on the Slovenian-Italian border were significant in 2010, while in the following years they rapidly decreased, which could be explained by the installation and operation of a phase-shifting transformer on this border.
- 191 As far as the CWE region is concerned, the unscheduled flows on all borders increased in 2012 with respect to the previous year, after they had decreased in 2011 compared to 2010. The highest values of unscheduled flows were recorded on the border between Germany and France. This may be explained, to some extent, by the presence of phase-shifting transformers on the Belgian-Dutch border and on the Dutch-German border.

192 Table 6 shows the 2012 correlation factors between unscheduled flows on the borders within the three regions and different types of generation, e.g. wind, solar and thermal units with installed capacity equal or above 100MW in Germany. The purpose is to analyse the correlation of unscheduled flows with: (i) mainly intermittent generation; or (ii) other type of generation, e.g. thermal units. Note that the analysis is only partial, as – due to the unavailability of data from any other relevant MSs – only German generation was taken into account. Thus, it does not provide for conclusions regarding the causality of unscheduled flows.

Table 6: Correlation matrix for different types of generation in Germany and unscheduled flows on the borders in the three regions – 2012

Border	Wind generation	Solar generation	Thermal generation	Total generation
DE-PL	0.48	0.09	0.29	0.51
CZ-PL	0.35	0.10	0.31	0.48
AT-CZ	0.41	0.24	0.02	0.31
CH-IT	0.08	0.12	0.23	0.30
DE-FR	0.10	0.05	0.25	0.29
AT-DE	0.29	0.19	0.07	0.28
FR-IT	0.12	0.11	0.19	0.27
AT-HU	0.20	0.25	0.07	0.26
AT-CH	-0.03	0.02	0.26	0.24
CZ-DE_50HZT	0.59	-0.16	0.05	0.23
HU-SK	0.34	0.06	0.03	0.21
CZ-SK	0.21	0.06	0.08	0.20
DE-NL	0.19	0.24	-0.02	0.18
BE-FR	0.19	0.26	-0.04	0.17
BE-NL	0.19	0.26	-0.04	0.17
PL-SK	0.33	0.00	0.01	0.15
CH-DE	0.02	-0.13	0.22	0.14
CZ-DE_TENNET	0.13	-0.12	0.10	0.09
AT-IT	0.05	-0.05	0.06	0.05
CH-FR	-0.04	-0.19	0.17	0.05
IT-SI	-0.03	0.00	-0.03	-0.04
AT-SI	0.26	-0.13	-0.10	-0.04

Source: Vulcanus, ENTSO-E (for the Czech Republic and the German border only) (2013), German TSOs' websites, EEX Transparency Platform, see: <http://www.transparency.eex.com/en/>, ACER calculations

Note: 'Solar generation' means generation from photovoltaic panels. 'Thermal generation' means generation from thermal units of installed capacity equal or above 100MW, including generation units in nuclear power plants. 'Total generation' means total generation from all wind, solar and thermal units.

193 While the absolute correlation factor values are not very high<sup>110</sup>, they provide some information on the nature of unscheduled flows. The highest correlation of unscheduled flows with wind generation is observed on the borders within the CEE region. On most borders within the CWE region the highest correlation of unscheduled flows is with both wind and solar generation. On most borders within the CSE region, as well as on the French-German border, unscheduled flows do not generally correlate with generation from RES plants.

### 3.4.2.3 Impact on cross-border trade

194 As indicated above, significant amounts of unscheduled flows may have a negative impact on cross-border trade, since unscheduled flows limit the cross-border capacity offered to the market participants (NTC) on some borders. This is because the physical capability of transmission lines on some borders has to be reserved to transport electricity (physical flows) resulting from cross-border trade on other borders (transit flows) or electricity exchanges within foreign bidding zones (loop flows). Note that unscheduled flows are not the only factor affecting the amount of cross-border capacity. The NTC values calculated by the TSOs also depend on capacity calculation methods, which are not fully harmonised yet across the EU (see the Agency's recommendation on the CACM Network Code of 14 March 2013<sup>111</sup>).

195 Figure 34 shows the average ratio between hourly unscheduled flows and the maximum physical flow on the borders within the three regions in 2012. The purpose of this indicator is to present the quantity of maximum available capacity on a given border that is used up by unscheduled flows<sup>112</sup>. In order to calculate this, the hourly unscheduled flow values were divided by a constant value equal to the maximum physical flow recorded over a year. Then, the average from hourly values was obtained for each border.

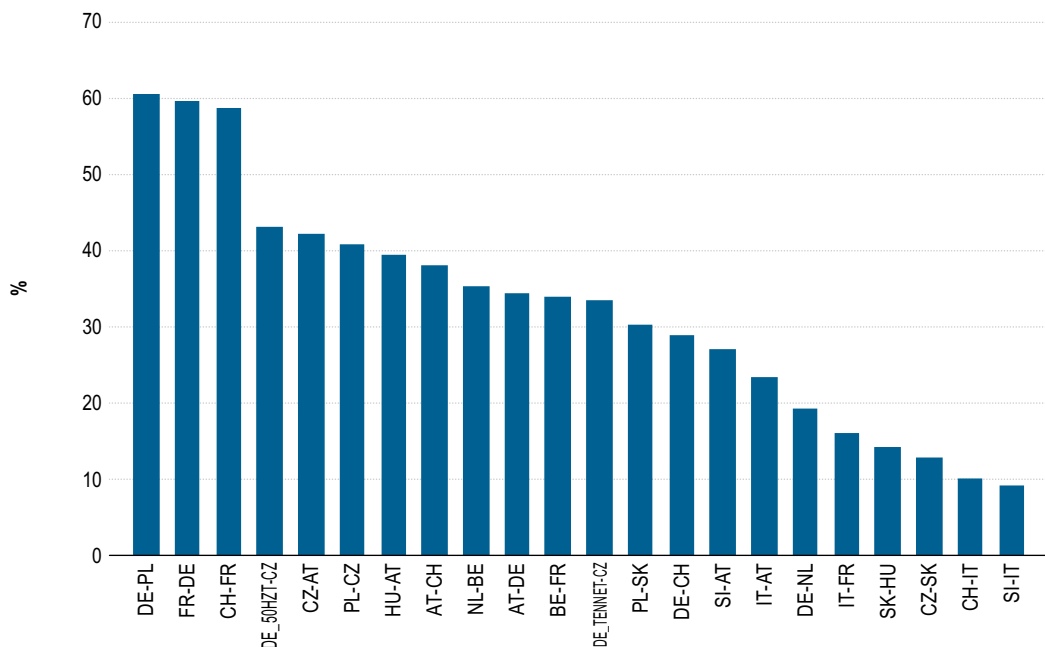
110 Note that correlation factors may be interpreted as follows: (i) between 0.30 and 0.50 – a weak correlation; (ii) between 0.50 and 0.70 – a moderate correlation; (iii) 0.70 and above – a strong correlation; and (iv) 1 – a perfect correlation.

111 For the recommendation, see: [http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Recommendations/ACER%20Recommendation%2001-2013.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2001-2013.pdf)

112 Given the existing structure of bidding zones, where internal constraints often limit cross-border capacities, the thermal capacity of interconnectors cannot be used as an indication of maximum available capacity on a given border. Instead, the maximum observed physical flow on a given border can be used as a rough indication of the maximum available capacity, assuming that this is the maximum physical flow where operational security is still maintained.



Figure 34: Average hourly ratio between unscheduled flows and maximum physical flow for three regions – 2012 (%)



Source: Vulcanus, ENTSO-E (for the Czech Republic and the German border only) and ACER calculations

Note: The maximum physical flows used in this analysis were calculated on the basis of data from 2010 to 2012 and after the exclusion of 1% of the highest observations.

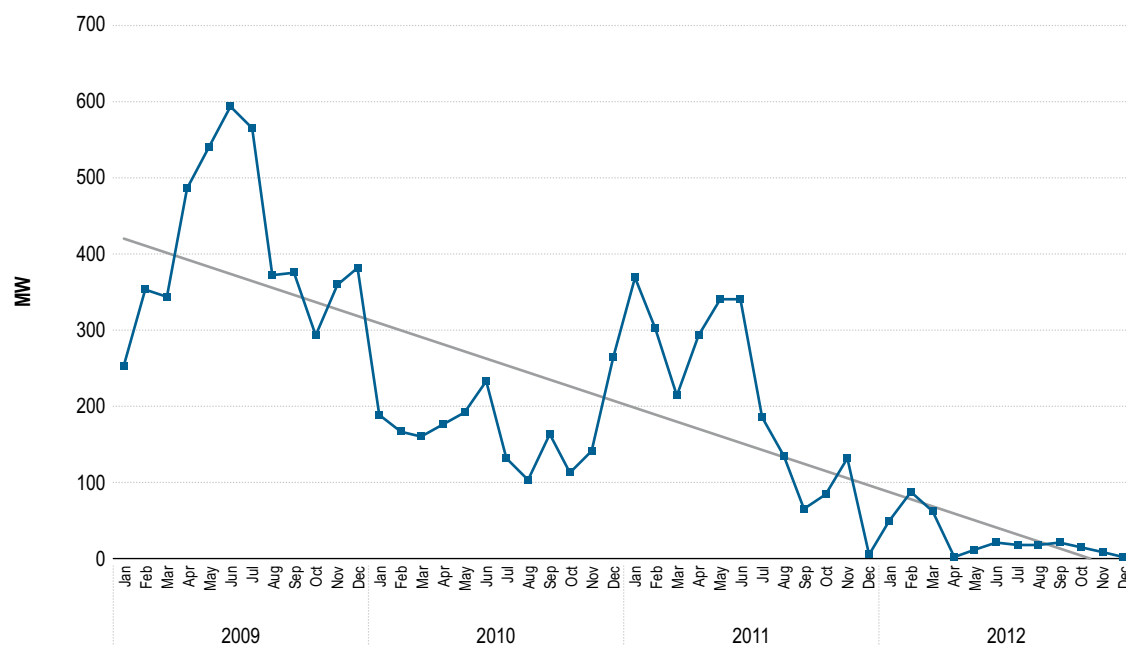
196 The highest values of this indicator, around 60%, relate to the borders between Germany and Poland, France and Germany, and Switzerland and France. There are 14 borders where this indicator falls to between 20% and 45%. For the remaining borders, this indicator is less than 20%. A more detailed interpretation of this indicator may require further information as to how unscheduled flows are influenced by cross-border schedules and by physical flows on a given border.

197 As far as the potential reduction of the NTC offered to market participants is concerned, some TSOs in the CEE region state that the increasing amount of unscheduled flows results in less cross-border capacity available to market participants. This is due to the uncertainty related to the forecast of physical cross-border flows and the lack of appropriate remedial measures available to the TSOs. Figure 35 illustrates monthly average import NTC values on the German-Polish border and their trend over the last four years. Note that the average monthly NTC values on this border have dropped to almost zero since 2009. For instance, in 2012, in more than 7,790 hours the import NTC was reduced to zero. Following this drop in the import NTC, 50Hertz and the Polish TSO started to work on a pilot project ‘Virtual Phase-Shifting Transformer’<sup>113</sup> to secure – among other things – a minimum level of import cross-border capacity to Poland<sup>114</sup>.

113 In line with the project goals, 50Hertz and the Polish TSO sought an agreement on remedial actions to be taken by themselves (use of re-dispatch potentials in the grids of the Austrian, Czech, German and Polish TSOs) to ensure a certain level of import cross-border capacity to Poland and secure operation of the Polish power system. The Virtual Phase-Shifting Transformer is a re-dispatching measure with an ex-ante predefined cost-sharing key. This pilot project initially covered the period from 8 January to 31 March 2013 and was extended until 30 April 2013. The objectives (criteria) set by the TSOs were not met for all hours during the mentioned period. A final report is under elaboration by 50Hertz and PSE.

114 See: [http://www.50hertz.com/en/file/20121222\\_PM\\_Phaseschieber\\_EN.pdf](http://www.50hertz.com/en/file/20121222_PM_Phaseschieber_EN.pdf)

Figure 35: Monthly average import NTC values on the Polish/German border – 2009 to 2012 (MW)

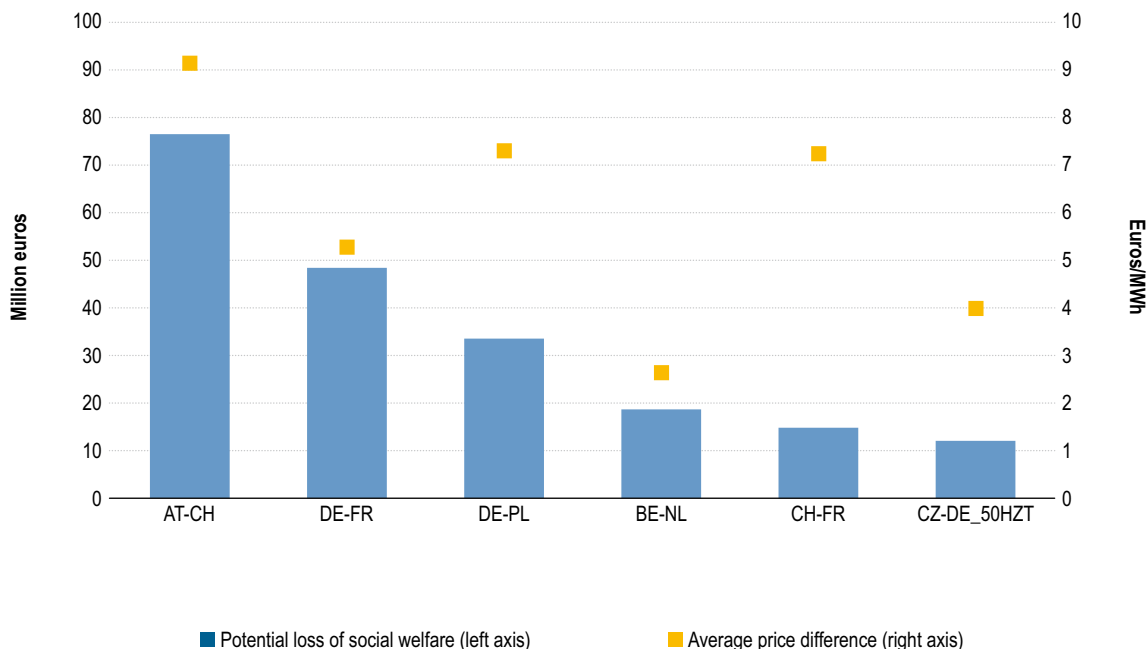


Source: ENTSO-E (2013) and ACER calculations

Note: Monthly average values were calculated on the basis of hourly data.

- 198 Decreasing NTC values are associated with a loss of social welfare on the affected borders and may fragment the IEM. As indicated above, avoiding the negative impact on cross-border capacities (through, e.g. the setting of a minimum amount of cross-border capacities on some borders, or of minimal available remaining margin on some limiting constraints) might be a preferable option compared to a financial compensation mechanism. More work is needed to address possible solutions to achieve this target.
- 199 The potential loss of social welfare in 2012 has been estimated for the two borders in each of the three regions with the highest value of the indicator. Potential limitations of cross-border capacities were calculated as the difference between annual maximum physical flow on a given border and annual maximum NTC offered to the market in the respective directions. The resulting values were then multiplied by hourly price differences between adjacent electricity markets. Figure 36 presents the results of this analysis, showing welfare losses ranging from 11.9 to 77 million euros.

Figure 36: Potential loss of social welfare due to unscheduled flows on selected borders – 2012 (million euros)



Source: Vulcanus, ENTSO-E (2013) and ACER calculations

200 This preliminary analysis does not take into account the fact that additional cross-border capacity would provide better (or even total) price convergence, which leads to an overestimation of the loss. Thus, not all additional cross-border capacity given to the market would be utilised by market participants for cross-border trading. The average price differences between adjacent markets are also shown in Figure 36.

### 3.4.2.4 Re-dispatching and counter-trading, capacity curtailments

201 To ensure operational security, different remedial actions are applied by the TSOs to relieve congestions, on either cross-border or internal lines, caused by physical flows resulting from both domestic and cross-border trade. Some remedial actions do not result in significant costs and are preventive (e.g. changing of grid topology). Others come at a cost to TSOs and may be either preventive (e.g. offering less cross border capacity) or curative (e.g. re-dispatching and counter-trading, and curtailment of capacity already allocated). The curative measures are presented in what follows.

202 Re-dispatching means a measure activated by one or several TSOs by altering the generation and/or load pattern in order to change physical flows in the transmission system and relieve physical congestion. More specifically, this refers to a TSO requesting, when congestion appears, some generators (or certain consumers) to start or increase production (or reduce consumption), and some other generators to stop or reduce production in order to maintain network security. Re-dispatching may be internal when it is performed only within the bidding zone where congestion occurred. External re-dispatching is performed in one bidding zone, whereas the congestion occurred in another bidding zone. TSOs may provide for cross-border re-dispatching when it is performed in different bidding zones. Moreover, TSOs may apply counter-trading, which means a commercial cross-zonal exchange between two bidding zones to relieve physical congestion between the same zones. In this case, the precise generation or load pattern alteration is not pre-defined.

203 Table 7 shows the costs incurred by TSOs for both re-dispatching (all types) and counter-trading in Europe.

Table 7: Total costs of re-dispatching and counter-trading in Europe – 2012 (thousand euros)

Country	Redispatching and counter-trading costs (thousand euros)
United Kingdom	268,000
Germany*	130,000
Poland	75,500
Finland	4,836
Sweden	2,990
Portugal	2,665
Denmark	2,372
France	1,310
Austria	1,200
Czech Republic	1,060
Estonia	806
Spain	561
Slovenia	382
Latvia	46
Belgium	8
Bulgaria	0
Greece	0
Hungary	0
Lithuania	0
Netherlands	0
Luxembourg	0
Romania	0
Slovakia	0
Switzerland	not available

Source: Data provided by NRAs through the ERI (2013), "Monitoring report 2012" (Bundesnetzagentur and Bundeskartellamt, 5 February 2013, available at: <http://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/BNetzA/PressSection/ReportsPublications/2012/MonitoringReport2012.pdf> and Agency calculations

Note: For the purpose of this table, the Agency requested in February 2013 the NRAs to provide the 'total re-dispatching costs'. Moreover, it was requested to disaggregate this total into: (i) the estimated costs of internal re-dispatching; (ii) external re-dispatching costs, and (iii) cross-border re-dispatching costs. Furthermore, the Agency requested the annual total costs for counter-trading. Information for Italy was not available at a sufficiently disaggregated level. \*For Germany, presented data refer to the previous year, and they report on national and cross-border re-dispatching and counter-trading costs. For Ireland, information was not available.

- 204 The numbers presented above do not serve as a basis from which conclusions can be drawn upon with regard to the share of the costs associated with relieving congestion caused by unscheduled flows or cross-border physical flows. Moreover, based on the information received, it was not possible to allocate these costs to particular borders<sup>115</sup>. This is because most TSOs do not distinguish between the re-dispatching and counter-trading costs associated with cross-border trade and the alleviation of internal congestion caused by domestic commercial exchanges. Nevertheless, there are some MSs where total costs are highly dependent on the amount of unscheduled flows, although the re-dispatching and counter-trading costs may be high.
- 205 Thus, more ongoing work by the Agency and NRAs in cooperation with ENTSO-E is needed to help better define the scope of the re-dispatching and counter-trading costs related to unscheduled flows and to propose an appropriate regulatory framework for cost-sharing. In addition, the Transparency Regulation of 14 June 2013<sup>116</sup> ('Transparency Regulation') should help increase the transparency with regard to remedial actions applied by the TSOs to ensure efficient cross-border trade. For instance, Article 13 of the Transparency Regulation requires TSOs to provide information to ENTSO-E relating to re-dispatching and counter-trading disaggregated per market time unit, including actions taken, network elements or bidding zones concerned, reasons and capacity affected or change in cross-zonal exchanges. Also, the costs associated with the above-mentioned actions as well as other remedial actions have to be reported monthly.
- 206 When dealing with unexpected situations in the grid, which, for example, may happen due to a sudden and unexpected loss of a major generation unit, a TSO may curtail the already allocated cross-border capacities in order to ensure secure grid operation. This may also be caused by the unexpected physical flows injected by neighbouring TSOs or unplanned outage of a direct current cross-border line. Note that any capacity curtailment may have a negative impact on efficient market integration. However, a more in-depth analysis would be required to assess this impact.
- 207 Figure 37 shows the number of hours for which capacity was curtailed. It also provides information on the total capacity (in MW) curtailed on a selection of borders for which cross-border capacity was curtailed<sup>117</sup>.

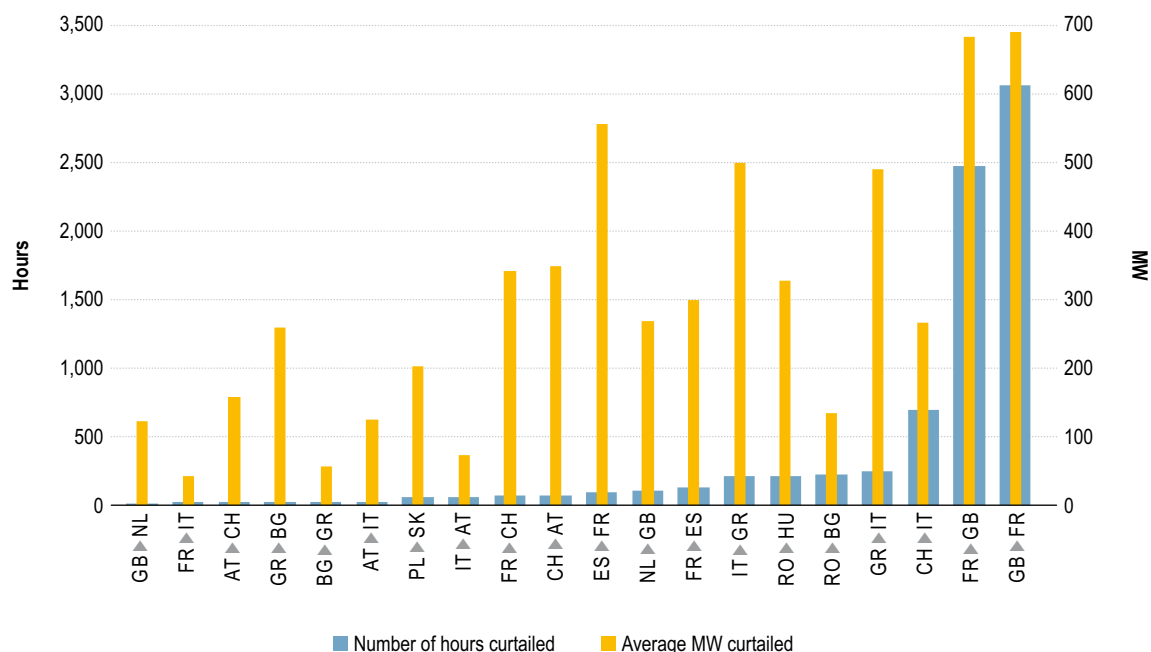
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115 Limited information as regards re-dispatching and counter-trading costs was also provided for the Market Monitoring Report of last year, see: [http://www.acer.europa.eu/Official\\_documents/Publications/Documents/ACER%20Market%20Monitoring%20Report.pdf](http://www.acer.europa.eu/Official_documents/Publications/Documents/ACER%20Market%20Monitoring%20Report.pdf) (pp. 75-76).

116 See footnote 78.

117 Average number of MW curtailed was calculated as total number of MW divided by number of hours for which cross-border capacity was curtailed.

Figure 37: Average MW and average numbers of hours curtailed per border – 2012 (hours and MW)



Source: Data provided by NRAs through the ERI (2013) and Agency calculations

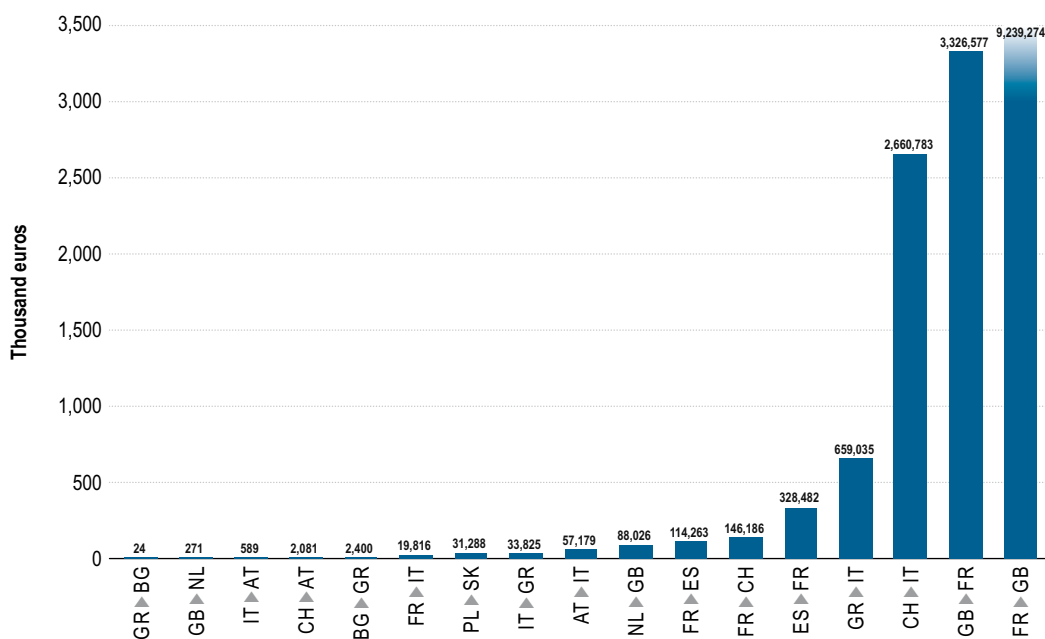
Notes: 1) In this figure, 'curtailment' is defined as 'long-term capacity curtailment'; it refers to a situation in which the sum of monthly and yearly auctioned capacity is higher in a specific hour than the day-ahead NTC value in the same hour. 2) For the borders of FR-ES, FR-IT, FR-CH, FR-GB, AT-CH, CH-IT and AT-IT the average MW capacity curtailed and the number of hours curtailed for 2012 provided by MSs TSOs, were not the same. For these borders an average was reported for both items.

208 As with the costs of re-dispatching and counter-trading, it is difficult to draw any conclusions, based on the data presented above, with regard to the share of curtailments caused by unscheduled flows. Moreover, the methodology used to calculate these data related to curtailment may differ between TSOs. While some TSOs report only on curtailments in the day-ahead market, the others include both the day-ahead and intraday ones. Nevertheless, the higher duration of unavailability of interconnectors and the higher amount of curtailed capacity usually relates to direct current cables. This is because unplanned outages of direct current cables often result in the unavailability of the total physical capacity of the interconnector, the repair of which usually takes a long time, particularly if it is a sub-sea cable<sup>118</sup>.

209 A capacity curtailment, if implemented by a TSO, is followed by compensation payments offered to the holders of cross-border transmission rights. Compensation schemes still differ across borders in the EU. For instance, while the CWE region offers market-based compensation, other regions usually propose a simple reimbursement. These costs are split between the TSOs involved in the operation in accordance with the agreed cost-sharing keys. Figure 38 shows the curtailment costs for a selection of borders.

118 In cases of alternate current overhead lines, an unplanned outage may result in limited unavailability of cross-border capacity as far as this transmission line can be by-passed by the other synchronously operated transmission lines. Moreover, due to better accessibility to this transmission line, its repair usually takes less time than that of sub-sea direct current cables.

Figure 38: Total curtailment spent per border – 2012 (thousand euros)



Source: Data provided by NRAs through the ERI (2013) and the Agency’s calculations.

Note: For the borders of FR-ES, FR-IT, FR-CH, FR-GB, AT-CH, CH-IT and AT-IT, the average total costs of curtailments for 2012, provided by both MSs’ TSOs were not the same. For these borders averages are shown

- 210 Curtailment costs may also depend on the price difference between respective bidding zones (markets) if a market-based compensation mechanism is implemented.

### Conclusion

- 211 Loop flows constitute a barrier to efficient market integration and to secure grid operation. The problems related to loop flows are constantly increasing, so an urgent solution is needed. For instance, there is still a lack of adequate transparency as regards the respective level of loop flows and transit flows when unscheduled flows are concerned. In addition, the number and costs of remedial actions applied by the TSOs with regard to loop flows are not transparent enough. Thus, the appropriate monitoring of loop flows and associated externalities, including the calculation of the loss of social welfare as well as the implementation of adequate remedial actions, are still challenges. The Agency has already proposed a possible method to increase the transparency of loop flows and further work on its development and implementation is required. Moreover, the recently adopted Transparency Regulation will contribute to better monitoring of all aspects related to loop flows.
- 212 The problem of unplanned flows is also an issue. However, the appropriate implementation of the forthcoming Operational Planning and Scheduling Network Code should help to reduce the amount of unplanned flows. If complemented with efficient congestion management methods, especially in the intra-day and balancing timeframes, the negative effects of unplanned flows can be mitigated.

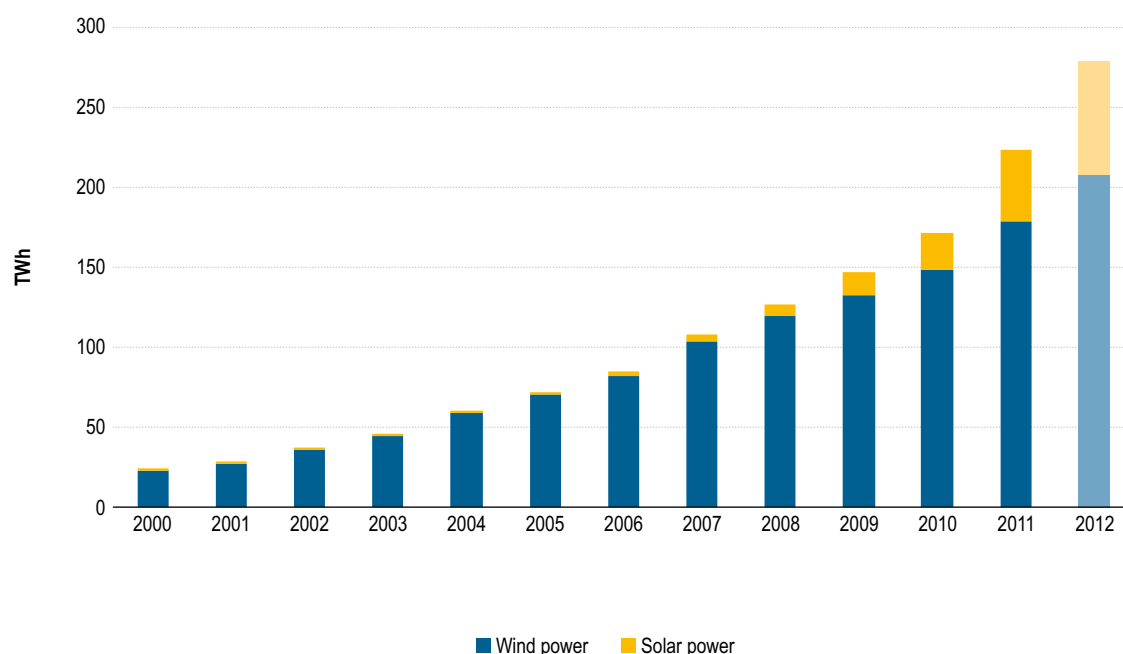
### 3.5 Network access and renewable energy sources

213 This section focuses on the integration of electricity from renewable energy sources, and in particular wind and solar plants, in EU electricity systems. It shows recent developments in variable RES-based generation and the associated challenges for electricity systems. This section includes case studies and points to solutions to these challenges. Finally, it reports on a number of complaints which the Agency received in 2012 with regard to network access for RES.

#### 3.5.1 Developments

214 In 2012, approximately 23%<sup>119</sup> of all electricity generated in Europe was produced from RES. Of these, a growing share is intermittent generation, such as solar and wind (see Figure 39).

Figure 39: Aggregated solar and wind generation in Europe – 2000 to 2012 (TWh)



Source: Eurostat (2013)

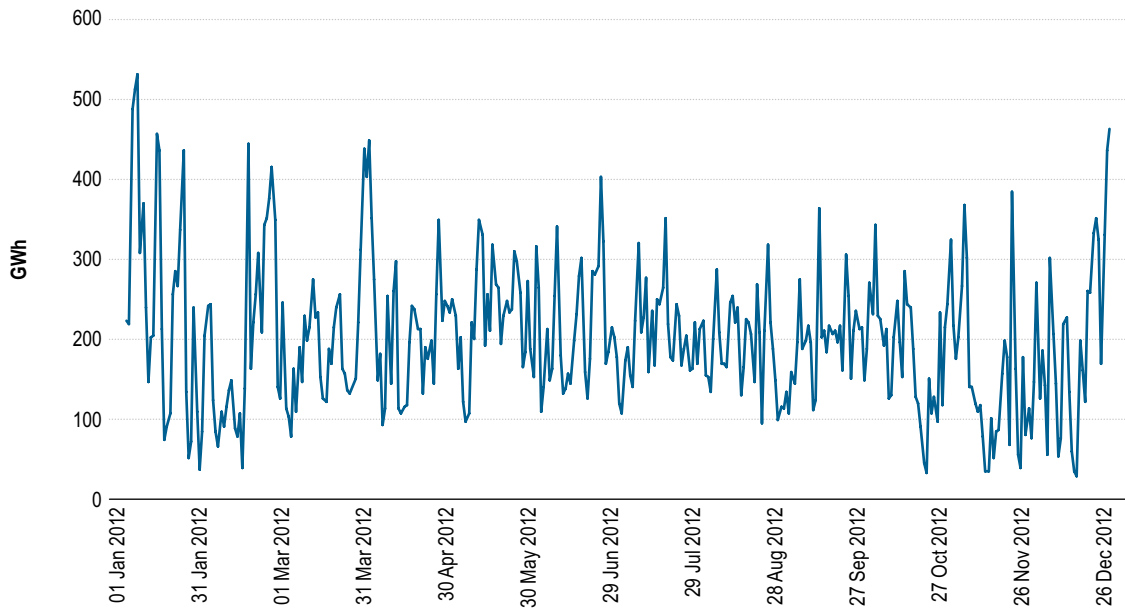
Note: Estimated value for 2012.

215 The increasing penetration of variable RES-based generation sources, in particular in MSs that have taken the lead in promoting these technologies (e.g. Denmark, Germany, Portugal and Spain), poses a challenge to TSOs to balance supply and demand in the network. This challenge stems from the fact that production from these sources is not always fully available or predictable, and its natural variability does not normally correlate with (also varying) demand.

216 Production variations of intermittent RES-based generation can occur in any timeframe and can be significant. For instance, in Germany the (daily) maximum solar and wind production was 19 times greater than minimum production in 2012 (see Figure 40). Furthermore, Figure 41 shows intra-day wind feed-in in Germany for a selection of days which displays fluctuations of up to 3GW within a single hour.

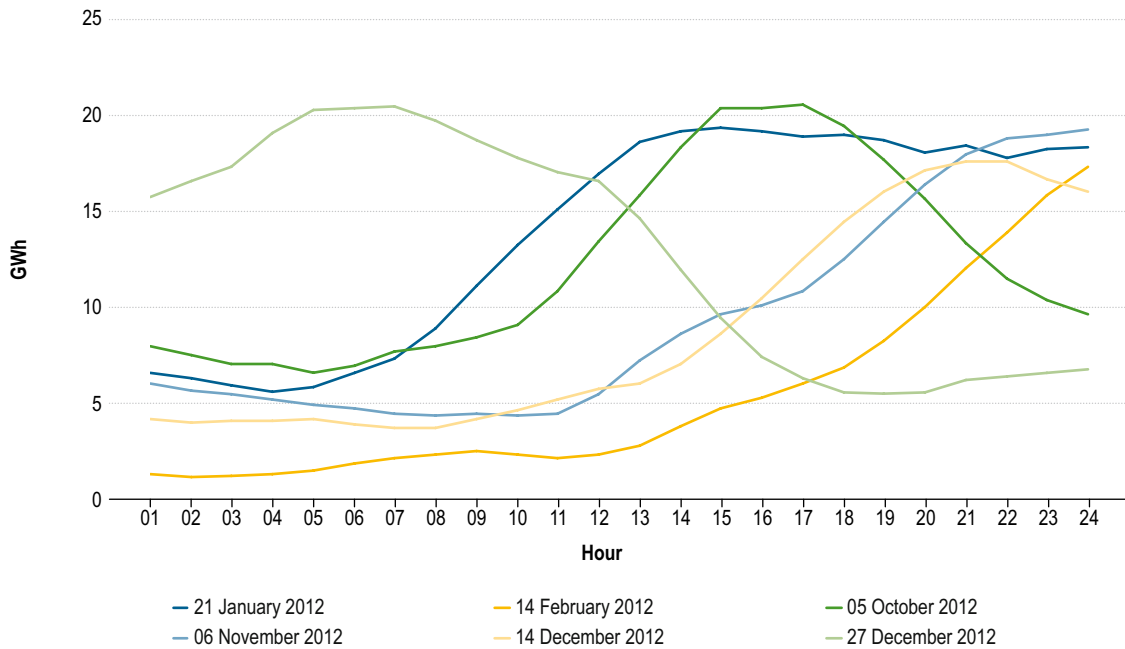


Figure 40: Aggregated daily wind and solar production in Germany – 2012 (GWh)



Source: The German TSOs (2013)

Figure 41: Hourly wind power production in Germany for a selection of days in 2012 (GWh)

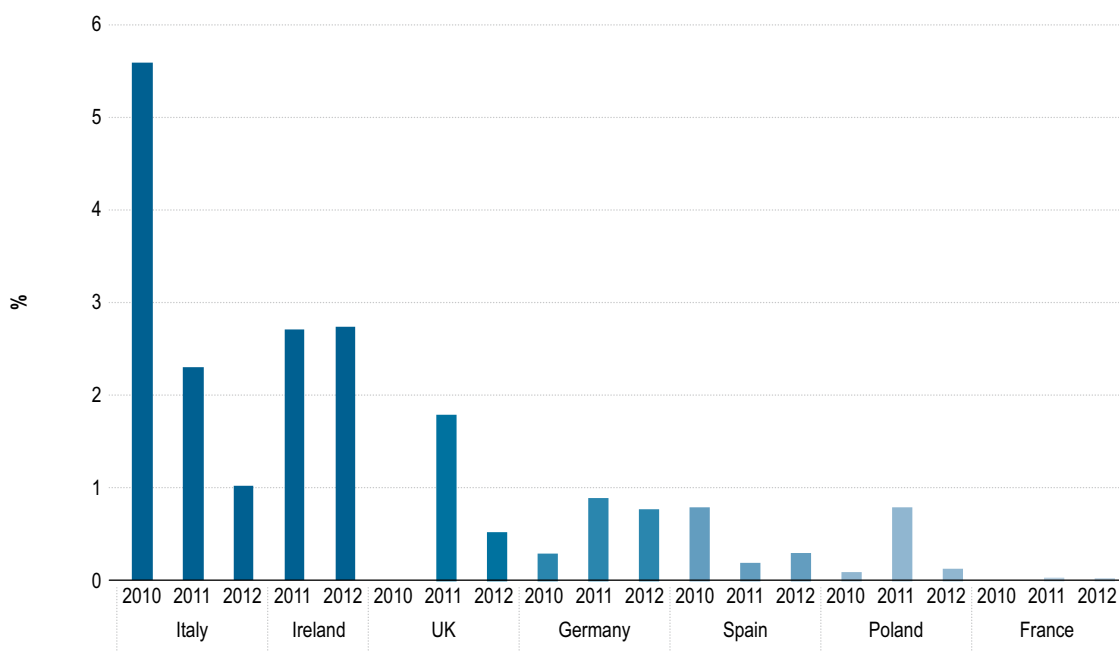


Source: The German TSOs (2013)

Note: The figure shows the days with the highest hourly wind production fluctuations in Germany in 2012.

217 The challenge with regard to integrating the increasing amounts of variable RES-based generation into the system is reflected in the presence of wind curtailments<sup>120</sup>. Figure 42 presents the level of curtailments applied to wind power in 2012 for a selection of MSs. According to this figure, the curtailment level for renewables remained unchanged compared to 2011 or was reduced. The highest level of curtailments is shown for Ireland, where internal demand and cross-border capacity continued to be frequently insufficient to absorb RES production fully. The figure also shows the decreasing importance of wind curtailments in Italy, where the amount of ‘lost generation’ decreased, following network expansions<sup>121</sup> in the areas with the most significant network congestions. In Germany, a decrease of wind curtailments was also observed in 2012. This was because of relatively constant weather conditions, showing fewer feed-in peaks of wind and solar, combined with some network expansion measures. In Spain, the highest level of RES curtailments was recorded in 2010, due to significant rainfall and strong winds.

Figure 42: Percentage of energy loss due to curtailment of wind-generated energy at national level – 2010 to 2012 (%)



Source: CEER National Indicators (2013)

218 According to NRAs, curtailments from electricity production from RES in 2012 occurred mainly due to transmission constraints (as in Great Britain and Italy) and the presence of excess generation in the relevant system control area combined with limited export capacity (as in Ireland and Spain).

219 In what follows, two case studies are provided about the experience of managing intermittency in Spain and Great Britain.

120 The RES curtailments and adequacy of the power systems are assessed in the ENTSO-E Outlook Reports, see: <https://www.entsoe.eu/publications/system-development-reports/outlook-reports/>

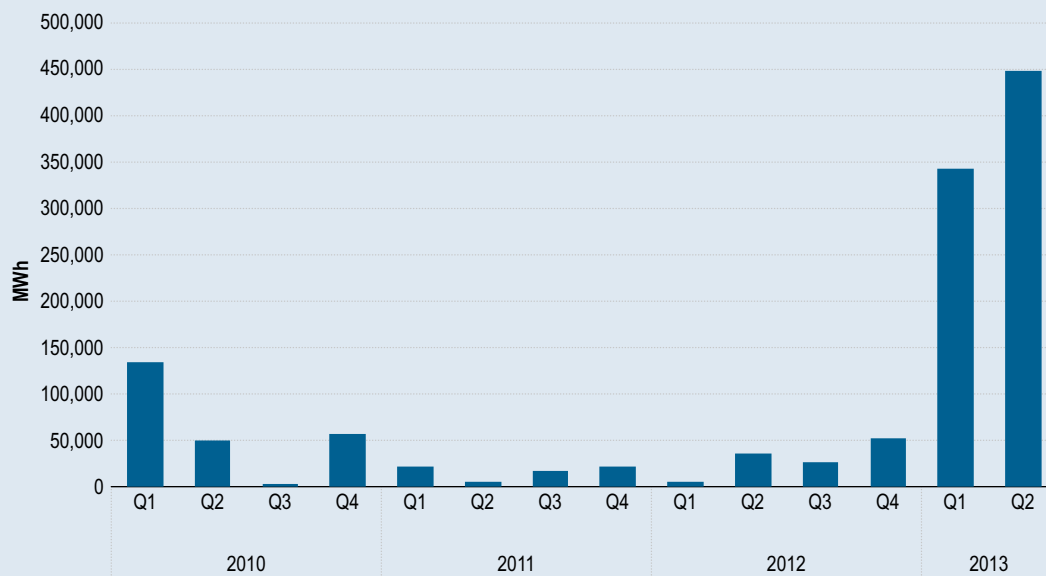
121 Together with investments in monitoring devices which contributed to the more efficient use of the network, including a reduction in the level of wind curtailments.

### Case Study 4: Integrating intermittent generation at times of high RES-E production in the Spanish system

In Spain, RES-based generation accounts for 59%<sup>122</sup> of the total installed generation capacity (in 2012) and is given priority access, meaning that the Spanish TSO (REE) has to exhaust all available market and operational tools at its disposal before resorting to curtailments of electricity produced from RES. Despite this priority access, over the last few years, electricity produced from RES had to be occasionally curtailed. This usually occurs at times of strong winds (frequently in combination with heavy rain) and low demand.

Figure i shows the quarterly evolution of wind curtailments in the Spanish system since 2010. In 2011 and 2012, wind curtailments were applied less frequently than in 2010 when exceptionally high hydro production was recorded.

Figure i: Quarterly evolution of wind curtailments in Spain, 2010 to April 2013 (MWh)



Source: CNMC, compilation of data from REE (2013)

Although this MMR focuses on 2012, this case study has, as an exception, made use of the 2013 data. This is due to the unusually high level of curtailments of electricity produced from RES registered during March and April 2013 in the Spanish system, when approximately 8% of available wind generation was curtailed. The situation was driven by an excess of generation in the system, including from hydro due to abundant precipitations which made hydro operators unload water reserves, coupled with high wind production under a low-demand scenario. Other curtailments also took place due to distribution or transmission constraints, but to a considerably lesser extent (approximately 0.3% of wind generation).

The excess generation may already be observed before real time in the day-ahead market when price equals zero<sup>123</sup> and the amount of power offered at that price<sup>124</sup> exceeds day-ahead demand. In such situations, market rules stipulate the pro-rata limitation of all plants which offered their energy at

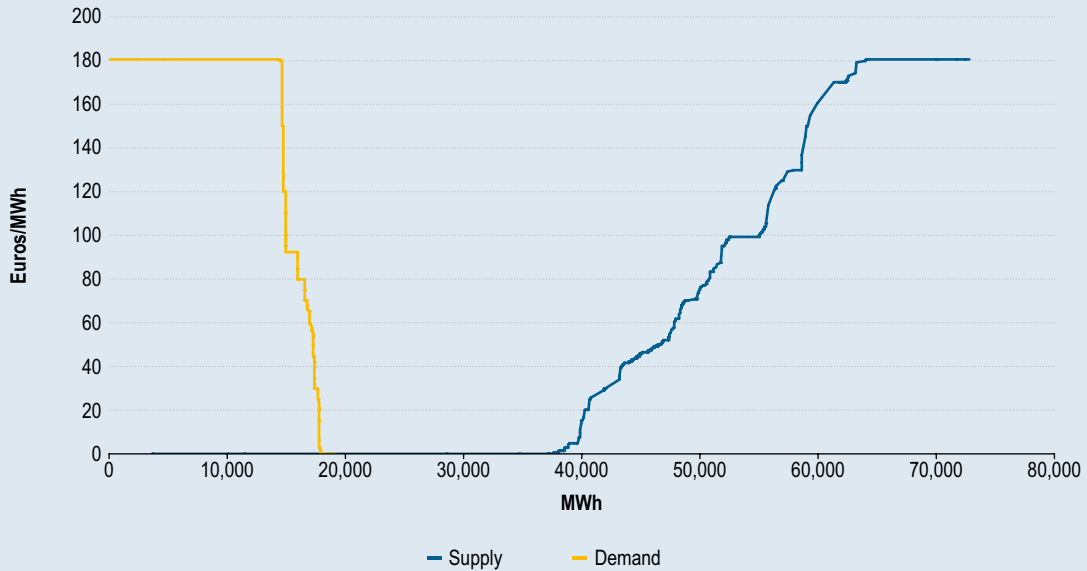
122 Conventional hydro power plants included.

123 Euro/MWh.

124 Mainly nuclear and RES-E plants.

zero price. An example of such events is illustrated in Figure ii, where the amount of electricity supplied in the Iberian market at zero prices is twice as high as demand at this price<sup>125</sup>.

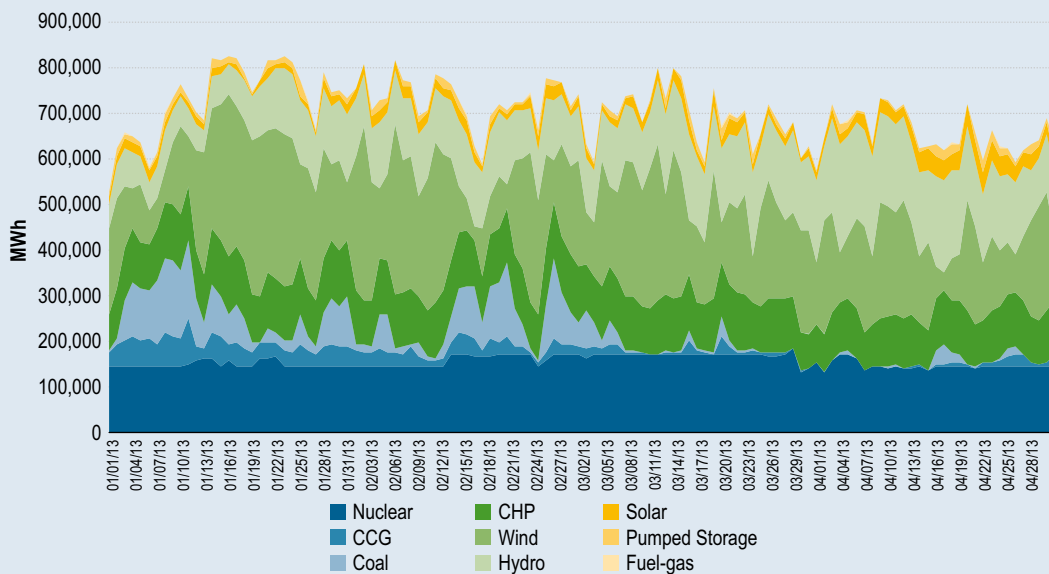
Figure ii: Aggregated supply and demand curves in the Iberian Market – 29 March 2013, hour 6 (euros/MWh)



Source: CNMC, compilation of data from OMIE (2013)

Furthermore, closer to real time, the TSO reassesses the need for curtailments based on the best available RES and demand forecasts and the availability of flexible conventional plants to balance the system. Figure iii shows the lack of (scheduled day-ahead) flexible resources in March and April 2013. During those months, the need for programming some flexible plants after the day-ahead time-frame contributed to curtailments of electricity produced from RES.

Figure iii: Scheduled day-ahead generation by technology (January–April 2013) (MWh)

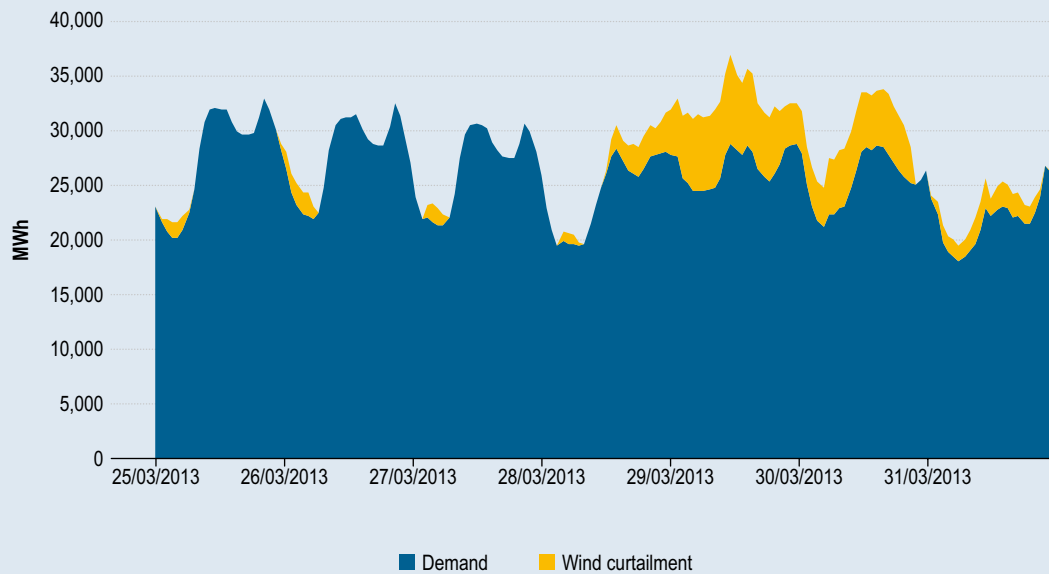


Source: CNMC, compilation of data from OMIE (2013)

125 Resulting from the day-ahead market clearing.

Figure iv shows the amount of wind curtailments in the week of 25–31 March 2013 ('the Period') in comparison with demand, when restrictions were more severe than ever. It is worth mentioning that nuclear and hydro plants were also subject to generation restrictions of 1GW and 2GW, respectively, during several hours, in particular on 29, 30 and 31 March, when demand was very low due to holidays<sup>126</sup>.

Figure iv: Wind curtailments compared to demand in Spain, 25 to 31 March 2013 (MWh)



Source: CNMC, compilation of data from REE (2013)

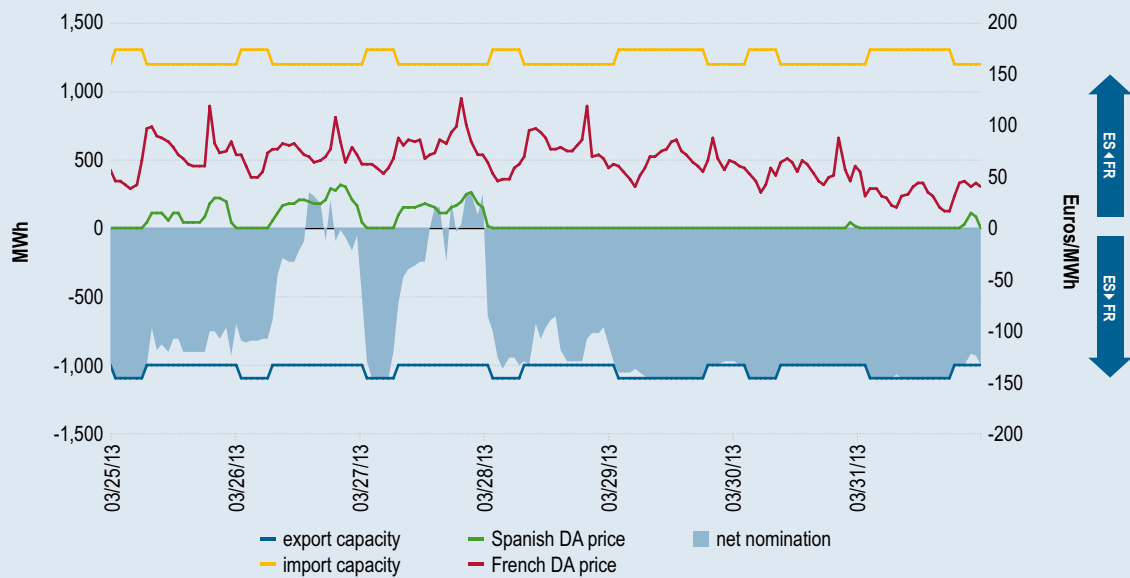
126 The legislation stipulates which technologies and units are prioritised and which are curtailed first within the RES plants. Manageable RES plants should be curtailed first. Small RES plants (below 10 MW) cannot be curtailed, as they are not required to be connected to a control centre, which does not allow them to be curtailed remotely by the TSO. Within each technology, the curtailments are applied pro-rata.

At times of excess generation, the system can use cross-border trade<sup>127</sup> and downward regulation<sup>128</sup> to limit the need for RES curtailments. The efficient use of these tools should not entail higher costs for the system. This is assessed below.

Use of cross-border capacity at times of excess electricity produced from RES

Figure v illustrates the use of capacity between Spain and France in the day-ahead timeframe during the Period. The respective day-ahead prices are also displayed. Figure v shows that the capacity was not fully utilised in the day-ahead timeframe, or was even used in the ‘wrong direction’ (i.e. from the higher to the lower price zone).

Figure v: Use of day-ahead capacity on the Spanish-French interconnection versus day-ahead prices – 25 to 31 March 2013 (MWh)



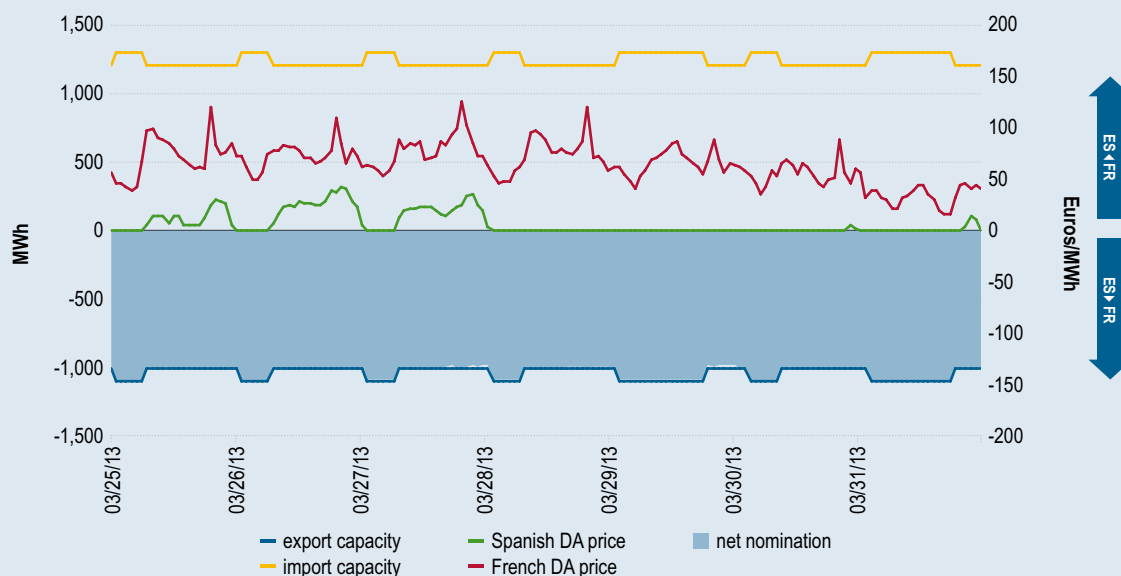
Source: CNMC, compilation of data from OMIE and REE (2013)

127 Day-ahead and intraday cross-border trade. Trade of balancing energy is not available across the Spanish borders.

128 Downward regulation is the level of generation flexibility that is required by the relevant TSO to reduce output on the system in order to maintain the balance between injections and withdrawals.

When day-ahead cross-border capacity on the Spanish-French border is not fully utilised, it is offered on the intraday market. Figure vi shows that the cross-border capacity available in the Spain to France direction was fully utilised during the Period. The incremental scheduled exports in the intraday timeframe allowed REE to reduce curtailments of electricity produced from RES, illustrating the importance of cross-border intraday trading to facilitate RES integration.

Figure vi: The France-Spain interconnection: final capacity versus final net use – 25 to 31 March 2013 (MWh and euros/MWh)



Source: CNMC, compilation of data from OMIE and REE (2013)

However, in the Period, the interconnection with Portugal (although not shown in the figures above) could not be used to relieve excess generation in Spain, since the Portuguese system also recorded high levels of production from RES. As regards the French border, the ongoing project<sup>129</sup> to increase the existing cross-border capacity between Spain and France is expected to support the integration of wind and other RES further.

However, this should be complemented by improved market design. In the Period, the capacity to France was fully utilised in real time, probably due to the presence of significant price differentials, which promoted intraday exports to France up to the limit of the available capacity. Under less extreme conditions, the price differentials between Spain and France are likely to be less evident for traders; then, the explicit auction mechanisms currently in place at the day-ahead and intraday timeframes might not induce the efficient use of the existing cross border capacity. The substitution of explicit allocation mechanisms by implicit allocation on the Spanish-French border would prevent such events.

129 A new line between Spain and France is currently under construction. This will increase the transmission capacity between Spain-France by 1,400MW. It is scheduled to be operational in 2014.

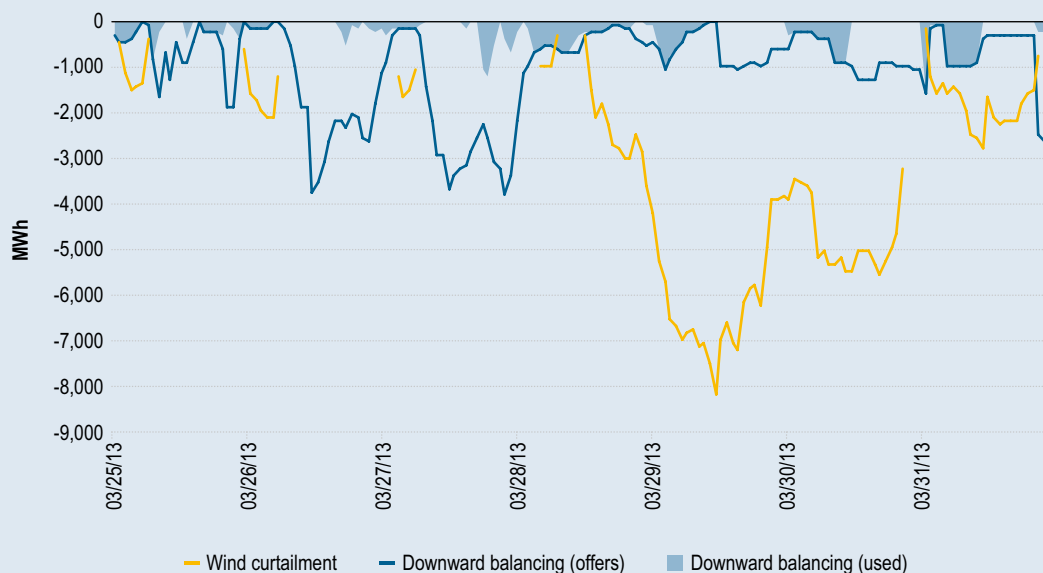
Moreover, allowing trade closer to real time would enable the better integration of intermittent generation. This would help fine tune the final schedule, including refined capacity allocation, according to the best intermittent RES forecast. In this context, it is important to speed up the implementation of the Target Model on all the Spanish borders, which includes continuous intraday cross-border trade and the exchange of balancing power. Currently, an interim solution between Spain, Portugal and France envisages the cross-border exchange of replacement reserves<sup>130</sup> using the available capacity at the interconnection. The system will be based on the Balancing Inter TSO (BALIT)<sup>131</sup> platform.

### Use of downward regulation at times of ‘excess’ electricity production from RES

As indicated above, the Spanish legislation specifies that conventional generation should be reduced first, in order to limit curtailments of RES production. This is achieved by using flexible generation (including thermal, hydro and pumped storage units). It is mandatory for these units to offer all their available downward<sup>132</sup> balancing reserves to the balancing market. Consequently, the Spanish TSO should exhaust all downward balancing reserves offered to the market – as long as it is compatible with the security standards of the system – before applying reductions to other technologies.

Figure vii shows the amount of downward regulation<sup>133</sup> offered to the market by the different flexible units in the Spanish system in the Period. The use of downward balancing energy by the Spanish TSO is also presented.

Figure vii: Use of available downward regulation – 25 to 31 March 2013 (MWh)



Source: CNMC, compilation of data from REE (2013)

Figure vii illustrates that the volume of available downward balancing reserves was lower during the days of highest wind curtailments (29 and 30 March). However, the available downward regulation was not always exhausted. According to the Spanish TSO, some available downward balancing

130 Operating reserves used to restore the required level of operating reserves to be prepared for a further system imbalance. This category includes operating reserves with an activation time from 15 minutes up to hours.

131 Model for inter-TSO balancing exchanges at the interconnection between France and England.

132 Offering all the available upward balancing reserves is also mandatory, although not relevant for this case study.

133 Only ‘Replacement reserves’ are shown.



reserves remained unused during those days, since it would have otherwise caused network congestions.

### Conclusions

In the context of the increasing amount of electricity produced from RES in the Spanish system, curtailment of wind (and other inflexible generation) may become more frequent.

This case study shows the importance of efficient utilisation of cross-border capacity in order to minimise curtailments of electricity produced from RES. For the Period (from 25 to 31 March) with high electricity produced from RES (wind) and low demand, interconnector capacities were fully utilised before the TSO resorted to RES curtailments.

The key measures to reduce curtailments further include: (i) reinforcing cross-border capacity on the border between Spain and France; (ii) implementing implicit mechanisms for the day-ahead and intraday timeframes on this border; (iii) allowing trade close to real time, and (iv) implementing cross-border balancing on all borders. All these measures are part of the implementation of the Target Model.

Finally, introducing more market-based methods to allocate curtailments across RES plants might prove more efficient compared to the existing pro-rata framework. The interaction with the existing feed-in tariffs needs to be considered prudently.

### Case Study 5: Managing intermittent and inflexible generation in the Balancing Mechanism in Great Britain

National Grid Electricity Transmission (NGET) is the electricity system operator (SO) for the on-shore and off-shore electricity transmission systems in Great Britain (GB). NGET plays a fundamental role in the functioning of the GB electricity market, as it is responsible for balancing the electricity system on a continuous basis.

The SO's role to balance the system is becoming increasingly challenging, as the proportion of electricity generation that comes from RES increases. RES-based generation is now at a level whereby output must be effectively managed in order to keep the system in balance. Existing constraints on the GB transmission network are being exacerbated by increased RES-based generation. These constraints occur when the capacity of the transmission network is exceeded, limiting the amount of generated electricity that can be transmitted to other parts of the network.

In relation to intermittent and inflexible generation, the most important transmission constraint is between England and Scotland, because the majority of this type of generation in GB is from Scottish wind farms. Electricity generation is generally higher than demand in Scotland, which typically results in a north-to-south flow of electricity within GB. 'Excess' electricity generated in Scotland flows out of Scotland via two routes: it is either exported to Northern Ireland via the 500MW Moyle interconnector or flows south to England across the Cheviot boundary.

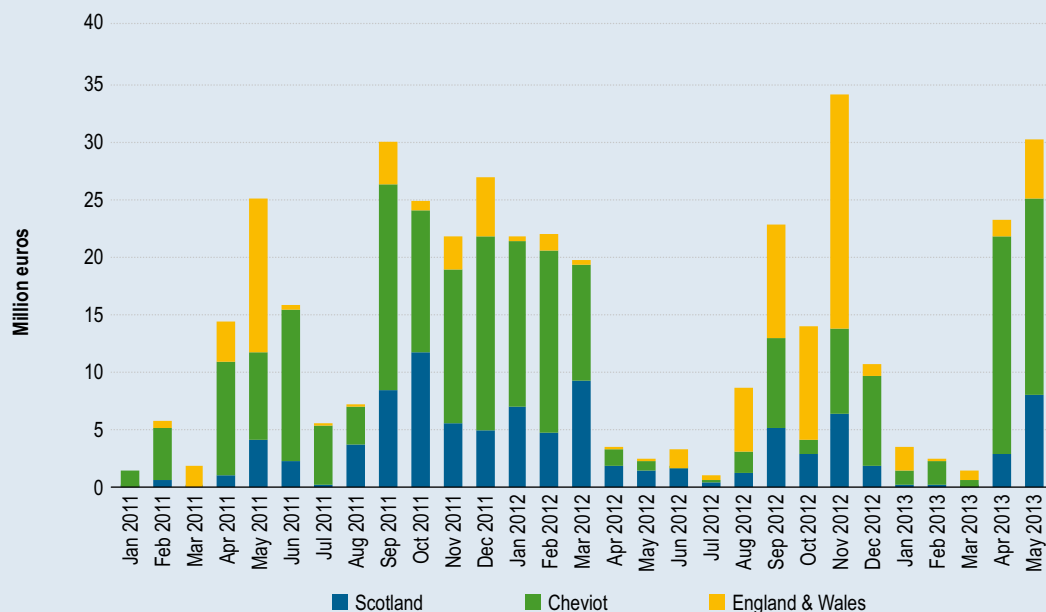
The amount of 'excess' generation in Scotland has increased as more wind farms have connected to the transmission system and increased the level of electricity generation. However, the limited capacity of the Moyle interconnector and the Cheviot boundary has meant transmission constraints have become more common between Scotland and England.

The SO has to take action to ensure that these constraints are relieved and the system remains in balance. Figure i shows the Balancing Mechanism (BM)<sup>134</sup> costs associated with the actions taken by the SO to resolve export constraints<sup>135</sup> in the GB market. Since increasing demand is difficult in the short term, the focus tends to be on reducing Scottish generation to a level no greater than the sum of Scottish demand plus what can be exported via the Moyle interconnector and across the Cheviot boundary.

134 The main purpose of the BM is to provide National Grid with a mechanism that enables supply and demand to be balanced across the electricity transmission system while also allowing the management of system security. National Grid aims to balance the system in the most economic manner. However, in certain circumstances, in order to preserve the integrity of the electricity transmission system, National Grid can use Emergency Instructions regardless of costs.

135 Export constraints occur when total generation in an area exceeds the total demand plus transmission capacity to export the excess electricity.

Figure i: BM costs associated with actions taken to resolve constraints in the GB market (million euros)



Source: National Grid Monthly Balancing Services Summary. Available from <http://www.nationalgrid.com/uk/Electricity/Balancing/Summary/>

Managing wind generators in the BM can be expensive because wind generators may submit negative bid prices (i.e. indicate that the SO needs to pay them to reduce output). These negative bid prices may reflect lost revenues associated with Renewable Obligation Certificates (ROCs)<sup>136</sup>, bilateral agreements between a generator and a supplier that require them to generate whenever possible, or the technical inflexibility of wind farms.

In order to reduce generation from the system, the SO has a number of options:

- Pre-gate trading actions, namely trades and option contracts with wind generators;
- BM actions, namely accepting bids from generators to reduce generation, or from demand-side BM units to increase consumption; and
- Emergency instructions, whereby the SO issues an instruction to a generator to reduce output. These actions are taken only if the safety and integrity of the network are at risk and all commercially available options have been exhausted. In this situation, compensation for lost generation is payable only for the periods for which gate closure has occurred i.e. up to the 'wall'. Where a BM Unit does not take part in the BM or Bid-Offer data is not submitted then the emergency instruction will be compensated at a zero price.

136 ROCs are green certificates issued by Ofgem to operators of accredited renewable generating stations for the eligible renewable electricity they generate. Operators can then trade the ROCs with other parties, with the ROCs ultimately being used by suppliers to demonstrate that they have met their obligation.

Recent experience has shown that the cost of managing such constraints in Scotland has been increasing, mainly due to high levels of wind generation during low demand periods. For example, during a total of 73 days across 2012, the SO had to take action to relieve transmission constraints within Scotland and between Scotland and England. The SO achieved this by curtailing wind generation in Scotland. During this period, the SO accepted negative bids from wind generators that were active in the BM to curtail a significant amount of wind generation which led to high constraint costs. The reasons for these constraints varied, but the key reasons included:

- High levels of generation:
  - High wind led to wind generation output reaching successive record levels across 2012;
  - Heavy rain caused hydro plants to run for environmental reasons; and
  - A requirement to keep some Scottish conventional generation running in order to maintain the required level of voltage in the system.
- Low levels of demand: the consequences of heavy rain include reduced demand for electricity from pump storage units; and
- For some time in 2012, there was lower than normal 'export' capacity from Scotland due to outages of the Moyle interconnector, which reduced exports from Scotland to Northern Ireland.

This example highlights the cost involved in short-term management of intermittent and inflexible generation. This challenge is set to continue as more of this generation comes onto the system: according to NGET forecasts, approximately 28% of transmission-connected generation in GB will consist of wind and other renewable generation by 2020. In the short term, the Transmission Constraint Licence Condition should help manage the costs associated with managing intermittent and inflexible generation through the BM by requiring that licensed generators do not obtain excessive benefit from electricity generation in relation to a transmission constraint period<sup>137</sup>.

However, other longer term options exist for managing intermittent and inflexible generation; for example, increasing transmission capacity between Scotland and England should enable additional power to be evacuated from Scotland. A range of options has been considered by the Transmission Owners (TOs), which aim to increase transfer capability of the circuits between Scotland and England. One development that will increase network capacity between Scotland and England is the Western HVDC link, a sub-sea 'bootstrap' running down the west coast of GB. The Western HVDC link is due to provide more than 2GW of additional transmission capacity for north-south transfers by 2016. The total project cost is estimated at £1,050m (850 million euros) and the cost benefit analysis of the project also shows net lifetime benefits in the range of £1bn (0.8 billion euros) to £4bn (3.2 billion euros) under the Gone Green scenarios<sup>138,139</sup>.

137 Transmission Constraint License Condition Guidance Paper is available at <http://www.ofgem.gov.uk/Markets/WhIMkts/CompanEff/Documents1/TCLC%20Guidance.pdf>

138 The Gone Green scenario represents a potential generation and demand background that meets the environmental targets in 2020 and maintains progress towards the UK's 2050 carbon emissions reductions target.

139 See: [http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/CriticalInvestments/InvestmentIncentives/Documents1/Jul12\\_WHVDC\\_decision\\_FINAL.pdf](http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/CriticalInvestments/InvestmentIncentives/Documents1/Jul12_WHVDC_decision_FINAL.pdf)

Upgrades to the transmission network such as this should not only better enable Scotland's power to be delivered to England, but will also improve the ability to export the increasing amount of intermittent and inflexible power generated in Scotland to continental Europe and Ireland via GB's interconnectors located in England.

Furthermore, day-ahead market coupling between national markets should simplify cross-border trading by removing the unnecessary risks of trading transmission capacity and energy separately. As a result of market coupling, prices across borders should converge when there is sufficient cross-border transmission capacity and social welfare should be maximised. With market coupling, cross-border capacity should be optimised, since it will respond to more accurate price signals. This may result in less curtailment of excess renewable generation in GB if this generation can be more easily traded across borders to satisfy demand in other countries.

### 3.5.2 Potential solutions

- 220 In view of the increasing share of variable RES-based generation, TSOs will have to draw on additional (flexible) resources to be able to balance the power systems at all times in a cost-effective way. The best way to pursue the deployment of sufficient flexible resources in the system is to create a well-functioning energy market. This renders sound prices that attract existing resources in the system to participate in the supply of flexible electricity. Moreover, these prices will send appropriate signals to the market for investments in generation and in distribution and transmission networks' expansions.
- 221 Full implementation of the ETM is the first priority in order to create a well-functioning energy market. It will improve the efficient use of the interconnections, ensuring that electricity flows efficiently from regions with an excess of low-cost generation to regions where the demand can absorb it.
- 222 With the full implementation of the ETM, efficient cross-border intraday and balancing trade will be implemented. This will yield greater availability of least-cost flexible resources on a wider geographic scale to mitigate the impact of intermittency, both for market players (during the intraday timeframe) and TSOs (during the balancing timeframe). The ETM will also provide motivation for better RES forecasts through closer-to-real-time intraday trade in combination with clear RES balancing responsibilities. Consequently, lower forecast errors will reduce the need for costly adjustments of supply and demand during the balancing timeframe.
- 223 Higher flexibility in the system may also be provided by demand-side response (DSR) measures. DSR refers to changes consumers make to their energy use in response to some form of signal, such as prices, that help manage the electricity system. While this needs to be assessed further, a more active participation of demand in the system should contribute to a more efficient balancing of the systems. In addition, a permanent participation of demand response should smooth the load curve, i.e. reduce the level of peak demand and contribute to a less costly long-term adequacy. A well-functioning market and an appropriate regulatory framework are the key elements to promote demand response participation.
- 224 Moreover, well located, efficient and flexible resources are best coordinated with an integrated and efficient EU wholesale gas market with sound price formation and transparent network access. For instance, it would be much more cost-effective to use the gas infrastructure to transport gas before it is turned into electricity to balance renewables, rather than reinforce electricity transmission grids to deliver power 'flexibility' on (remote) networks with high levels of (variable) RES generation. Therefore, flexibility in wholesale electricity markets (including RES balancing) requires efficient and well-integrated gas markets.
- 225 All in all, efficient cross-border trade and well-functioning wholesale electricity markets are required to better integrate RES in the system<sup>140</sup>. These elements should be able to deliver sound prices, reflecting the correct value for flexibility. This would render the right incentives for investment in, inter alia, flexible new plants, storage, distributed generation, demand-side response technologies.

140 This includes the progressive removal of distortive and non-harmonised technology-oriented support instruments for RES-based generation. Moreover, the role a reviewed EU Emission Trading System (ETS) could play to promote efficient price formation should be further investigated. By placing an effective price on emitting carbon and thereby giving a financial value to each tonne of emissions saved, ETS may indeed contribute to market-driven investments in low-carbon technologies.

- 226 As regards investments in new power plants, the need for sufficient flexible back-up resources has contributed to the debate on whether Capacity Remuneration Mechanisms (CRMs) should be introduced. Careful attention needs to be paid to such mechanisms in relation to the functioning of the IEM, which was elaborated on by the Agency in a previous report<sup>141</sup>.
- 227 Efficient price formation should also deliver the right incentives to invest in the network in order to increase transmission and distribution capacities. Although network investments aim, among other things, at ensuring the functioning of the internal energy market or safeguarding security of supply, they also contribute to integrating variable RES generation. Indeed, ENTSO-E has identified 100 bottlenecks in the EU network, of which 80% are related, directly or indirectly, to the integration of renewables. According to ENTSO-E, the renewal or construction of the necessary power lines will require a significant investment, of 104 billion euros<sup>142</sup>, which will have to be supported by a thorough cost-benefit analysis.

### 3.5.3 Network access complaints

- 228 In 2012, the Agency received a number of complaints regarding access to the network from developers of RES (i.e. wind and solar plants). At the heart of these complaints lay the unanticipated changes to national regulation regarding renewable sources proposed or implemented in some MSs.
- 229 Following a sudden increase in the costs of renewable energy support schemes, some MSs modified the conditions for access of renewables to the network. These changes resulted in interruptions or suspensions of the existing support schemes. Moreover, certain MSs imposed additional connection fees or network charges exclusively on RES plants.
- 230 The two most relevant complaints received by the Agency in 2012 are summarised below.

#### 3.5.3.1 Complaint about new network fees applied uniquely to a specific technology

- 231 The first complaint relates to the decision of a MS to increase the use-of-system charge through a new additional network fee, specifically for electricity generated from photovoltaic power plants. This charge was mainly introduced because of higher network management and balancing costs caused by the increasing RES share. Under the new provision, the charge is applied irrespective of the incurred imbalances caused by the specific source. All photovoltaic plants will be affected by the new additional fee, including plants which became operational before this provision entered into force.
- 232 In this context, it is worth recalling some of the EU legal provisions relevant to the complaint (i.e. network access).
- 233 First, pursuant to Article 32 of Directive 2009/72/EC 'Member States shall ensure the implementation of a system of third-party access to transmission and distribution systems based on published tariffs applicable to all eligible consumers and applied objectively and without discrimination between system users (...)'<sup>143</sup>.

141 See: [http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Publication/CRMs%20and%20the%20IEM%20Report%20130730.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/CRMs%20and%20the%20IEM%20Report%20130730.pdf)

142 ENTSO-E, 'Ten-Year Network Development Plan 2012', see: [https://www.entsoe.eu/fileadmin/user\\_upload/\\_library/SDC/TYNDP/2012/120705\\_TYNDP\\_2012\\_report\\_FINAL.pdf](https://www.entsoe.eu/fileadmin/user_upload/_library/SDC/TYNDP/2012/120705_TYNDP_2012_report_FINAL.pdf)

143 Article 32 of Directive 2009/72/EC, of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC (OJ 2009 L211/55).

- 234 Second, network charges should aim to recover the actual costs of using the network consistently with the principle of cost-reflectivity as specified in Regulation (EC) No 714/2009<sup>144</sup>.
- 235 Third, these charges should send the right price signal to network users, contributing to the efficient use of the network. A similar approach should apply to the provision of balancing services, although this should be achieved preferably through setting up transparent market-based mechanisms as soon as the electricity market is sufficiently liquid. In the absence of such a liquid market, balancing tariffs should be non-discriminatory and cost-reflective, while appropriate signals should be provided to balance, and not endanger, the system<sup>145</sup>.
- 236 The Agency believes that RES producers should not receive special treatment for their imbalances. Indeed, the Agency's 2012 Framework Guidelines on Electricity Balancing stipulate that all injections and withdrawals of energy from the network should be assigned balancing responsibility. Moreover, this should be complemented by adequate incentives to encourage balancing near to real time.
- 237 Based on the information received and the relevant EU provisions, the Agency considers that the allocation of the costs of balancing irrespective of the incurred imbalances does not provide adequate incentives for RES-based producers to meet their schedules. More importantly, allocating balancing costs to (only) one technology might be discriminatory.
- 238 Finally, the fear of unpredictable technology-specific changes in the regulation as described above may increase the risk perceived by investors in certain RES-based technologies, resulting in higher costs of capital. This may undermine investor confidence in the sector and reduce the appetite for investment.

### 3.5.3.2 Complaint on suspension of procedures for licensing and connecting to the network

- 239 The second complaint refers to the suspension of procedures for licensing and connecting new photovoltaic plants in a MS. The complainants argue that they did not intend to have access to any state support or public subsidy in order to finance the project.
- 240 According to the NRA in question, the suspension affected only the new photovoltaic plants, since this technology already met the goals set by the 2020 national target, while the other RES technologies did not exceed the target. Further, the Agency was informed by the NRA that the suspension affected all new projects of that technology. This includes projects which do not intend to receive any public subsidy, but aim to participate in the market under the same conditions as conventional plants.
- 241 Based on the information received and the relevant EU provisions mentioned above, the Agency considers that the suspension might contradict the principle of non-discriminatory access to the network.
- 242 Further, the Agency considers that granting access to the network for RES-based plants which are not included in any kind of support schemes would be an important step towards enhancing the integration of generation from RES and hence progressively have these producers participate in a competitive internal energy market on an equal footing with conventional generators.

144 Article 14 of Regulation (EC) No 714/2009 of The European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003 (OJ 2009 L176).

145 Recital 35 (preamble) and Article 32 of Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC (OJ 2009 L211/55).



243 The above-described measures affecting network access for RES-based plants were perhaps designed to pursue the economic sustainability of the system. However, this should best be achieved by not introducing additional distortions such as restricting access to the network or the inefficient allocation of network and balancing-related costs. In contrast, the Agency believes that the costs incurred to integrate RES in the network may be better addressed through cost-reflectivity and market-based mechanisms. These mechanisms should reflect the specificities of all forms of generation, and enable producers of renewable energy to participate in a competitive market.

### 3.6 Conclusions and recommendations

244 Significant scope for further price convergence across the EU remains. For instance, in 2012, the CWE region recorded a notable decrease, of 18%, in full price convergence compared to 2011, which partly reflects the challenges underlying the integration of RES in Europe (see below). Price convergence in the CEE region was significantly enhanced following the implementation of market coupling between the Czech Republic, Hungary and Slovakia, with full price convergence achieved in more than 80% of the hours in the last quarter of 2012. Overall, the results show that market coupling is an important driver of price convergence.

245 The European electricity market integration also depends on investments in new infrastructure and on the reinforcements of the existing transmission lines, which will increase the total amount of interconnection capacities offered for cross-border trade. For instance, additional interconnection capacity between Great Britain and Ireland increased price convergence on this border. Since 2008, the expansion of cross-border capacity in Europe has been modest, albeit noticeable increases, driven by network expansion investments, have been observed on 11 borders. As emphasised in the Framework Guideline on CACM, the harmonisation of capacity calculation methods in Europe can also increase the amount of interconnection capacities offered for cross-border trade.

246 Over the last two years, thanks to the implementation of market coupling, the overall efficient use of interconnectors has increased from 60% at the end of 2010 to 76% in 2012. The highest 'losses in social welfare' are now observed on the Swiss borders, due to lack of market coupling, among other factors. Overall, it is recommended that market coupling be implemented urgently on all remaining borders where this is lacking.

247 The use of cross-border capacities after day-ahead market closure is still limited. Indeed, 60% of the total capacity remains unused after the intraday timeframe. Developing efficient cross-border intraday and balancing trades should contribute to more efficient market integration.

248 Loop flows are important barriers to efficient market integration and secure grid operation. The increasing problems related to loop flows include decreasing cross-border capacities available to the market on some borders and the associated loss of social welfare. The high volatility and limited predictability of loop flows create a challenge for operational planning, so an urgent solution is needed.

- 249 Appropriate monitoring of loop flows and the associated externalities, including calculation of the loss of social welfare, as well as the implementation of adequate remedial actions, are urgently required. For instance, there is a lack of adequate transparency with regard to the level of loop and transit flows concerning unscheduled flows and with regard to the number and costs of remedial actions applied by the TSOs to remedy the negative effects of loop flows. While, the recently adopted Transparency Regulation will contribute to enhancing the transparency of all loop-flow related aspects (in particular with regard to costs and actions applied by TSOs), the Agency invites the relevant parties to make available information listed in the above-mentioned regulation well before February 2015, when the data becomes available through the transparency platform from ENTSO-E.
- 250 The increasing penetration of intermittent generation sources poses a challenge to TSOs to balance supply and demand in the network. This results from the fact that production from these energy sources is hardly predictable and its variability normally does not follow actual electricity demand.
- 251 In view of the increasing share of variable RES-based generation, TSOs will have to draw on additional (flexible) resources to be able to balance the power systems at all times in a cost-effective way. The best way to pursue the deployment of sufficient flexible resources in the system is to create a well-functioning energy market with efficient prices that attract existing resources in the system to participate in the supply of flexible electricity. Moreover, these prices will send appropriate signals to the market for investments in generation and expansions of distribution and transmission networks.
- 252 Therefore, the full implementation of the ETM for cross-border trade, in particular in the intraday and balancing timeframe, remains an absolute priority for arriving at sound prices reflecting the correct value of generation flexibility.
- 253 Finally, in view of integrating RES into EU power systems, there is an increasing need for flexible resources in the system. Flexibility in wholesale electricity markets (including RES balancing) requires efficient and well-integrated gas markets which depend on, inter alia, balancing regimes, flexibility tools (such as storage and line-pack), nomination and re-nomination lead times, bundled capacity products at border points, transparent and consistent cross-IP transportation tariffs, as well as well-functioning secondary markets for both capacity and commodity.

# PART II

## The gas sector



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## 4 Retail gas markets

### 4.1 Introduction

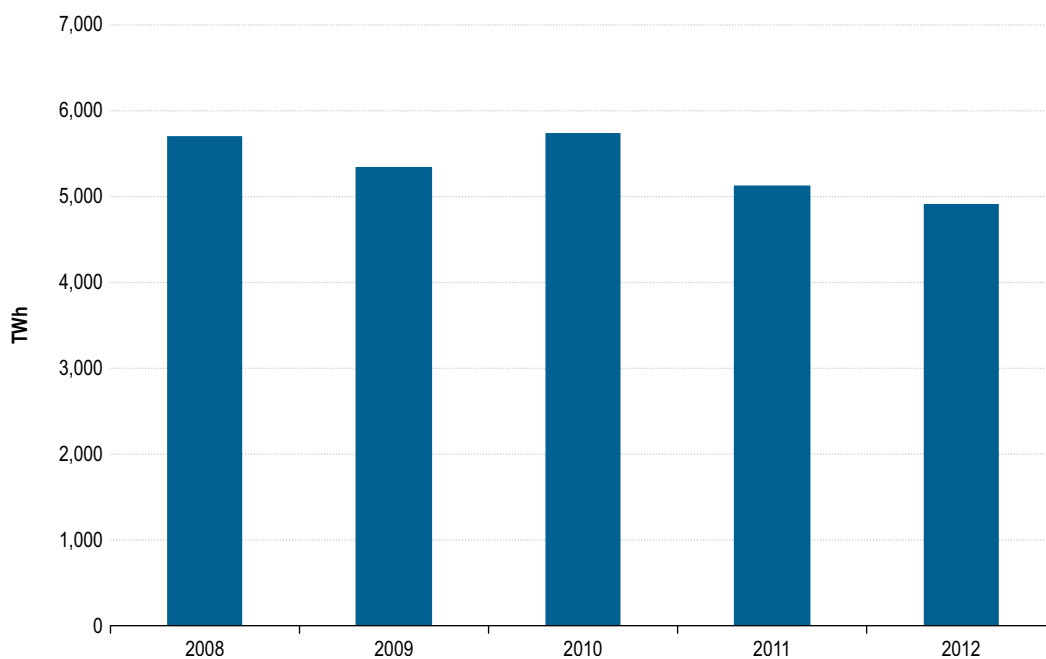
254 This chapter describes the main EU gas demand and price trends as observed in 2012 (Section 4.2). The evolution of demand and prices in the household and industrial segments is described, as well as retail price components and non-price competition in supplying households. Section 4.3 explores the concept of retail market integration and proposes some market integration indicators. Section 4.4 focuses on barriers to retail market integration. Some measures to quantify entry barriers are explored. The features of retail price regulation as a relevant barrier to market integration are further discussed in Section 4.5.

## 4.2 Demand and prices

### 4.2.1 End-user demand

255 In 2012, the EU-27's natural gas demand<sup>146</sup> was 4,910 TWh (Figure 43). This shows a decline of approximately 4% compared with 2011. In 2011, gas demand had already decreased by 10.5% year-on-year. Like all energy markets, gas markets were influenced by adverse macroeconomic conditions, with severe GDP decreases in several EU-27 MSs, but also by the evolution of European price differentials between natural gas and alternative fuels for electricity generation (e.g. coal).

Figure 43: Gas demand in the EU-27 – 2008 to 2012 (TWh)



Source: ACER, based on Eurostat (26/6/2013)

Note: Gross inland gas consumption (GIC).

256 Consumption in the household segment, representing a 38-40% share of European gas consumption<sup>147</sup>, has been declining in spite of relatively colder winters, due to: (i) governmental efforts to promote energy efficiency in existing and new houses; (ii) increasing natural gas prices in most countries; and (iii) decreasing consumer purchasing power due to adverse economic conditions (prompting users to reduce thermostat temperatures and/or change their source of heating<sup>148</sup>).

257 The characteristics of natural gas consumption at household level are very different across countries. Only in a few MSs are more than 50% of households connected to gas networks (the Netherlands, Hungary, Great Britain, Italy, Slovakia, the Czech Republic, Belgium, and Latvia).

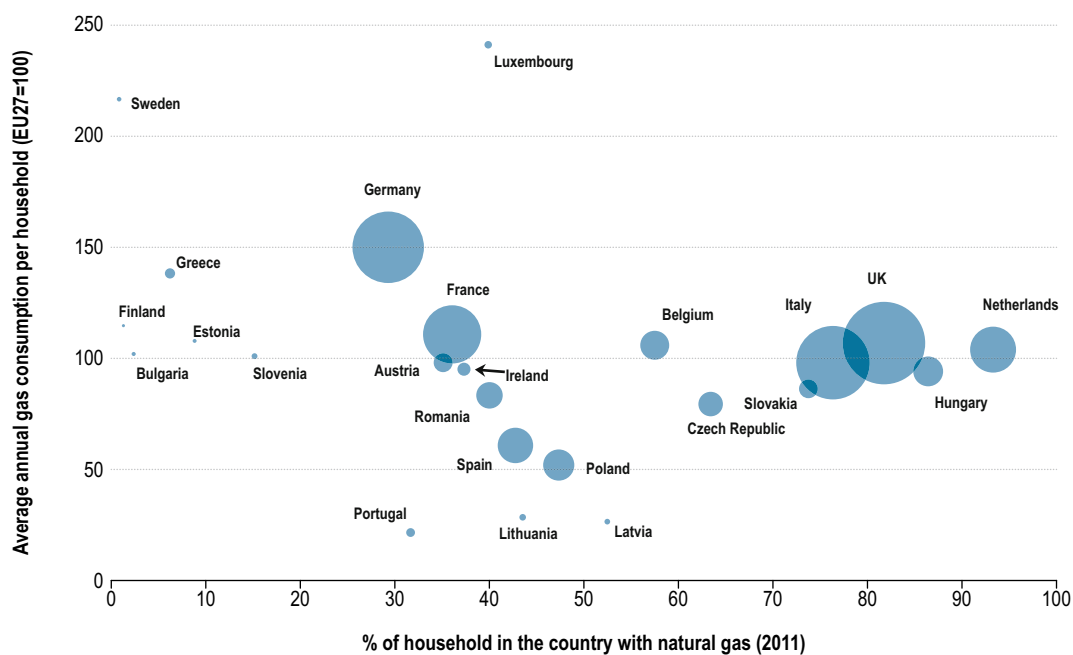
146 Gross inland annual consumption. Calculations based on Eurostat monthly data in TeraJoule and Gross Calorific Value (TJ GCV) as of 15 May 2013. Eurostat data are provisional for some countries.

147 IEA Energy, Spring 2013 issue.

148 According to the Dutch competition authority and energy regulator ACM (ex NMa), the 7% decrease in consumption for the Netherlands resulted (at least partially) from a substitution effect between natural gas and electricity for space heating.

258 Gas consumption per capita across Europe reflects very different underlying profiles. In Portugal, Lithuania, and Latvia, household per capita consumption is less than 50% of the level in Italy, the UK and the Netherlands (mainly reflecting different space heating solutions and heating needs) and is only a small fraction of Luxembourg’s. The Netherlands, the UK, Italy, Belgium, and Austria all have similar consumption patterns.

Figure 44: Percentage of households with natural gas, average annual gas consumption per household and overall household consumption in 2011



Source: ACER, based on Eurostat (30/5/2013) and CEER National Indicators (2012)

Note: The size of the blue circles reflects the magnitude of household gas consumption in each country. The number of households is generally smaller than the number of residential addresses (homes) in any given country.

259 The economic crisis has significantly affected industrial gas consumption. Manufacturing output indices in 2012 were below their 2007 level in most European countries, translating into a subdued level of gas consumption. Another setback resulted from the fact that the North American fertiliser and chemical industries are now enjoying an unprecedented competitive advantage, as wholesale gas price levels in the US are currently less than 40% of European ones. As a consequence, the 2012 output of European fertiliser and chemical industries fell below the 2007 level and demand for gas contracted<sup>149</sup>.

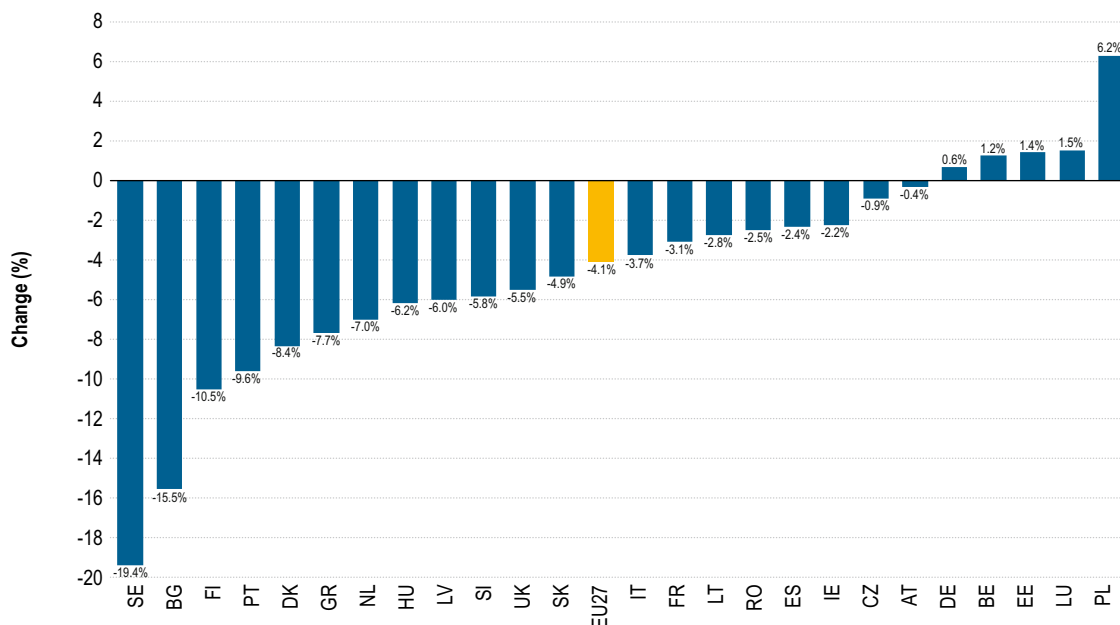
260 Power generation, a major driver of gas demand fluctuations, faced a sharp drop in most European countries in 2012. Gas-fired power plants were suffering not only from decreasing electricity demand, but also from the continued growth of RES (a 16% increase in 2012<sup>150</sup>) and from lack of competitiveness vis-à-vis coal-fired generation. Low US gas prices prompted a switch away from coal in the US, with inexpensive US coal becoming available for export, triggering an increase in coal-fired generation in Europe, reinforced by low EU-ETS CO<sub>2</sub> prices.

149 Fertilisers Europe – EU fertiliser market key graphs – 2013.

150 See Section 3.5.1 in Part I.

261 The rates of change in natural gas consumption were significantly different across MSs in 2012 (Figure 45).

Figure 45: Change in gas demand in the EU-27 – 2011 to 2012 (%)



Source: ACER, based on Eurostat (26/6/2013).

Note: Data from Belgium were revised based on information provided by CREG (10/6/2013). Data from Lithuania were revised based on information provided by the regulator’s National Report (5/8/2013).

262 The countries showing the most pronounced decline in natural gas consumption were Sweden (-19.4%) and Bulgaria (-15.5%). In Sweden, electricity production from hydro sources increased by 18% year on year due to the positive hydrological 2012 season, giving rise to a substitution effect away from gas-fired generation. The decline observed in Bulgaria reflects dwindling industrial consumption and a more general de-industrialisation trend in the region – not a recent phenomenon, but now certainly compounded by the adverse macroeconomic climate.

263 On the other hand, Poland registered an increase in natural gas consumption of 6.2%. Consumption in Poland is growing, led by a relatively healthy economy, in conjunction with a substantial programme aimed at expanding the gas distribution network and replacing some of the existing district heating networks based on solid fuel, oil and LPG<sup>151</sup>.

264 The decrease in gas demand across Europe is certainly not helped by the increase in household and industrial consumer prices, on average by 10.1% and 10.5% respectively, between 2011 and 2012.

151 Natural gas distribution networks will be built or modernised in areas which have not yet been ‘gasified’. By the year 2015, more than 1,000 km of gas transfer pipelines and 4,900 km of gas distribution pipelines will be funded through the so-called OPI&E (Operational Programme Infrastructure and Environment), the largest utility investment programme carried out by a MS in the history of the European Union. This programme is worth 37.7 billion euros, of which 28.3 billion euros will come from EU funds, see: [http://ec.europa.eu/regional\\_policy/country/prordn/details\\_new.cfm?gv\\_PAY=PL&gv\\_reg=ALL&gv\\_PGM=1212&LAN=7&gv\\_per=2&gv\\_defl=7](http://ec.europa.eu/regional_policy/country/prordn/details_new.cfm?gv_PAY=PL&gv_reg=ALL&gv_PGM=1212&LAN=7&gv_per=2&gv_defl=7).

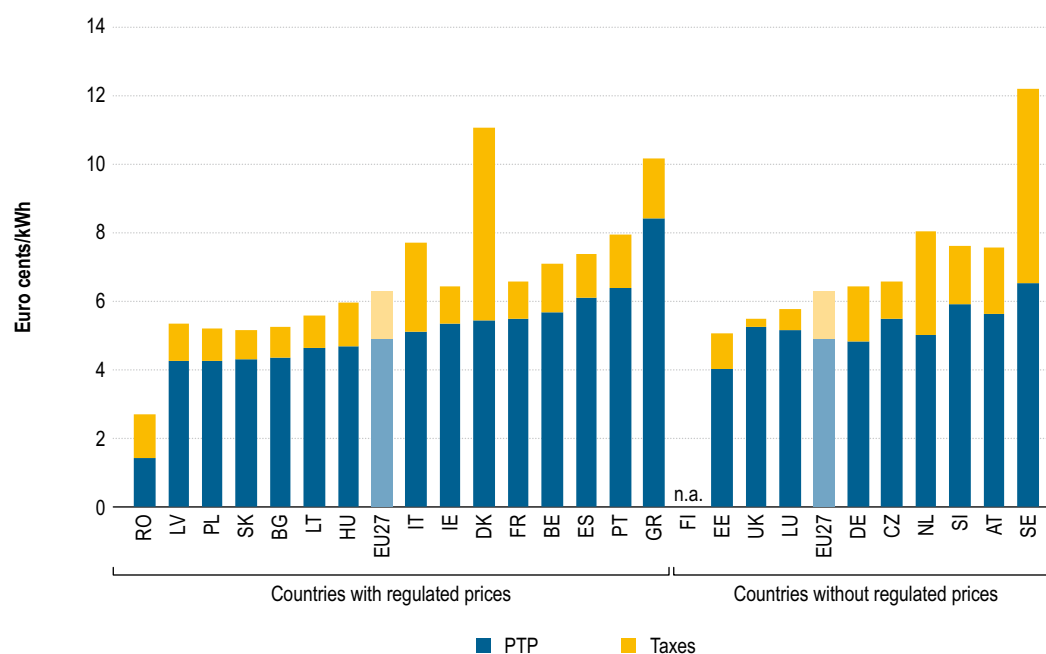
## 4.2.2 Developments in gas retail prices and retail price break-down

265 Substantial POTP and PTP differences persist across the EU-27. In 2012, on average<sup>152</sup>, the POTP for households<sup>153</sup> in Sweden (the country with the highest price) was 4.5 times higher than in Romania (the country with the lowest price).

266 The POTP level in Sweden and Denmark is influenced by the comparatively higher level of taxation on non-renewable sources of energy such as gas.

267 Differences were even higher in terms of PTP prices. The PTP in Greece (the country with the highest PTP) was 5.9 times higher than in Romania (the country with the lowest PTP), even though both countries are located in roughly the same European (climatic) region. Even excluding Romania, the maximum-minimum ratio on a pre-tax basis was 2:1 (see Figure 46).

Figure 46: Gas POTP and PTP for households – EU-27 – 2012 (euro cents/kWh)



Source: Eurostat (30/5/2013)

Note: Data for Spain were revised based on information from CNMC. No data available for Finland. MSs are ranked according to PTP.

268 Price regulation plays a significant role in the price differences observed in Central and Eastern Europe. In Romania, Estonia, Latvia, Poland, Slovakia, Bulgaria, Lithuania and Hungary, retail prices were still capped at relatively low levels in 2012. Germany, the Netherlands, and Italy had PTP prices close to the EU-27 average.

269 With the exception of Romania and Hungary, in other MSs the PTPs for industrial consumers were lower than for households, reflecting the positive role of retail liberalisation (fewer countries have regulated prices for industrial consumers) and different underlying costs.

270 The absence of regulated prices, scale effects, greater diversity of suppliers, and more price-sensitive consumers created the conditions for industrial consumers to pay (on a unit PTP basis) around 40% less than households in the UK, the Netherlands, Belgium, the Czech Republic, and Spain.

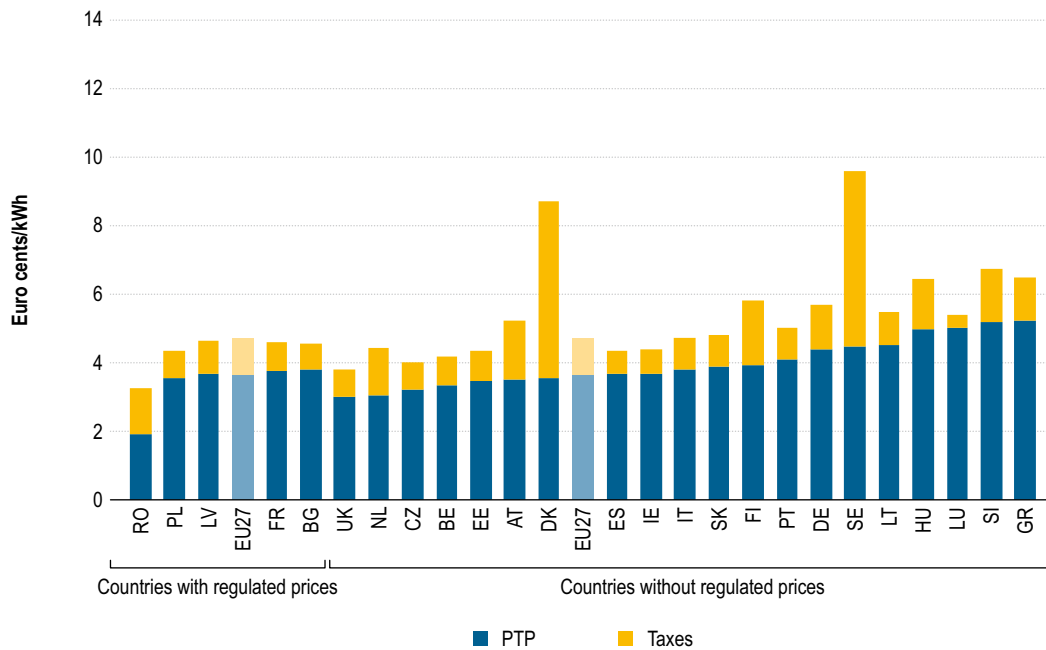
152 The unweighted average of first- and second-semester prices was used.

153 Eurostat Band D2: 20 GJ < Consumption < 200 GJ.



271 The price gap between MSs is also relatively smaller for industrial consumers<sup>154</sup> (Figure 47).

Figure 47: Gas POTP and PTP for industrial consumption – EU-27 – 2012 (euro cents/kWh)



Source: ACER, based on Eurostat (30/5/2013)

Note: MSs are ranked according to PTP.

272 In 2012, on average, the POTP in Sweden (the country with the highest price) for industrial consumers was 2.9 times higher than in Romania (the country with the lowest price).

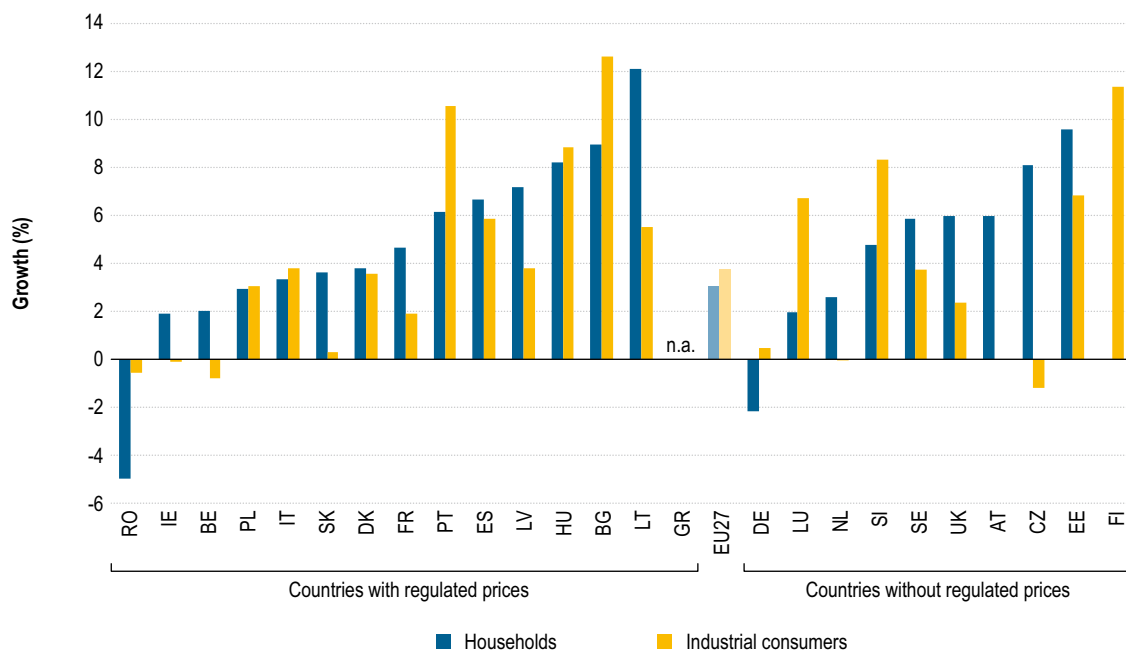
273 Price differences were similar on a PTP basis. The PTP in Greece (the country with the highest PTP) was 2.7 times higher than in Romania (the country with the lowest PTP). Excluding Romania, the 2012 maximum-minimum ratio on a pre-tax basis decreases to 1.5.

274 Year-on-year, in 2012, the average EU-27 POTP increased by 10.1% for households and by 10.5% for industrial consumers, and over the last 4 years, the compounded annual growth rate (CAGR<sup>155</sup>) was 3.0% for households and 3.7% for industrial consumers (Figure 48).

154 Eurostat Band I3: 10,000 GJ < Consumption < 100,000 GJ.

155 For the definition, see note under Figure 5.

Figure 48: POTP compounded annual growth rate (CAGR) – EU-27 – 2008 to 2012 (%)

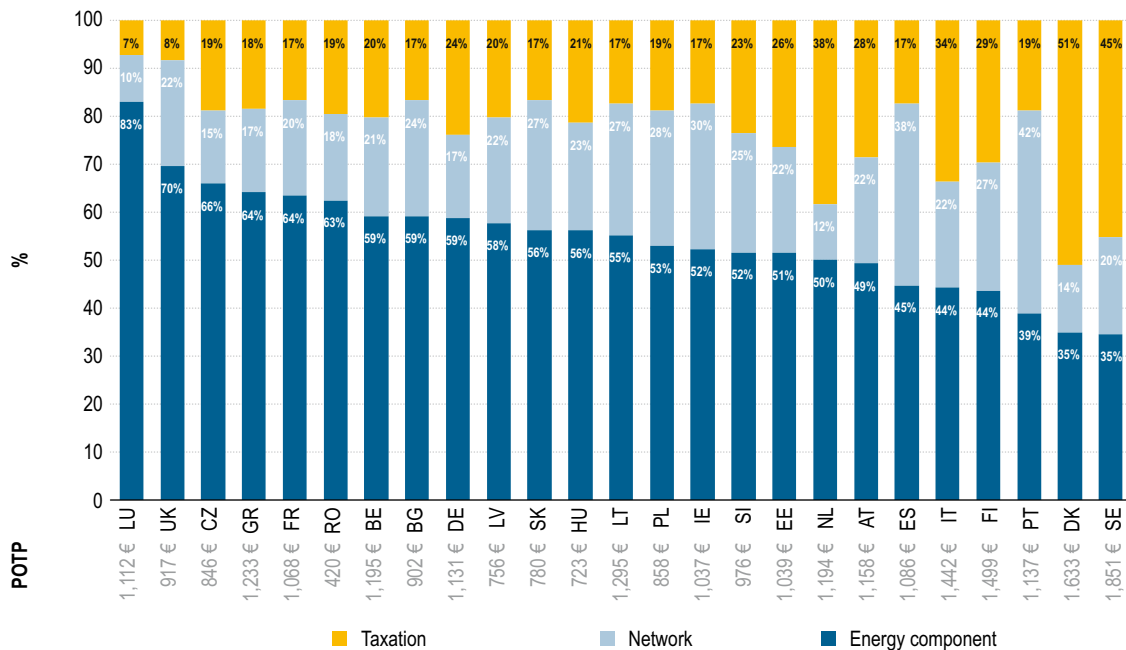


Source: ACER, based on Eurostat (30/5/2013)

- 275 Price changes are significantly different across MSs. Price regulation tends to add uncertainty to price levels. In 2012, prices changed more widely in those countries featuring regulated prices. In general, countries with initially lower regulated prices (Lithuania, Bulgaria, Hungary, and Latvia) eventually had to raise retail prices faster than other countries.
- 276 Levies and taxes continue to play a relevant role in terms of competition. If new entrants can compete only on, for example, 50% of the end-user price, this might limit their willingness to enter the market. As in end-user fuel markets, governments have an incentive problem in terms of their willingness to curb final gas (or electricity) prices, because by doing so they will reduce their own tax revenues, since most energy taxes are proportional to the energy component of the final bill and demand is relatively inelastic. This incentive compatibility issue becomes more evident in difficult economic circumstances.
- 277 In order to understand price differences and the evolution of prices, the Agency and CEER analysed the POTP break-down as of December 2012, based on the incumbent’s standard offer in the capital city (Figure 49)<sup>156</sup>.

156 The incumbent’s standard tariff offer in the capital city is acceptably representative of the average situation in the whole MS. In terms of taxation (Eurostat does not provide data on network charges), the results are consistent with Eurostat data for the whole country. In 10 countries, the share of taxation is the same; in seven of them, it differs by one percentage point, and in the others (with one exception: Romania) it deviates by two to three percentage points. For Romania, the Agency and CEER used information provided directly by the NRA.

Figure 49: POTP break-down – incumbent’s standard offer for households in the capital – December 2012 (%)



Source: ACER retail database (December 2012)

Note: For Sweden, Gothenburg was used as reference, as there is no substantial household gas market in the capital.

- 278 In general, the energy element is still the most relevant component of the end-user price. In some capital cities (Luxembourg<sup>157</sup>), it makes up as much as 83% of the final bill<sup>158</sup> but in other cities (Gothenburg and Copenhagen, part of high-taxation economies) it accounts for only 35%. For most capitals (17), it is more than half of the final bill.
- 279 Excluding MSs with relatively small<sup>159</sup> household gas markets, in those with no retail price regulation – Germany, Great Britain, the Czech Republic, Austria and the Netherlands – the level of the energy component for household consumers in the capital is relatively similar. Indeed, in all of these five MSs, without exception, it is possible to find several retail offers within the capital<sup>160</sup> with almost identical energy components (this is represented as a red area in Figure 50). This means that the same energy price (limited to the energy component, excluding taxation and network charges) is found in these five capitals.

157 The following sections approximate entire EU countries by their capital cities. Both the Agency and CEER are fully aware that this approximation can sometimes (albeit not always) be crude. The actual availability of better regional (granular) data is matter for future research.

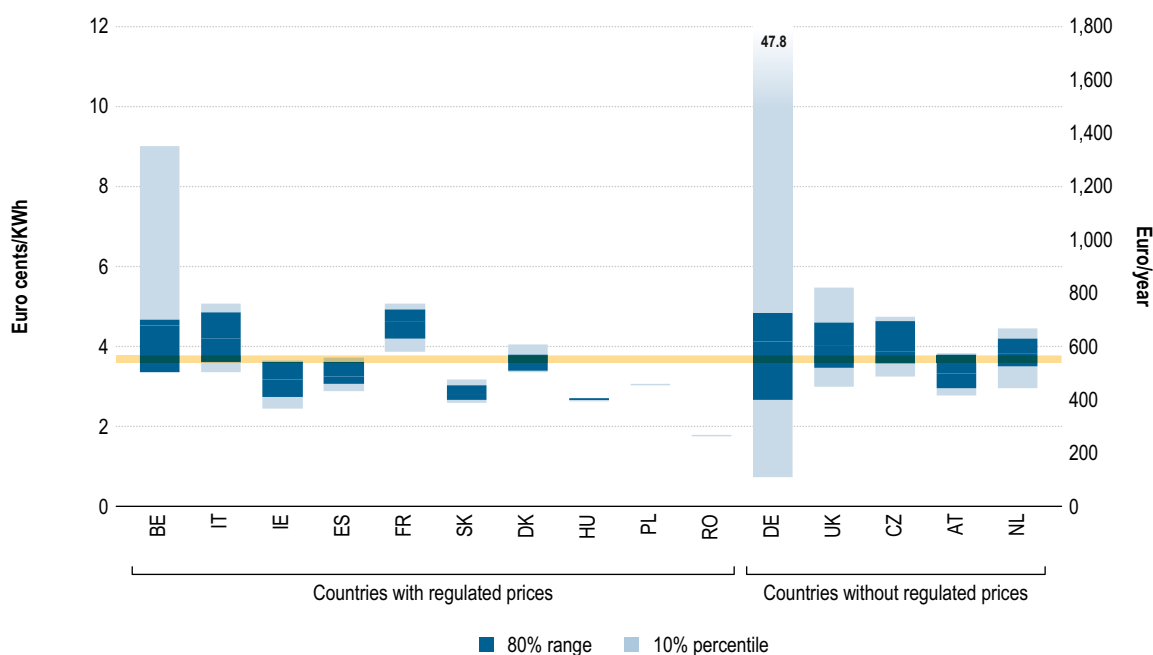
158 In Luxembourg, as advised by the energy regulator (Institut Luxembourgeois de Regulation), this value actually includes not only the energy price, but also network components, both within Luxembourg and in neighbouring countries, to compensate for the use of foreign transportation networks feeding gas into the country.

159 Countries with less than 5,000GWh/year household consumption (Luxembourg, Sweden, Finland, Estonia, and Slovenia).

160 Once extreme (outlying) offers are excluded and a restricted offer range of 80% is considered.

280 The above does not apply to those capitals and countries with regulated retail prices, even where the wholesale prices seem to be similar. Even after excluding countries with relatively small<sup>161</sup> household markets, of the remaining group of 10 countries only three have similar energy components in their capitals (Belgium, Italy, and Denmark). In these three countries, price regulation or capping follows wholesale prices more closely, at least as far as their capitals are concerned.

Figure 50: Dispersion in the energy component of retail prices for households in capitals – December 2012 (euro cents/kWh)



Source: ACER retail database (December 2012)

Note: Based on a consumer profile of 15,000kWh/year. Countries with more than 5,000GWh/year household consumption.

281 Therefore, the retail price differences observed in Figure 46 mainly reflect the retail regulatory regime (capitals in Portugal, France, Greece, Hungary, Lithuania, Latvia, Poland, and Romania), the level of competition (or lack thereof) affecting the energy component of the final price, as well as network charges and taxation. In eight MS capitals (the Netherlands, Austria, Spain, Italy, Finland, Portugal, Denmark, and Sweden) network charges and taxation make up more than 50% of the final bill.

282 Very different tax regimes persist across the EU-27. VAT rates on natural gas range from 5% in the UK to 27% in Hungary. A few MSs (Belgium, Finland, Germany, and Italy) have local taxes ranging from 1.9 euro cents per kWh in Belgium to 3 euro cents per kWh in Finland<sup>162</sup>. Some MSs (Belgium, Finland, France, Hungary, and Lithuania) socialise public service obligations, others have special taxes/levies, including local ones, for non-renewable energy (for example, Germany, Finland, Denmark, and Sweden) and others subsidise the pension fund of electricity/gas employees (France). As a consequence, energy (or other) taxation ranges from 7% (in Luxembourg) to 51% (in Denmark) of the overall consumer bill.

161 Countries with less than 5,000GWh/year household consumption (Greece, Lithuania, Portugal, Bulgaria, and Latvia).

162 Before VAT.

- 283 Differences in network charges can be as marked as differences in taxation. In some MSs, network charges make up around 10% of the final bill (Luxembourg), but in others they can be as high as 42% (Portugal, at least in Lisbon).
- 284 Diverging network charges, possibly resulting not only from differing underlying transmission and distribution costs, but also from different regulatory methodologies in use by NRAs at a TSO and/or DSO level (asset eligibility, asset valuation and asset remuneration for instance), tend to create additional transaction costs which may potentially deter cross-border entry if foreign entities cannot familiarise themselves (at no cost) with different and potentially inconsistent regulatory regimes.
- 285 Some harmonisation of cost assessment methodologies and efficiency analysis might be needed in the interest of internal market integration. The partial harmonisation of regulatory regimes in terms of network regulation might be beneficial to downstream market integration.
- 286 In summary, the observed differences in retail prices across the EU-27 capitals are mainly due to retail price regulation or central government (quasi-)planning, to the level of competition (or lack thereof) downstream (in retail markets) and upstream, to network charging methodologies in use by NRAs at a TSO and/or DSO level (asset eligibility, asset valuation and remuneration) and to differing taxation regimes. While taxation regimes are the sole responsibility of MS governments, the regulatory regime, the level of competition in retail markets, and the possible harmonisation of network regulation methodologies are issues that NRAs can tackle to facilitate the creation of a truly functioning internal retail market.
- 287 Retail price regulation should be lifted once the main barriers to entry into retail markets are addressed and the methodologies in use to regulate network charges are made compatible across Europe.

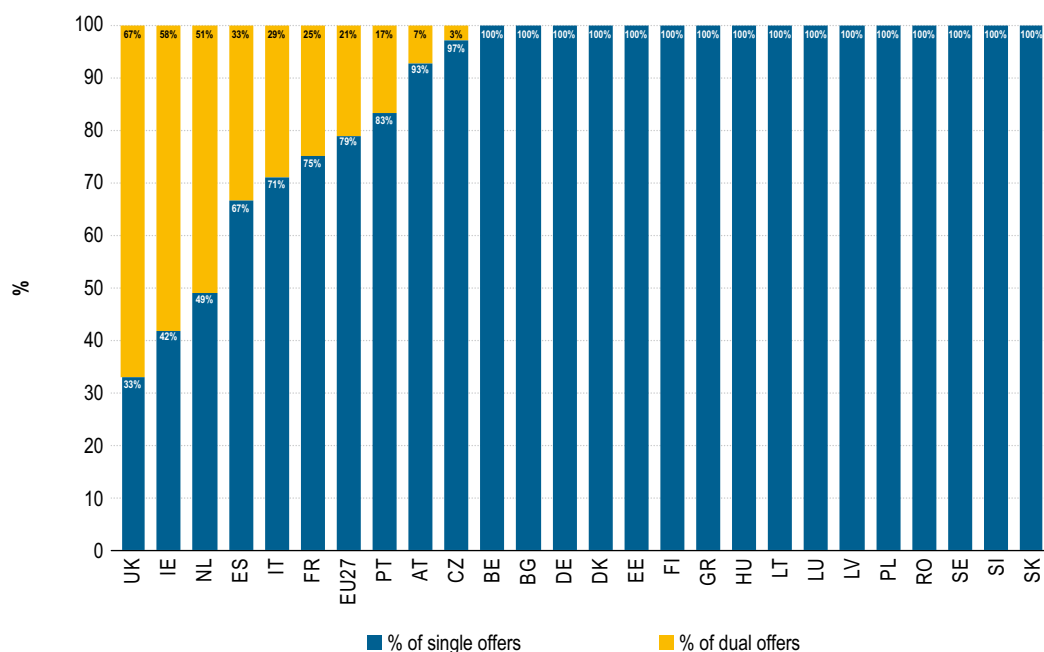
### 4.2.3 Non-price elements

- 288 The nature of some European energy retail markets is changing, not only due to new entry, but also to the strategies that existing suppliers have been introducing to enhance loyalty and improve margins. Two non-price elements are analysed here: dual-fuel offers and the use of contract duration lock-in to retain customers. Non-energy and multi-utility offers are not considered in this subsection.
- 289 Dual-fuel offers are bundled products combining the supply of electricity and gas with an overall discount that would not be present otherwise (i.e., when buying the two fuels separately from the same supplier). Dual-fuel offers usually represent additional savings for consumers<sup>163</sup>, but also lower costs for suppliers<sup>164</sup>.
- 290 Dual fuel offers have been present in some markets (Great Britain) for many years and have been recently introduced in other MSs.
- 291 With special respect to capital cities, at the end of 2012, the percentage of dual-fuel offers in the total number of gas offers is shown in Figure 51.

163 Ofgem in GB reports higher margins for dual-fuel offer customers than for single-fuel customers, although – when taken in isolation – the margin for the dual-fuel offer would be significantly lower than the sum of the two separate margins for the single-fuel offers.

164 Because of lower customer management costs and a lock-in effect inducing lower switching.

Figure 51: Percentage of dual-fuel offers in the EU-27 capitals – December 2012

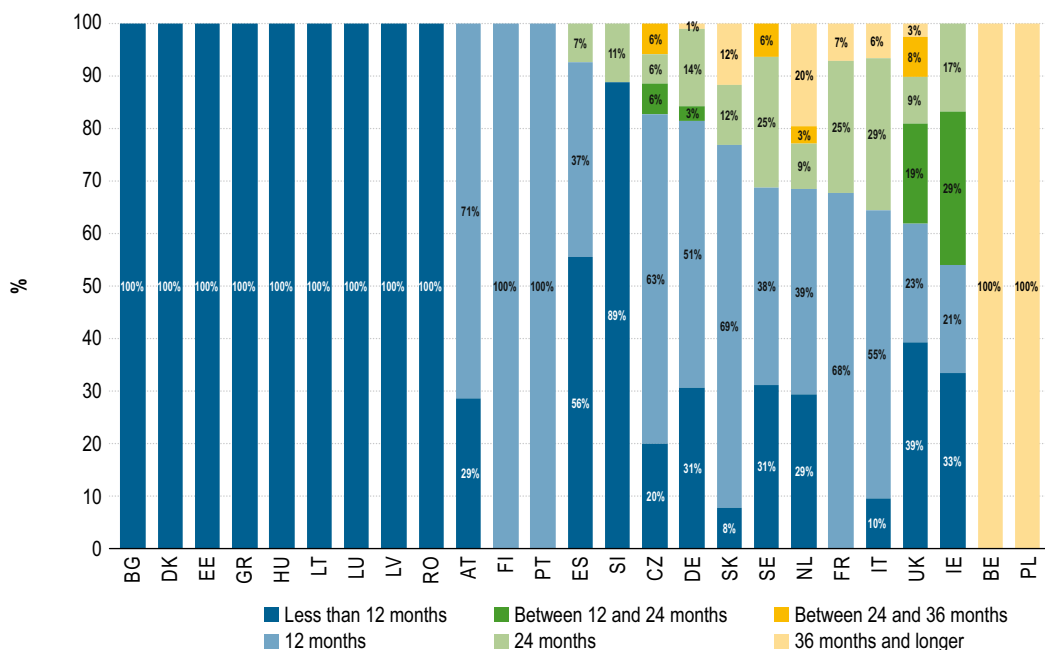


Source: ACER retail database (December 2012)

Note: For Sweden, Gothenburg was used as reference, as there is no substantial household gas market in the capital.

- 292 In London, Dublin and Amsterdam, the number of dual-fuel offers is greater than the number of gas-only offers. Madrid, Rome, Paris and Lisbon also seem to be evolving towards a dual-fuel model, although this retail strategy has been emerging only quite recently there.
- 293 Dual-fuel offers also enhance the ability of gas companies to enter electricity markets and vice versa, possibly at the expense of new entrants which will face increased operational complexity and may feel forced to enter both the electricity and gas markets simultaneously in order to be able to propose attractive commercial offers.
- 294 In several MSs, the average length of the contract termination period has increased since retail liberalisation. Before the liberalisation process, gas was usually provided through an indefinite duration contract that could be terminated at very short notice (from one to a few months). Following liberalisation and in an attempt to differentiate offers and retain customers for longer periods, contract termination notices have been extended. The increase in contract duration is also associated with an increase in the number of fixed-price offers, tying customers in for longer periods. In these cases, the supplier usually matches the fixed-price period to (minimum) contract duration, while imposing penalties for early exit which are very similar to those observed in the telecommunications and banking sectors, usually quoting the need to hedge some of the forward price risk on futures/swap markets as a justification. The average minimum contract duration for retail deals in the EU-27 capital cities, as of December 2012, is shown in Figure 52.

Figure 52: Contract duration for new household contracts in the EU-27 capital cities – December 2012



Source: ACER retail database (December 2012)

Note: For Sweden, Gothenburg was used as reference, as there is no household gas market in the capital.

- 295 In all capital cities, with only two exceptions (Brussels and Warsaw), more than 50% of the offers implied minimum contract durations of one year or less. In Brussels, prevailing minimum contract durations were as long as three years. However, in 2012, new legislation enacted by the Belgian government after considering studies and recommendations by the energy regulator CREG (see Case Study 1) prevented suppliers from charging final consumers for early contract termination.
- 296 At the end of 2012, four capitals had more than 30% of active offers in the market with minimum contract durations greater than or equal to two years: Rome, Paris, Amsterdam and Gothenburg<sup>165</sup>. In Rome, 29% of contracts on offer locked consumers in for at least two years, and 6% had minimum lengths exceeding three years: however, such minimum durations are not legally enforceable in Italy unless the contract is for industrial consumption. In Amsterdam, around 20% of offers were in the form of contracts with a minimum duration longer than three years.
- 297 As a large number of offers are for minimum durations longer than two years, it is important to ensure that any exit fees charged to end users for early contract termination are transparent at the time of offer take-up, and that such fees are set at levels which fairly split upstream risk between suppliers and consumers. The situation differs by country (for instance, in Italy exit fees are fairly low, generally amounting to a few months' worth of the standing charge). As a general rule, regulators should ensure that exit fees are cost-reflective and that consumers are fully aware of such charges when they enter into a new contract.

165 Gothenburg is not the Swedish capital, but it was used as reference for gas since Stockholm does not have a gas distribution network aimed at households.

### 4.3 Market integration

298 Following the same methodology described in the electricity section of the report (Section 2.3), this section assesses the impact of network and wholesale market integration on retail markets in order to understand how upstream integration might foster retail market integration.

299 In those MSs where the incumbent player still retains a very high share of the market, there is a presumption of low market contestability and a limited role for supply-side substitution to promote retail market integration. Table 8 provides a general overview of the incumbent's market share<sup>166</sup> and the level of foreign entry into national retail markets<sup>167</sup>, with data presented in matrix format.

**Table 8: An overview of the incumbents' presence and foreign supply side substitution to promote retail market integration – December 2012 (capital cities in the EU-27)**

		Estimated incumbent market share in the household market – December 2012 (capitals)		
		>90%	Between 70 and 90%	Less than 70%
Presence of foreign players (capital city)	>50%	RO (1/1)		ES (4/6); SK (9/12)
	Between 20 and 50%		IT (4/8); FR (3/8); IE (2/4); BE (2/4)	NL (6/18); CZ (4/18); GB (4/14)
	Between 0 and 20%			AT (2/10); DK (2/11); DE (4/74); SE (1/6)
	0%	GR (0/1); BG (0/1); EE (0/1); FI (0/1); LT (0/1); LV (0/1); EE (0/1); PL (0/1); PT (0/3)	SI (0/6)	

Source: Agency analysis based on the ACER retail database (December 2012), CEER National Indicators (2012), and NRA Market Monitoring Reports (2012).

Note: The number of suppliers shown in this matrix only takes into account the number of suppliers with active offers in the capital in December 2012 (as known to the Agency). A comprehensive analysis of the evolution in the number of active nationwide suppliers can be found in Sections 2.4.1 and 4.4.1. For Sweden, Gothenburg was used as a reference, as there is no substantial household gas market in the capital. The figures beside country codes represent the ratio between the number of foreign retailers active in the capital and the overall number of retailers active in the capital (household segment).

300 The classification in the matrix is based on a combination of the incumbent's market share<sup>168</sup> and the intensity of cross-border entry into the domestic retail market<sup>169</sup>.

301 London, Amsterdam, Madrid, Prague, and Bratislava seem to show slightly stronger signals of supply dynamism, mixed with higher levels of foreign presence.

166 Market shares are split into groups reflecting their magnitude, differently from electricity because in gas incumbent market shares tend to be higher, other things being equal: above 90%, between 70 and 90%, and lower than 70%.

167 Here, the split is consistent with the methodology used in electricity: above 50%, between 20% and 50%, lower than 20%, and zero.

168 Wherever possible, market shares for the capital city were used (Brussels, Bucharest, Budapest, London, Madrid, Sofia and Warsaw). However, in the majority of cases, market shares for the whole country were used instead due to lack of data, under the assumption that whole-country figures can be taken as a proxy for the conditions faced in the capital.

169 Due to data constraints, only suppliers active in EU-27 capitals are covered. Therefore, some of the conclusions drawn from these calculations might not necessarily be valid for the whole country in question. The analysis was performed for household markets, as the latter are usually more concentrated and have a stronger national component than industrial ones. In most countries, the role of competition and foreign entry to promote retail market integration is much greater in the industrial sector.



- 302 The capitals of Bulgaria, Estonia, Finland, Greece, Latvia, Lithuania, Luxembourg, Poland, Portugal and Slovenia seem to be the least integrated.
- 303 As expected, the MS capitals with a stronger tendency to retail market integration, measured by lower incumbent market shares mixed with higher levels of foreign participation, are also the ones facing higher levels of integration at network and wholesale level (including bigger and/or less contractually congested cross-border interconnectors and more liquid and price responsive wholesale markets).
- 304 Britain and the Netherlands have by far the most liquid wholesale markets in Europe: National Balancing Point (NBP) and Title Transfer Facility (TTF) – see Figure 69. More than 80% of the time, the price difference between these hubs is lower than 3% (see Figure 66). Also, the Netherlands has high capacity connections to Germany, the second-largest gas market in Europe, and although wintertime contractual congestion may be affecting most of these connections in the Netherlands to Germany direction, it seems to be less of a problem in the opposite direction<sup>170</sup>. Unsurprisingly, 33% of active household market players in the Dutch capital are owned by companies headquartered in another MS, mostly Germany. In London, the situation is similar, with 29% of active suppliers in the household market being foreign companies, some of which are from Germany and France.
- 305 In Spain, lower levels of contractual congestion at liquefied natural gas (LNG) terminals<sup>171</sup> (see Section 5.4.2) and relatively limited congestion at the main IP with Portugal (Badajoz) in the Portugal to Spain direction might be playing a role in terms of retail market integration. Although most foreign players active on the Spanish household market have a relatively small market share, in Madrid (as of December 2012) 66% of active suppliers came from another MS, typically Portugal, Italy, and Germany. Most, but not all, of them entered the Spanish market through the acquisition of existing companies.
- 306 In the British, Dutch, Spanish, Czech and Slovak capitals, there is also a more moderate incumbent presence or foreign entry to promote retail market integration. In the Czech and Slovak case, this stronger level of integration, compared with other MSs, has mainly historical reasons. These two MSs were part of the same country – Czechoslovakia – until the early 1990s and their gas systems were fully integrated. The level of contractual congestion between the Czech Republic and Slovakia seems to be lower than at many other European IPs. Interestingly, in Bratislava, about 75% of household gas suppliers are foreign companies, headquartered (mostly) in the Czech Republic. In Prague, about 22% of suppliers in the household market are foreign companies from elsewhere in Central and Western Europe.
- 307 The capitals with almost no retail market integration seem to come from those countries featuring very limited network connections to the most liquid gas markets in North-West Europe, as well as limited LNG capacity (Finland, Estonia, Latvia, Lithuania, Greece and Bulgaria).
- 308 Therefore, the level of retail market integration seems to be consistent with the developments observed in wholesale markets and in network integration, as described in Section 5.2.
- 309 The Agency will continue monitoring retail market integration over time, as congestion management rules are mandatorily implemented from 1 October 2013 across the EU-28, and further measures are taken to increase wholesale market liquidity and contestability.

170 Even if capacity levels are different.

171 The relevance of LNG in the Iberian Peninsula and Spain in particular, where it represented 60% of overall gas supply in 2012, is described (for instance) in: *El Sistema Gasista Español: Informe 2012 – Enagas*.

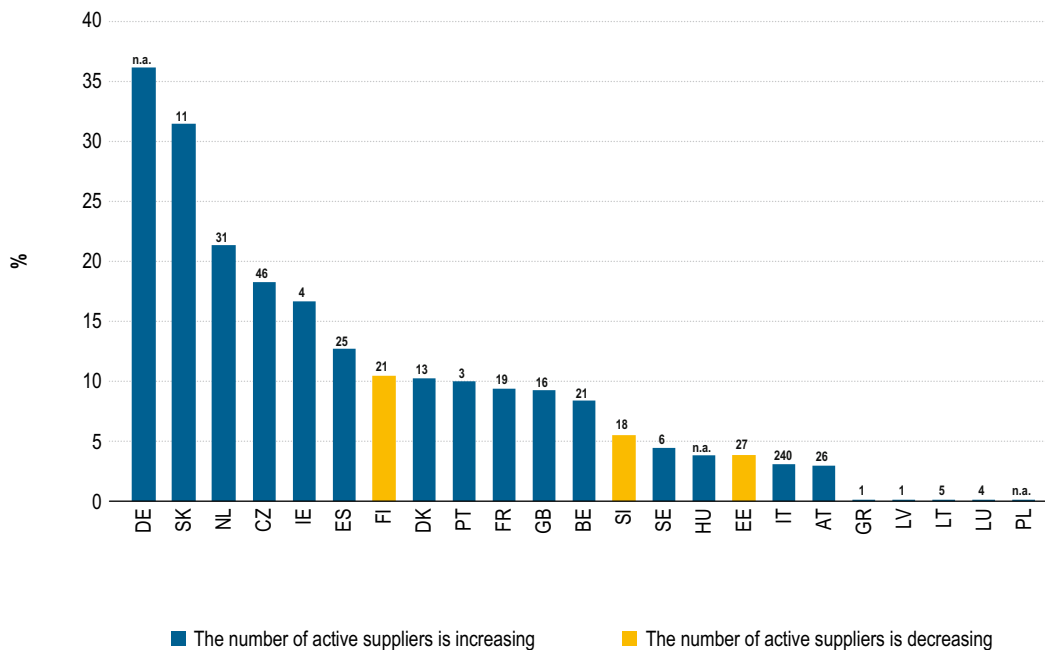
## 4.4 Barriers to completing the internal market

### 4.4.1 Level of barriers to entering retail markets

- 310 It is relatively difficult to measure the level of barriers to entry, as the latter may have different dimensions. No single indicator can measure them, but a combination of different indicators may help understand the main underlying issues.
- 311 The history of entry to and exit from a market can provide useful information about the level of barriers to entry. Markets with higher barriers are not likely to witness high levels of entry and exit. Significant entry and exit may be associated with lower barriers. It is also important to understand exit behaviour. In competitive markets, less competitive companies will exit the market and more competitive ones will enter it or expand their shares of the market.
- 312 However, if industry profitability is not attractive to new entrants, low levels of entry may not necessarily imply the existence of significant structural or behavioural barriers to entry. Still, due to the dynamic nature of the competitive process, such equilibrium is not an end in itself. Over time, some initially competitive companies will tend to become less competitive. This will trigger entry once again.
- 313 A piece of evidence that is helpful for understanding the level of barriers to entry is the profitability level of the sector. In markets with a very large incumbent market share, the market's profitability can be estimated by calculating the incumbent's profitability. Data showing that the incumbent has been earning persistently high profits are generally consistent with high entry barriers, especially if entry/exit is relatively subdued in the relevant market. By the same token, data showing that the incumbent consistently failed to earn high profits are generally consistent with lower entry barriers, especially when entry/exit activity is relatively intense.
- 314 The Agency and CEER measured the entry/exit activity in household retail markets and the level of profitability of the incumbent's retail business in the household market.
- 315 Entry/exit activity was assessed as the percentage of net new suppliers in the market in a given year. The absolute value<sup>172</sup> of this percentage for each year was then averaged to calculate the indicator on a four-year (average) basis (Figure 53).

172 Absolute values were used to avoid the smoothing (netting) effect that the use of the net entry variable could create. For example, if in one country the increase in the number of suppliers in two years were 50% a year and the decrease in the number of suppliers in the two following years were 50% a year, then the average change over a 4-year period would be 0%, which is an incorrect estimate. Averaging absolute variations much more closely reflects the entry/exit dynamics of the market (in this particular case, the average would be 50%). To highlight which countries saw their number of suppliers decrease in 2012, we coloured such countries in red.

Figure 53: Entry/exit activity in the household retail market – 4-year average – 2009 to 2012 (%)



Source: ACER analysis based on CEER National Indicators (2012), NRA country reports for Denmark, Finland, the Czech Republic, Luxembourg, Poland, Sweden, and NRA national monitoring reports<sup>173</sup>.

Note: Entry/exit activity calculated as a percentage of the average number of active suppliers in the market. Figures on top of each bars represent the number of nationwide suppliers in the relevant MS for 2012. Some data are missing (n.a.); no information on Hungary, Poland and Germany. Data for Romania and Bulgaria were excluded due to lack of disaggregation. Data for Estonia and Belgium include both residential and non-residential, as it was not possible to distinguish between active players in different markets. Data for Italy available via the energy regulator and not aggregated by holding company.

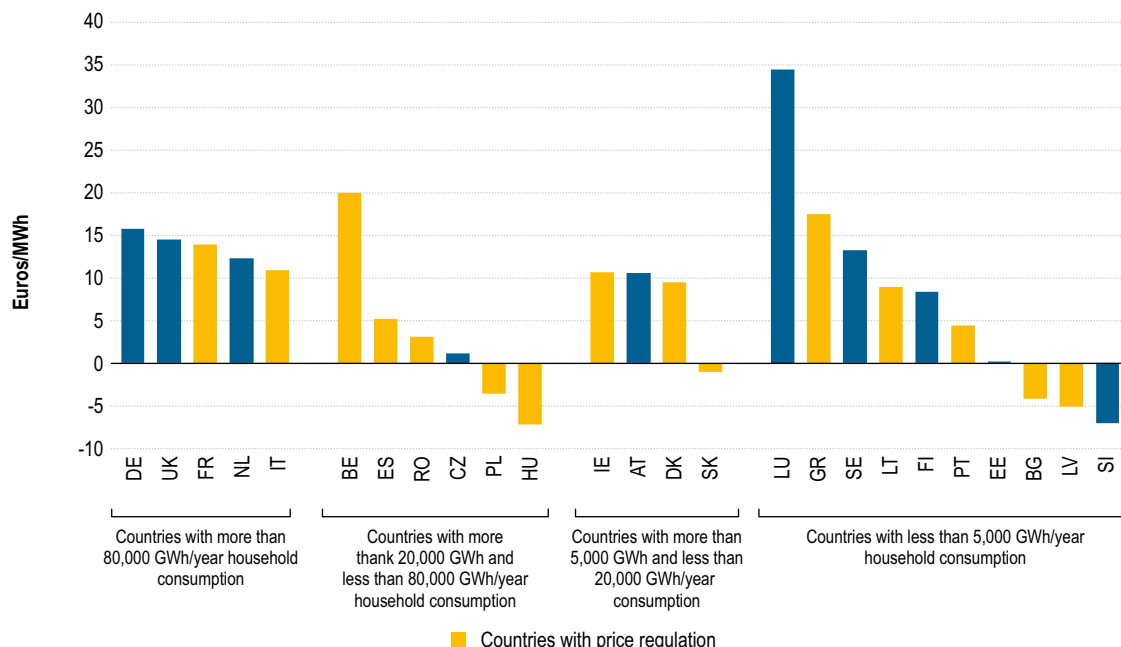
316 The profitability level was calculated using, as a proxy, the incumbent’s mark-up in the capital’s household market as of December 2012<sup>174</sup>. To calculate the mark-up, the value of the incumbent’s standard offer was used as the reference retail price and the wholesale price was estimated based on the hedging and contractual strategies of the operator in question<sup>175</sup> (see Figure 54).

173 Belgium: Report on ‘Marché du gaz en Région wallonne (réseaux de distribution): faits et tendances’ (2009 – 2013); Marktgegevens Aardgas 2011: Marktaandeel Actieve Leveranciers – VREG (2008-2012); Les marches du gaz et de l’électricité en Région de Bruxelles – Capital en chiffres (4eme trimestre 2012); France: Observatoire des marches de l’électricité et du gaz (4th quarter, 2008 to 2012) – CRE; Germany: Monitoring Benchmarking Report 2011 – BNetzA; Hungary: Vezetékes Energiahordozók Statisztikai Évkönyve – 2010 and 2011 – MEH; Ireland: Electricity & Retail gas markets Report, 4th Quarter 2011 and 2012; Change Of Supplier Update – February 2013 – CER; Romania – Raport 2011 privind activitatea Autorității Naționale de Reglementare în domeniul Energiei ANRE, 2011; Spain - Informe trimestral de supervisión del mercado minorista de gas natural en España – cuarto trimestre 2012, Informe de supervisión del mercado minorista de gas natural en España - año 2011; Informe sobre la evolución de la competencia en los mercados de gas y electricidad, periodo 2008-2010 y Avance 2011 – CNMC.

174 The consumer profile used for the mark-up calculations is 15,000kWh/year.

175 Reference import prices are based on COMEXT/Eurostat data and BAFA import price indices for Germany, plus day-ahead and forward prices from ICIS Heren. The wholesale price is the weighted average of different prices, based on the estimated contractual/hedging strategy of the incumbent. The incumbent’s contractual/hedging strategy was estimated based on three information sources: the regulator’s national market monitoring report; company reports; and CEER’s national indicators database on long-term contracting.

Figure 54: Incumbent standard retail offer's mark-up – for a 15,000kWh/year household consumption profile in the capital – December 2012 (euros/MWh)



Source: ACER analysis based on ACER retail database (December 2012), COMEXT/Eurostat database revised by ACER (2013), ICIS Heren (2013), Eurostat 2013, and NRA national monitoring reports<sup>176</sup>.

Note: The values on the horizontal axis correspond to the annual gas consumption of all households in 2011 according to the Eurostat taxonomy (the Eurostat update for 2012 was not available at the time of compiling this document). The network cost element for Luxembourg, including the cost of transportation networks located outside the country, could not be deducted from the energy component.

- 317 Over the last few years, five capitals registered significant entry levels to the household market: Bratislava, Berlin, Amsterdam, Dublin and Prague.
- 318 In Bratislava, Prague and Amsterdam the entry process led to good progress in terms of price competition, consistent with lower levels of incumbent profitability. In 2012, these markets faced not only a strong supply push, but also consumer initiative (in the Czech Republic, consumer response was very strong, with switching rates significantly above reference levels, and in the Netherlands switching stayed at relatively high levels – see Section 4.4.2.2). Unsurprisingly, as seen in Section 4.3, these countries belong to the group of MSs in which competition and new entry is creating the basis for stronger retail market integration. Nonetheless, the situation in Slovakia deserves closer scrutiny in the coming years, as price regulation is leading to very low mark-ups and, most likely, to lack of profitability in the household retail market (see Section 4.4.2.2).

176 Belgium: 'Aperçu et évolution des prix de l'électricité et du gaz naturel pour les clients résidentiels et les PME' – April 2013 – CREG; Beslissing (B)130417-CDC-1221G/2 over 'de vaststelling van de correcte toepassing van de indexeringsformule en de conformiteit met de exhaustieve lijst van toegelaten criteria voor de contracttypes met een variabele energieprijis door de leverancier; Electrabel Consumer Solutions tijdens het tweede kwartaal van 2013 – CREG; France: GDF Suez – The State Council's positive decision about gas tariffs in France – Conference Call – 30 January 2013; Portugal: Galp Energia Annual Report and Accounts 2012; United Kingdom (GB): Methodology for the Supply Market Report – 31 January 2012 – Ofgem; Romania: The publication 'Tipul surselor de gaze naturale în luna decembrie 2012' was used to calculate the split between internal production and imports, and the publication 'Evaluarea sumei fixe unitare pentru acoperirea costurilor de achiziție a gazelor naturale pentru consumatorii casnici și producătorii de energie termică, numai pentru cantitatea de gaze naturale utilizată la producerea de energie termică în centralele de cogenerare și în centralele termice destinată consumului populației pentru perioada ianuarie - iunie 2012' was used to calculate the domestic supply price.

- 319 In Germany, the retail entry rate has been relatively high over the last four years<sup>177</sup>. When the retail market was first opened to full competition, Germany's 730 vertically integrated DSO/suppliers mostly avoided competing into each other's sub-national markets. However, after a few years and several changes in the regulatory design of wholesale markets and network access regulation, progress started with the integration of sub-national retail markets. This is now reflected in the high availability of competing offers in Berlin. Consumer switching behaviour (further explained in Section 4.4.2.2), the degree of cross-ownership in the market and the lack of foreign companies' presence may also play a role in driving the mark-up.
- 320 Ireland has witnessed a high entry level over the last four years, and its mark-ups are in line with the reference group. In 2012, Ireland's switching rates were the highest in Europe (see Section 4.4.2.2), price competition was intense (being one of the countries with the highest potential savings from switching for household consumers), and consumers behaved actively. In the medium term, it is likely that the incumbent's market share will be eroded more quickly in Ireland than in most other European markets and that the potential for market integration on the supply side will increase.
- 321 On the other hand, over the last four years, no effective entry into the household market has occurred in a significant number of MSs: Sweden, Poland, Luxembourg, Lithuania, Latvia and Greece. Unsurprisingly, these MSs show no signs of market integration at retail level (as shown in Section 4.3).
- 322 In 2012, following previous trends, Poland, Latvia, Bulgaria, Romania<sup>178</sup> and Hungary<sup>179</sup> continued to regulate retail gas prices at levels that can be difficult to reconcile with cost recovery. No significant new entry has been observed in these markets over the last four years.
- 323 In Sweden and Luxembourg, although retail prices are not regulated, entry is not occurring. The small size of these markets, in a business featuring economies of scale, and the level of per capita income might be influencing consumer switching there.
- 324 In Belgium, the incumbent's mark-up in the capital would suggest higher entry/exit activity. However, according to market monitoring findings by CREG<sup>180</sup>, the incumbent's price/cost mark-up in the Brussels region tends to be higher than that observed in other regions. This might explain different levels of entry in different regions.

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177 Although the German retail market was nominally opened in 1998, competition initially failed to develop due to a complex transport tariff regime coupled with a fragmented high-pressure transportation network. Prior to the introduction of entry/exit transport tariffs in 2006, a supply contract involved negotiating transportation contracts (postage-stamp pricing) with a multiplicity of network owners, thus making transit prohibitively expensive. The German regulator also encouraged a reduction in the number of network areas: there were still eight of them in 2008, but only two now remain. Another important step for market liberalisation was the introduction of a unified switching procedure for all market participants in 2008.

178 Romania is a particular case because, although the retail mark-up was positive in December 2012, this resulted mainly from the fact that the wholesale price is regulated by ANRE. The wholesale price is calculated by the NRA taking into consideration a weighted average of the internal (i.e. national) production price and the import price. For the purpose of this calculation, the NRA assumes that more than 90% of the gas consumed by households is internally produced. The price of national gas production is regulated at a level corresponding to roughly one-third of the import price. If either the import price or an international spot benchmark were used to calculate Romania's retail mark-up, the latter would become negative. In the absence of nationwide data on retail entry in the household segment, the considerations made on Romania in this section only apply to Bucharest.

179 Retail price regulation in Hungary is based on wholesale prices (both spot and oil-indexed). The indexation used in bulk supply contracts differs from the indexation formulae used by the regulator. In 2011, the largest unregulated supplier in the country went bankrupt, amidst press reports of a number of foreign investors wishing to abandon the retail sector.

180 <http://www.creg.be/fr/evolprixg.html>

- 325 Great Britain, formerly one of the most dynamic markets, has recently been overtaken by other MSs in terms of market dynamism<sup>181</sup>. The retail mark-up in the household segment has been increasing significantly since 2009<sup>182</sup>, with the exception of 2011. In 2011 and 2012, the level of profitability in the household segment surpassed the level of profitability in the electricity segment<sup>183</sup>. Price competition seems to be easing and competition is taking a non-price form (as seen in Section 4.2.3). This higher mark-up environment may trigger more pronounced entry/exit activity in the future.
- 326 The history of entry and exit into and from a market and industry profitability levels suggest that relevant barriers to entry into retail markets persist across the EU-27, with a few exceptions.

#### 4.4.2 Main barriers to entering retail markets

- 327 According to a survey conducted by the Agency in early 2013<sup>184</sup>, the major entry barriers in EU retail gas markets relate to:
- illiquid and/or concentrated wholesale markets;
  - consumer switching behaviour;
  - retail price regulation; and
  - the regulatory framework.

##### 4.4.2.1 Illiquid and/or concentrated wholesale markets

- 328 Most EU gas is imported from non-EU countries by incumbent operators through long-term contracts with take-or-pay clauses (the latter being now in a phase of decline). These operators usually retain an important share of the retail market and sometimes some network and storage capacity.
- 329 Incumbent players in retail markets have no incentive to provide liquidity in upstream markets because more liquidity would stimulate retail market entry by smaller suppliers. Storage access control by incumbents allow the latter to balance supply and demand without the need to use or create balancing markets. Some incumbents vertically integrate wholesale and storage activities.
- 330 In addition, the fact that many long-term contracts are still indexed to oil prices and that, in recent years (2010-12), such contracts have been priced at usually higher levels than spot gas reduces/eliminates the incentive for incumbents to resell their gas on hub-based markets, even in the presence of take or pay clauses<sup>185</sup>.
- 331 Without direct access to the upstream market and a liquid wholesale market, smaller players may have difficulties entering retail markets, because gas supplies would not be sourced at an efficient scale.

181 Ten MSs have witnessed stronger entry/exit activity over the last four years (Figure 53).

182 According to Ofgem's report 'Financial Information Reporting: 2011 Results', based on audited financial results, the profit margin (as a percentage of revenue) in the household segment increased from around 0% in 2009 to 4.3% in 2011 (information for 2012 is not available in this report). Data from the 2011 and 2012 segmental statements from Centrica, E.On, EDF Energy, RWE/npower and Scottish Power also show a significant increase in retail margins in the household segment from 2011 to 2012.

183 According to Ofgem's report ('Financial Information Reporting: 2011 Results') dated 11 April 2013 (Figure 10).

184 Conclusions drawn at the retail workshop on barriers to entering retail markets, organised by ACER/CEER in Milan, 30 and 31 May 2013.

185 Take-or-pay (ToP) clauses may force some incumbents to sell excess gas on wholesale markets, but only if ToP contract penalties exceed the contract versus spot price differential.

- 332 In most MSs, balancing markets were designed with the largest players in mind and tend to impose artificial economies of scale. Smaller participants face significant entry volume barriers due to the minimum volumes required for trading on balancing markets. This asymmetrically affects smaller players vis-à-vis larger ones, but also non-vertically integrated companies vis-à-vis vertically integrated ones<sup>186</sup>.
- 333 Using liquid wholesale markets from a foreign country might be a solution to reduce barriers to entry, but this will be effective only if enough capacity (both physical and contractual) exists at cross-border points along the route and if IP tariffs are set in a fair and non-discriminatory way. As shown in Sections 5.4.1 and 5.3.1, seasonal contractual congestion is still a major issue at many relevant European IPs.
- 334 Liquidity is more important when coupled with lower concentration levels in wholesale markets. The only two European countries with adequate liquidity and a low degree of concentration are Great Britain and the Netherlands.
- 335 As illustrated in Section 4.3, these two countries tend to have higher levels of retail market integration compared with other European countries, confirming that more liquid wholesale markets seem to be somehow associated with lower barriers to entering retail markets and with higher levels of retail market integration. It is also interesting to highlight that these countries, together with Germany<sup>187</sup> and Denmark, are those where retail entry by small players<sup>188</sup> has been more relevant and non-transitory.
- 336 In the rest of Europe, hubs still lack significant liquidity. Aggregating pools of liquidity by merging cross-border zones and virtual hubs might be a solution. Good examples could be the virtual point planned for the Iberian market and similar developments in Central Europe.
- 337 The lack of relatively liquid wholesale markets in Belgium<sup>189</sup>, Spain, France, Hungary and Italy has forced some foreign companies to enter these retail markets via the acquisition of existing companies with an established consumer base. In these cases, the supplier can overcome the lack of liquid wholesale markets by negotiating gas directly with first-sale producers or by importing it from a (neighbouring) country where the company has direct operations. However, the potential to promote competition in retail markets through this type of entry is more limited than when liquid local wholesale markets exist.
- 338 To conclude, it appears that illiquid or concentrated wholesale markets, coupled with contractually congested IPs, represent a major retail entry barrier in almost all MSs. Also, the design of balancing markets should be enhanced to avoid artificial barriers for smaller or non-vertically integrated players. In 2012, limited progress was made in terms of aggregating pools of liquidity by merging cross-border zones and virtual hubs. Most MSs still follow a national approach by creating virtual hubs at national level.

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186 Conclusions drawn at the retail workshop on barriers to entering retail markets, organised by ACER/CEER in Milan, 30 and 31 May 2013.

187 In Germany, the presence of small municipally or community owned companies accounts for a relevant entry share into local markets.

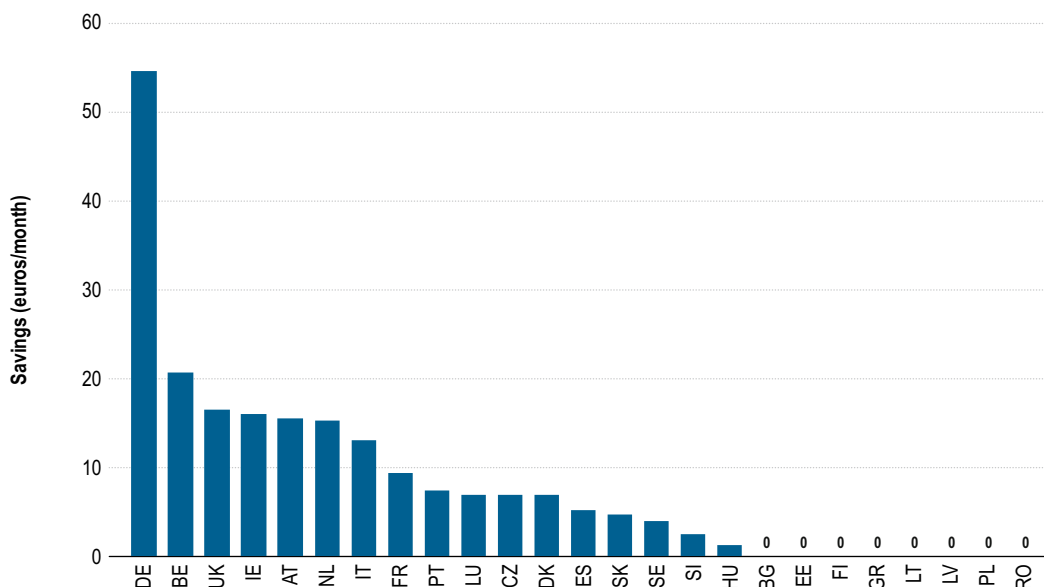
188 In capital cities, examples of smaller players which were able to stay in the market as of December 2012 are: NL – Anode Energy, Atoomstroom, Energy Cooperative, Green Choice, Innova, Main Energy, Noordhollandse Energy Cooperative, Robin Energy; GB - Cooperative Energy, Ecotricity, First Utility, Good Energy, Ovo Energy, and Utilita Energy Group.

189 In 2012, Belgium introduced an entry/exit regime in order to promote liquidity.

#### 4.4.2.2 Consumer switching behaviour

- 339 The price elasticity of demand tends to be lower for energy services than for the average good/service, because energy is harder to substitute. However, company-specific price elasticity of demand<sup>190</sup> can be higher (in absolute value) than industry-wide elasticity.
- 340 If consumers are price sensitive and a price differential exists, they will tend to switch supplier. If this is the case, more competitive suppliers could enter the market by undercutting the incumbent.
- 341 The Agency and CEER have analysed the potential savings from switching in different MSs (Figure 55) and the relationship between potential savings and switching (Figure 56).

Figure 55: Average monthly saving from switching from the incumbent’s standard offer to the lowest priced offer on the market – capital – December 2012 (euros/month)

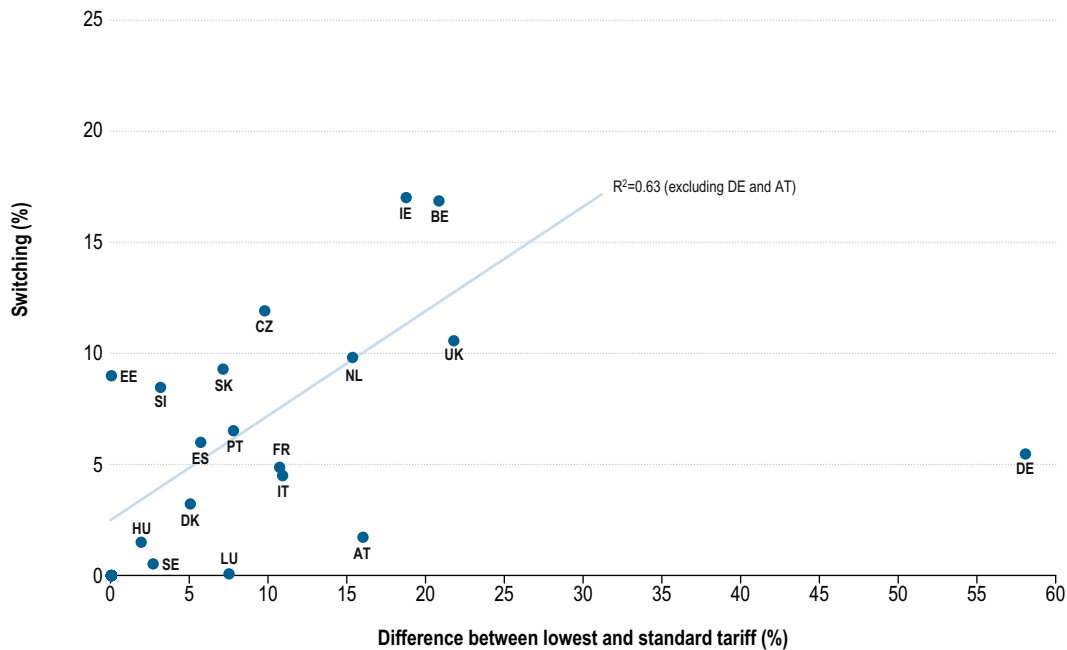


Source: Agency analysis based on the ACER retail database (December 2012)

Note: Calculations for a consumption profile of 15,000kWh/year.



Figure 56: Average monthly saving from switching from the incumbent's standard offer to the lowest priced offer on the market in the capital as of December 2012 compared to the country's over-all switching rate – 2012 (%)



Source: Agency analysis based on ACER retail database (December 2012) and CEER National Indicators database

Note: For Sweden, Gothenburg was used as a reference, as there is no significant household gas market in the capital. Romania was excluded due to lack of switching data. Denmark provided switching rate data only for 2011. Intra-group switching (switching between companies belonging to the same group) was excluded.

342 In some MS capitals, consumer response seems to be closely related to price differentials, but in other MSs consumer behaviour could be influenced by other elements. The saving potential seems to be a moderately relevant factor, explaining consumer behaviour in most EU-27 markets (if the German outlier<sup>191</sup>, Berlin, and the Austrian one, Vienna, are excluded, the determination coefficient is 0.63). In general, MS capitals with higher saving potentials also seem to have higher switching rates.

343 Germany and Austria are the two countries where consumer behaviour appears to be a major barrier to entry, as consumers seem to be less price sensitive there than in other MSs. In 2012, Germany and Austria featured switching levels substantially below what would be expected using the EU-27 as a reference. France, Great Britain, Italy and Denmark<sup>192</sup> are also on the list of countries where consumers arguably under-switched in 2012. Such behaviour might be linked to different consumer preferences and to barriers to switching.

191 The Berlin outlier is mainly due to a commercial strategy of the supplier with the lowest price, based on an advance payment combined with a rebate, or with higher ex-post prices in case the initial consumption threshold is exceeded by those consumers who could not correctly predict their real consumption level before entering into the (binding) contract. Similar strategies are now common in a number of markets and have been present in GB for a long time. Since exit fees are sometimes unenforceable, retailers introduce ex-post rebates, which are in fact an indirect form of exit fee. Aftermarket rebates work as follows: energy is over-priced and higher bills are charged for – say – 1 year. Consumers can withdraw from the contract at any time without penalties. However, if they do, they lose the rebate, which normally takes place after 12 months or so. Taking the rebate into account, ex-post energy prices will be lower, and will correspond to the amounts shown in the retailer's initial price offer. This is why such rebates are in effect the same as exit fees if the customer does not wait. Many of these contracts have now been clarified by suppliers, at least in some MSs, to ensure that prospective consumers understand that any cashbacks/rebates will materialise only after (for example) one calendar year and not immediately.

192 Data for Germany are estimated based on 2011, as no information for 2012 was available.

- 344 Apart from potential savings, other determinants can influence switching: consumer awareness<sup>193</sup>, price structure simplicity/comparability, switching costs, past switching experience, loyalty incentives, trust, momentum and psychological elements.
- 345 In December 2012, the largest difference between the incumbent's standard offer and the lowest offer in a capital was found in Berlin (more than twice the difference found in any other capital – even after removing the most extreme offers, the saving potential was still the largest in the EU-27). However, the switching rate for the country as a whole was well below the levels found, for example, in Brussels, London, and Dublin, where the saving potential was significantly lower. This relatively lower level of switching may result from stronger loyalty to incumbent suppliers (many of the active suppliers are municipally-owned companies linked to consumers<sup>194</sup> by trust due to their public ownership structure), possibly lack of consumer awareness, and the difficulty of comparing complex offers. In 2012, Germany had by far the largest number of suppliers and offers in the gas market<sup>195</sup>, and one of the most complex pricing structures in the EU-27.
- 346 In Germany (not just in Berlin), pricing complexity results from many different elements: (i) price indexation formulas (different indexes); (ii) the split between fixed and variable components; (iii) contract duration (from one to 36 months); (iv) payment timing (pre- against post-payment); (v) payment method (direct debit, credit card); (vi) contracting platform (on-line only, shops); (vii) the percentage of green energy (biogas); (viii) one-off discounts (as a percentage, fixed, as a fraction of consumption, loyalty points); and (ix) additional product/service offers<sup>196</sup>.
- 347 In 2012, pricing complexity was also observable in other MS capitals, particularly in Great Britain, the Netherlands and Slovenia. In 2012, Ofgem presented the results of its GB Retail Market Review (RMR), launched in 2010, which addressed the issue of pricing complexity and proposed solutions aimed at making switching easier (Case Study 6). The final RMR proposals were consulted on in March 2013.
- 348 Making consumer choice easier is crucially important. However, NRAs in liberalised markets should resist the temptation to reduce the retailers' ability to price-discriminate fairly, as price discrimination can enhance welfare in non-perfectly monopolistic or oligopolistic markets, where perfect price discrimination is unsustainable, but other forms of discrimination (for instance, cost-based) might be perfectly legitimate.

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193 Product promotion and placement influences consumer awareness.

194 In Berlin, there were around thirty municipally-owned active retail suppliers in December 2012.

195 As of December 2012, 228 different offers were available for household customers, with a consumption of 15,000kWh/year in Berlin. In Amsterdam and London over the same period, the number of offers for the same consumer profile was 92 and 79, respectively.

196 As of December 2012, for example, the cheapest offer in Berlin for a consumer with a 15,000 kWh/year profile was a fixed price offer for a period of one year, with 12-month prepayment of 14,000kWh and extra payments thereafter, with no additional fixed fee. On top of the basic offer, the consumer received a one-off ex-post rebate.

- 349 Consumer choice can be facilitated without interfering with the ability of suppliers to set prices through, for example:
- promoting the development of reliable and comprehensive web comparison tools for retail products (several MSs do not have functioning web comparisons sites<sup>197</sup>);
  - the adoption of standardised fact sheets that companies have to complete and make publicly available for each retail offer, in order to provide consumers with transparent and comparable basic information on all relevant elements<sup>198</sup>;
  - the definition of standardised price measurements (cf. the Tariff Comparison Rate, or TCR, in the UK), providing a means of making an initial, at-a-glance, comparison of prices similarly to Annual Equivalent Rates in the financial industry<sup>199</sup>; and
  - the promotion and development of systems/platforms allowing easy collective switching.
- 350 In Austria, although switching from the incumbent's standard offer to the lowest offer on the market could save consumers more than 15% of their bills, the switching rate in 2012 was one of the lowest in the EU (1.7%). This low level might result from stronger loyalty to incumbent suppliers (as in Germany, many Austrian suppliers are owned by municipalities<sup>200</sup>) and, arguably, from lack of consumer awareness or interest. It seems that neither incumbent players from other sectors nor new entrants (be them domestic or foreign) have ever been particularly interested in targeting Austria.
- 351 In 2012, France and Denmark also featured below-average switching rates. In these countries, lack of consumer awareness may be playing a relevant role. According to the French energy regulator (CRE), more than 50% of gas end users in France are not aware that they can change supplier and, in any case, they perceive regulated prices as cheaper and more stable<sup>201</sup>. Lack of awareness seems to be exacerbated by the sense of protection created by the existence of a regulated price. Consumers tend to trust the regulated price more than other prices in the market. In Italy, general lack of consumer awareness has also been referred to by the energy regulator as a possible barrier to entry.
- 352 Regulated prices can therefore play a role similar to traditional municipal ownership. Both create a sense of trust and protection which consumers value, sometimes above monetary savings, when confronted with the possibility of switching.

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197 In Austria, Belgium, Italy, Portugal, Slovakia, Slovenia, and Spain the regulator provides a web comparison tool. In Great Britain and Belgium, price comparison websites are rubberstamped by the regulator. Although this does not mean that non-rubberstamped websites should leave the market, the initiative is beneficial in making consumers aware of the existence of de minimis non-compulsory rules to which these websites should adhere if they want to receive the energy regulator's stamp of approval. The latter should, however, in no way become obligatory or act as a deterrent to other websites to access or stay in the market. Web comparison tools can and should be benchmarked by consumers, exactly in the same way as consumers benchmark energy and other prices through such sites.

198 Including auxiliary charges, such as exit fees and minimum contract duration.

199 For example, Annex II of Directive 87/102/EEC.

200 As of December 2012, out of the ten different suppliers available for household customers in the capital city, four were owned by local or regional councils (Vienna's city council, Klagenfurt's city council, the state of Carinthia, and regional distribution companies in the state of Salzburg).

201 According to CRE's annual retail survey conducted in September 2012 through a 15-minute phone questionnaire over a sample of 1,500 consumers, five years since liberalisation only one household consumer out of two appeared to know that switching is a possibility. Globally, regulated prices are perceived as being lower and more stable than market offers. Also, consumers are not always willing to learn more about the liberalised market, showing lack of interest (20%).

- 353 In 2012, consumers were more likely to switch in Ireland, the Czech Republic, Slovakia, Slovenia and Spain. More aggressive supply strategies may have played a role in these countries. Ireland has witnessed a very relevant level of entry over the last four years. In 2012, Ireland's switching rates were the highest in Europe; price competition was intense, and consumers showed engagement. In the Czech Republic and Slovakia, supplier-pushed strategies seem to be strong, but easing off, and most serial switchers have now stabilised. It remains to be seen whether repeat switching will take place. Slovenia had a very significant increase in switching during 2012 (especially in the 4th quarter of the year) due to the entry of a new player in the liberalised market. The absence of price regulation allowed the new player to enter the market with a pricing and sourcing strategy very different from that of the existing players (see Case Study 7). In Spain, companies have been playing a more active role in promoting switching away from the regulated price (the last resort tariff), providing end users with additional services and bundled products (including electricity) to promote migration towards unregulated prices<sup>202</sup>.
- 354 In summary, consumer behaviour and attitudes, including cultural and psychological factors, might act as a barrier to entering retail markets in some MSs. However, in many cases, consumer behaviour is itself the result of other factors, such as the presence of strong traditional brands (incumbents and state-owned companies) which are sometimes used in misleading ways, as well as the persistence of regulated prices. Consumer choice can be facilitated (without interfering with the ability of suppliers to set prices) by having web comparison tools in place allowing reliable, comprehensive and easy ways to compare suppliers' offers, by adopting standardised fact sheets for each retail offer, by publishing easily comparable unit prices in terms of standing charge and variable rate for standard consumption profiles and by promoting systems/platforms fostering collective switching.

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202 For example, in Spain the switching rate, excluding intra-group switches, is estimated at around 6%. If intra-group switches were considered (consumers switching from the regulated to the non-regulated tariff within the same group of companies), the 2012 switching rate would be around 20%.

## Case Study 6: The Retail Market Review in Great Britain

Ofgem launched the Retail Market Review (RMR) in November 2010, following persistent concerns from the public that retail electricity and gas markets were not working effectively for consumers, despite some improvements following the 2008 Energy Supply Probe<sup>203</sup>.

The RMR consists of two separate research and consultation processes leading to two sets of regulatory proposals, one focussing on domestic consumers and the other on non-domestic consumers, particularly small businesses.

### The domestic RMR

Domestic gas and electricity markets in GB were opened up to retail competition in 1998-99 and price controls for households were completely removed in 2002. After a process of consolidation and acquisition, both markets are now dominated by six large suppliers (EDF Energy, E.ON, British Gas, RWE/npower, ScottishPower and Scottish and Southern Energy) and new entry by small suppliers has been relatively limited. Most customers have remained with the supplier they had before liberalisation, and there has been little change in market shares.

In this context, extensive market research conducted by Ofgem has identified three key barriers to effective consumer engagement:

1. The large number of offers, many of which have complex structures and discount arrangements<sup>204</sup>;
2. Gaps and lack of clarity in the information given by suppliers to consumers, with many consumers not being aware of the opportunity to save money by changing offers or supplier; and
3. Lack of trust and poor supplier conduct, also evidenced by the number of enforcement cases processed by Ofgem and the sanctions imposed.

Together, these factors have a detrimental impact on competition, as a large contingent of inertial customers do not put any competitive pressure on incumbent suppliers to offer good service at an efficient cost (and to innovate and improve over time). Moreover, in the electricity case, the resulting stability of market shares tends to exacerbate the poor liquidity in the wholesale market and makes it difficult for new entrants to compete on equal terms.

After an extensive public consultation process<sup>205</sup>, on 27 March 2013 Ofgem issued its final package of domestic RMR proposals, addressing the above-mentioned problems in three main ways<sup>206</sup>:

203 The Probe introduced some new requirements relating to the information provided by suppliers to consumers, as well as other measures to promote consumer engagement, which were not always delivered as intended. For more details, see Ofgem, Energy Supply Probe – Proposed Retail Market Remedies, August 2009.

204 Source: Ofgem's analysis of supplier tariff permutations as of 28 August 2012, using information provided by suppliers.

205 Successive public consultations on earlier RMR proposals were run by Ofgem in March 2011, December 2011, February 2012, and October 2012. A consultation on final RMR proposals was carried out in April 2013.

206 For full details see Ofgem, The Retail Market Review – Final domestic proposals, March 2013, at: <http://www.ofgem.gov.uk/Markets/RetMkts/rmr/Documents1/The%20Retail%20Market%20Review%20-%20Final%20domestic%20proposals.pdf>

### 1. Simpler offer choices

- A limit on offer numbers: each supplier will provide no more than four core electricity offers and four core gas offers for each specified meter type (single rate, time of use, etc.). Each core offer may include a choice of payment method, as well as rules on discounts and bundles designed to make customer choice easier. Furthermore, offers will continue to be permitted to vary by region and new offers for collective switching will be allowed (under certain rules).
- Simpler offer structure: each offer will have to be presented in the form of a standing charge (which may be zero) and a unit rate. Complex offers which increase or reduce the price per unit as consumption increases will no longer be allowed.
- Complementary rules, including: if a consumer is on an 'evergreen' offer that is no longer available and can save money by moving to a similar 'live' offer, then the supplier will need to enact this; a ban on unilateral price increases and contract roll-overs within fixed-term deals; suppliers to notify customers in advance about any disadvantageous offer change.

### 2. Clearer information

- Increasing consumer awareness of alternative offers<sup>207</sup> through the provision by retail suppliers of, among other things, personalised information on cheaper offers with the current supplier and the associated saving, communication of the Tariff Comparison Rate (TCR), calculated for each region in Great Britain, and a reminder that consumers can change offers or supplier.
- Improving consumer access to relevant information in suppliers' regular communications, including details about the consumer's current offer, their consumption over the last 12 months, whether there are any exit fees, the personal impact of a price increase and a notice to explain new offer options when the current fixed-term offer is about to end.
- Helping consumers assess alternative offers and choose the most suitable one for their needs, mainly through the introduction of 'Personal Projections', showing the projected cost of a particular offer for the following year, and the 'Tariff Information Label', providing all offer features in a standardised label format.

### 3. Fairer treatment

The introduction of new Standards of Conduct (SOC) as binding licence conditions which will require suppliers to treat consumers fairly and take consumer needs into account. Each supplier will have to embed the SOC in all aspects of their engagement with consumers (excluding the pricing level). The SOC also contain a range of more specific principles covering supplier behaviour and describing how suppliers should provide information to customers.

<sup>207</sup> This includes the Bill (or statement of account) and the Annual Statement. Ofgem will also require communicating this information on the Price Increase Notice (and notifications about unilateral variations to other terms and conditions) and the End of Fixed Term notice.

## The non-domestic RMR

Overall, the market for business customers is more competitive than the domestic one. There are more suppliers, lower incumbent market shares, higher switching rates and more price-responsive demand<sup>208</sup>. However, the market for smaller business customers is similar to the domestic market in aspects such as high concentration and low engagement levels. Research and survey data showed recurring problems being reported around three areas in particular - billing, contracts and transfers - with poor information in these areas being a common problem.

In order to address these issues, Ofgem carried out a public consultation process<sup>209</sup> and issued its package of non-domestic proposals on 22 March 2013, including<sup>210</sup>:

- Amending existing rules to bring more, slightly larger, businesses under the micro- business protections.
- New rules to make processes clearer and simpler for smaller businesses.
- New sanctions on energy suppliers who do not deal with their smaller business customers fairly when they contract with them, switch, have a deemed contract, or when billing.

Moreover, Ofgem is increasing its monitoring of retailers' behaviour for any size of business and working to help all business customers engage confidently with third-party intermediaries.

## Implementation of the RMR proposals

As far as domestic proposals are concerned, the regulator's aim is to incorporate them into the supply licence, starting in summer 2013. All measures should be in place by the end of March 2014, with an intermediate phase for a number of measures lasting until 31 December 2013.

If no appeal is lodged, it is intended that non-domestic market reforms will start to take effect by the second half of 2013.

208 See the October 2012 consultation document. For further information: <http://www.ofgem.gov.uk/MARKETS/RETMKTS/RMR/Documents1/The%20Retail%20Market%20Review%20-%20Updated%20domestic%20proposals.pdf>

209 Initial and amended proposals for the business market were issued for consultation in November 2011 and October 2012, respectively. A final consultation was carried out during April 2013 on final proposals launched in March 2013.

210 For full details see Ofgem, The Retail Market Review – Final non-domestic proposals, March 2013, available at: [http://www.ofgem.gov.uk/MARKETS/RETMKTS/RMR/Documents1/The%20Retail%20Market%20Review%20-%20Final%20non%20domestic%20proposals\\_22%20March\\_FINAL.pdf](http://www.ofgem.gov.uk/MARKETS/RETMKTS/RMR/Documents1/The%20Retail%20Market%20Review%20-%20Final%20non%20domestic%20proposals_22%20March_FINAL.pdf)

#### 4.4.2.3 Retail price regulation

- 355 Retail price regulation<sup>211</sup> is an entry barrier affecting many MSs. It is an absolute barrier to entry when prices are regulated below cost, and to a lesser extent when prices are regulated above cost, as in this case it will disengage consumers from switching due to a perception of protection.
- 356 However, the differences in terms of retail price regulation across the EU-27 may alter the impact of price regulation as a barrier. In some countries, the government/NRA sets prices in a more politicised context, paying less attention to underlying costs or to internationally prevailing wholesale prices (this is the case in Romania<sup>212</sup>, Latvia<sup>213</sup>, Bulgaria<sup>214</sup>, Poland and Hungary). In other countries, the government/NRA sets prices with closer reference, but not always full indexation, to wholesale prices (for example, in Italy, Belgium, France, Ireland, Denmark, and Spain).
- 357 Some countries tend to regulate prices in all sub-markets, from households to large industrials (for example, France, Poland, Romania, and Bulgaria), while others regulate only household prices (Ireland, Spain, Lithuania, and Denmark).
- 358 These differences are summarised in Table 9. More details on end-user regulation regimes can be found in Section 4.5.

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211 Retail price regulation means government or NRA interference, either ex-ante or ex-post, with the energy component of the final price (before network charges and taxes). Governmental or regulatory interference usually affects either the final retail price or the retail (profit) margin.

212 In Romania, the NRA assumes that more than 90% of the gas consumed by households is internally produced. The price of internal gas production is regulated at levels corresponding to roughly one third of the import price. In 2013, the internal (i.e. national) gas price was set by Government on a convergence path throughout 2013-2018 in order to ensure the gradual realignment of the domestic price with internationally prevailing wholesale prices.

213 This MS had regulated prices and negative mark-ups in 2012, as reported in Section 4.4.1.

214 This MS had regulated prices and negative mark-ups in 2012, as reported in Section 4.4.1.



Table 9: Categorisation of consumer groups supplied under regulated prices in the EU-27 – 2012

Country	Markets supplied under regulated prices			
	Households	Households with special needs	SMEs	Industry
Austria				
Belgium	x	x	x	
Bulgaria	x	x	x	x
Czech Republic				
Denmark	x			
Estonia				
Finland				
France	x	x	x	x
Germany				
Greece	x	x	x	
Hungary	x	x	x	
Italy	x		x	
Ireland	x			
Latvia	x		x	x
Lithuania	x			
Luxembourg				
Netherlands				
Poland	x		x	x
Portugal	x	x	x	
Romania	x	x	x	x
Slovakia	x		x	
Slovenia				
Spain	x			
Sweden				
United Kingdom (GB)				

Source: Agency questionnaire on end-user price regulation (2013)

Note: The Netherlands does not regulate prices but retains ex-post price setting powers for household consumers and SMEs, intervening in cases where prices are assessed as unreasonable. Belgium imposed a price 'freeze' in 2012.

359 In Romania<sup>215</sup>, Latvia, Bulgaria, Poland and Hungary<sup>216</sup>, retail price regulation, with only a limited link to actual wholesale prices, creates a high barrier to entry. Estimated retail margins in these MSs were negative in 2012 and, over the last four years, no relevant new entry has occurred there<sup>217</sup> (as reported in Section 4.4.1). Some of these MSs do not yet comply with the 3<sup>rd</sup> Package.

215 The qualification expounded for Romania regarding the regulation of domestic gas prices applies here, as previously mentioned.

216 The usual caveat applies to Hungary regarding the way retail prices are regulated.

217 For Romania, there are no available nationwide data on household market entry; therefore, this statement is based on the household market in Bucharest.

- 360 Retail price regulation also has a relevant impact in those countries where regulated prices tend to be market-linked. For instance, in Spain, price regulation generated comparatively lower retail mark-ups and relatively lower levels of entry into the retail market (see Section 4.4.1)<sup>218</sup>.
- 361 Even in those cases where price regulation does not result in low or negative margins (for example, France and Belgium), it somehow discourages consumers from switching for psychological and perception reasons. Many gas consumers are not aware that they can change supplier and perceive regulated prices as lower and more stable (as analysed in Section 4.4.2.2).
- 362 Moreover, price regulation may create uncertainty because, although regulated prices may be perceived by consumers as more stable, in practice regulated prices can oscillate, depending on short-term government priorities and the electoral cycle. Rules for price setting may change, and what is today a profitable market may suddenly (for instance, as a result of ad hoc administrative/political changes) become unprofitable. Frequent regulatory changes in the price setting mechanism (where regulated/capped retail prices still exist, typically as a result of governmental policies rather than regulatory determinations) can be a relevant entry deterrent<sup>219</sup>.
- 363 In summary, price regulation – regardless of differences across regimes – is likely to have an important impact on market entry. When retail prices are set below cost, they can act as an absolute barrier to entry. When price regulation reduces margins (even without pushing them to negative levels), it will usually dampen entry incentives, increase investor uncertainty, and might prompt consumers to disengage from the switching process.

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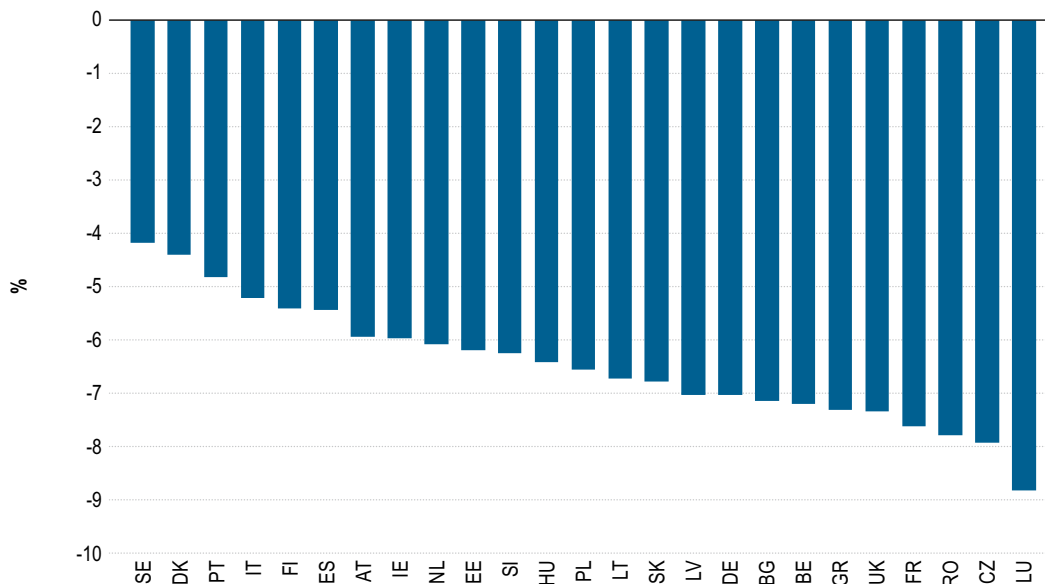
218 Comparing MSs with similar gas household market sizes, as of December 2012, there were only three operators supplying household customers in Lisbon (Portugal) where regulated prices persist, compared with six in Ljubljana (Slovenia), where regulated prices have been abolished; there were only six operators supplying household customers in Madrid (Spain), where regulated prices persist, compared with 18 in Amsterdam (the Netherlands) where regulated prices have been abolished; there were only eight operators supplying household customers in Rome (Italy), where regulated prices persist, compared with 14 in London (Great Britain) and 74 in Berlin (Germany) where regulated prices have been abolished.

219 Comparing MSs with similar gas household market sizes, as of December 2012, there were only four operators supplying household customers in Brussels (Belgium) where regulated prices persist, compared with 18 in Prague (the Czech Republic) and Amsterdam (the Netherlands), where regulated prices have been abolished.

#### 4.4.2.4 Regulatory framework

- 364 In some MSs, new entry into retail markets is either impossible or extremely difficult because of legislation, regulation, or previous contractual arrangements (Poland, Bulgaria, Greece, and Romania), including the presence of ‘energy islands’, due to vintage contracts in the Baltic region (Estonia, Latvia, Lithuania). Unless significant changes are introduced to liberalise both wholesale and retail markets, new entry to these MSs will be difficult because of absolute barriers arising from legal, regulatory, contractual and geopolitical factors. Infrastructure limitations in those regions compound the problem.
- 365 The Agency and CEER analysed what the impact on a typical household gas bill would have been as a result of a new entrant offering a 10% reduction in the energy component<sup>220</sup> of the retail price. In the majority of the capital cities examined<sup>221</sup>, the impact would have been lower than 7% (Figure 57).

Figure 57: The percentage impact on the final bill of a 10% decrease in the energy component of the retail price – households in the capital – December 2012



Source: Agency analysis based on the ACER retail database (December 2012)

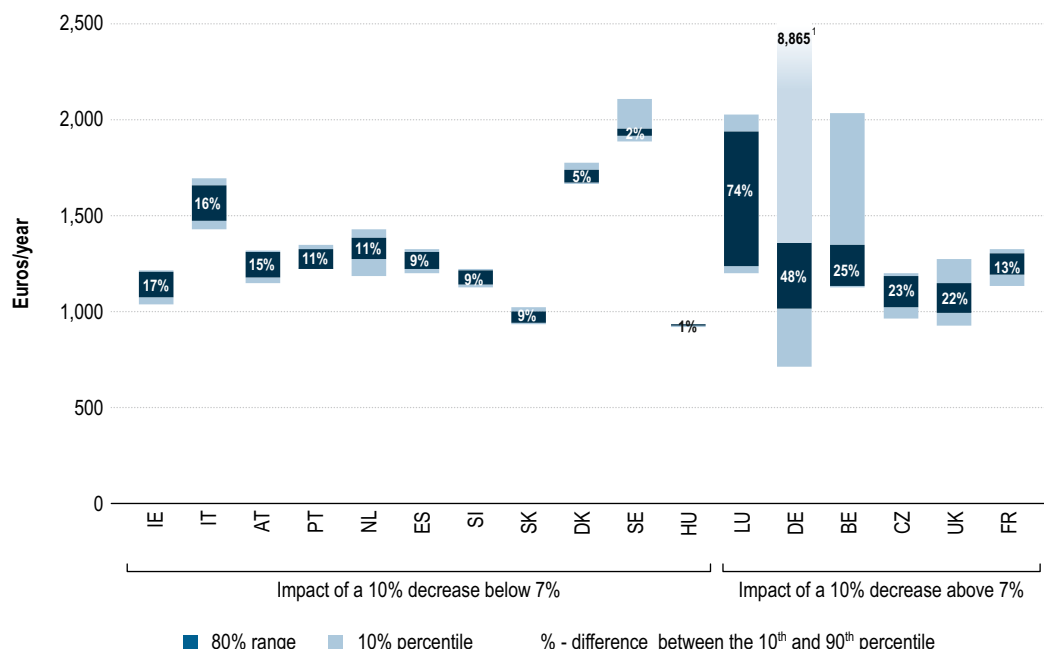
Note: The simulation is based on the incumbent’s standard offer in the capital.

- 366 In those countries where the incidence of regulated transmission/distribution network charges and taxation are higher, the ability for new entrants to differentiate final prices is further reduced (see Figure 58).

220 Including wholesale price and retail margins/costs.

221 Data for December 2012.

Figure 58: POTP dispersion for households in the capital – 15,000kWh/year consumption profile – December 2012 (euros/year)



Source: Agency analysis based on the ACER retail database (December 2012)

Note: Based on a consumption profile of 15,000kWh/year and considering countries with more than 5,000GW per year's worth of household consumption. Capitals with only one retail supplier were excluded, as price dispersion in such cases would have obviously been zero. The highest price in Berlin (8,865 euro/year) corresponds to a deal comprising a large fixed advance payment covering a 'package' of 150,000kWh/year. This is clearly not a competitive offer for a consumer profile of 15,000kWh/year and – for this reason – it was treated as an outlier.

367 Figure 58 shows that in those capitals where regulated network charges and taxation elements have a higher impact on final prices, the ability of suppliers to compete on price will decrease, resulting in lower price dispersion (other things being equal). For example, as of December 2012, the capitals of Denmark, Portugal, Italy and Spain (where a 10% change in the energy component implied a less than 7% change in the overall gas bill), showed a maximum price difference of 5%, 11%, 16% and 10%, respectively, in 80% of retail offers (hence cutting off 10% of offers on either tail of the distribution).

368 In those capitals where regulated network charges and taxation elements have a lower impact on the ability of suppliers to compete on price, there was more price dispersion<sup>222</sup>. For example, capitals in Germany, Belgium, Great Britain, the Czech Republic and Luxembourg (where a 10% change in the energy component implied a more than 7% change in the overall consumer bill), showed a maximum price difference of 48%, 26%, 22%, 23% and 74%, respectively on 80% of retail offers.

369 Therefore, even if network charges are set in a non-discriminatory way, different charging structures will have a different impact on retail market entry, because they will impact the extent to which any change in the energy component of the end-user price can actually make a difference in terms of final bills<sup>223</sup>. Some harmonisation of cost assessment methodologies and efficiency analysis might be needed to progress towards internal market integration.

222 France being an exception, arguably due to the regulated price's 'anchoring' effect.

223 According to a study commissioned by the Dutch regulator ACM (<https://www.acm.nl/nl/download/bijlage/?id=6200>), the WACC, the equity beta, and the risk premium determined by domestic regulators for their TSOs can differ by as much as 2:1 across MSs.

## 4.5 End-user price regulation

370 It is clear that different types of price regulation or capping can have a marked impact on retail markets. This section is devoted to explaining the differences in (retail) regulatory regimes across the EU<sup>224</sup>.

### 4.5.1 Application of price regulation

371 As seen before (Table 9), price regulation for households and small and medium-sized businesses<sup>225</sup> persists in most MSs. However, only in very few countries (France, Poland, Romania, Bulgaria, and Latvia) do regulated prices persist for large industrial consumers.

372 A considerable number of MSs still have price regulation for households (15<sup>226</sup> out of 25<sup>227</sup> - Table 10) and for small and medium-sized business (12 MSs<sup>228</sup>). In seven MSs<sup>229</sup>, there is retail price regulation for household consumers with special needs (Table 10).

Table 10: Retail gas price regulation for household consumers across Europe – 2011 and 2012

Country	% of households with regulated prices		% of households with social tariffs	
	2011	2012	2011	2012
Belgium	11%	8%	4.1%	0.9%
Bulgaria	100%	100%		
Denmark	85%	n.a		
France	86%	84%	2.9%	4.3%
Greece*	100%	100%		
Hungary	100%	97%	43.7%	n.a
Ireland	73%	66%		
Italy*	89%	n.a	3.2%	3.1%
Latvia	100%	100%		
Lithuania	100%	100%		
Poland	100%	100%	n.a	n.a
Portugal	94%	90%	0.5%	0.4%
Romania	100%	100%	n.a	n.a
Slovakia	100%	100%		
Spain	35%	31%		

Source: CEER national indicators database (2013)

Note: \* refers to the previous year. In Italy, a 'reference price regime' (whose values are set by the regulator) is in place: all suppliers must offer the reference price together with any alternative offer. Some of these offers can beat, and apparently did beat later in 2013, AEEG's reference price. Some MSs have agreed to develop roadmaps to deregulate prices in the coming years (see Section 4.5.5).

224 The analysis is based mainly on the 2013 ACER questionnaire on end-user price regulation and on the outcomes of the ACER/CEER workshop on retail entry barriers held in Milan in May 2013. Nineteen MSs replied to the questionnaire: Austria, Belgium, Cyprus, the Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Slovenia, Spain, Sweden, and the United Kingdom (Great Britain only). An extension of the analysis to include additional countries was performed on the basis of the additional information available from the National Reports.

225 Note that the definition of what an SME is differs by country.

226 France, Poland, Romania, Bulgaria, Latvia, Hungary, Greece, Belgium, Italy, Portugal, Spain, Slovakia, Lithuania, Denmark and Ireland. Italy removed price regulation for non-households in 2013.

227 Malta and Cyprus do not have commercial gas networks.

228 France, Poland, Romania, Bulgaria, Latvia, Hungary, Greece, Belgium, Italy, Portugal, Spain and Slovakia.

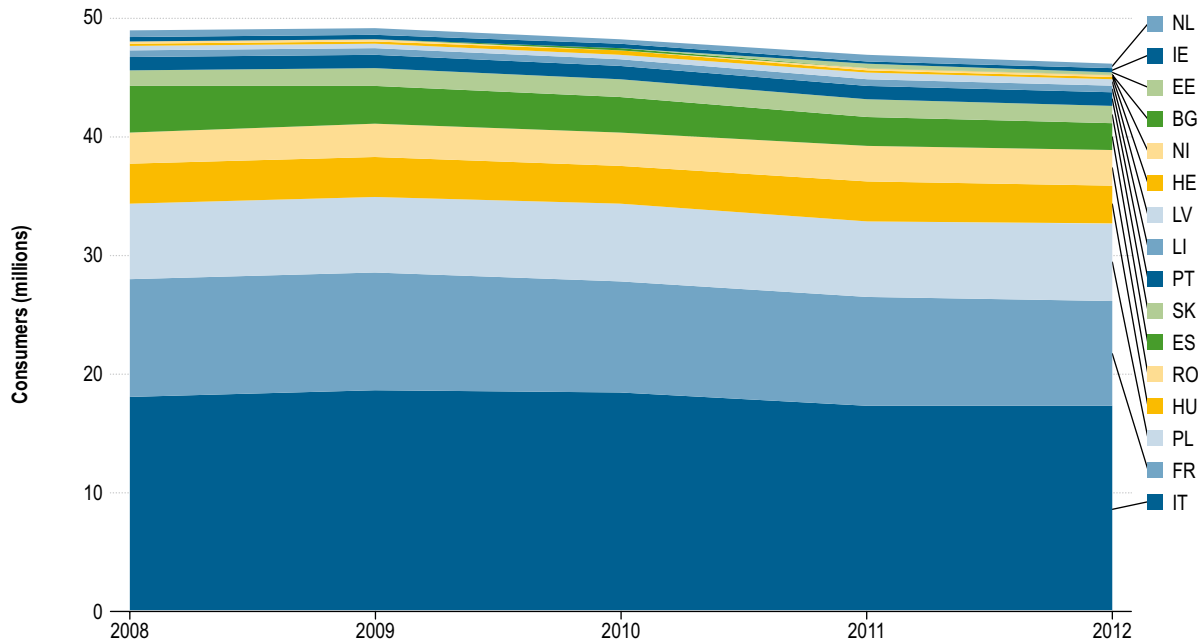
229 France, Poland, Romania, Bulgaria, Hungary, Portugal, Greece and Belgium.

- 373 In 2012, the Netherlands and Estonia had price supervision frameworks which were compatible with the absence of price regulation (hence, exceptionally, these countries are labelled as not having regulated prices for the purpose of this MMR). Still, either regulators or governments in these countries had some power to interfere with retail price setting mechanisms in 2012.
- 374 In the Netherlands, the NRA (ACM) does not approve retail prices ex-ante. However, it assesses on an ex-post basis whether prices are 'reasonable' using a non-disclosed model. Whenever prices are judged to be unreasonable, ACM is legally competent to intervene and set prices at a particular level. In 2012, according to ACM, fewer than 1% of total offers on the end-user market were challenged by the regulator. In those cases, retail suppliers voluntarily chose to revise prices before the regulator stepped in.
- 375 In Estonia, small gas retailers (not in a dominant position) are not obliged to submit their proposed prices for approval. However, the dominant undertaking does have to submit its retail margin for approval, as a component of the final household price<sup>230</sup>.
- 376 In 2012, Belgium (see Case Study 1 in the electricity retail chapter), was in a transitional period which eventually led to the introduction of the so-called 'safety net' mechanism.
- 377 NRAs, or any other authority, do not interfere with setting retail prices in only eight jurisdictions (Austria, the Czech Republic, Finland, Germany, Luxembourg, Slovenia, Sweden, and Great Britain).
- 378 As a consequence, in 2012, 46.2 million European household consumers (about 46% of the total number of households with natural gas) were supplied under regulated prices (a 1.5% decrease compared with 2011 – Figure 59).

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230 The dominant retailer in Estonia is AS Eesti Gaas. The Estonian Competition Authority is responsible for approving the sales margin of undertakings in a dominant position.

Figure 59: Number of gas household consumers supplied under regulated prices in the EU-27 – 2008 to 2012 (millions)



Source: CEER National Indicators (2013) and Danish energy regulator

Note: No data for 2012 for Italy, Greece and Northern Ireland were available; therefore, the 2012 information presented for these jurisdictions in 2012 is a forecast. The data for the Netherlands were revised, taking into consideration that there was no regulated retail price over the period covered. According to ACM, the NRA does have ex-post surveillance powers, but the right to set retail prices was not used during the period covered by the analysis.

379 At the end of 2012, more than 90% of households in Bulgaria, Greece, Hungary, Latvia, Lithuania, Poland, Portugal, Romania and Slovakia paid regulated prices. In Denmark, France and Italy between 70% and 90% of household consumers chose regulated prices. In Ireland, the number of households with regulated prices dropped to a record low (66%) in 2012, down from 98% three years before. In Spain and Belgium, fewer than 35% of household consumers were still on regulated prices in 2012<sup>231</sup>.

#### 4.5.2 Types of price regulation

- 380 All NRAs who replied to the questionnaire mentioned a market price reference in their calculation methodology for all consumer groups supplied under regulated prices, with the exception of households with special needs, i.e. those defined as vulnerable consumers according to national definitions and/or those supplied under a social price. The regulated prices applied to those consumers are generally decoupled from any market reference, in order to guarantee price stability protection for this specific consumer group.
- 381 However, according to the data analysed in Section 4.4.1, it seems that in some MSs (Poland, Romania<sup>232</sup>, Latvia and Bulgaria<sup>233</sup>)<sup>234</sup> the government/NRA has been setting prices in a more politicised context with weaker links to international wholesale market prices. In Romania<sup>235</sup> retail prices are indexed to the domestic costs of natural gas exploration, hence not necessarily reflecting the wholesale price of traded gas at European hubs.
- 382 In Hungary, end-user price regulation is the duty of the Ministry. Retail price regulation formulas envisage multiple indexation to long term contracts, international spot prices (TTF) and oil-linked prices. However, the indexation formula used by the energy regulator to cap end-user prices does not reflect the suppliers' actual wholesale cost. As a consequence, in December 2012, the retail mark-up was negative in this MS<sup>236</sup>.
- 383 In other MSs (Italy, Denmark, Belgium, Ireland, and Spain), the government/NRA sets retail prices with closer reference to wholesale prices.
- 384 In Italy and Denmark, regulated prices are set with a direct link to wholesale spot prices. In Italy, prices are set and updated on a quarterly basis. A so-called 'marketing component' (retail margin) is also included in the price. This component is updated every two years. In Denmark, the companies with an obligation to supply are regulated ex-post, subject to a combination of revenue cap and efficiency benchmarking. In particular, their performance on gas purchase agreements is compared to similar OTC gas agreements on North-West European markets, whereas their performance on costs other than those related to gas purchases is benchmarked against related utility companies from the gas industry which have an obligation to supply. The Danish energy regulator approves a company's operating costs, as well as its profits, which should be reasonable when compared with turnover and purchasing efficiency.

232 The EC launched an infringement procedure against Romania in the summer of 2009 for breach of Article 3(1), in conjunction with Article 3(2), of Directive 2009/73/EC. Under this action, the Commission considered that the application of the mechanism of regulated prices for gas supply did not comply with the principle of proportionality in accordance with the determinations of the European Court of Justice. To comply with the provisions of Community law, the Romanian regulator and competition authority put forward a draft memorandum which proposed, inter alia, to assess the impact of phasing out regulated prices to end customers and to set up a roadmap for their gradual removal. The roadmap was approved by Government and enshrined in the new Electricity and Gas Law (no.123/2012). The infringement procedure was halted after Romania adopted the roadmap.

233 When regulating prices for gas distribution and supply, the Bulgarian regulator takes into account the characteristics of the market, including the fact that the distribution infrastructure in the country is still in progress and that only a few customers are currently connected to the distribution network.

234 These countries had regulated prices and negative mark-ups in 2012.

235 As mentioned before, in Romania the national gas price has now been set by Government for the 2013-2018 period on a convergence path with import prices.

236 Additional discounts apply to families with at least three children.



- 385 In Belgium, the so-called 'safety net' regulation package enacted in 2012 applies to SMEs<sup>237</sup> and household consumers alike, and includes quarterly checks by the NRA (CREG) of the indexation of variable price formulas and potential price increases by suppliers, including an element of price comparison with other countries in the same European region. Safety net regulation is a weaker form of retail price regulation, and follows the price cap 'freeze' introduced by the Belgian government in early 2012 (see Case Study 1 in the electricity retail chapter). Furthermore, Belgium applies regulated social prices<sup>238</sup> to selected end users. A different regulated price is applied to those customers in arrears with their payments and to those customers who were dropped by their supplier (usually because of continued non-payment).
- 386 Spain uses a cost-reflective approach for price regulation (without challenging supply cost efficiency), plus quarterly energy auctions, including an allowance for ancillary services and network losses, a risk premium and capacity payments.
- 387 The Portuguese energy regulator caps network OPEX within the end-user price and rewards network CAPEX with a pre-tax nominal rate of return (weighted average cost of capital) on the regulatory asset base.
- 388 The cost-plus method, which allows a company to maximise its returns by allowing it to recover all its eligible costs (e.g. fuel costs, OPEX and a retail margin) is applied in France, Greece, Poland<sup>239</sup>, and Lithuania. In Greece and Poland, prices are updated annually, and twice a year in Lithuania. In France, prices were updated on a quarterly basis in the past and, since January 2013, have been updated monthly.
- 389 In terms of methodology, the differences across MSs are summarised in Figure 60.

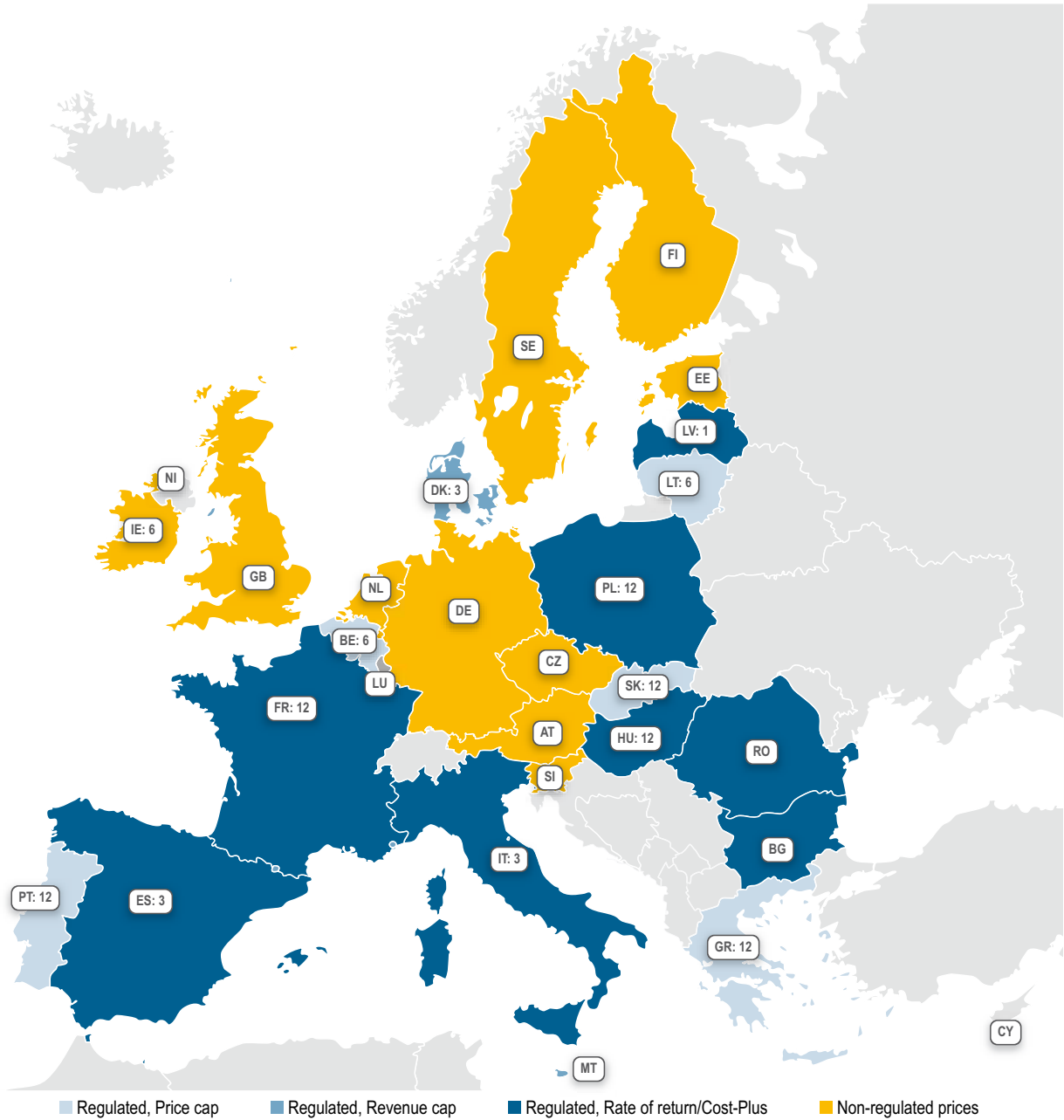
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237 The definition of what an 'SME' (small or medium enterprise) is generally differs by country. In Belgium, SMEs are – for 'safety net regulation' purposes – those consumers who do not exceed 100MWh of gas consumption per annum. This is the threshold used by the energy regulator to differentiate SMEs from other large users and to keep them within the temporary safety net regulation framework recently introduced by the federal government and illustrated in the electricity section's case study.

238 The social tariff is reviewed every six months.

239 In Poland, the costs underpinning price calculations are verified (e.g., through the application of comparison methods) and limited to a level which is economically justifiable by the energy regulator.

Figure 60: Price regulation method and frequency of energy component updates (months) in Europe – 2012



Source: CEER National Indicators database (2013) and ACER questionnaire on regulated prices (2013)

Note: The frequency according to which the MS updates prices is presented, in months, next to the country code. Malta and Cyprus have no commercial gas sector. In France, the regulator reserves the right to update the energy component more frequently in case wholesale gas prices are subject to unusual volatility.

### 4.5.3 Body responsible for setting regulated prices

- 390 In 2012, out of the 15 MSs which still had regulated prices for households, eleven had their retail prices set/approved by the NRA (Denmark, Ireland, Slovakia, Greece, Italy, Latvia, Lithuania, Poland, Portugal, Romania, and Bulgaria), whereas in four countries this responsibility was retained by the government/ministry (Belgium, France, Hungary, and Spain).
- 391 When the government/ministry is responsible for setting prices, the role of the NRA is usually that of providing a public consultative opinion (France, Hungary, and Spain) or to monitor and report on the level of retail prices (Belgium<sup>240</sup>). In 2012, in Spain, the NRA gives a consultative opinion after receiving a proposal regarding the access component of the end-user regulated price and, regarding the energy component, the regulator computes the cost of energy and submits it to the government, which finally publishes the energy component to be included in regulated end-user prices. In Hungary, in 2012 the role of the NRA was limited to making a non-binding price proposal to the government
- 392 The NRA will decide about the timing for removing regulated prices in Poland only. In all other MSs, this will fall under the responsibility of the government as a whole, the energy ministry, or Parliament. Therefore, in many MSs the NRA's role in terms of setting a roadmap for removing regulated end-user prices is rather limited, and retail price regulation remains a political issue which sometimes depends on general government (including social and macroeconomic) strategies, not on energy policy alone. This has become even more evident during the economic downturn, not only in Central and Eastern Europe.

### 4.5.4 Switching in and out of regulated prices

- 393 In 2012, end users were able to switch away from, and back to, regulated prices as often as they wished in seven MSs (Belgium, Denmark, France<sup>241</sup>, Hungary, Italy, Slovakia and Spain). In Latvia, Lithuania, Bulgaria and Greece, consumers could not switch to non-regulated prices at all (this was prevented by law). In Portugal<sup>242</sup>, consumers could switch to the liberalised market without being able to return to the regulated offer, as this MS is now in the process of phasing out regulated offers. The phasing out of regulated end user prices in Portugal continued throughout 2012 and 2013. In the first semester of 2012, end user prices were phased out for all consumption levels higher than 10,000 cubic meters per year. In the second semester of 2012, the phasing out process was extended to all consumption levels higher than 500 cubic meters per year. In 2013, the phasing out process was completed. Portugal has a social tariff available to all economically vulnerable customers for both fuels. In Poland, customers are fully entitled to switching supplier; however, switching is hardly possible in practice due to the lack of effective retail competition (Table 11)<sup>243</sup>.

240 After the 'price freeze'. See Case study 1.

241 In France, only customers featuring a consumption level of 30MWh/year or higher are legally prevented from switching back to regulated prices.

242 In Portugal, switching back to the regulated price is possible in very specific situations: the last-resort supplier is obliged to supply economically vulnerable customers and those consumers who could not find any other supplier, or whose supplier went bankrupt.

243 The Polish regulator reported only 210 supply switches in the household segment in 2012.

Table 11: Focus on price regulation regimes – switching in and out of regulated tariffs, scope, coverage, price update frequency and switching rates for household consumers – 2012

MS	Switching in and out allowed	% of household customers under regulated prices in 2012	Customer segments covered by regulation	Frequency of price updates (months)	2012 switching rate for household consumers
Belgium	Yes	8.4%	4/4	6	12.8% <sup>1</sup>
Bulgaria	No	100.0%	4/4	-	0.0%
Denmark	Yes	n.a	1/4	3	3.2% <sup>1</sup>
France	Yes	84.0%	4/4	12 <sup>2</sup>	4.9%
Greece	No	100.0%	3/4	1	0.0%
Hungary	Yes	97.1%	3/4	12	n.a
Ireland	-	65.6%	1/4	6	17.0%
Italy	Yes	n.a	2/4	3	4.5%
Latvia	No	100.0%	3/4	1	0.0%
Lithuania	No	100.0%	1/4	6	0.0%
Poland	Yes	100.0%	4/4	12	0.0%
Portugal	No	90.3%	3/4	12	6.1% <sup>1</sup>
Romania	No	100.0%	4/4	-	n.a
Slovakia	Yes	99.9%	2/4	12	9.3%
Spain	Yes	30.9%	2/4	3	19.4% <sup>3</sup>

Source: CEER National Indicators database (2013) and ACER questionnaire on regulated prices (2013)

Notes: 1 – Data for 2011. 2 – For all costs. Supply cost can be updated more frequently. 3 – Data for Spain include intra-group switching.

#### 4.5.5 Roadmaps for abandoning price regulation

- 394 Six years since nominal liberalisation, many retail markets across Europe are still subject to end-user price regulation and only three MSs (Portugal, Ireland, Poland and Romania) seem to have a roadmap for abandoning household price regulation in place<sup>244</sup>.
- 395 Portugal agreed to phase out regulated prices for households as part of the tripartite agreement with the IMF, EC, and ECB in the context of its financial support plan.
- 396 In Ireland, domestic gas market deregulation will occur if the following criteria are met: at least three suppliers must achieve a market share in excess of 10%; the overall switching rate must exceed 10% per year; and the incumbent's market share must fall below 60% if the incumbent's retail business is rebranded, or 55% if it is not.
- 397 The Romanian authorities agreed to propose a scenario aimed at phasing out regulated prices by 31 December 2014 for commercial and industrial consumers (but if a significant difference between the domestic gas price and the European import price jeopardises market stability, the deadline will be extended to 31 December 2015). The deadline for households will be 31 December 2018<sup>245</sup>.

244 Interestingly, those MSs who have been subject to bail-out agreements over the last few years tend to have a roadmap in place.

245 ANRE's National Report 2011.

- 398 As previously indicated, end-user price regulation has an impact on retail markets, as regulated prices influence the degree of market competition. However, price regulation for households persists in many MSs. Where regulated prices are present, end consumers tend to stay with them with only a very few exceptions (Spain, Belgium). Industrial consumers, on the other hand, are mostly exposed to market prices. In the majority of MSs, the NRA is responsible for setting regulated prices, but parliaments/governments/ministries would typically decide about their removal, including setting up roadmaps.

### **Case Study 7: The impact of a new supplier's entry into a recently liberalised (non-regulated) retail gas market: Slovenia**

The Slovenian natural gas market is one of the smallest in the EU-28, totalling around one billion standard cubic metres per year. Most natural gas sold in the retail market is consumed by industry and other non-household consumers. Slightly less than 120 million m<sup>3</sup> are consumed by households for cooking and heating. Gas is mainly consumed during the heating season, from October to March. This is also the period in which end users have the highest incentive to switch.

In 2012, more than five years since full market liberalisation (1 July 2007), retail competition finally increased due to a new entrant, GEN-I. This case study provides evidence of the potential impact on retail markets of a new entrant in the absence of price regulation. The focus of this case study is on the household market.

#### **The household market**

From 2007 to 2012, the household market increased in size from about 110,000 consumers to around 130,000. On the other hand, supply remained static. During the same period, 16 suppliers were operating in the market. Each of these suppliers operates as a public utility service and its ownership is unbundled from distribution. Limited sources of natural gas, virtually no storage capacity and the absence of hub-based markets are significant barriers to entry for new potential suppliers in Slovenia. The small size of the end-user market also limits the potential exploitation of scale economies.

Incumbent retailers in Slovenia typically used to buy natural gas from importers (shippers). In the past, some European utilities showed an interest in entering the Slovenian gas market, but no entry took place, perhaps because of the wholesale market lock-in resulting from long-term import contracts.

The Energy Agency of the Republic of Slovenia ('Energy Agency') has been trying to stimulate competition in the retail market for households by implementing a web application called 'Supply Comparison', which only went live in 2011 due to lack of previous cooperation on the part of suppliers. When the price comparison application went live, differences in prices were too small to result in any significant switching.

#### **The new entrant**

Starting as an electricity supplier, GEN-I, an independent supplier with no distribution network, decided to enter the retail gas market in the early autumn of 2012.

Because of its significantly lower retail prices and fixed price offers, sustained through different sourcing of gas (buying gas on European hubs instead of relying on long-term contracts), GEN-I gave rise to an unprecedented change in the nature of competition in the Slovenian gas market.

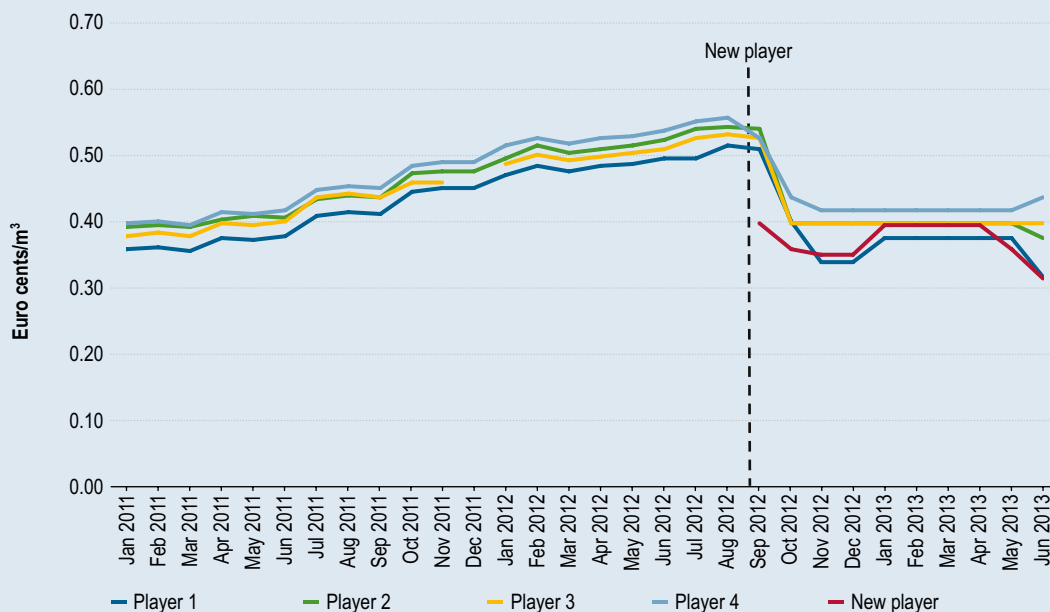
## Entry impact

### 1. End-user prices

Natural gas prices in Slovenia were increasing continuously since 2010, before declining sharply in the fourth quarter of 2012, arguably because of a combination of GEN-I's entry and better access conditions to cross-border capacity in the Austria-Italy-Slovenia area (TAG pipeline).

In September 2012, GEN-I 'shocked' the (household) retail price, leading to a fast response from incumbent suppliers. The price initially proposed by GEN-I was lower than existing prices by around 10 cents per cubic metre (21.7% lower than the largest player's price before the new entry took place), reflecting the company's different gas procurement strategies. Since October 2012 and well into 2013, prices have been declining to less than 40 cents per cubic metre due to the continued competitive response from incumbent suppliers, as well as seasonal factors (Figure i).

Figure i: Average retail gas prices in Slovenia, 2010-2013 (euro cents/m<sup>3</sup>)



Source: Slovenian Energy Agency (AGEN-RS)

### 2. Retail mark-ups and long-term contract renegotiation

Figure 54 shows that, in December 2012, the gas incumbent fell into negative mark-up territory.

Lack of profitability in the retail market created additional pressure on the incumbent to renegotiate its long-term contracts, and fostered stronger alignment between existing contracts and hub prices<sup>246</sup>.

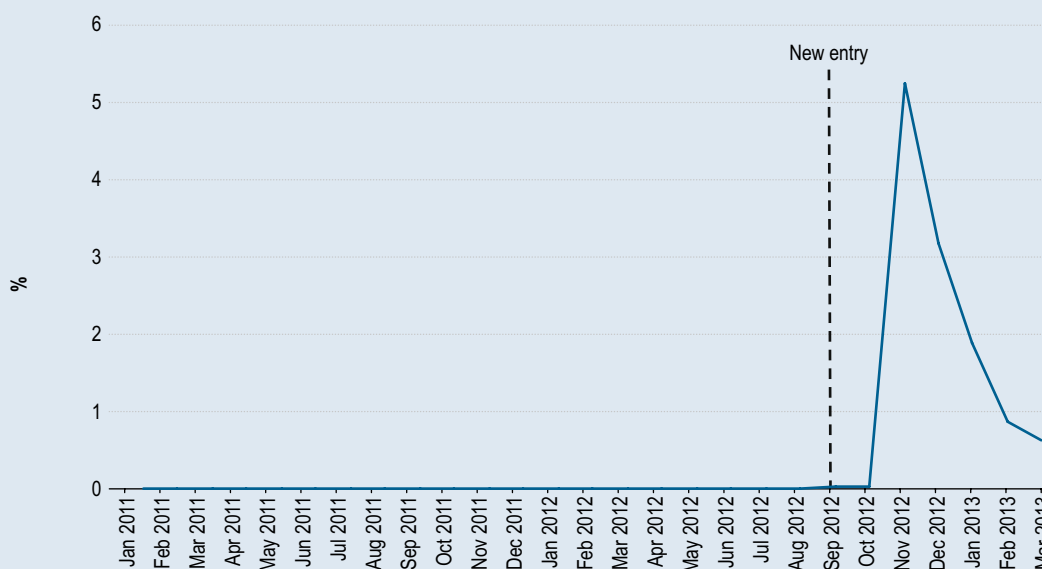
<sup>246</sup> At the beginning of 2013, the Slovenian incumbent announced major price drops in its buying prices, resulting from renegotiation with upstream producers.

### 3. Consumer switching

Since market liberalisation, household switching in Slovenia never exceeded 1%. By November 2012, two months after the announcement of lower prices by GEN-I, the switching rate had risen to almost 5%. Other suppliers responded to the new entrant and started to fine-tune their own offers to consumption patterns, taking into account seasonal elements and changing their marketing strategies. By the end of 2012, the annual switching rate had risen to 8.5%, placing Slovenia at a level similar to those observed in the Netherlands and Germany (Figure 56).

Since GEN-I entered the market, some incumbents started to advertise their products much more actively. This happened with more frequency when reacting incumbents were also strong in the electricity market<sup>247</sup>.

Figure ii: Monthly switching rates for gas household consumers – Slovenia (%)



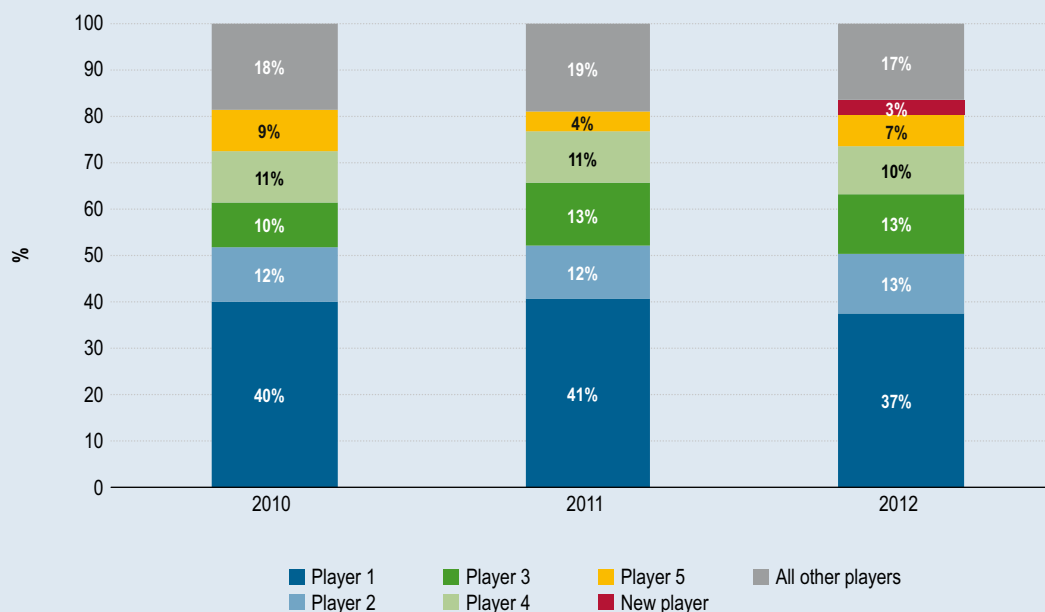
Source: Slovenian Energy Agency (AGEN-RS)

### 4. Changes in market shares

Although GEN-I's entry is relatively recent and its market share in the household segment was still relatively small by the end of 2012 (3.2% - Figure iii), if one considers that this share was achieved over a period of only four months (mostly at the expense of the largest market player) and that GEN-I's impact on the behaviour of other companies was remarkable, one can conclude that, in the short run, GEN-I's entry strategy seems to have been successful in terms of capturing market share and providing savings to final consumers.

<sup>247</sup> Experience from the more eventful retail electricity market and the possibility of offering dual-fuel deals is expected to make the Slovenian gas market gradually more dynamic in future.

Figure iii: Retail market shares in Slovenia (households), 2010 to 2012 (%)



Source: Slovenian Energy Agency (AGEN-RS)

### Conclusions

This case study provides evidence that market liberalisation and integration enable new players to enter retail markets more easily.

The absence of price regulation enabled suppliers to react quickly to the new entrant, enhancing consumers' ability to access a broader spectrum of lower prices.

Better EU-wide market integration through enhanced access conditions to cross-border capacity and access to liquid wholesale markets also played a major role in the Slovenian case, reshaping upstream markets and reducing the power of some upstream market players.



## 4.6 Conclusions and recommendations

- 399 Europe's retail gas markets (with special respect to households) still suffer from limited entry, lack of competition, and low levels of switching. Looking at capitals, over the last few years, five witnessed significant entry into the household market: Bratislava, Berlin, Amsterdam, Dublin, and Prague. In the Czech Republic, consumer response was very strong, with switching rates significantly above reference levels, while in the Netherlands switching stayed at relatively high levels.
- 400 In Germany, the retail entry rate has been relatively high over the last four years. This is now reflected in the high availability of competing offers in the Berlin retail market.
- 401 Ireland has witnessed a very high level of entry over the last four years. In 2012, Ireland's switching rates were the highest in Europe; price competition was intense, and consumers engaged in the retail market. In Great Britain, the market showed further signs of maturity, while entry remained static. The high profitability level of the so-called 'Big 6' prompted the British energy regulator to launch a Retail Market Review (RMR), whose recommendations point towards the introduction of easier and more comparable base tariffs and to a reduction in the absolute number of available offers.
- 402 No substantive entry took place in a significant number of MSs, for instance Greece, Latvia, Lithuania, Luxembourg, Poland and Sweden. Many of these countries still regulate retail prices in the household segment.
- 403 Sweden and Luxembourg, although retail prices are not regulated, saw no new entry. Market size and the level of per capita income might limit consumer switching in these countries, either because of a lack of alternatives or because of low incentives due to high incomes.
- 404 According to a survey among NRAs conducted by the Agency in early 2013, the major barriers to entering retail markets are: illiquid and/or concentrated wholesale markets; consumer switching behaviour; retail price regulation; and the regulatory framework.
- 405 In order to remove such barriers, the Commission, MSs, and NRAs should:
- open up wholesale markets by enacting the 3<sup>rd</sup> Package in full;
  - ensure that infrastructure is optimised, transportation costs minimised, and cross-border trade takes place to the maximum possible extent and at minimum cost;
  - enhance consumer engagement and awareness by ensuring that switching costs are minimised, for instance through the introduction of easier and less costly conditions for switching, once again following the provisions of the 3<sup>rd</sup> Package;
  - remove retail price regulation as soon as entry conditions are propitious and wholesale markets can support free retail markets by becoming more open and liquid; and
  - ensure that regulatory regimes, including the regulation of monopolistic (network) activities and market design (for instance, in terms of balancing mechanisms) are conducive to open retail markets and do not impose excessive burdens on potential new or smaller entrants, so that the latter do not suffer from undue discrimination.

## 5 Wholesale gas markets and network access

### 5.1 Introduction

406 Wholesale and retail markets are closely interrelated. Liquid and efficient wholesale markets, in combination with effective mechanisms for accessing networks, promote competition and provide fairer price formation at all levels in the gas value chain.

407 The European Gas Target Model<sup>248</sup> (GTM) is made up of a number of measures, mainly enacted through European network codes and rules, notably (but not exclusively) encompassing:

- hub-to-hub trading and competition;
- bundled capacity products at Interconnection Points (IPs);
- capacity auctions and, possibly, implicit capacity and commodity auctions;
- harmonisation of cross-border transmission tariff structures; and
- a new balancing regime, including the possibility of within-day balancing obligations.

408 The GTM is currently under review to assess whether enhancements are required to address some new challenges which have arisen in both the gas and electricity sectors<sup>249</sup>. However, it is important to recognise that the GTM is essentially a wholesale market model. There is no retail market model in place in Europe yet. Wholesale and retail markets go hand in hand, and there is no reason for wholesale and retail market reforms not to be coordinated in the future. There is no evidence that this coordinated all-market approach was seriously considered in the past, in spite of CEER's significant efforts in pushing for coordinated retail market structures<sup>250</sup>.

409 This chapter provides a review of the main wholesale gas market developments and indicators for 2012 across the EU. It infers the expected trends in terms of prices and liquidity, cross-border flows and, particularly, contracting strategies. It also aims to detect the main entry barriers that are slowing down EU wholesale market integration.

248 [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Gas/Tab/C11-GWG-82-03\\_GTM%20vision\\_Final.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Gas/Tab/C11-GWG-82-03_GTM%20vision_Final.pdf)

249 Such as the increased presence of non-conventional gas in the global gas market and of renewable generation in the European electricity sector.

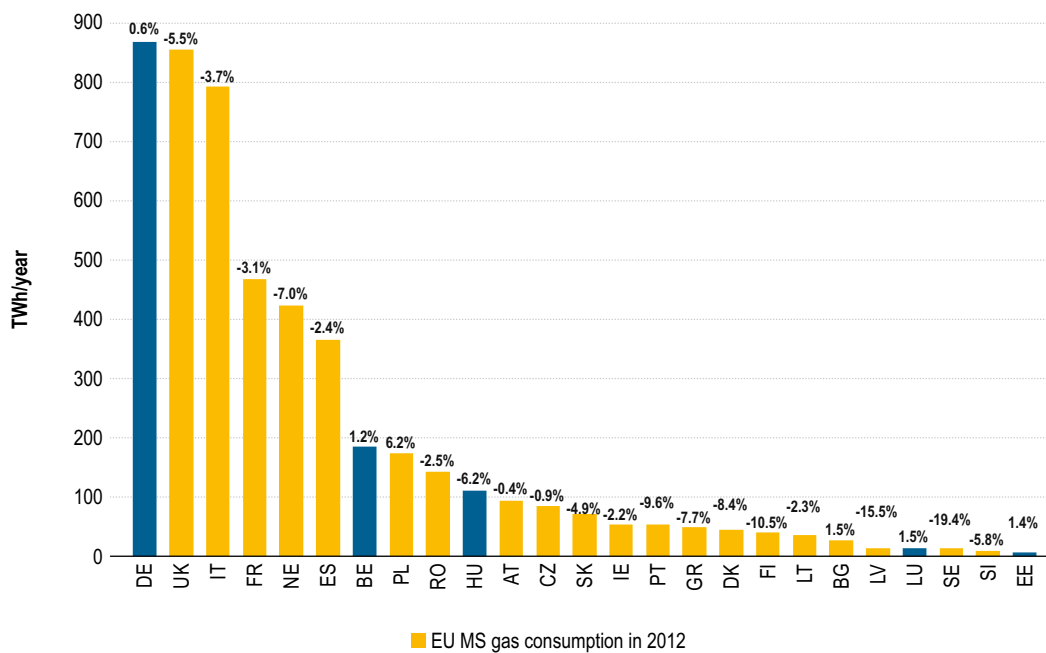
250 For instance, if retailers cannot freely establish themselves in a given country because of lack of interconnection, a shut-down wholesale market and/or hostile local legislation, then discussing retail market integration makes little sense. Wholesale markets and network access must be integrated in parallel with, not separately from, retail markets in order for at least some of the benefits of EU market integration to percolate throughout the whole production chain and reach end users.

## 5.2 Market integration

### 5.2.1 Introduction

410 Natural gas consumption in the EU-27 totalled 4,910TWh in 2012<sup>251</sup>, a decrease of 4.1% compared with 2011. The effects of the economic downturn, the escalation of coal as fuel of choice for power generation (due to cheaper coal becoming available, mainly from the US) and the increasing penetration of electricity generated from renewables help put this in context.

Figure 61: EU-27 gross inland gas consumption: 2012-2011 percentage variation (TWh/year)



Source: ACER based on Eurostat (26/06/2013)<sup>252</sup>. Those countries where demand increased in 2012 compared to 2011 are shown in blue.

Note: For Belgium, Eurostat data were cross-checked against regulatory information (CREG).

411 End-user gas demand decreased in 2012 because of several factors: the reduction in industrial production<sup>253</sup> in the EU-27, the promotion of energy efficiency, and, in general, adverse economic conditions weakening both industrial and non-industrial consumption.

412 The reduction in gas demand for electricity generation has been substantial. Gas-fired power generation in the EU became generally less profitable than coal-fired generation given gas/coal spark/dark<sup>254</sup> spreads, as indicated in Figure 62.

251 Gross annual inland consumption. Calculations based on Eurostat's monthly data in TJ (GCV) as of 15 May 2013. Eurostat data are provisional for some countries.

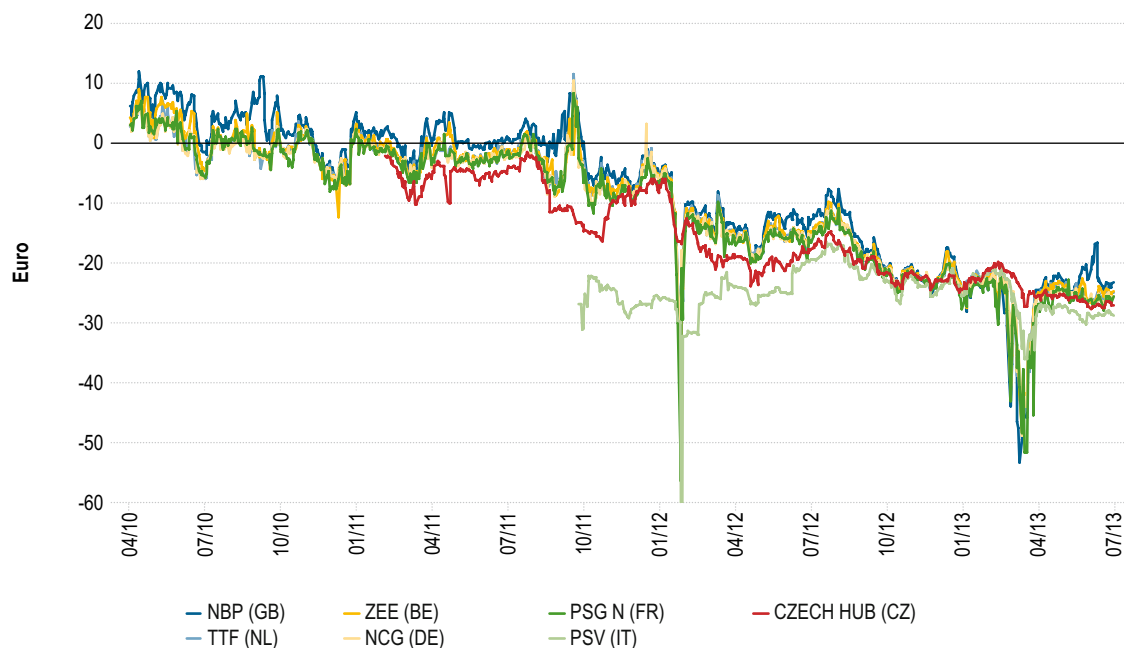
252 TSO data from France seem to contradict the information obtained from Eurostat, pointing towards a consumption increase in 2012. In this MMR, the Agency chose to use Eurostat information, but is aware of possible inaccuracies at national level. Such inaccuracies should be checked and resolved by Eurostat in cooperation with individual MSs.

253 See: [http://epp.eurostat.ec.europa.eu/cache/ITY\\_PUBLIC/4-13022013-AP/EN/4-13022013-AP-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/4-13022013-AP/EN/4-13022013-AP-EN.PDF)

254 The spark spread is the gross margin of a gas-fired power plant from selling a unit of electricity, having bought the fuel required to produce this unit of electricity. The dark spread is the gross margin of a coal-fired power plant. All other costs (operation and maintenance, capital, and other financial costs) must be covered through spreads. If they are not covered in full, the company owning the plant would be, other things being equal, better off selling the fuel rather than burning it.

413 In the US, the development of cheaper shale gas stimulated inter-commodity competition and led to relevant coal exports. This situation compounded the effects of relatively slower economic growth in developing countries (highly dependent on coal) and led to increased liquidity in global coal markets and lower coal prices in 2012 (both in the EU and elsewhere). As a result, the cost effectiveness of coal for electricity generation was significantly higher than that of natural gas.

Figure 62: Spark/dark spreads in selected EU MSs since 2010 (euro)



Source: Ofgem

Note: In the calculation of gas/coal spreads, the following assumptions were made: thermal efficiency (gas) = 49%; thermal efficiency (coal) = 36%; O&M cost (gas) = 0.40 GB pence/therm; O&M cost (coal) = 2 USD/tonne; Transportation cost (gas) = 2 GB pence/therm; Transportation cost (coal) = 10 USD/tonne. CO<sub>2</sub> emissions prices are not considered. Exchange rates are annual averages for each relevant year considered in the analysis.

414 Moreover, certain national regulations still favouring indigenous coal consumption (as a counter-cyclical measure in response to the economic downturn) had a significant effect, leading to shrinking gas-fired electricity generation in some jurisdictions. It remains to be seen whether any new EU decisions relating to the allocation of greenhouse gas emissions rights may reverse the gas-versus-coal profitability comparison in the future. Technically speaking, coal plants, even if their operating costs are currently lower, may not be perfect substitutes for gas-fired plants because they do not react as fast when called on to generate in order to balance intermittent power sources. Newer-technology coal plants might, however, approach the level of flexibility which is more typical of gas-fuelled power generators.

415 On the other hand, electricity production from RES in the EU increased by 15%<sup>255</sup> in 2012 in comparison with 2011, as a result of direct support schemes and lower generation costs. This also contributed to crowding gas-fired generation out<sup>256</sup>.

255 See BP Statistical Review of World Energy, 2013.

256 Country figures: GB -33%, Germany -15%, Spain -12% gas consumption for electricity generation year on year. See IEA and DG ENER's Quarterly Reports, 2012.

## 5.2.2 Wholesale price evolution

- 416 Overall, decreasing EU gas demand did not translate into decreasing average EU wholesale prices<sup>257</sup>. In fact, the tendency has been towards a further price increase compared to 2011, thus confirming the price interdependence of gas as a global commodity and the idea that purely internal EU demand/supply movements are not necessarily the main drivers of EU wholesale gas prices. The continuing rise in wholesale prices in 2012 can be explained by three main factors.
- 417 Firstly, source countries kept their first sale<sup>258</sup> production prices much higher than, for example, shale gas producers in the US. This circumstance signals that EU gas supply markets still lack a sufficient degree of upstream competition and reinforces the need for EU legislation facilitating price transparency in trading operations.
- 418 Secondly, another element impacting EU price formation is the premium at which East Asian LNG markets (Japan, South Korea and Pacific China) trade above both European and North American prices. East Asian markets can currently sustain price levels which greatly exceed landed gas costs to any location across the wider Pacific Rim. For this reason, they tend to trigger the diversion of LNG cargoes away from Europe, sometimes giving rise to LNG reloading and reshipment from European terminals. As a result, 2012 LNG imports into Europe fell by 26% in comparison with 2011, influencing hub price formation and contributing to rising wholesale prices<sup>259</sup>.
- 419 Finally, in the EU, approximately 60%<sup>260</sup> of gas supplies are still linked to long-term, oil-indexed contracts (LTCs). Even if the tendency is for those contracts that were historically oil indexed to be gradually renegotiated and indexed to hub prices, the price increments observed on the global oil market in 2012 did influence European oil-indexed contracts and, in turn, put upward pressure on hub prices. Figure 63 shows the evolution of oil and gas<sup>261</sup> prices on European markets in recent years.

257 Reverse causality – higher wholesale prices leading to lower demand – is also a possibility.

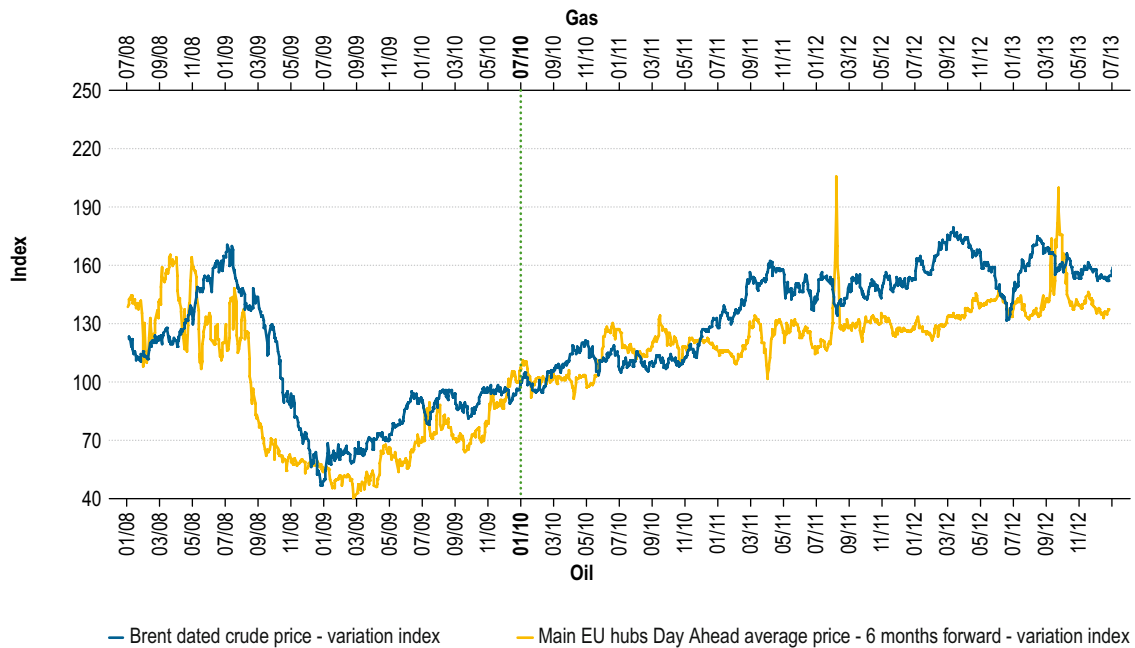
258 The first-sale price is the first import price paid, either at the EU border or at an LNG terminal, prior to potential resale within the EU.

259 LNG price and volume variations tend to respond to both demand and supply shocks, since LNG is usually more flexible than piped gas. For instance, LNG responded to a demand shock in Spain by being partially diverted away through re-liquefaction. It responded to supply shocks elsewhere by acting as a replacement for piped gas, although in GB we observed piped gas being sometimes more flexible than LNG. LNG's actual flexibility versus piped gas must therefore be assessed on a case-by-case basis. Macroeconomic conditions in Europe and Asia (not just Japan's peculiar situation with respect to power generation) have also affected LNG levels, as well as the itineraries LNG took throughout the world in 2012.

260 Reuters estimates, December 2012.

261 The average day-ahead (DA) price at main EU hubs is taken as a proxy for the wholesale gas price in Figure 63.

Figure 63: Oil and gas price evolution in Europe since 2008

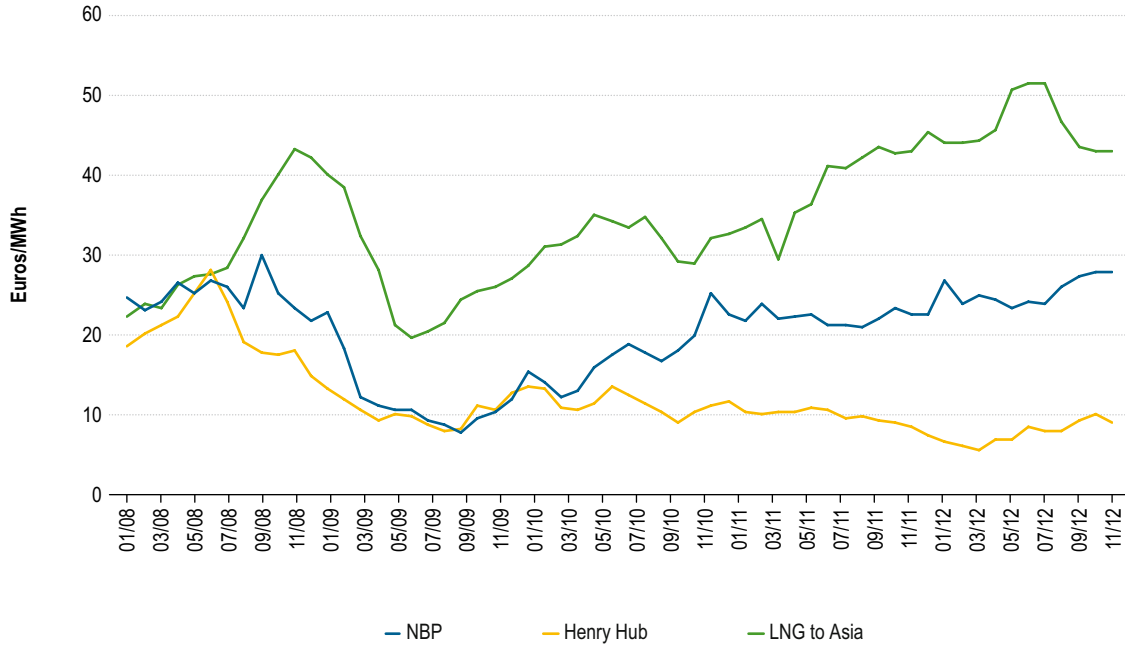


Source: Platts and the Agency

Note: A six-month forward lag is used for gas in the comparison with oil prices. The gas price index variation is calculated with reference to average hub gas prices on 1 July 2010 (on the upper X axis). The oil price variation is calculated with reference to the oil price on 1 January 2010 (on the lower X axis). This is because day-ahead (DA) hub prices are predominantly influenced by oil-indexed contracts, whose prices track oil with a lag of six to nine months. Oil prices are still the main determinant of wholesale gas prices in Europe, even if correlation is decreasing.

420 Gas is a global commodity and its price is partially globalised. The ‘global’ gas market is imperfect, because production areas are far from consumption centres and transferability by cargo is limited by transportation costs and by the relatively limited availability of technically able and cost-effective LNG terminals or cargoes. Moreover, the current US regulatory regime results in the export of excess coal rather than gas. This separates the US gas market from both Asia and Europe, meaning that the Louisiana-based Henry Hub does not really influence EU price formation. This is shown in Figure 64.

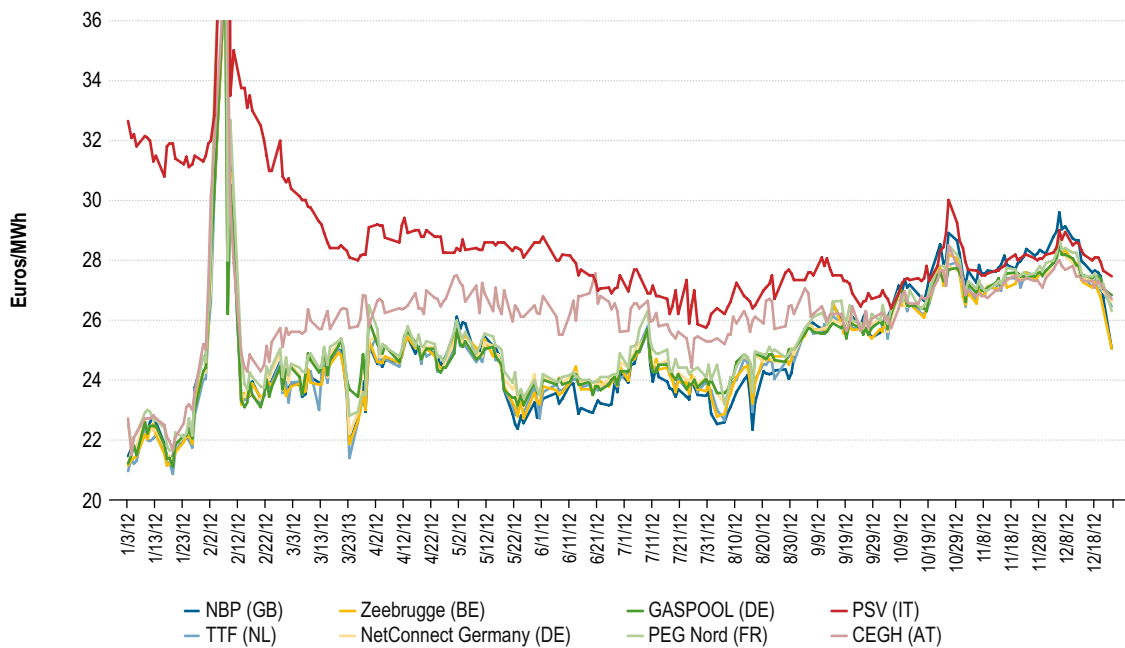
Figure 64: International wholesale price evolution since 2008 (euros/MWh)



Source: Platts, Thomson Reuters

421 Monthly average prices for day-ahead products increased from 23.3 euros/MWh in January to 27.8 euros/MWh in December 2012. This rise was consistent throughout Europe, as hub prices significantly converged further in 2012 (in an upward direction) in comparison with the previous year.

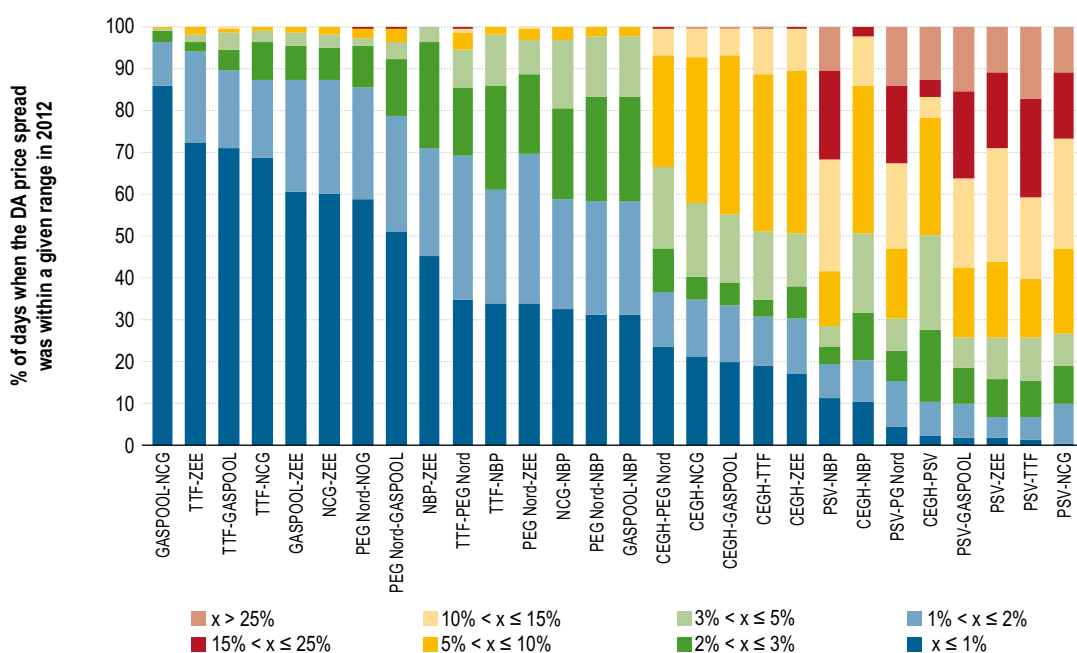
Figure 65: Day-ahead gas prices at main EU hubs in 2012 (euros/MWh)



Source: Platts

- 422 Overall EU hub price spreads on a day-ahead basis were drastically reduced, mainly due to South European (PSV and CEGH) prices moving closer to other EU spot markets, following an overall upward trend. The main reason<sup>262</sup> behind the South’s alignment was arguably the decrease in South European gas demand, followed by the auctioning of new transmission capacity at the Austrian-Italian border.
- 423 Price differentials, as observed at the major North-West European (NWE) hubs, are influenced by the extent of underlying connecting capacity and by associated transmission charges. Since transmission charges between relevant NWE hubs are relatively competitive, and given the high capacity utilisation level in the region, price convergence between adjacent NWE hubs has increased, as indicated in Figure 66. Price spreads were also influenced by currency fluctuations (with foreign exchange volatility between NBP and TTF being hedged at either hub<sup>263</sup>).

Figure 66: Frequency of deviations in the day-ahead price spread between hub pairs, expressed as a % of total days, in 2012



Source: Platts and Agency/CEER

Note that those hub pairs where price divergence stayed below 1% for at least 40% of the time are all separated by just one political border.

- 424 Figure 65 also reflects short-run price peaks in early February 2012, when a combination of reduced Russian exports – with some Russian gas temporarily diverted to domestic usage – during a short but severe cold snap in much of Europe, coupled with low levels of storage and problems at some LNG terminals<sup>264</sup>, gave rise to short-term price spikes.

262 Other reasons were the new policy on storage capacity allocation in Italy and the more recent (2013) transformation of CEGH (Baumgarten) into a virtual trading hub.

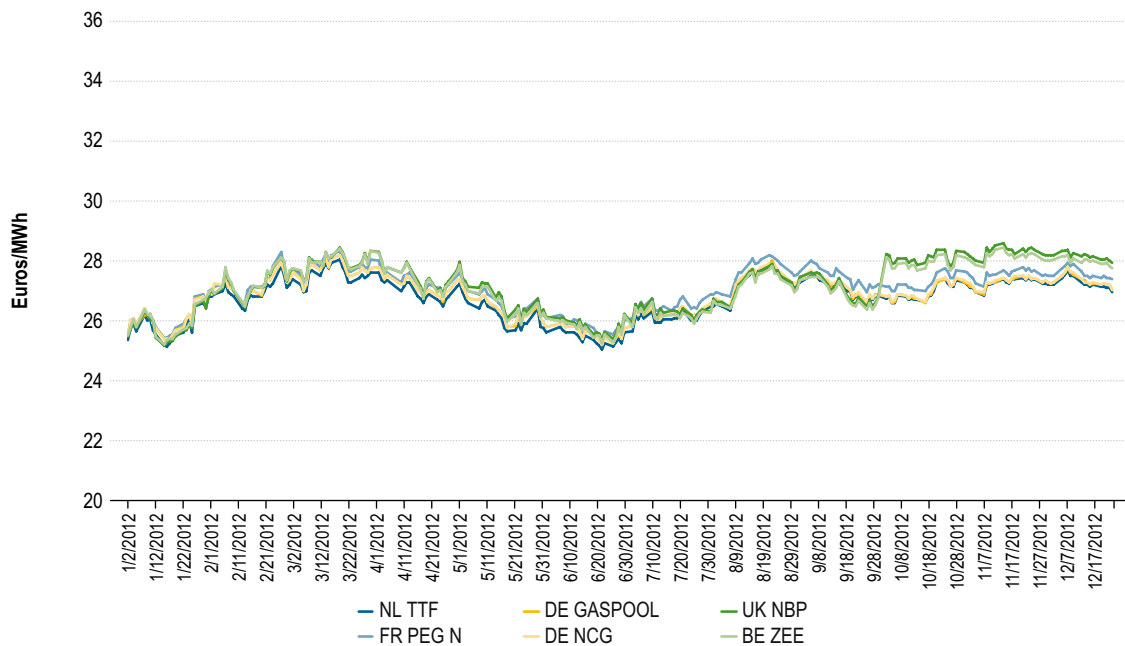
263 Sources: NBP – TTF, Flame 2013, and ICIS Heren.

264 As stated in DG ENER’s Quarterly Reports on European Gas Markets, Q1/2012.



425 On a one-year forward basis, overall cleared prices were slightly higher than day-ahead ones, reflecting appreciation expectations. Future prices are influenced by market liquidity and by negotiation thickness (or lack thereof) towards the far end of the price curve. One-year forward price spreads across hubs were markedly lower than spot price differentials. Forward spreads became notably higher by the end of the year between NBP and Zeebrugge vis-à-vis other hubs<sup>265</sup>.

Figure 67: One-year forward gas prices at main EU hubs in 2012 – euros/MWh



Source: Platts

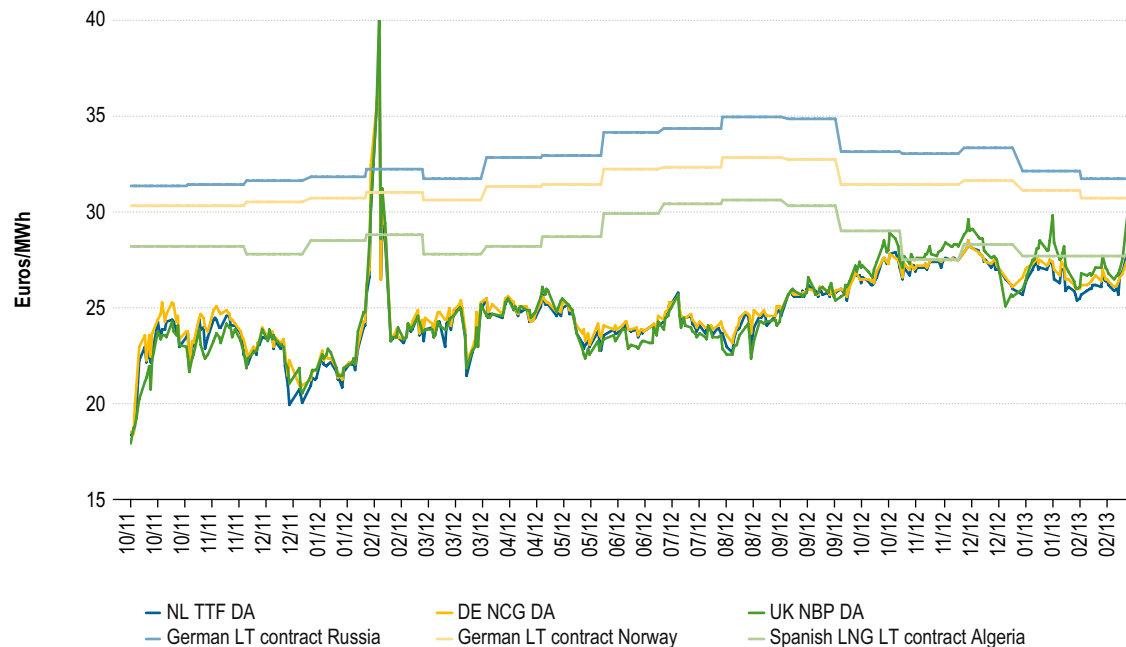
426 Long-term contracts and/or those trades bilaterally negotiated over the counter (OTC) escape, either in part or in full, central counter-parties and are not necessarily related to hub spot prices. Such deals are not straightforward to assess because of lack of public information. However, some OTC and especially LTC prices can be deduced with a degree of approximation from declared import prices at borders, from the assessment of contract clauses which are occasionally available in the public domain and from analyses provided by independent price reporting agencies (PRAs)<sup>266</sup>, based on their own methodologies and surveys.

427 The values in Figure 68 show that oil-indexed and partially oil-indexed prices maintained a premium throughout 2012 above hub spot prices, even though retroactive discounts granted by some producers to shippers and distributors following contract renegotiations have now narrowed the gap. The renegotiation trend continues, generally centred on spot price indexation.

265 In 2012, Zeebrugge Beach (physical shore hub, not euro ZTP) still traded in parallel with NBP spot, using the same currency (the pound sterling). These two hubs are highly interdependent because of the IUK physical link (the UK-Belgium interconnector) landing at Zeebrugge Beach. The spread between them and other hubs on a forward basis can be explained by higher futures liquidity at NBP (which, nonetheless, decreased throughout 2012) and by exchange rate swings (both expected and real) between the pound and the euro.

266 Traders also use synthetic LTC estimators.

Figure 68: Day-ahead (DA) prices at main EU hubs in 2012 as compared to LTC (oil indexed) prices (euros/MWh)



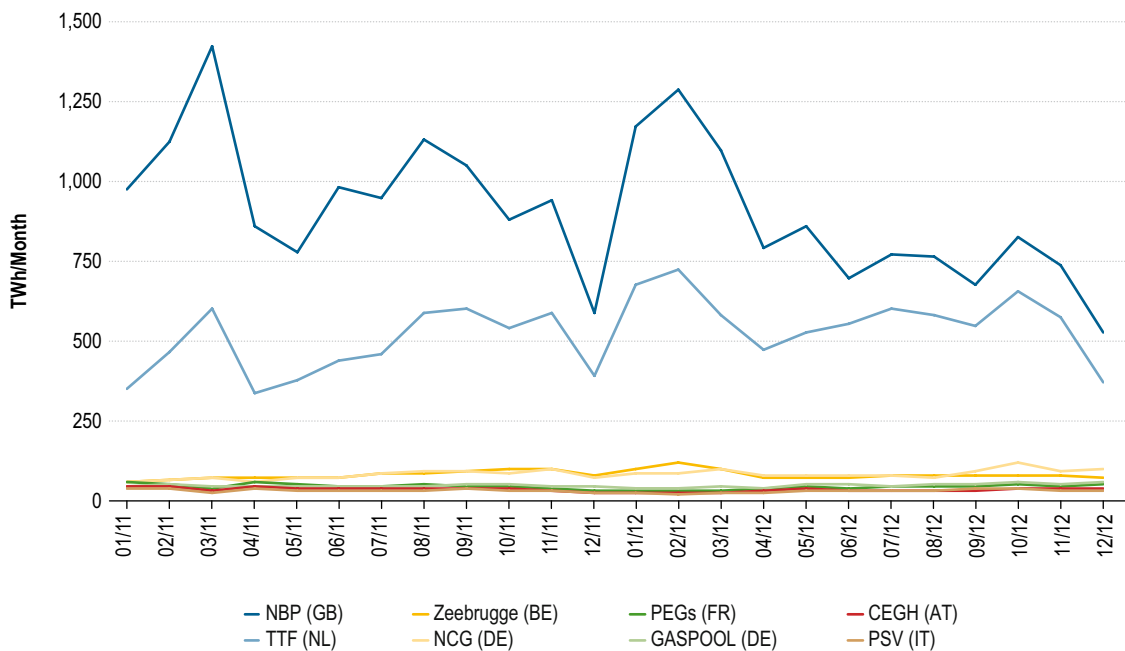
Source: Platts for hub prices and ICIS Heren for average front month prices

- 428 Reacting to new pricing trends, a number of European utilities and traders have recently been ready to go to arbitration with upstream suppliers on commodity pricing issues under long-term contracts. Traders were spurred by growing liquidity at some European gas hubs and were no longer willing to take losses on gas trades. Particularly, Norwegian producers (mostly Statoil) showed some renewed flexibility in their pricing approach and thus gained overall market share.
- 429 Russia's Gazprom accounted for more than 12 billion cubic metres (bcm) of the estimated 16 bcm decline in European gas imports in 2012. Gazprom's strategy so far has been one of 'divide and rule' based on the renegotiation of individual conditions and ex-post rebates (not de-indexation) with traders and suppliers, depending on the latter's willingness to pay and on the availability of alternative supplies in the region. Retroactive discounting (around 10% on average in 2012 according to press sources and to Gazprom itself) has so far been preferred by the Russian producer to direct spot price indexation. However, Gazprom might react further (especially if EU demand keeps on decreasing and issues of margin squeeze materialise downstream) by easing take-or-pay obligations on some of its LTCs<sup>267</sup>.

### 5.2.3 Hub liquidity evolution

- 430 Liquidity at continental European trading hubs has generally grown in 2012; however, once exchange trades (ICE) are excluded, it declined at the (still) most liquid EU hub, NBP. In effect, NBP’s decline was mainly driven by decreasing OTC trades, whereas GB exchange trading went against this trend. Different performances at hubs had a zero-sum outcome in that total volumes negotiated at EU hubs in 2012 were similar to those negotiated in 2011.
- 431 The rising share of new contracts – negotiated at spot prices – supported the growth of Continental hubs, complemented by the renegotiation of existing LTCs. Some Continental hubs continued, however, being mostly used as mere balancing and/or storage platforms.
- 432 Among the reasons for NBP’s OTC liquidity decrease in 2012 were the reduction in futures negotiations, given price and demand uncertainty, as well as the difficulties encountered by shippers and traders in gaining access to credit for financing long-term trading operations in what has continued to be a tight credit market. Unsurprisingly, traders reacted to continuing uncertainty by shifting away from bilateral contracts and into ICE-negotiated short-term products.
- 433 Aggregated traded volumes at main EU hubs exceeded 20,000 TWh in 2012, more than four times the overall EU-27 physical gas consumption. OTC remained by far the predominant source of trading<sup>268</sup>, especially on the Continent, representing more than 90% of trades.

Figure 69: Traded OTC volumes at main EU hubs – 2011 and 2012 (TWh/Month)



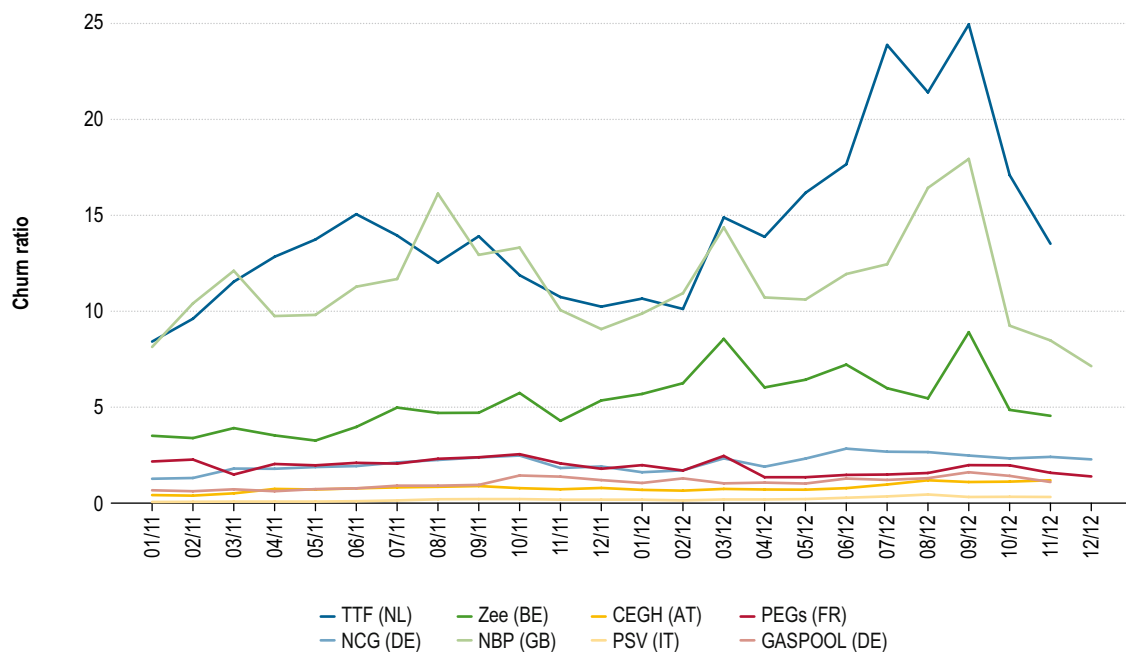
Source: ICIS Heren. The values shown are volumes traded during the month for delivery at any point in the future.

268 Among other factors, OTC predominance over cleared exchange (organised) markets can be explained by the trust-based (relatively circumscribed) trader community and by better counter party knowledge. Moreover, clearing fees imposed by organised markets with a central counter party may constitute a barrier. Finally, the confidentiality that is guaranteed by bilateral contracts is understandably prized by traders.

434 NBP moved the largest gas volumes as a proper market place for contracting short-term and long-term portfolio supply operations, followed by Dutch TTF and, to a lesser extent, NCG (Germany) and Zeebrugge (Belgium).

435 Figure 70 illustrates churn ratio<sup>269</sup> values at the main European hubs. The impressive liquidity growth at TTF, coupled with relatively lower physical demand in TTF’s direct geographical catchment area (the Netherlands), has been so remarkable that TTF overtook NBP during most of 2012 as the most (OTC) liquid EU hub in terms of churn ratio. Meanwhile, at other hubs on the Continent, trading operations related to physical short-term and/or balancing positions still dominated. A more detailed analysis of each hub’s features in 2012 is provided in the following section.

Figure 70: Churn ratios at main EU hubs – 2011 versus 2012



Source: ICIS Heren and TSOs

### 5.2.4 The performance of individual EU hubs in 2012

#### NBP (GB)

436 NBP, Great Britain’s virtual trading point, is still Europe’s main hub, in spite of a smooth decline in OTC operations in 2012, partially counter-balanced by a short-term rise in cleared (ICE) hub operations resulting from the early February 2012 cold snap. Absolute negotiated volumes at NBP were in the order of slightly less than twice those at TTF (Dutch hub). NBP features a major variety of negotiated longer-extension products. However, its day-ahead contract remains the most influential gas contract in Europe and is widely considered to respond closely to market fundamentals. Even if exchange-traded volumes at ICE have increased in relation to 2011, overall OTC long-term seasonal contracts experienced some volume decrease in 2012 due to a combination of factors. As demand and prices remained relatively volatile throughout the year, gas traders showed hesitation in com-

269 The (OTC) churn ratio is the ratio between the amount of gas traded at a given hub or market places and the amount of physical gas throughput in the area or region covered by the hub (however defined). Figure 70’s values represent all OTC deals at any given hub, divided by physical hub throughput. Please note that churn ratios can be defined in many different ways and that – for this reason – any policy conclusion based on them must be taken with a pinch of salt.

mitting to longer-term positions because of the associated financial risk and moved their contracting positions to the short term. This was compounded by decreasing LNG liquidity throughout the EU, pushing traders even closer to real time. Norway's Statoil remains the most influential producer in terms of wholesale price formation in Great Britain, particularly because Norwegian supply contracts are compatible with full spot price indexation on NBP than on mainland European markets.

### TTF (NL)

- 437 The most significant European hub development in 2012 was TTF's consolidation. The Dutch hub was, once again, by far the most liquid continental European hub, moving closer to NBP. Volumes of both negotiated short term and curve positions on the exchange more than doubled in 2012 with respect to 2011, thus giving this hub greater market depth and reduced volatility. OTC trading is on the rise and remains predominant. Liquidity is supported by the fact that several sellers or resellers in this part of Europe provide gas from bilateral contracts at a price that is linked to the hub, and those shippers who are still on oil-indexed contracts aim to cover positions, or even renegotiate their contracts, based on TTF's spot price. Russian and Norwegian gas suppliers have entered the hub, and the GATE terminal is providing some LNG liquidity. The main TTF actors are now Norwegian and Dutch producers or resellers, and to a lesser extent LNG operators. TTF is increasingly used not only by Dutch, but also by German and other market operators in Central and Southern Europe as a reference hub, as well as for seasonality hedging and storage-related trading. The hub also handles demand for electricity generation and balancing. In terms of spot price, TTF quotes are more and more significantly in line with NBP, with price spreads now mainly reflecting GB-NL transmission costs and currency bets and hedges between the pound sterling and the euro.

### NCG/GASPOOL (DE)

- 438 Even if NCG, the main German hub, has the theoretical potential to become a reference hub, at least in continental Europe, its liquidity increase in 2012 was not as much as at TTF. In part, this is due to the fact that German utilities still trade a considerable fraction of their positions on TTF, arguably because of TTF's much higher liquidity. German market players seem to be using their own country's hubs mainly for balancing and storage purposes.
- 439 The majority of operations in the NCG catchment area are still performed OTC. NCG prices generally quote at a premium above TTF. This spread stays below overall transmission costs, even though particular national effects (including the weather), storage and electricity generators' demand (and certainly price movements affecting Germany's oil-indexed contracts) can lift the NCG-TTF spread above transmission costs. Improved interconnection with Scandinavia, and eventually Russia, might also have an impact on price spreads in the future.
- 440 GASPOOL's liquidity also increased in 2012. Approximately, GASPOOL's volumes were about half of those traded at NCG. Other factors affected GASPOOL's prices: the influence of TTF and NCG prices, domestic demand effects (including seasonality) and oil prices - given the continuing presence of oil-indexed contracts. GASPOOL plays a more short-term role than NCG, being instrumental in storage and balancing physical operations, as well as in balancing demand from distribution zones.
- 441 Merger talks between the two German hubs continued in 2012 amidst lack of industry enthusiasm, until the energy regulator in early 2013 rejected the merger upon consideration that the expected transmission investment costs needed to integrate the hubs would have been likely to exceed the liquidity benefits. Combined NCG/GASPOOL liquidity has in any case increased on the back of

oil-indexed contract renegotiation and also in view of German hubs being increasingly regarded, together with TTF, as reference spot markets by Central and East European spot traders. In addition to a higher percentage of oil-indexed LTCs, one of the main obstacles to further liquidity growth in Germany is the existence of hub-imposed conversion fees between different gas qualities, still present in 2012 and widely opposed by traders. These fees will be gradually reduced over time and should disappear by 2016.

### Zeebrugge and ZTP (BE)

442 Zeebrugge, referred to as 'Zeebrugge Beach' since 1 October 2012, also experienced a liquidity rise in 2012, supported by increasing interaction with other hubs – mainly NBP and TTF – which partially counter-balanced an LNG diversion-induced liquidity decline. The new virtual hub established in Belgium, ZTP, is potentially expected to attract market liquidity, as its new entry/exit capacity allocation arrangements will not force market parties to contract transmission capacity on location. In parallel, the extension of the country's transmission and interconnection capacity is expected to increase the relevance of the two Belgian hubs, even though one might argue that splitting trades between Zeebrugge Beach and ZTP might result in a reduction in overall liquidity even if these two marketplaces offer distinct trading services. Zeebrugge Beach is still slanted in favour of physical trading, while financial (non-locational) trading is ZTP's main activity. Similarly to other Continental hubs, the proportion of exchange-cleared trades is minor at both hubs, in contrast with OTC operations. The major price driver at Zeebrugge Beach in 2012 was the NBP price<sup>270</sup>, given the physical link with Great Britain through the IUK sub-sea gas interconnector. Conversely, prices at ZTP are highly correlated with TTF and NCG, indicating a high degree of interconnection with neighbouring mainland markets and a more 'Continental' focus.

### The PEGs (FR)

443 Overall, OTC traded volumes at PEG Nord, the most liquid of the French exchange markets, fell in 2012. At PEG Sud and TIGF, liquidity slightly increased, even if volumes remained much lower than those at PEG Nord. Overall liquidity at the two main French hubs was affected in 2012 by the reduction in LNG imports into southern France, as more cargoes were diverted to Asia and the Pacific. Trading principally focussed on the prompt in south-west's TIGF, which has no forward or otherwise financial operations at all, mainly driven by storage and balancing. Low volumes were traded on the forward curve at PEG Nord. At the northern hub, prices are influenced by other markets, particularly TTF, but also NBP. At the two southern hubs, prices normally correlate to the northern exchange, usually at a premium to take account of within-France transmission capacity constraints, and are subject to volatility depending on the vagaries of LNG deliveries to southern terminals.

### CEGH (AT)

444 In 2012, the Austrian hub's behaviour was influenced by preparatory work to transform it into a virtual trading point in 2013. The virtual hub is now operational and is based on a single entry/exit zone, with trading parties not being required to own transmission capacity rights. This should reduce counterparty risk and increase liquidity. Additionally, both short- and long-term transmission capacity at Austrian cross-border points will be auctioned, which is expected to attract higher market interest. OTC operations remained the dominant share of volumes traded at this hub in 2012 and increased

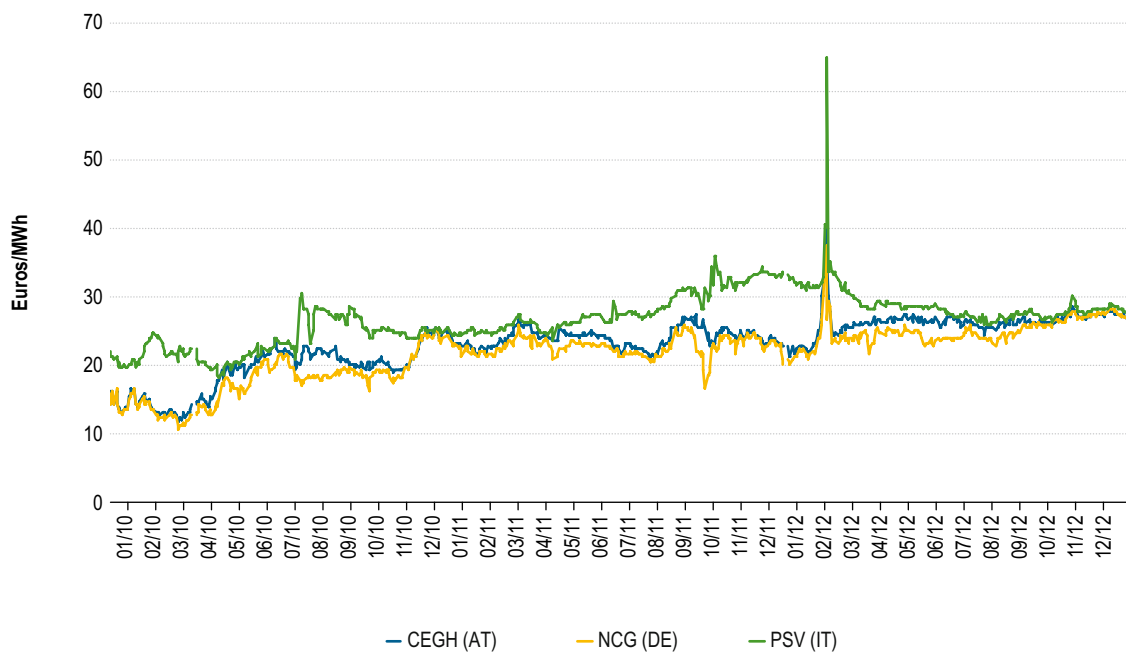
270 See also the case study 8 on IUK flows and the analysis of price effects following an investigation by the three NWE energy regulators Ofgem, ACM (then NMa), and CREG.

by 44% with respect to 2011. Day-ahead operations were more liquid than medium/long-term trades. Norway’s Statoil increasing activity at this hub is seen as positive in a regional market dominated by Russian gas on the supply side and by Central European, particularly German, utilities on the demand side. The Austrian hub closely follows NCG prices, with a slightly positive spread, even if the influence of Italian demand/supply movements is now increasing, and the price spread between PSV and CEGH was greatly reduced in 2012.

**PSV (IT)**

445 Italy’s traded volumes, particularly OTC, increased in 2012 following the launch of a balancing market and the allocation of cross-border capacity through auctions at the Tarvisio/Arnoldstein IP, in coordination with Austrian TSO TAG. Price convergence ensued, as shown in Figure 71. The launch of a virtual storage scheme in Italy also contributed to higher liquidity. Italy’s gas incumbent (ENI), however, participates in PSV only to a limited extent (PSV is not compulsory), which greatly limits overall volumes. PSV prices, once mainly dependent on oil-indexed contracts which are typical of the region, are now also influenced by other European hubs, particularly TTF. The latter has also started to be used as a benchmark by the Italian energy regulator for retail price regulation purposes in 2013.

Figure 71: CEGH, PSV and NCG DA prices – 2010 to 2012 (euros/MWh)



Source: Platts

### Other organised markets in Europe<sup>271</sup>

- 446 Other organised markets have seen an increase in activity and/or were launched during 2012. Liquidity on the Czech OTC virtual market almost quadrupled in 2012, dominated by short term operations, and the market attracted more counterparties. This might, in time, reduce Czech dependence on German hub trades.
- 447 Poland also progressed significantly in 2012 through the implementation of measures intended to give rise to a virtual trading point. In early 2013, the Polish market saw its first OTC operations, which are expected to be a first step towards wholesale market development and towards reducing the country's dependence on Russian gas. In addition, the new Świnoujście LNG terminal on the Baltic Sea, planned for 2014, as well as physical reverse flows from Germany through Mallnow (2013), should contribute to diversification and security of supply.
- 448 2013 is expected to be the decisive year for the implementation of a proper single organised gas market in Spain. The current MS-ATR platform, where shippers perform OTC trade operations at various system nodes, is the starting point. Currently, the majority of ATR trades are swap operations to cover shipper positions, particularly on LNG. In 2012, Spain saw a reduction in the volumes traded at the platform, as a result of decreasing gas demand and the diversion of LNG cargoes to Asian markets. The planned Spanish hub (which should also capture Portuguese trades) is expected to introduce a fairer price reference for gas traded on the Iberian market. In combination with the expansion of interconnections with France, this should contribute to integrating the Iberian gas markets with those in Central Europe and to improving LNG access for Central European countries.

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271 Some of the developments mentioned in this sub-section follow events taking place in 2013. They are mentioned here, in the interest of continuity and timeliness, because they will be subject to assessment in next year's report.



### 5.2.5 Licensing

449 An important aspect impacting the progress of integrating wholesale markets relates to licenses to perform trade/supply operations. Licensing covers aspects such as access to market places (hubs), gas supply activities, and the acquisition of transmission capacity through TSOs. Table 12 illustrates the different licensing approaches currently in place across the EU.

Table 12: Licensing requirements in the EU-27 for trading and supply activities

Role	AT	BE	BG	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	NL	PL	PT	RO	SK	SI	ES	SE	UK
Supplier			2		3		na								6	6				6			4	1	
Trader	1		na			na	na	4						na							na	na			7
Shipper			2			na	na								6	6				6					
Contract with TSO									5																

Source: KEMA/COWI Entry/Exit Study for DG ENER, May 2013 and review by NRAs.

Notes: 1. Being a shipper enables market parties to engage in supply to end consumers (upon notification to the NRA in Austria).

2. In Bulgaria, suppliers are also obliged to be shippers.

3. In Denmark, a public licence is required only for Universal Service Providers. All shippers have to be registered with the Danish TSO, Energinet.dk.

4. Registration with the Ministry is required in order to become a shipper. Once registered, shippers are able to engage in wholesale market operations and to supply end users, as well as accessing LNG, TSO and DSO infrastructure.

5. In Germany, a framework agreement between a supplier and a DSO is required if final consumers are to be supplied.

6. Supplier licenses are a prerequisite for a market party to become a shipper in Lithuania and Romania. There is a single licence in Luxembourg.

7. Traders who deliver physical gas to the network are required to become shippers.

NA = not applicable (roles are not distinguished by the MSs).

Non-NRA or public authority licensing procedures are present in those countries highlighted in blue.

450 As shown in Table 12, trading and shipping through the transmission system are subject to different regimes across the EU. Austria, Spain and Sweden only require notifications. Existing research seems to suggest that neither licensing nor registration exist for natural gas traders in Belgium, Denmark, Germany, Italy, the Netherlands and Slovakia. The other MSs typically require publicly granted licenses (not necessarily by NRAs) for supply activities.

451 The challenge, for both regulators and market designers alike, is to strike the right balance between a reasonable degree of regulatory supervision in the interest of fair and transparent competition, on the one hand, and the minimisation of administrative barriers that could interfere with the free market, on the other.

452 Until now, licensing obligations have been national decisions. In the future, potential EU-wide regulations could lead to a degree of EU-wide harmonisation (through Framework Guidelines tackling common rules for trading at hubs).

## 5.3 Cross-border transportation tariffs and network charging regimes

### 5.3.1 IP transportation (network access) charges

453 The weight of overall high-pressure transportation tariffs in total end-user EU gas prices ranges from 5% to 10% in most cases<sup>272</sup>. Transportation tariff values – and their differences – depend on a number of factors, including:

- structural factors, such as the geographical and topological characteristics of the network, the extension of the system, the terrain, climate, and general macro-economic conditions affecting investment costs;
- the initial investment cost, the age of the network, and the depreciation regime;
- NRA/TSO tariff-setting methodologies and TSO cost allocation strategies and rules; and
- demand and supply characteristics.

454 Cross-border tariff variation across Europe is not in itself a cause for concern, provided that tariffs result from a fair calculation methodology. However, unjustifiably high transmission tariffs can negatively affect wholesale market integration. In addition, different tariff calculation methodologies on either side of a border, coupled with different units of measurement even within the same country (for instance, where multiple supra-regional TSOs are present), are difficult to reconcile with the idea of interoperable and comparable access systems, and ultimately with the IEM.

455 EU regulation<sup>273</sup> prescribes that tariff methodologies be fair and compatible. Even if this does not necessarily mean that the structure of tariffs must be homogeneous and/or tariffs themselves must converge, compatibility should, as a minimum, ensure that different tariffs can be fairly compared and that units of measurement are uniform.

456 The underlying principle is the facilitation of effective competition by avoiding undue price discrimination. The Framework Guidelines on Harmonised Gas Transmission Tariff Structures<sup>274</sup> prescribes that cross-border tariffs be calculated by using one of a common set of cost allocation methodologies. The objective is to have cost-reflective tariffs, to avoid undue discrimination between network users and to increase the price rationality of gas flows in order to stimulate market integration.

457 The Agency has collected EU-27 cross-border tariff information published by TSOs in order to identify variations in the magnitude of entry and exit tariffs for connection and use of system at cross-border interconnection points. While it is not within the scope of this report to make judgements about the structure of tariffs, it is important to note that very pronounced differences exist in terms of tariff magnitudes at EU borders, and sometimes even within countries when multiple domestic zones are present.

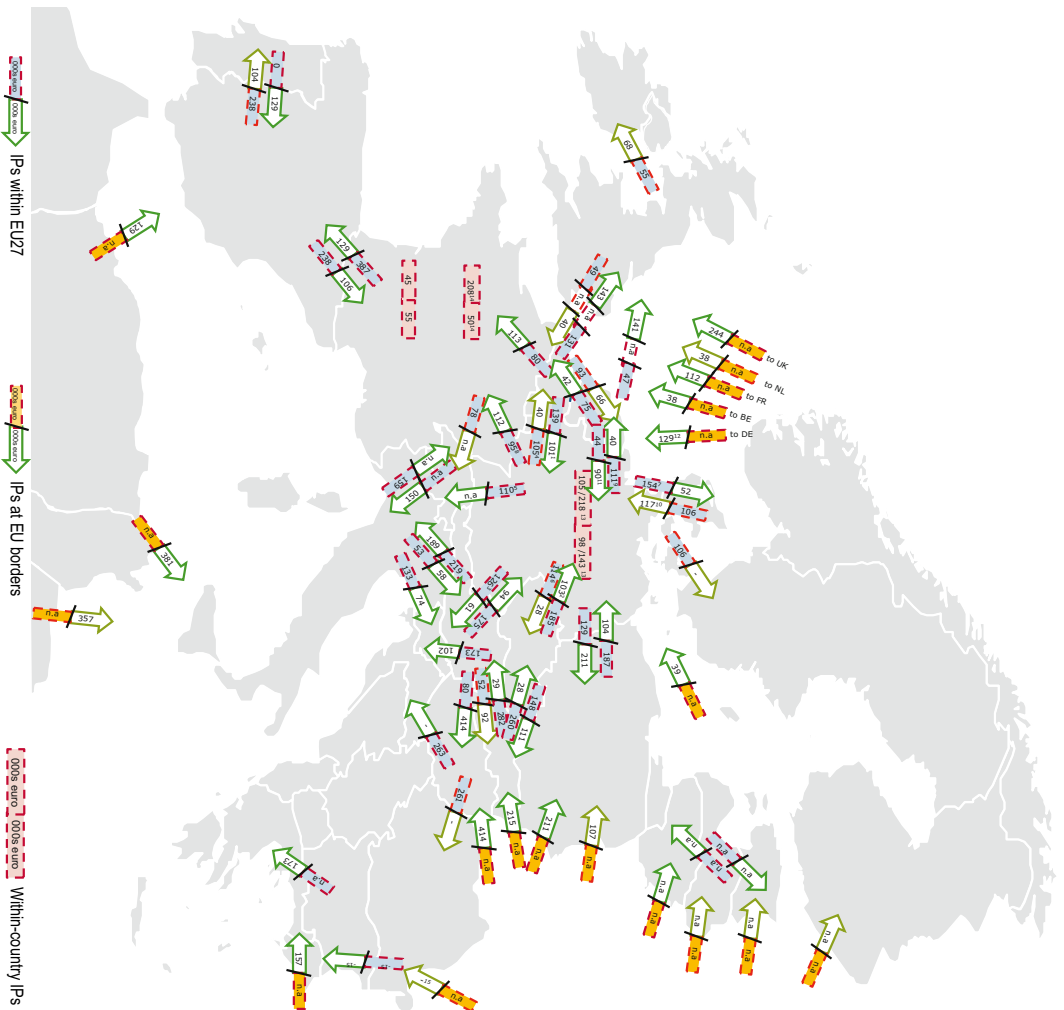
272 TSO charges only; distribution comes on top. Charges can also vary, depending on the nature of flow paths.

273 See Section 5.3.2 for a deeper insight into the provisions and current situation at MS level.

274 See: [http://www.acer.europa.eu/Gas/Framework%20guidelines\\_and\\_network%20codes/Documents/outcome%20of%20BoR27-5%201\\_FG-GasTariffs\\_for\\_publication\\_clean.pdf](http://www.acer.europa.eu/Gas/Framework%20guidelines_and_network%20codes/Documents/outcome%20of%20BoR27-5%201_FG-GasTariffs_for_publication_clean.pdf)

- 458 Excessive differences in the magnitude of transportation tariffs, which are not justified by genuine underlying efficient cost differentials, should be investigated. Cross-border tariffs should be designed compatibly with domestic ones, and price discrimination between cross-border and domestic users should be avoided, unless demonstrably justifiable by cost differentials.
- 459 When comparing gas transportation tariffs, the following aspects should be kept in mind:
- lack of cost information;
  - underlying structural factors; and
  - differences in terms of units of measurement and weights (a peculiarity of the gas industry).
- 460 The Agency would find it beneficial if the industry developed network access tariff comparisons, especially in Central-East and South-East Europe, where tariff comparisons (or even the availability of plain data) have been lacking so far. Such comparisons exist in electricity and other network industries. The Agency and CEER encourage ENTSOG to work together with individual TSOs to make price and, possibly, underlying cost benchmarking possible in the not too distant future.

Figure 72: Average gas transportation charges through EU-27 borders



Source: Agency analysis based on TSO and NRA data  
 Note: Simulation of cross-border charges for flowing 1 GWh/day/year by entry/exit IP, based on published 2013 tariffs (in thousand euros). Average weighted charges by border, by TSO, and by IP capacity level. Individual IP details can be found in Annex 4 on IP Tariffs.

At those cross-border points featuring more than one IP – but dissimilar tariffs – a single charge per border was estimated as the weighted average of charges according to offered capacity per IP and/or distinct TSO. More information can be found in the Annex on EU 27 IP tariffs.

For example, cross-border flows in Germany can attract different charges, depending on the IP and/or TSO at the same IP. In Germany, cross-border tariff ranges for the assumed 1GWh/day/year flow may vary as follows (min/max in thousand euros):

- 1 BE to DE: 72/108
  - 2 CZ to DE: 69/138
  - 3 DE to AT: 86/161
  - 4 DE to BE: 59/128
  - 5 DE to CH: 68/151
  - 6 DE to CZ: 105/128
  - 7 DE to DK: 140/161
  - 8 DE to FR: 87/128
  - 9 DE to NL: 100/140
  - 10 DK to DE: 109/182
  - 11 NL to DE: 40/123
  - 12 NO to DE: 108/141
- “DE” above is used to refer to flows to/from Germany, although – more precisely – actual flows go to and from either German domestic zone (NCG or GASPOLL).
- 13 Range of min/max E/E charges to flow gas between TSO zones in Germany.
  - 14 North – south/south – north; single E/E payment. Between TIGF/GRITgaz Sud zones. Entry and exit payments.
  - 15 Transit charges, independent of transmission charges.

Charges for simulated flows were estimated on the basis of yearly contract duration, using units of measurement published by TSOs. In those cases where tariff units of measurement were not published on a yearly basis, a direct conversion was performed. At some IPs, different tariffs could apply to different capacity contracting periods, but this was not considered in this year’s exercise. More details can be found in the Annex on the EU-27 IP tariffs.

461 Based on the map displaying cross-border tariffs by IP (Figure 72), one can observe the following:

- In the majority of EU MSs<sup>275</sup>, TSOs now apply entry/exit transmission charging models. However, some TSOs still apply uniform postage-stamp transportation charges.
- Regarding the way charges are calculated, entry/exit tariffs either result from revenue recovery objectives or are determined through the application of a cost-allocation methodology centred on underlying cost drivers. A detailed overview of the methodologies and entry/exit recovery splits in use in 2012 is given in Table 13.
- Countries where TSOs apply, at least on a preliminary basis as input reference, a 50/50 entry/exit split (e.g. Germany, Poland and Slovakia) show more comparable entry/exit charges. In some other countries, the TSO pre-sets charges in such a way that revenue is recovered to a larger extent from exits than from entries – this is the case in Austria, Spain<sup>276</sup> and the Czech Republic – even if the actual ex-post revenue recovery split depends on actual physical flows. Different entry/exit splits can stimulate or privilege certain flow directions, but are not wrong if fairly and transparently determined. After all, the total transmission charge paid by shippers is the sum of entry and exit fees, which is independent of the split. The larger the domestic gas transportation network, and the less numerous the number of cross-border points, the higher the resulting IP tariff (e.g. in France, Italy, and Spain). This does not imply per se that the per km transportation charge will be necessarily higher. The fact that offshore cross-border interconnection point prices are usually set at higher levels might be due to comparably more expensive underlying investment. However, in the absence of cost data, this cannot be demonstrated.
- No data were obtained for Baltic IPs, for exempted pipelines (such as the IUK interconnector and BBL), for countries with cross-border auctions (such as Switzerland), and for independent transit pipelines (such as those in Romania and Bulgaria).

462 A few particular cases are worth highlighting:

- Portugal aims to attract transit entry into its national system by not charging exit fees at its IPs with Spain<sup>277</sup>. Sweden, on the contrary, does not apply entry tariffs (these are paid concurrently with Denmark's exit capacity) and only charges at domestic exits<sup>278</sup>.
- Remarkable differences can be found in Germany by IP and TSO. This influences the price spread from which a shipper can profit when trading between the same pair of hubs, depending on the TSO and/or IP being used.
- Austrian TSOs' exit charges towards Italy are higher than those applied to other bordering countries. Price discrimination which is not based on genuine and demonstrable underlying efficient cost differences at different border points runs counter to EC competition policy rules. The situation remains undecided in the absence of efficient cost analyses. Austrian-Italian border pricing issues gave rise to appreciable controversy in the second half of 2012.

275 Detailed information on allocation mechanisms by country can be found in the tables in section 5.3.2.

276 To be modified once a new cost allocation regime is agreed, following the implementation of the European Network Code on transmission tariff structure harmonisation.

277 This entry/exit split can arguably enhance Iberian market integration, but it is still to be coordinated by Spain and Portugal in order to avoid tariff distortions.

278 Sweden does not have cross-border exits.

### 5.3.2 Cost allocation regimes

- 463 As already indicated, significant differences in tariff structures and cross-border transmission charges can still be observed across the EU. The Framework Guidelines on Harmonised Gas Transmission Tariff Structures and the corresponding Network Code should provide NRAs and TSOs with a coordinated framework by setting common concepts to establish cost allocation methodologies and general terms for tariff structures. No specific harmonised tariff structure is implied at this stage, but certain requirements are established to be complied with. In addition, a defined set of fair cost allocation methodologies is proposed for calculating tariffs.
- 464 The idea behind a fair and compatible tariff-making structure is to facilitate effective competition by avoiding undue price discrimination. Therefore, the Framework Guidelines encourage the calculation of tariffs under cost-reflective conditions within the framework of one of the proposed cost allocation methodologies. Such methodologies must guarantee that no cross-subsidies exist between different categories of network users, including between domestic and cross-border ones. The Framework Guidelines are closely connected with capacity allocation provisions. In this sense, tariff guidelines also cover the assumptions to be made when determining auction reference prices, in particular potential variations in reserve prices depending on product duration. Auctions are viewed as the fairest capacity allocation mechanism, because auctioned capacity is allocated according to market valuation and its allocation should be compatible with efficient network development.
- 465 Table 13 summarises the main aspects of the tariff systems in place throughout the EU-27, except Cyprus and Malta, which have no commercial gas sector, at the end of 2012<sup>279</sup>. As there is no binding mandatory Network Code on tariffs, MSs have no obligation to incorporate EU-wide provisions<sup>280</sup> at this stage. However, the table provides some indication on the status quo, as well as actions that will be needed in the future in order to harmonise transmission tariff methodologies. The comparison is mainly based on the KEMA/COWI (2013) study on entry/exit regimes<sup>281</sup>, as well as on NRA input. One can observe that, even though the majority of MSs apply an entry/exit regime, there is still considerable heterogeneity in tariff structures.

279 For certain countries which have implemented relevant modifications in their systems in 2013, see detailed comments in Annex 3: Tables summarising gas access regimes in the EU-27 – Footnotes.

280 The provisions established by the 3rd Package are: tariff transparency, cost reflectiveness, and no determination of fixed paths (no point-to-point charging). These are already mandatory for all MSs.

281 See: [http://ec.europa.eu/energy/gas\\_electricity/studies/doc/gas/201307-entry-exit-regimes-in-gas-parta.pdf](http://ec.europa.eu/energy/gas_electricity/studies/doc/gas/201307-entry-exit-regimes-in-gas-parta.pdf) and [http://ec.europa.eu/energy/gas\\_electricity/studies/doc/gas/201307-entry-exit-regimes-in-gas-partb.pdf](http://ec.europa.eu/energy/gas_electricity/studies/doc/gas/201307-entry-exit-regimes-in-gas-partb.pdf)

Table 13: Tariff regimes in the EU-25 (see table footnotes in Annex 3)

Country	Entry/exit	Tarification Model	Other	Number of entry/exit systems	Locational signals considered	Tariff cost allocation methodology				Price Control Mechanism		Role of NRA in tariffs setting	Methodology	Approval	Role of TSO	Revenue Recovery Entry / Exit split		Dedicated transit pipelines with particular conditions	Tariff recovery basis		Reserve Price (Tariff) Multipliers (Coefficients) an annual period reference price basis					Comments by NRAs	
						Distance to Virtual point	Capacity weighted distance	Matrix	Poststage	Revenue Cap	Price Cap					Recovery %	Exits %		Yes	No	% Capacity	% Commodity	1 year	6 months	3 months		1 months
Austria	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20	80	✓	✓	100	0	1	1.25	1.5	1		
Belgium	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~30	~70	✓	✓	100	-93	1	from 0.7 to 2.6				
Bulgaria	✓			n.a.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100	100	✓	✓	100	1	1.9-1.2	3.6 (DA)-2.2 (WD)				
Czech Republic	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~22	~78	✓	✓	100	-97	1	0.88-2.8	0.72-3	0.95-3.6		
Denmark	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	50	50	✓	✓	100	-75	1	0.88-2.8	0.72-3	0.95-3.6		
Estonia	✓			n.a.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100	100	✓	✓	100	1	1					
Finland	✓			n.a.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100	100	✓	✓	100	1	1	1.5	1.5	1	[23]	
France	✓			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~40	~60	✓	✓	100	100	1	1	1	1	1	
Germany	✓			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	[3]	[3]	✓	✓	100	100	1	1	1	1	1	
Greece	✓	[26]		1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100	100	✓	✓	100	-90	1	1.6	1.85	2.3	2.3	[25]
Hungary	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~82	~18	✓	✓	100	-78	1	1.2-4.4	2.4-10.8	6.1-13.3		
Ireland	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	[7]	[7]	✓	✓	100	-90	1	0.12-4.68	0.18-8.6			
Italy	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	50	50	✓	✓	100	-85	1	1.1	1.2	1.4	1.4	
Latvia	✓	[1]		n.a.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100	100	✓	✓	100	1	1	1	1	1	1	
Lithuania	✓			n.a.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100	100	✓	✓	100	-70	1	0.7-1.6				
Luxembourg	✓			n.a.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100	100	✓	✓	100	1	1	0.9-3.6	1.8-7.3			
Netherlands	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	40	60	✓	✓	100	100	1	1	1	1	1	
Poland	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	50	50	✓	✓	100	-80	1	1.1-1.7	1.4-1.8	2.1-2.7	[29]	
Portugal	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	[28]	[28]	✓	✓	100	-90	1	1.1-1.7	1.4-1.8	2.1-2.7	[32]	
Romania	✓	[24]		n.a.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6	94	✓	✓	100	1	1	1.59-2				
Slovakia	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~48	~52	✓	✓	100	100	1	1	1	1	1	
Slovenia	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~23	~77	✓	✓	100	100	1	1.3	1.3	1.9-5.4		
Spain	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	[19]	[19]	✓	✓	100	[19]	1	1.2	1.2	1.8-3		
Sweden	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100	100	✓	✓	100	[20]	1	1.59-2				
United Kingdom	✓			1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	50	50	✓	✓	100	[22]	1	0.67 (DA) 0 (WD)				

Source: ACER analysis based on the KEMA/COWI (2013) study on entry/exit regimes and NRA data

## 5.4 Cross-border capacity utilisation

### 5.4.1 Utilisation analysis by IP

- 466 Capacity calculation in the gas industry is a complex process. When establishing the offering of technical capacity, TSOs need to make assumptions on network parameters (including crucial physical conditions), operational requirements, system integrity, and the expected utilisation of networks based on probabilistic models. The amount of total technical capacity offered depends on its firmness, depending on the more or less stringent assumptions that TSOs make.
- 467 The more networks and flows are integrated and meshed, the more probability-based capacity calculation becomes, resulting in important stochastic elements. The Network Code on Capacity Allocation Mechanisms<sup>282</sup> (CAM NC) mandates that any extra cross-border capacity be calculated by adjacent TSOs using a common method, in order to maximise the supply of bundled capacity products across borders. This increases the need for TSO coordination.
- 468 Capacity allocation procedures at EU cross-border points are being harmonised under a common European methodology, as detailed in Section 5.5.1. At present, current contracted IP capacity values correspond to the historical allocation mechanisms used by individual countries before harmonisation started.
- 469 An overall analysis of contractual capacity values indicates that EU IP capacities are, to a significant extent, fully pre-booked over the longer term at the most relevant European cross-border points. This mirrors traditional commodity contracting instruments, which are based on LTCs with upstream producers. Total contracted values for capacity on a long-term basis are generally determined by yearly peak utilisation levels as anticipated by shippers.
- 470 However, the capacity contracting trend is gradually changing, following developments in the commodity market<sup>283</sup>. Shippers are starting to contract less cross-border capacity over the long term, as they rely more on virtual spot trading points for their supplies, particularly in the most developed markets. This leads to a migration towards short-term capacity contracting and to the use of secondary capacity markets for trading between adjacent markets. The speed of these changes is also clearly influenced by the way in which the different capacity products are priced in relation to duration and timing (yield management), with short-term capacity normally priced more steeply, but on relevant occasions also at a discount<sup>284</sup>. A comparison of capacity pricing by duration in each country is available in Table 13.
- 471 The level of available capacity between market zones can help explain price-related flows. The latter arise from the incentive to profit from trading opportunities (arbitrage) between liquid markets in the short term.

282 Cf. the Framework Guidelines and the (draft) Network Codes on Capacity Allocation and on Interoperability and Data Exchange, linked to ENTSOG from [www.acer.europa.eu](http://www.acer.europa.eu)

283 See Section 5.1.

284 For example, day-ahead (DA) capacity contracting values used to be much higher in Germany before the regulator forcefully raised the short-term capacity reserve price above zero. After this decision, demand for DA capacity dropped, and in 2013 the NRA reset the reserve price once again in order to avoid revenue under-recovery. Under-recovery is tackled differently in GB, for instance, where the TSO and NRA let the price of short-term capacity float freely, and fall to zero in case of no demand, with a commodity (gas) charge being available to the TSO in order to tackle fixed/sunk transmission cost under-recovery.



- 472 Capacity utilisation levels diverge significantly across Europe. At some IPs, contracted and utilised values are reasonably aligned. However, at other IPs, substantial differences exist between contractual values and actual utilisation. This fact might give rise to a presumption of capacity hoarding by shippers, in the absence of fully developed congestion management procedures.
- 473 The challenge is to ensure that unused capacity, whether or not strategically acquired, can be easily returned to the market so that other shippers can use it. Along these lines, the new EU (comitology) Guidelines on Congestion Management Procedures (CMP) should enable an efficient reallocation of unused capacity, thus facilitating market integration and price convergence<sup>285</sup>.
- 474 The Agency and CEER have analysed the issue of contractual congestion and physical capacity utilisation on a sample of the most relevant IPs<sup>286</sup> in 2012. To do so, the Agency and CEER selected a sample of IPs supporting an assortment of the main gas flows throughout Europe. In some cases, appreciable differences between contractual values and physical utilisation rates were found.

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285 See Section 5.5.1.

286 Only firm capacity is considered. Overall utilisation values are calculated based on this (firm) capacity. Interruptible capacity is not considered.

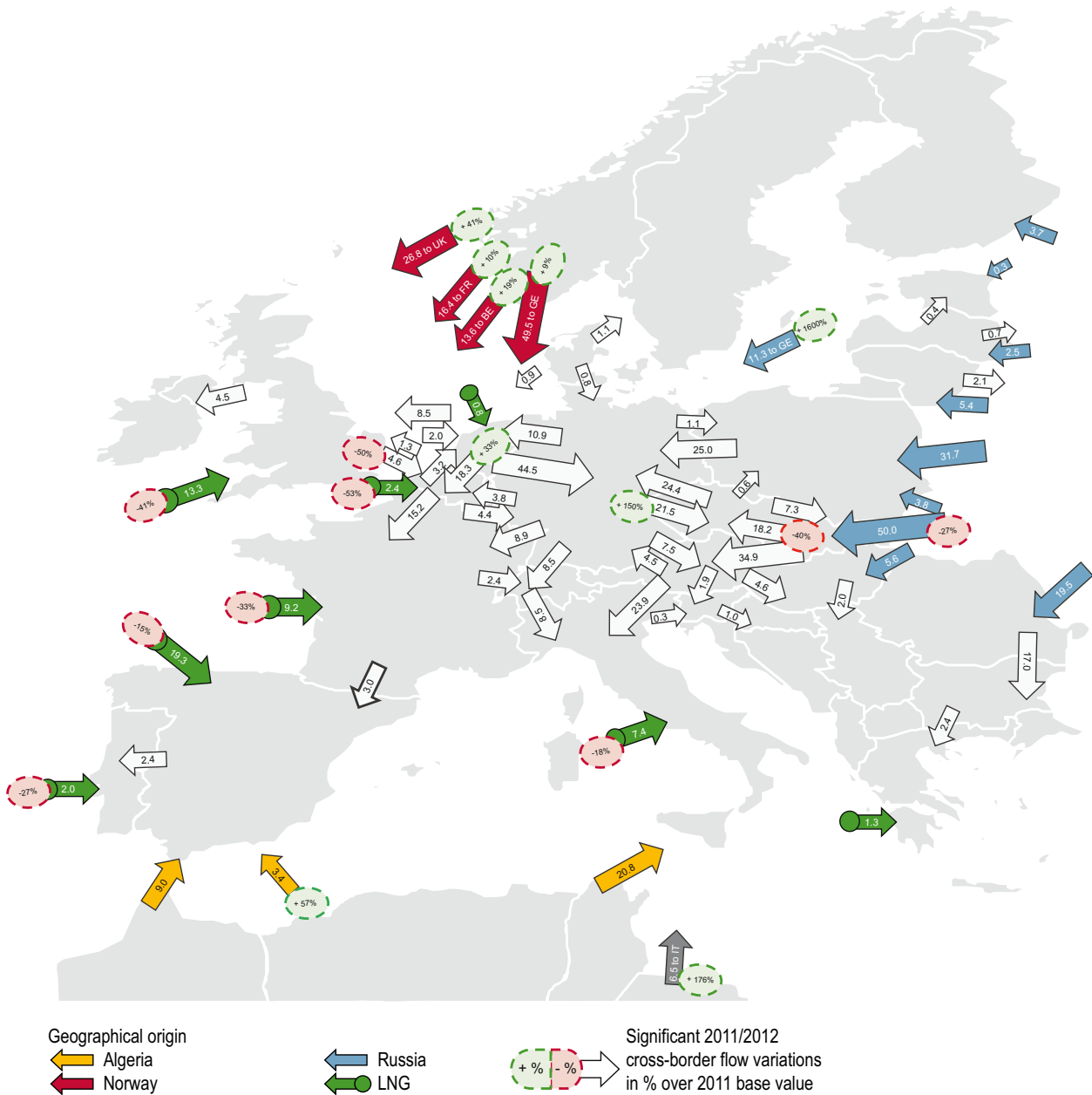
Table 14: Used versus booked capacity at natural gas IPs in the EU – averages for 2012

IP Name	Border and direction	Technical physical capacity in GWh/d (July 2012)	Average yearly firm contracted capacity	Average yearly used capacity	For those bi-directional IPs with physical flows in both directions, average utilisation for all days when the flow is in the relevant direction	Month of maximum capacity utilisation	Monthly maximum capacity
Velke Kapusany	UA to SK	3115	95%	67%	-	January	67%
Baumgarten	SK to AT	1612	99%	62%	-	December	80%
Lanzhot	SK to CZ	1268	99%	42%	-	April	73%
Arnoldstein / Tarvisio	AT to IT	1185	100%	54%	-	February	78%
Waidhaus	CZ to DE	1017	91%	54%	-	April	69%
Mallnow	PL to DE	932	100%	77%	-	April	97%
Interconnector	UK to BE	632	100%	26%	30%	August	58%
Interconnector	BE to UK	805	100%	26%	17%	November	24%
Emdem ETP	NO to NL	635	91%	45%	-	April	62%
Medelsheim / Obergaibach	DE to FR	619	91%	84%	-	February	95%
Taisnières (H)	BE to FR	570	66%	54%	-	February	71%
Dunkerque	NO to FR	585	91%	84%	-	February	95%
Julianadorp	NL to UK	454	94%	43%	-	February	66%
Bocholtz	NL to DE	451	100%	53%	-	February	84%
Tarifa	ALG to SP	355	73%	61%	-	February	82%
Oberkappel	AT to DE	154	95%	83%	89%	June	100%
Oberkappel	DE to AT	107	100%	83%	52%	December	64%
Larrau	FR to SP	100	100%	91%	-	July	100%

Source: Agency analysis based on TSO data

- 475 From the assortment of IPs considered in the exercise, the average contracted firm technical capacity is 92%, while the average utilisation rate is 59% and peak monthly utilisation 77%. The figures on capacity utilisation generally indicate that there is still some excess contracted capacity, but that, at times of seasonal peak demand, winter flows match technical capacity more closely.
- 476 As Table 14 shows, the largest divergences between contracted and utilised capacity were found at IUK (Belgium/UK), Julianadorp (the Netherlands/UK), and Lanzhot (Slovakia/Czech Republic), all of which had contracted capacity near to or at 100%, but much lower physical utilisation. These differences may be explained by shippers enacting balancing trades in both directions – taking advantage of physical reverse flows, even though at Julianadorp and Lanzhot a predominant gas direction is observed throughout the year.
- 477 In relation to actual IP capacity utilisation at regional level, Figure 73 depicts flow variations across EU cross-border IPs between 2011 and 2012.

Figure 73: EU cross-border gas flows (bcm/year) in 2012 and main variations from 2011



Source: IEA and Agency calculations

478 From the values shown in Figure 73, the following main flow variation trends were identified between 2011 and 2012, affecting and sometimes explaining IP capacity utilisation levels:

- i. A significant reduction in the import of Russian gas through Slovakia via Ukraine, as a result of increasing Nord Stream flows

479 The commissioning of the Nord Stream pipeline has significantly changed the traditional flow route of Russian gas into Europe. The comparison between 2011 and 2012 shows a 20% reduction in westward Russian gas flows through the Ukraine into Central Europe. Figure 73 also illustrates the increase in reverse flows between the Czech Republic and Slovakia, as well as some directional changes between Germany and Austria (also due to reduced westward Slovak flows).

480 Russian gas has started to counter-flow from Germany to the Czech Republic<sup>287</sup>, Slovakia, and through Baumgarten. From Austria, the gas is then redirected to Italy and Slovenia. This trend might eventually favour the creation of a regional market area if Austria, Slovakia and the Czech Republic agree on the creation of a single regional market zone, with an arguably mitigating effect on potential cross-border contractual congestion.

481 Several Central and Eastern European countries (not limited to the EU), such as Ukraine and Poland, are striving to diversify their gas sources away from Russia, and have been looking into Western Europe's spot markets as alternative sources. This phenomenon is contributing to directional changes in traditional gas flow patterns across the Continent.

#### ii. Substitution effect between Norway and Russia

482 Gazprom accounted for more than 12 bcm of the estimated 16 bcm decline in European gas imports in 2012<sup>288</sup>. Gazprom's exports to Europe in 2012 dropped by 8% compared with 2011; in the meantime, Norwegian exports rose by around 10%. Statoil, which accounts for most of Norway's presence in European gas markets, has shown greater flexibility than Gazprom in its approach when renegotiating its long-term supply contract terms. Renegotiating the price of existing oil-indexed contracts and indexing them, at least partially, to hub spot prices (rather than offering indirect rebates) allowed Statoil to increase its European market share.

#### iii. UK gas flows to and from mainland Europe have changed

483 In 2012, there was evidence that the nature of flows through the IUK interconnector had changed, showing higher flow responsiveness to price differentials across markets, and a somewhat higher propensity for the UK to import gas during periods throughout the year when the UK would have been expected to export gas instead. However, on the Bacton-Balgzand (BBL) pipeline between the UK and the Netherlands, flows have remained similar in nature, despite the introduction of virtual backhaul. BBL is physically unidirectional, but it auctions a virtual reverse flow product from Great Britain to the Netherlands. The partial change in flows from/to Great Britain since 2011 can also be explained by a lower price spread between mainland Europe (TTF) and Great Britain (NBP)<sup>289</sup> in the first half of the year and, on occasion, by negative spreads, with NBP prices outstripping Zeebrugge and TTF in late 2012.

287 The flow from Germany to the Czech Republic is mostly a transit from Nord Stream via OPAL to Gazelle, back into Germany via Waidhaus. However, there is also a growing tendency to commercially flow gas into the Czech Republic.

288 Source: Platts.

289 As far as flows are concerned, the availability and transferability of stored gas in Germany and the Netherlands is playing an increasing role in terms of cross-EU balancing.

484 Under normal circumstances, NBP's higher level of competition and choice of sources would result in lower prices there than on Continental hubs, so that Zeebrugge and other North Western hubs in mainland Europe would act as followers and cater for residual demand. This is also due to mainland European hubs generally dealing with a greater proportion of oil-indexed, higher-price contracts stimulating imports from the UK in the presence of lower NBP prices. However, as better price formation develops at Continental hubs and ex-forex price convergence becomes a reality between TTF and NBP, NBP versus Continent price differentials can change sign under particular seasonal conditions, including:

- low British storage levels in winter;
- declining UK Continental Shelf production;
- unseasonably cold weather in otherwise temperate Gulf Stream regions; and
- lower LNG deliveries to the UK.

485 As a result, mainland European gas may be imported into the UK both in winter and summer, although overall yearly values for 2012 still pointed to the UK as a net gas exporter.

486 The British, Belgian and Dutch energy regulators have recently finalised a study on the responsiveness of IUK and BBL to price differentials between the relevant regional hubs – this study is described below.

#### iv. A significant reduction in LNG deliveries to Europe

487 There was a notable reduction (26%) in European LNG flows in 2012. The presence of European incumbents tied up by long-term agreements and a very attractive market in East Asia have driven LNG away from European shores. More price-responsive pipeline deliveries to North-West Europe from Norway and the simultaneous activation of Nord Stream from Russia, coupled with environmental concerns about the building of new LNG terminals – especially in the Mediterranean region – have also contributed to LNG's decline, in addition to global price differentials with Japan and dwindling demand in the Iberian and Italian peninsulas. To substitute for LNG imports, certain cross-border IPs (for example, Spanish interconnections with France) have seen their utilisation rates increase. A more detailed analysis of LNG trends can be found in the following section.

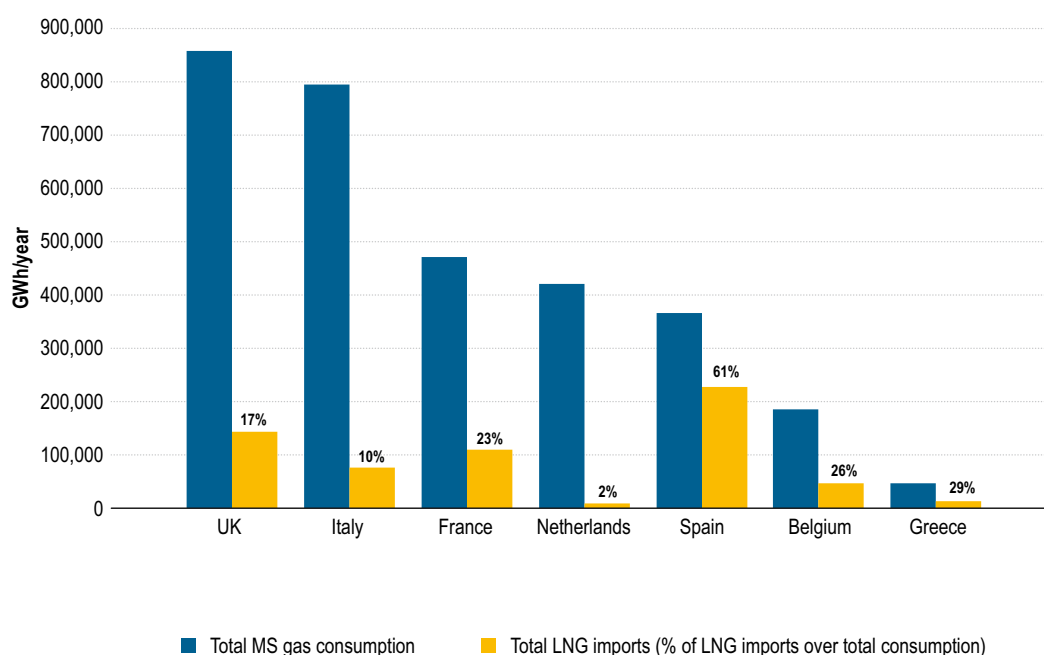
#### 5.4.2 LNG utilisation analysis

488 The share of LNG in total EU gas supplies has been rising since the mid-2000s. However, 2012 saw a significant decrease in LNG imports (around 26%) in comparison with 2011. The overall decrease in gas demand and the diversion of cargoes to Asia due to price differentials were the main reasons for this change. In 2012, LNG represented only 15% of total European gas imports compared with 20% in 2011<sup>290</sup>. Spain represented 32% of total imports in 2012, the UK accounted for 22% and France for 15%<sup>291</sup>. LNG imports, albeit declining, were still substantial in a number of European countries as shown in Figure 74.

290 Source: BP 2013 Statistical Review.

291 Source: Waterborne.

Figure 74: LNG versus total gas consumption in a selection of EU MSs in 2012 – GWh/year



Source: BP Statistical Review 2013 and IEA

489 In terms of LNG versus pipeline imports, Spain was the only major market which imported gas through LNG to a larger extent than through pipelines in 2012<sup>292</sup>.

490 LNG terminals have played an increasingly important role in European gas markets in recent years, by offering an additional gas source in a highly import-dependent region. Indeed, LNG supplies help contribute to security of supply and diversification of origin; they provide more flexibility to the system and allow for greater competition by facilitating arbitrage across markets.

491 Despite this reduction in LNG imports, Europe's regasification and storage capacity increased in 2012, with new facilities coming online and several projects under construction. However, a number of ambitious terminal development plans are being reconsidered in view of declining demand.

492 LNG access capacity<sup>293</sup> is available either in the primary or secondary market. Previously contracted capacity, if not used, must be brought back to the market on a day-ahead basis according to the firm 'use it or lose it' rules contained in the Guidelines on Congestion Management Procedures.

493 The average rate of LNG regasification capacity utilisation in Europe declined in 2012 to 50% of total technical capacity, down from 67% in 2011. This overall decrease was caused by declining deliveries and, in some cases, by the parallel development of new investment which expanded the terminals' overall regasification capacity.

292 With the exception of the UK and the Netherlands, which feature indigenous gas production, the other MSs represented in Figure 74 mostly import the remainder of their gas through pipelines.

293 See Section 5.4.3 on LNG access regimes.

- 494 Capacity availability figures differ across terminals and countries<sup>294</sup>. At Spanish, Portuguese, and Italian terminals there is plenty of available primary capacity. In Spain, on an average yearly basis, 56% of total capacity was available in 2012; this figure was 39% in Italy and 57% in Portugal<sup>295</sup>. In other MSs, at all of the TPA-exempted terminals<sup>296</sup> and some of the regulated ones (e.g. those in Belgium and France), most capacity was fully booked through long-term contracts<sup>297</sup>. Nonetheless, as indicated in the 2013 CEER Status Review<sup>298</sup>, utilisation values as a percentage of contracted capacity are markedly higher at those terminals with smaller overall shares of total pre-booked technical capacity, which might signal capacity hoarding at other terminals.
- 495 The particular supply role played by LNG in each country, shipper contract obligations, and the nature and density of transmission infrastructure help explain the different capacity utilisation figures observed on a country-by-country basis.

### 5.4.3 Gross welfare losses and flows against price differentials

- 496 In Section 5.2.2, the extent of price convergence at main European hubs was presented. The liquidity of most European hubs is still limited (see Section 5.2.3) and considerable volumes are still delivered through bilateral, long-term contracts.
- 497 Based on import prices, it is possible to infer that the level of (undisclosed) prices in long-term contracts is quite diverse across Europe, reflecting different degrees of bargaining power. Several MSs are still dependent on either a single or very few gas suppliers, due to network limitations and/or lack of integration with the rest of Europe, while others have access to wider gas sources. The lower the ability to switch supplier, the more likely it is that the prices paid will reflect a premium. In addition, the dependence on a single monopolistic gas supplier can also lead to potential interruptions, which in winter can have a consumer impact going well beyond the price effect.
- 498 This subsection focuses on the absence of flows between some MSs despite significant differences in gas import prices, and the phenomenon of flows against price differentials. An assessment of the gross welfare impact across the EU-25 is performed.
- 499 During 2012, six MSs out of 25 with a gas supply system were still relying on a single gas supplier, and five of them had no more than two suppliers (Figure 75).

294 See CEER Status Review and evaluation of access regimes at LNG terminals in the EU: [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Gas/Tab3/C12-%20LNG-15-03\\_Acces%20at%20LNG%20Terminals\\_13032013\\_final\\_published.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Gas/Tab3/C12-%20LNG-15-03_Acces%20at%20LNG%20Terminals_13032013_final_published.pdf)

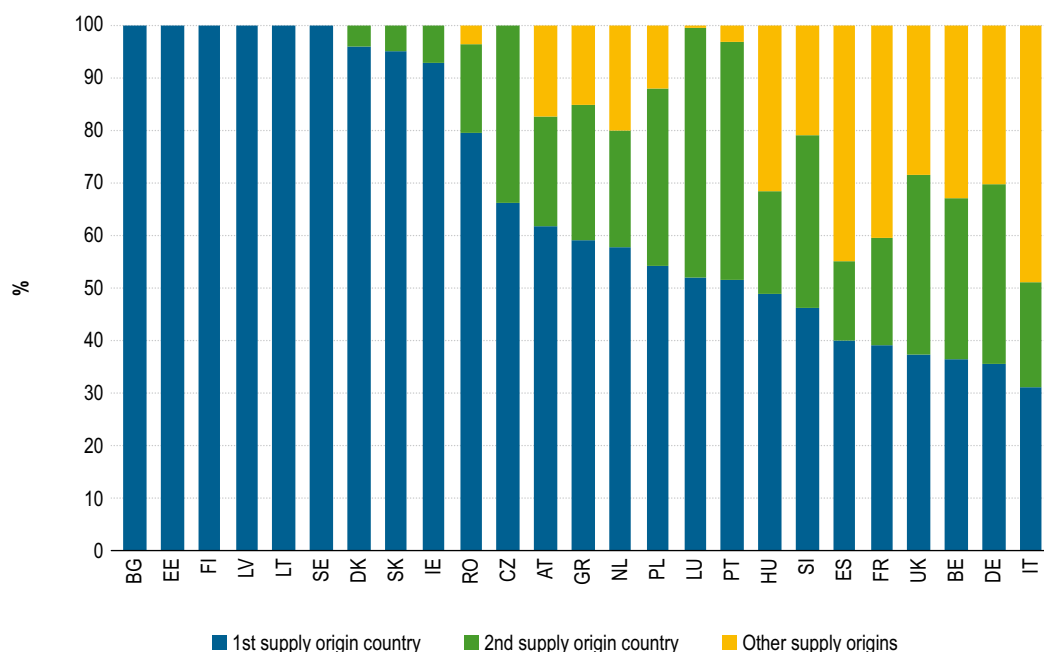
295 See GIE Transparency template: <http://www.gie.eu/index.php/maps-data/gle-transparency-template>

296 Those in GB, the Netherlands, and – partially – Italy. See Section 5.4.3 on LNG access regimes.

297 The only way for newcomers to access these terminals will then be through the secondary market. In those MSs featuring low available primary capacity, but substantial amounts of capacity offered on secondary markets, hoarding cannot be inferred easily. France seems to be a case in point.

298 See: [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Gas/Tab3/C12-%20LNG-15-03\\_Acces%20at%20LNG%20Terminals\\_13032013\\_final\\_published.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Gas/Tab3/C12-%20LNG-15-03_Acces%20at%20LNG%20Terminals_13032013_final_published.pdf)

Figure 75: Estimated market share of the main natural gas supplier(s) – 2012



Source: ACER/CEER, BP Statistical Report 2013, Eurostat, and CEER National Indicators.

Note: Transit gas is not accounted for. Indigenous production is taken into account as independent supply.

- 500 In 2012, Estonia, Finland, Lithuania, Latvia, and Bulgaria were still highly dependent on Russian supplies. These countries lack relevant transmission connections to Western European countries and have no LNG import facilities. Sweden and Denmark also showed high dependence. Fewer than 5% of households are connected to the grid in these MSs (Figure 44). These MSs tend to face relatively higher first-sale price premia.
- 501 In Romania, the dependence on one or a few suppliers is partially limited by the fact that indigenous gas production makes up a relevant share of the country's overall consumption. However, indigenous gas is sold domestically at significantly lower prices (regulated by the government) than NWE benchmarks and cross-border trading is not taking place, both because of a lack of infrastructure and incomplete compliance with the 3<sup>rd</sup> Package<sup>299</sup>.
- 502 Slovakia and the Czech Republic also featured strong dependence on Russian gas.
- 503 Italy, Germany, Belgium, the United Kingdom, France, and Spain have the highest levels of gas supplier diversification, with LNG playing a relevant role in all of them except for Germany.

299 In 2011, the Romanian government introduced a temporary ban on indigenous gas exports for the duration of the economic crisis. Following an infringement procedure launched by the European Commission in November 2012, the measure was repealed in March 2013. Nevertheless, for the time being, there are only virtual exports, as for physical ones considerable infrastructure investment would be needed (there are separate Russian transit flows to Bulgaria, arguably infringing the 3<sup>rd</sup> Package).



Figure 76: The EU-27 transmission capacity map – May 2012



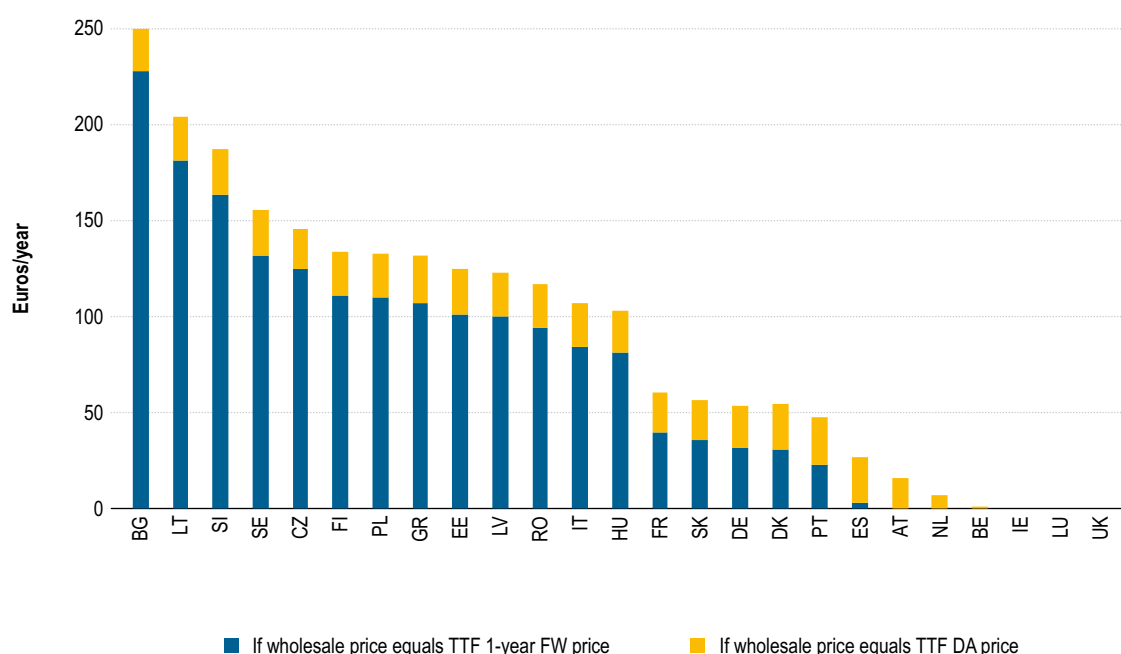
Source: ENTSOG

- 504 The lack of adequate cross-border transmission infrastructure (including LNG terminals) is a major barrier to EU market integration in several peripheral MSs, creating what is commonly referred to as 'energy islands'. Supply-side constraints were the main drivers of wholesale price differences across the EU in 2012.
- 505 In 2012, the estimated annual gross welfare loss in Europe (the EU-25) due to the lack of cross border infrastructure, cross border capacity hoarding, LTC (oil-indexed) supply contracts and a lack of wholesale market liquidity was estimated by the Agency at 11 to 18 billion euros<sup>300</sup>.

300 Using as reference the hub with the average lowest spot prices in 2012 (TTF). ACER estimate based on: TTF day-ahead and 1-year forward prices (benchmarks); individual countries' import prices (Eurostat – COMEXT); and consumption of imported gas in each country (Eurostat). The reference price range reflects different hedging possibilities (from day-ahead to one year forward). These estimates do not take into account transportation cost or the availability of import capacity. Estimates consist solely of an assessment of the potential savings that could be achieved if all wholesale markets in the EU had similar liquidity and competition levels, and thus prices, as TTF does.

- 506 The gross welfare loss<sup>301</sup> per household consumer is the highest in Bulgaria, Latvia, Slovenia, Sweden, the Czech Republic, Finland, Poland, Greece, and Estonia. In these countries, the loss can be estimated at between 3.1 and 3.6 billion euro/year, the equivalent of 20% to 27% of the overall gross welfare loss<sup>302</sup>.
- 507 In 2012 the gross welfare loss per typical household consumer<sup>303</sup> in all of these countries was above 100 euro/year (Figure 77). In Bulgaria, it was more than 200 euros/year.

Figure 77: Gross welfare loss per year per typical household consumer due to a lack of wholesale and network integration in the EU-27 – 2012 (euros/year)



Source: ACER analysis based on COMEXT (Eurostat) and Platts

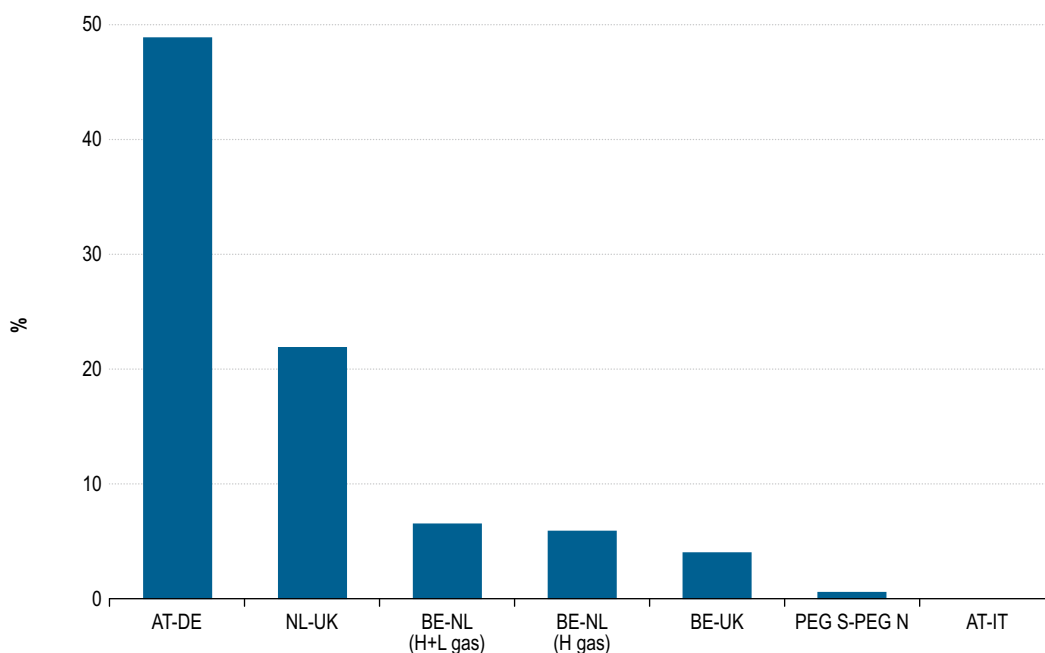
301 The welfare loss is 'gross' in that it does not take into account the investment needed to reduce (at least, some of) the supply and demand side constraints. The gross welfare loss is the difference between the average wholesale price in any given MS in 2012 and the average reference price in Europe, multiplied by net consumption in that MS, on a per-household basis. This amount was calculated using average EU overall household consumption, estimated at 15,000 kWh/year. The following criterion was used to determine the reference price for the welfare calculations: a (continental) European market with fewer demand and supply constraints and greater levels of liquidity. The TTF price was then selected as reference (it is correlated with NBP and ZEE). The fact that wholesale prices are being benchmarked against TTF does not mean that, for wholesale price convergence to happen, gas has to physically flow from TTF. Gas can flow from anywhere (piped or regasified), e.g. Russia, Norway, the Netherlands, the UK, Algeria, Qatar, Nigeria, Libya, Trinidad/Tobago or Egypt. The relevant transportation costs in this analysis would be those from the gas field of origin to destination (not necessarily those from the Netherlands to the relevant MS). As a consequence, for some MSs transportation costs can be even lower than those reflected in TTF prices. The gross welfare calculation assumes that, once demand/supply constraints are eliminated, wholesale prices will tend to converge to a level equivalent to one of the most liquid European hubs. According to a recent study funded by the European Commission ('Benefits of an integrated European energy market' – 20 July 2013, Booz and Co., see footnote 94), reducing demand and supply constraints can lead to a price equilibrium below TTF spot. For the purpose of this MMR, the Agency used a more conservative approach and estimated the price equilibrium at or around TTF spot.

302 Gross welfare loss estimates by MS: Finland – 286 to 345 million euros; Estonia – 44 to 54 million euros; Latvia – 105 to 128 million euros; Lithuania – 415 to 469 million euros; Bulgaria – 418 to 461 million euros; Slovakia – 169 to 262 million euros; the Czech Republic – 723 to 845 million euros; and Romania – 905 to 1,128 million euros.

303 Assuming a consumption profile of 15,000kWh/year.

- 508 In Italy, gas import prices were higher than reference day-ahead and forward prices in 2012, implying gross welfare losses of between 4.5 and 5.7 billion euros/year. Existing contractual arrangements (either LTCs or long-term capacity or storage bookings) might explain part of the welfare loss in this MS.
- 509 Another indication that LTC arrangements may be influencing gas flows, making them less responsive to short-term (day-ahead) price differentials between hubs, is seen when considering flows against price differentials.
- 510 Not only did gas fail to flow (on a number of occasions) from the country with lower wholesale prices to the country with higher prices, as should be expected in the absence of barriers to the internal market, but in both 2011 and 2012<sup>304</sup> gas flowed against the price differential<sup>305</sup> on a significant number of days (Figure 78).

Figure 78: Percentage of days when gas flowed against price differentials at specific hubs – 2011 and 2012 (%)



Source: EC Quarterly Reports on European Gas Markets

304 This analysis covers both 2011 and 2012, because the data provided were on a biannual basis.

305 This subsection not only draws on DG ENER's Quarterly Reports, but also on specific studies performed by DG ENER's Statistical Unit (A1).

- 511 In particular, at Austrian-German cross-border IPs over the last two years, gas has been flowing against the DE-AT price differential, i.e. from the more expensive to the less expensive country, for around 50% of the time. This high value indicates that flows are still dominated by LTCs rather than by hub price fundamentals. At the Netherlands/United Kingdom 'border point' (BBL), counter-price differential flows have frequently been observed over the last two years. Merging zones and hubs could increase liquidity and promote a more integrated internal market by limiting the problem represented by gas flows going against price differentials. This should be a self-reinforcing mechanism, as the development of hub trading is likely to trigger the revision of take-or-pay clauses in LTCs (if companies with LTCs lose volumes to companies being supplied at the hub, they will have to renegotiate their take-or-pay clauses so that their LTCs can be sustained in the long term).
- 512 BBL flows came under scrutiny in 2012, when the British, Dutch and Belgian energy regulators investigated BBL's unresponsiveness to price differentials between NBP and TTF. The three regulators also investigated price responsiveness at the Great Britain-Belgium interconnector (IUK).
- 513 As a general comment, hub price spreads are not sufficiently powerful signals to completely prevent flows against price differentials, due to existing LTC obligations. The persistence (albeit decreasing) of oil-indexed, take-or-pay contracts, combined with seasonal contractual congestion, is still a major issue impacting the 'rationality' of cross-border gas flows and, more generally, the possibility of achieving the objective of a well-functioning internal energy market by 2014. In addition to LTCs, flows against price differentials may also result from insufficient liquidity, lack of transparency in price formation, barriers to obtaining short-term capacity, technical issues (such as outages due to either planned or unplanned maintenance) and the possibility that total cross-border transportation charges might sometimes outweigh the cross-hub price differential.
- 514 In 2012, full price responsiveness of cross-border gas flows throughout the EU was still hindered by a number of factors:
- a lack of adequate gas transportation infrastructure (flexible cross-border pipeline capacity and LNG terminals) in specific MSs, namely: Estonia, Finland, Lithuania, Latvia, Bulgaria, Romania, Slovakia, and the Czech Republic;
  - a lack of wholesale market transparency: in most wholesale markets, shippers do not have stable and robust price signals, hampering their ability to make efficient trading decisions; and
  - long-term commitments, cross-border capacity reservations and storage reservations. Barriers to access short-term capacity on a regular basis in the direction opposite to the main flow are still relevant hurdles.

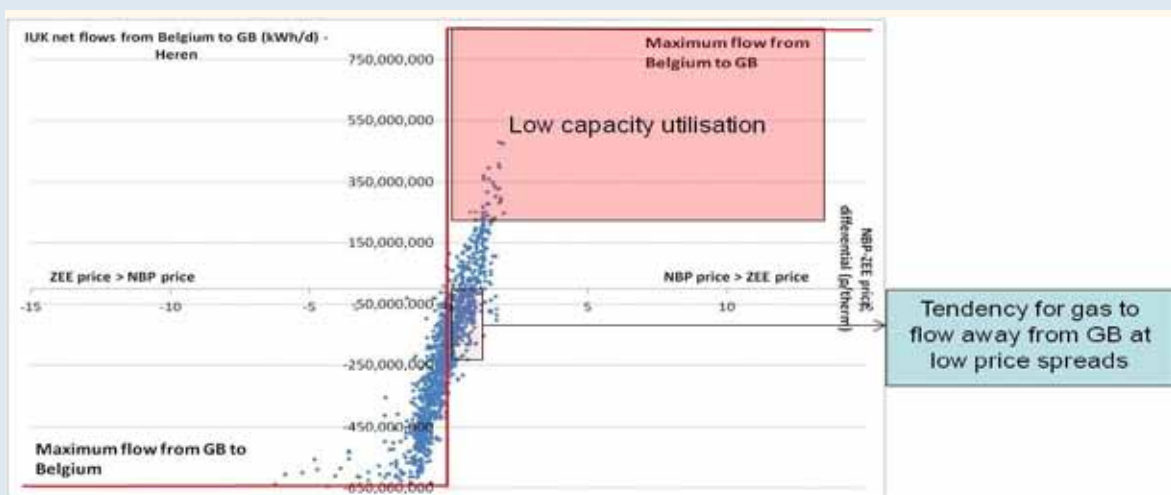
### Case Study 8: The efficiency of flows on the gas interconnectors between Great Britain and Belgium (IUK), and between Great Britain and the Netherlands (BBL)

The British, Belgian and Dutch NRAs examined whether or not gas trades between Great Britain and Belgian and Dutch hubs (i.e. between NBP<sup>306</sup> and ZEE and TTF hubs, respectively) are efficient. Cross-border trades are economically efficient if gas flows from the lower-priced to the higher-priced market. If this is not the case and gas flows in the opposite direction, one observes flows against price differentials (FAPDs). Where FAPDs are observed, the role of interconnectors in terms of security of supply is undermined, since FAPDs may result in additional gas being exported from the market in which price signals suggest gas should actually flow to. This case study assesses gas flow efficiency in a number of different ways:

- based purely on the price spread between the trading hubs;
- for IUK (which is bi-directional), taking into account the transportation charges in Great Britain which shippers have to pay when the gas they wish to move is not physically located (yet) at either trading hub; and
- looking at FAPDs only where the price spread between hubs exceeds the charges necessary to transport gas between them.

An additional measure of efficiency is capacity utilisation, and this is shown for both BBL and IUK. In all cases, the analysis is for the period January 2009 to June 2012.

Figure i: Pure hub price spread and flows on IUK (both in this and in all following charts, flows are in kWh per day and price spreads are in pence per therm)



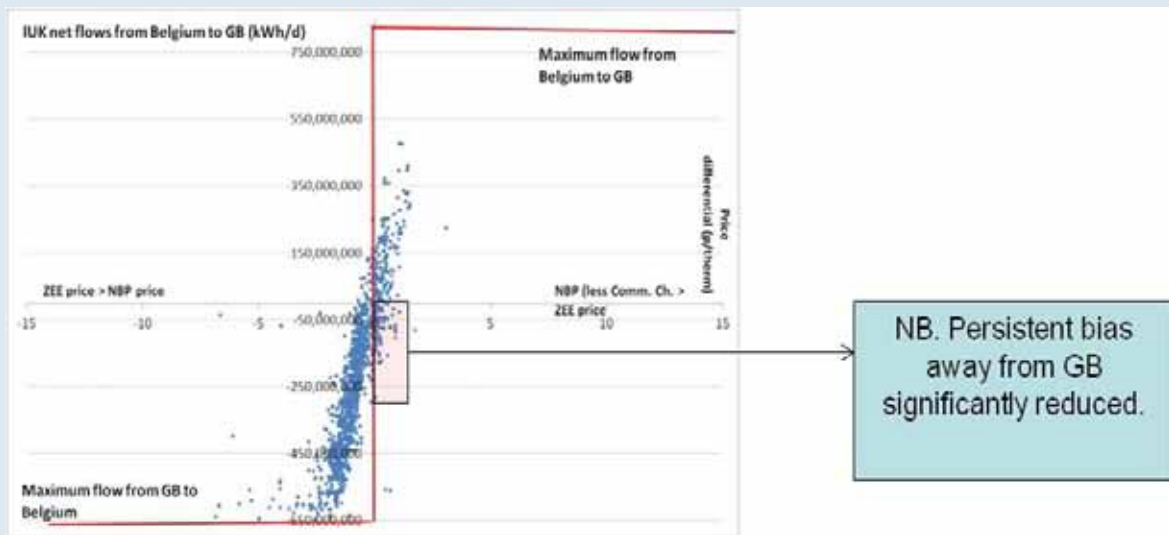
Source: ACM, CREG, Ofgem

306 NBP stands for National Balancing Point and is the virtual trading hub in GB. ZEE is short for Zeebrugge, which is the trading point between IUK and the Belgian entry/exit system. TTF stands for Title Transfer Facility, which is the virtual trading hub in the Netherlands.

Each blue dot in Figure i displays the net physical flows between Great Britain and Zeebrugge on one day in the period analysed. The horizontal axis shows the difference between day-ahead prices at NBP and ZEE, all converted to GB pence/therm. The vertical axis indicates the flow in kWh/day: any flows above zero show gas imports from Belgium into Great Britain. Any below-zero flows represent exports from Great Britain to Belgium. The red line depicts the theoretically efficient flow using day-ahead prices as an indication of the short-term value of gas (assuming no marginal cost of transportation), i.e. that if there is a price differential, then capacity should be fully utilised<sup>307</sup>. The graph indicates that there is relatively low utilisation in the direction from Belgium to Great Britain; this is discussed further below. The data also suggest a bias to flow gas from Great Britain to Belgium even when the price in Great Britain is higher (this only occurs when the price difference is small). The data indicate FAPDs on 26% of days.

To explore the impact of charges on the possible bias in flows, we also looked at IUK’s efficiency from the position of a gas shipper with gas at neither hub (but at Bacton Beach). This is a particularly relevant piece of analysis, because gas is brought into Bacton from North Sea production fields, and shippers sometimes bring gas through BBL to Bacton, and then export it via IUK to Belgium. The marginal charges associated with bringing gas to NBP are different from those bringing gas into Bacton for immediate export to Belgium through IUK. In the latter case, market participants face a lower commodity charge, known as the ‘short-haul’ tariff (because they use only a small fraction of the British network).

Figure ii: Marginal charges when gas is at neither trading hub, but at Bacton Beach



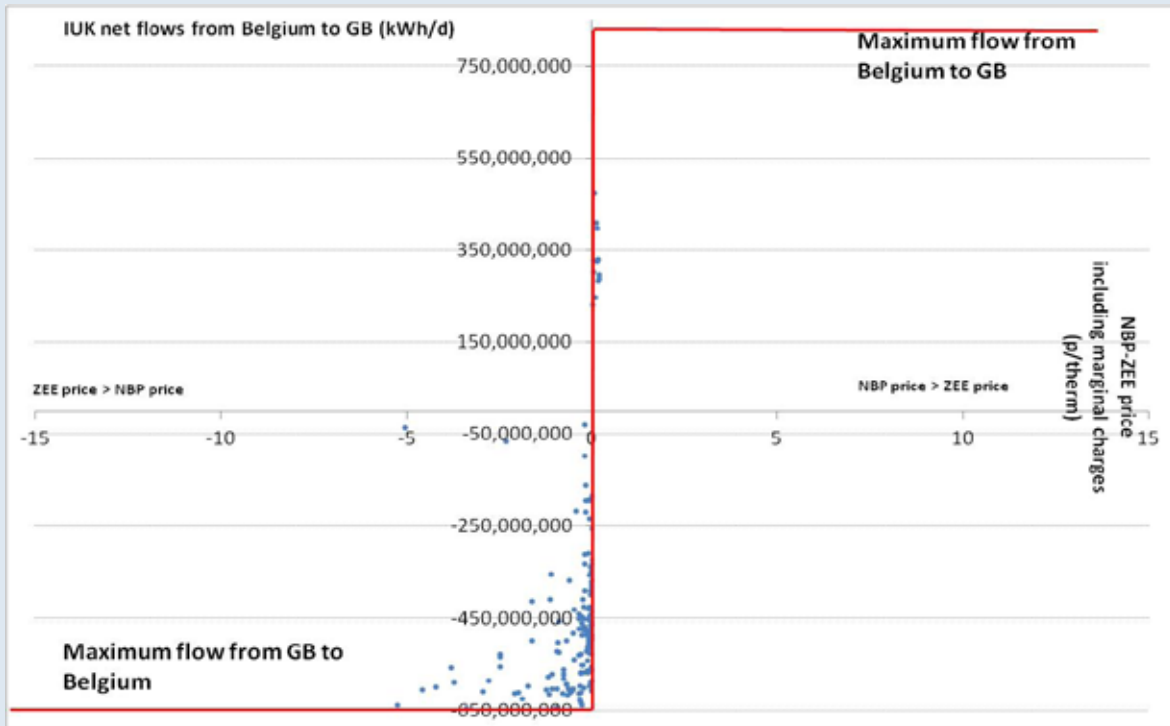
Source: ACM, CREG, Ofgem

The graph in Figure ii demonstrates that the tendency for gas to flow away from NBP was the economically logical response on IUK to avoid entry commodity charges in Great Britain. In Figure ii, FAPDs fall to 9%.

307 The use of day-ahead prices means that changes in the value of gas during the day are not captured. However, day-ahead prices are still the best approximation for the short-term value of gas.

The final test we look at in Figure iii shows IUK flows excluding those days where the marginal transportation charges of moving gas between the Belgian and British trading hubs are greater than the NBP/ZEE price spread. This test is meant to explore the degree to which flows against price differentials take place in response to transportation charges as opposed to the degree of price convergence.

Figure iii: Flows after excluding days when transportation charges exceed the price spread between hubs



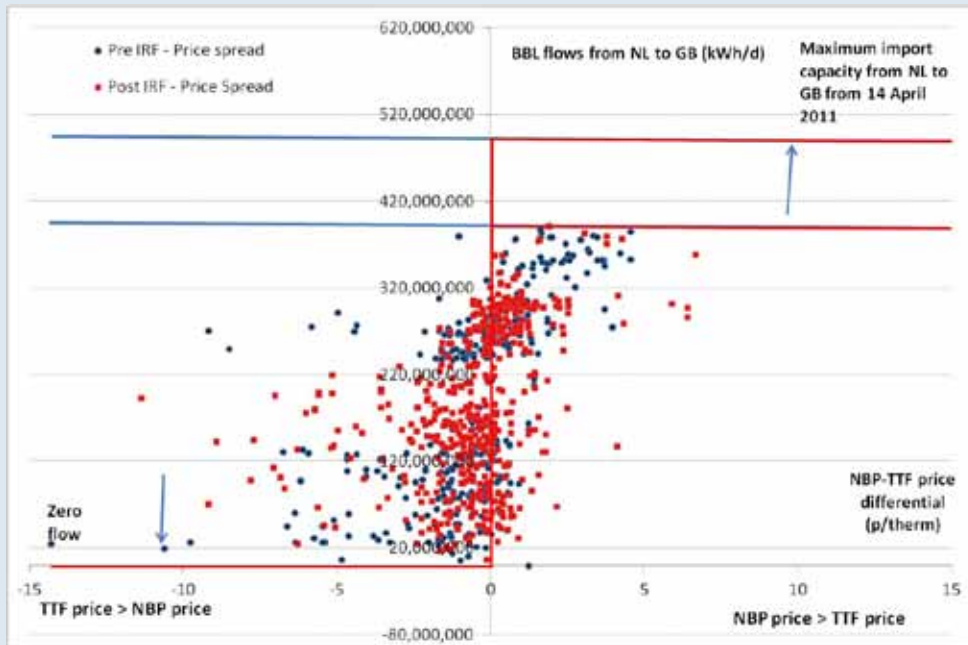
Source: ACM, CREG, Ofgem

After this correction, there were virtually no FAPDs left on IUK. It is also instructive to note that the NBP/ZEE markets converged during the period under consideration, such that transportation charges exceeded the hub spread on 83% of days.

### BBL

The same analysis was conducted for the BBL interconnector between the Netherlands and Great Britain. Figure iv applies the same approach as Figure iii, except that it shows flows between the Netherlands and Great Britain against the price differential between NBP and TTF (there are no negative flows here, because BBL does not have a physically firm capability to export back to the Netherlands). Note that BBL’s maximum capacity increased on 14 April 2011: this is why there are two lines indicating maximum flow. Flows to the left of the vertical red line indicate flows to Great Britain, when the British price is lower than the TTF price. FAPDs occurred on 60% of days.

Figure iv: Gas flows on BBL between the Netherlands and GB



Source: ACM, CREG, Ofgem

Figure v below shows those days when the price spread between NBP and TTF exceeded the cost of flowing gas between the two markets. On those days when the market spread exceeded marginal charges to flow gas on BBL between Great Britain and the Netherlands, there were still FAPDs 54% of the time. This means that the likely causes of flow inefficiency are due to additional factors and not only to transportation costs.

Figure v: BBL FAPDs when the price spread exceeded transportation costs



Source: ACM, CREG, Ofgem



## Summary

Flows through IUK appear to be price-responsive, but the British transmission charging regime – and, in particular, the commodity charge – gives rise to a disincentive to flow gas to NBP when price spreads are low. BBL is less price-responsive, even when only considering occasions where transportation charges are lower than the hub price differential.

The full analysis described in this case study, as well as the causes of flow distortions and the measures proposed by the three regulators to aid market operation, can be found in the following joint publication:

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=225&refer=Europe>

## 5.5 Cross-border network access

### 5.5.1 IP access regimes

515 The CAM Network Code introduces harmonised allocation procedures and standardised product duration at cross-border IPs. Its underlying rationale is to facilitate a competitive, integrated and stable capacity contracting framework aimed at supporting the development of competition and EU-wide market integration.

516 The main aims of the CAM Network Code are:

- to define an EU-wide harmonised capacity allocation mechanism based on auctions;
- to establish a precise allocation sequence of capacity products; and
- to introduce a set of standardised, bundled cross-border capacity products at virtual points across the EU.

517 Employing the same (market-based) capacity allocation procedures at all IPs should provide a fairer and more competitive framework and remove uncertainties over timing and processes. A clear capacity allocation framework should also provide correct investment signals to market players. With the implementation of the Network Code, hub liquidity should be enhanced and gas trading should become easier, especially following the introduction of bundled capacity products at border points.

518 In 2012, gas capacity allocation mechanisms still varied widely across the EU, with first come, first served (FCFS) being the predominant procedure. This procedure can result in suboptimal capacity allocation, since it does not generally reflect actual willingness to pay. However, several countries are already implementing capacity auctions and/or developing pilot projects as a means to test the provisions contained in the CAM Network Code<sup>308</sup>.

519 In 2012, capacity products also differed with regard to duration, firmness, simplicity of allocation and on whether bundled products were available at borders. Table 15<sup>309</sup> summarises the main aspects of capacity allocation mechanisms as observed throughout the EU in 2012.

520 The information reported in the following tables is an Agency elaboration of the KEMA/COWI (2013) entry/exit study findings for the European Commission and of the answers to the CEER CMP Questionnaire (2013).

308 The Agency and ENTSOG, in cooperation with NRAs and TSOs, set up a roadmap for the early implementation of the CAM Network Code via pilot projects (CAM Roadmap), testing the early implementation by TSOs of the provisions contained in the CAM Network Code before it becomes binding in November 2015, and promoting experience sharing and the exchange of lessons learned throughout the process. The CAM Roadmap document is available on the ACER website at: [http://www.acer.europa.eu/Gas/Regional\\_%20Initiatives/CAM\\_roadmap/Pages/default.aspx](http://www.acer.europa.eu/Gas/Regional_%20Initiatives/CAM_roadmap/Pages/default.aspx)

309 The Table reflects the situation at the end of 2012. For certain countries which implemented relevant modifications in S1/2013, the data in the Table might also reflect the new situation, as observable in early 2013. See more detailed comments in Annex 3: Tables summarising gas access regimes in the EU-27 – Footnotes.

Table 15: CAM regimes in the EU-25 (see table footnotes in Annex 4)

Country	Common Allocation Mechanism for firm existing capacity				Bundled products at some IPs		Virtual interconnection Point(s) (VIP)		Product duration and type						Reservation of Capacity		Comments by NRAs (e.g. on current/expected changes)
	Auction	FCFS	OSP	N A / other	Yes	No	Yes	No	1 year	6 months	3 months	1 month	Day ahead	Within day	Short term (1 year) %	Number of years if > 1 and percentage	
Austria	>				>		>		>	>	>	>	>	>	10%	4 / 35%	
Belgium	>				>		>	5% [11]	>	>	>	>	>	>	40%		[12]
Bulgaria		>			>		>		>	>	>	>	>	>		[1]	
Czech Republic		>	>	[19]	>		>		>	>	>	>	>	>	10%	5 / 35%	
Denmark	>				>		>		>	>	>	>	>	>	10%		
Estonia		>			>		>		>	>	>	>	>	>			
Finland		>		[2]	>		>		>	>	>	>	>	>			
France		>			>	30%	[4]		>	>	>	>	>	>	20%		[3]
Germany	>	[5]			>		>	[16]	>	>	>	>	>	>		2 / 20% - 4 / 15%	
Greece		>			>		>		>	>	>	>	>	>	10%		
Hungary	>	[14]		[9]	>		>		>	>	>	>	>	>	10%		[20]
Ireland		>			>		>		>	>	>	>	>	>			
Italy		>			>		>		>	>	>	>	>	>		[6]	
Latvia				[7]	>		>		>	>	>	>	>	>	n.a		
Lithuania		>			>		>		>	>	>	>	>	>			
Luxembourg		>			>		>		>	>	>	>	>	>		3 (6) / 60% (20%)	
Netherlands	>				>		>		>	>	>	>	>	>	[8]		
Poland	>				>		>		>	>	>	>	>	>	10%		[13]
Portugal		>			>		>		>	>	>	>	>	>			[16], [17]
Romania		>			>		>		>	>	>	>	>	>		1 / 100%	[15]
Slovakia		>			>		>		>	>	>	>	>	>			
Slovenia		>			>		>		>	>	>	>	>	>			
Spain	>	[9]		[9]	>		>		>	>	>	>	>	>		2 / 25%	
Sweden					>		>		>	>	>	>	>	>			
United Kingdom	>				>		>		>	>	>	>	>	>			

Source: Agency analysis based on the KEMA/COWI (2013) study on entry/exit regimes and NRA data

- 521 Complementary to the CAM Network Code, the Guidelines on CMP, implemented on 1 October 2013, set harmonised and non-discriminatory rules governing capacity hoarding detection and the management of congestion. The ambition of these Guidelines is to create a transparent regulatory framework increasing the availability of capacity and enabling the efficient reallocation of unused capacity through the application of firm use-it-or-lose-it (UIOLI) and oversubscription plus buy-back mechanisms. As a result, the share of unfulfilled capacity requests at IPs should be reduced, thus promoting a more efficient, liquid, and open internal gas market.
- 522 The CMP mechanisms in use in MSs at the end of 2012 are summarised in Table 16. At the end of 2012, long-term UIOLI mechanisms were more prevalent than short-term ones, so the efforts to accommodate the new CMP provisions will focus on the second type of requirement. Although a majority of MSs indicate that organised secondary capacity markets have already been implemented, only a few countries have liquid organised capacity markets, whereas in others these markets are not organised, although the possibility of capacity trading does exist on a bilateral basis. In this latter case, and for those countries not yet having organised markets, some developments are expected in the near future. Significant efforts have been made during 2013 for the timely adoption of the new CMP provisions by 1 October 2013.

Table 16: CMP regimes in the EU-25 (2012)

Country	Congestion Management Procedure		Organised Secondary Capacity Market		Oversubscription & Buy-back		Surrender of Capacity		Other Capacity Allocation Mechanism in case of congestion			Comments by NRAs (e.g. on current/expected changes)
	ST UJOL (restriction of renomination rights)	LT UJOL	Yes	No	Yes	No	Yes	No	Auction	OSP	Pro Rata	
Austria	✓	✓	✓			✓		✓				
Belgium		✓	✓			✓		✓			✓	[2]
Bulgaria				✓		✓			✓			
Czech Republic			✓			✓		✓	✓			
Denmark			✓			✓		✓				
Estonia				✓		✓		✓				
Finland				✓		✓		✓				
France		✓	✓			✓		✓	✓	✓	✓	[4]
Germany	✓	✓	✓			✓		✓				
Greece		✓		✓		✓		✓				
Hungary			✓			✓		✓	✓			
Ireland		✓	✓			✓		✓				
Italy	✓	✓	✓			✓		✓		✓	✓	
Latvia				✓		✓		✓				
Lithuania				✓		✓		✓				
Luxembourg		✓	✓			✓		✓			✓	
Netherlands			✓			✓		✓				
Poland		✓		✓		✓		✓	✓	✓		
Portugal				✓		✓		✓	✓			[5]
Romania		✓	✓			✓		✓			✓	
Slovakia			✓			✓		✓			✓	
Slovenia	✓ [3]		✓	✓		✓		✓			✓	
Spain		✓		✓		✓		✓	✓	✓	✓	[1]
Sweden				✓		✓		✓				
United Kingdom	✓		✓			✓		✓				

Source: Agency analysis based on the KEMA/COWI (2013) study on entry/exit regimes and NRA data

## 5.5.2 LNG access regimes

- 523 The access regimes applying to LNG terminals are crucial in ensuring that market participants have fair access to regasification, storage, and capacity slots for LNG injection into the high-pressure grid.
- 524 Access to terminals normally takes place through bundled products, including the unloading of cargoes, the storage of liquefied gas, regasification and post-regasification injection into transmission networks. Additional services can be offered independently by terminals. In order to buy capacity, it is necessary to sign contracts with the LNG System Operator (LSO) and obtain entry access to the relevant TSO network(s).
- 525 Different capacity allocation mechanisms are currently applied across European LNG terminals; FCFS is still the most common one. However, open season procedures are also widely used. On occasion, different capacity allocation mechanisms are used at the same terminal: for instance, to separately allocate short- and long-term capacity and/or primary/secondary capacity<sup>310</sup>.
- 526 A distinguishing aspect of LNG terminal accessibility is whether or not LNG terminals are regulated in terms of third-party access (TPA). In Europe, 19 LNG facilities are located in nine MSs. Fourteen of these are subject to a regulated TPA regime, meaning that their owners are required to open up access and share it with any third party which is granted access rights by the regulatory or licensing authority, under transparent and non-discriminatory conditions. In the remaining five LNG terminals – the UK ones, the Dutch Gate and partially the Rovigo terminal in Italy – an exemption from TPA requirements was granted according to the European legal framework<sup>311</sup>. The implementation of a secondary capacity market and fair anti-hoarding mechanisms are necessary conditions to make exemptions possible, as they oblige primary shippers to make unused capacity available to third parties.
- 527 LNG does not yet fall in the domain of framework guidelines' or network codes' provisions. In particular, there is no requirement for the harmonisation of LNG access regimes throughout Europe. However, a general requirement in favour of open LNG access is included in the 3<sup>rd</sup> Package. The provisions included in European legislation focus on secondary markets and anti-hoarding mechanisms (which may still differ from one terminal to another).
- 528 Commendable initiatives were observed throughout 2012, such as the CEER/GLE Transparency Template<sup>312</sup>, a shared facilitating tool to promote, share and disseminate information about access to European LNG terminals. The above-mentioned CEER study<sup>313</sup> also underlines the importance of short-term slot availability in order to increase the competitive stimulus stemming from LNG and to reduce entry barriers.

310 See CEER Status Review and evaluation of access regimes at LNG terminals in the EU, Annex 3, summarising the capacity allocation and congestion management regulations currently in place in different MSs, as well as the rules for spot cargo unloading. [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Gas/Tab3/C12-%20LNG-15-03\\_Acces%20at%20LNG%20Terminals\\_13032013\\_final\\_published.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Gas/Tab3/C12-%20LNG-15-03_Acces%20at%20LNG%20Terminals_13032013_final_published.pdf)

311 Article 36 of Directive 2009/73/EC.

312 See: <http://www.gie.eu/index.php/maps-data/gle-transparency-template>

313 See: CEER LNG TF study on congestion management procedures and anti-hoarding mechanisms at European LNG terminals, available at: [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Gas/Tab/E10-LNG-11-03b\\_CMP%20in%20LNG\\_%2012\\_Apr\\_2011.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Gas/Tab/E10-LNG-11-03b_CMP%20in%20LNG_%2012_Apr_2011.pdf)

### 5.5.3 Update on balancing regimes

- 529 In October 2012, ENTSOG submitted the Network Code on (Gas) Balancing of Transmission Networks<sup>314</sup>, based on the preceding Agency Framework Guidelines on Balancing. This code aims to harmonise European gas system balancing provisions to enhance gas trading and promote market integration.
- 530 The Network Code establishes a series of requirements aimed at stimulating market-based balancing. For those countries still lacking organised wholesale markets, balancing platforms should be created. The establishment of (however embryonic) trading platforms should enhance liquidity, improve transparency, and provide fair price benchmarks. Network users must be motivated to balance their portfolios on the market, thus reducing direct TSO balancing actions. Imbalance prices must be set, based on trades on exchanges and/or open platforms.
- 531 The Network Code proposes a harmonised nomination scheme across all EU IPs to better coordinate cross-border trading operations. Consistency in terms of the timing of information provision by network operators on shipper positions must be ensured, as well as operational coordination with the Guidelines on CMP and with the CAM Network Code.
- 532 The Network Code determines that balancing positions should be settled, by default, on a daily basis. It also sets out a detailed process to be undertaken by TSOs in order to implement Within Day Obligations (WDOs), if and when the latter are deemed relevant to system management and overall integrity.
- 533 The balancing regimes in use by the EU-25 MSs at the end of 2012 are shown in Table 17. The table shows that several MSs already feature liquid markets – or specific balancing platforms – where shippers and TSOs can trade gas for balancing purposes or perform their balancing actions, respectively. Some other countries are still in the process of implementing balancing platforms, in line with the obligations laid out in the Network Code. Tolerance levels are still widely available, and their potential removal could imply regulatory changes at national level. The level of flexibility for balancing offered in each MS is influenced by the characteristics of the system (some MSs rely more on transmission pipeline capacity, or line pack, whereas others rely on underground or LNG storage for balancing). The adoption of new provisions is expected to be progressively completed during the implementation period of the Network Code, even if the Code already envisages offering more time flexibility, allowing for the adoption of interim measures in those MSs whose balancing systems require deeper modifications.

314 At the time of going to press, the Network Code on Balancing had not been formally adopted.

Table 17: Balancing regime provisions in the EU-25 (see table footnotes in Annex 3)

Country	Number of balancing zones	Balancing period				Can within-day (hourly) obligations be imposed?	Is the DSO part of the balancing zone?	Are there any standardised ST balancing products?	Does the TSO/Market Operator have access to the market/balancing platform?	Imbalance charges		Market price used as reference	Imbalance charge calculation process		Is there a tolerance band?		Linepack availability based on transmission capacity	Comments by NRAs (e.g. on current/expected changes)
		Hourly	Daily	Weekly	Monthly					Yes	No		Offset or mark-up applied as a % of reference price	Fixed imbalance charge/penalty	Yes	No		
Austria	3	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	
Belgium	2	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[17]
Bulgaria	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	
Czech Republic	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[22]
Denmark	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[1]
Estonia	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	
Finland	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[2]
France	3	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	
Germany	2	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	
Greece	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[3]
Hungary	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[4]
Ireland	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[5]
Italy	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[6]
Latvia	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	
Lithuania	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[7]
Luxembourg	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[8]
Netherlands	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[9]
Poland	3	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[10]
Portugal	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[11]
Romania	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[12]
Slovakia	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[13]
Slovenia	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[14]
Spain	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[15]
Sweden	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[16]
United Kingdom	1	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	[16]



### 5.5.4 Update on capacity platforms

- 534 Throughout 2012, an increasing number of European gas TSOs joined forces to start a voluntary implementation project in line with the provisions contained in the CAM Network Code. This project, a capacity allocation platform which started operations in April 2013, is known as PRISMA. As of early May 2013, soon after its establishment, around 300 shippers and 600 users had registered. Although the platform is centred on North-West Europe, considerable interest in it has spread across continental Europe<sup>315</sup>.
- 535 The platform carries out capacity auctions, with capacity denominated in kWh/h. Capacity sold through the platform has been initially low, in part because of higher price convergence across Continental hubs removing arbitrage opportunities. During its debut month, PRISMA managed to sell cross-border, day-ahead firm bundled capacity on a daily basis for the following IPs<sup>316</sup>:
- Belgium to France;
  - Germany to France; and
  - Austria to Italy.
- 536 Unbundled capacity was initially sold across the following borders:
- Belgium to Germany;
  - The Netherlands to Germany;
  - Germany to France;
  - Germany to Denmark and vice versa;
  - Austria to Germany; and
  - Austria to Italy.
- 537 The initially very limited amount of capacity sold was such that the reserve price was never exceeded, so that only one fully bundled product was effectively sold.
- 538 The platform's primary functionalities encompass FCFS, auctions, and the possibility to surrender capacity. PRISMA also envisages the implementation of secondary market functionalities which, subject to consultation and testing, should go live by January 2014.
- 539 TSOs can configure which transaction types can be allowed to be concluded at each IP. The data to be provided by TSOs (credit limits, grid points, balancing groups and the like) are submitted simultaneously to the platform for both primary and secondary functionalities. The platform's software also envisages the possibility for unbundled capacity products of an entry/exit nature to be bundled and sold through the platform if relating to the same IP. Capacity can be fractioned; it can be bought and sold in chunks if desired.
- 540 Until the deal is fully concluded for non-OTC (bilateral) transactions, parties will stay anonymous under the platform's aegis in all secondary market transactions. In fact, parties can stay anonymous even after the capacity deal is concluded, provided the TSOs decide to do so, but the latter possibility will only apply to deals concluded at the regulated transmission tariff.

315 More TSOs are currently discussing whether to join this initiative via a service contract allowing them to use the platform to allocate interconnection capacity.

316 Day-ahead bundled capacity is also offered in the backhaul France-to-Belgium direction. This offer only started on 28 April 2013 because of maintenance work taking place at the beginning of the month.

541 When this report was compiled, the platform operator was still discussing with NRAs and individual TSOs regarding the nature of the information that should be made available to the public. These still being early days, it is premature to reach any conclusion about the future success of this platform. Next year's MMR may draw some preliminary conclusions about how liquid the platform will effectively manage to become.

### 5.5.5 Network access transparency

542 Transparency and fair access to information are indispensable elements for well-functioning gas markets. An adequate level of transparency about network access conditions is necessary to increase competition, minimise entry barriers and diminish asymmetry and costs for market participants.

543 In 2012, the Agency, in cooperation with ENTSOG, developed an analysis of transparency in gas markets<sup>317</sup> by monitoring TSO compliance with the transparency provisions listed in Regulation (EC) No 715/2009.

544 The analysis revealed that, although full compliance had yet to be achieved, a fairly high degree of compliance was observed in the majority of areas: namely, in the description of transmission system and network access conditions, the features of services offered, charges, and contracting clauses.

545 Steps are being taken in those areas where room for improvement remains. This applies in particular to: (i) information 'near(er) real time' concerning actual physical flows; (ii) historic information on capacity, nominations and interruptions; (iii) flexibility and tolerance levels, and (iv) information about secondary markets and balancing regimes. Figure A-1 in Annex 5 summarises the Agency's findings on the accomplishment of individual transparency requirements.

546 Forthcoming further transparency obligations – related to congestion management procedures, capacity allocation, balancing and tariff provisions, as well as to the future process for monitoring network code implementation – will reinforce the need for enhanced transparency tools and more comprehensive websites and platforms. In view of these upcoming requirements, renewed efforts will be needed by TSOs and in particular by ENTSOG. The latter set up a revamped EU-wide central data platform on 1 October 2013.

### 5.5.6 RES network access (biogas)

547 Reduced indigenous production and increasing dependence on external energy imports have raised the political support for biogas over the last few years, albeit to differing extents throughout the EU.

548 Biogas, as a renewable energy source, provides several benefits:

- it is carbon neutral (pending wider lifecycle considerations);
- together with gas from other sources, it can be more easily and cheaply stored than power;
- it decreases import dependence on fossil fuels; and
- the raw materials needed to produce it can usually be stored.

317 See: [http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Publication/ACER\\_Report\\_Gas\\_Transparency\\_Monitoring%209%20April%202013.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Report_Gas_Transparency_Monitoring%209%20April%202013.pdf)

549 Biogas added to the natural gas grid, especially at higher pressures, is beneficial in terms of general gas-to-power economics, considering it can be used to offset and balance other, less foreseeable renewable sources such as wind and solar. Local biogas injections also limit grid expansion requirements, other things being equal, thus saving money and sparing the environment in terms of incremental capacity. It also limits the imports of fossil fuels and electricity, and it improves the utilisation rate of the domestic gas grid. Higher gas grid utilisation, other things being equal, also lowers network charges for transmission and distribution, as fixed costs are spread over a larger volume of throughput. Finally, biogas widens the amount of gas choice available domestically, thus boosting domestic production and the import substitution of gas itself, not only of derived fuels such as electricity.

### Case Study 9: Network access for biogas in the German gas sector

Germany is one of the leading European countries in biogas. Based on information provided by the German energy regulator, it is possible to specify the conditions under which biogas has evolved in Germany with respect to the following aspects:

- sharing of investment (connection) costs;
- contracts for grid connection (biogas in Germany can be injected into the grid, and not just spent locally);
- availability and roadmap;
- priority access;
- quality standards; and
- power-to-gas issues.

German legislation mandates a feed-in target for biogas of 6bn cubic metres by 2020 and of 10bn cubic metres by 2030. Connection is envisaged to be jointly planned by the applicant and the interested TSO/DSO. According to section 33 (1) of the German Gas Ordinance, connection investment costs must be incurred jointly by the connecting party and the network operator, with the latter bearing three quarters of the total. The connecting party is further protected by an absolute cap of EUR 250,000 in terms of cost coverage. Legislation also provides for rules regarding metering and pressure-boosting equipment.

The practical experience with biogas connection and injection, following the enactment of secondary legislation on the matter, has been mixed. The German regulator witnessed considerable delays in 2012 before connection contracts could be fruitfully concluded. The need for planning connection steps jointly between applicants and network operators might be one of the causes of the observed delays.

Another important aspect of the German case, which is not found in many other countries, is priority access. According to the law, the TSO can refuse biogas access only if technically impossible or economically unreasonable (as discussed in last year's MMR). Technical impossibility can be demonstrated only in extreme cases. Therefore, the main issue is economic reasonableness. This principle, not fully defined in the law, could potentially give rise to long disputes between connecting

parties and network operators.

Germany is actively planning the use of biogas as a primary domestic energy source, also considering that the government announced the country's complete abandonment of nuclear power generation by 2022. It is the government's intention to replace at least part of the country's nuclear capacity by renewable energy sources, including power and heat produced from biogas, either directly or through grid injection.

Another potential technical problem regarding transport capacity is reverse feed-in of conventional gas into a biogas installation.

The German Gas Ordinance grants biogas network access priority over other forms of injected gas, irrespective of pressure (but pressure must be made fully uniform and compatible with piped gas before grid injection). Quality of supply must also be guaranteed.

Open issues remain regarding gas-to-power, especially when it comes to sharing gas connection costs across the two sectors, assuming better connections and more gas flowing through the domestic gas grid also benefit the power sector and not only the gas industry per se. At the moment, gas-to-power connection costs are mainly borne by gas customers. This remains an open discussion point between governments, regulators, and industry.

## Case Study 10: Network access for biogas in GB

The British energy regulator Ofgem established a review group for Energy Market Issues for Biomethane Projects (EMIB)<sup>318</sup> in 2011, to provide a forum for informed debate on the potential barriers to the commercial development of biomethane projects within the energy sector, and to analyse the appropriate means of addressing such barriers. The EMIB Group Report in March 2012<sup>319</sup> set out the group's key findings, as well as the actions required to address any remaining barriers. Some issues still being addressed relate to gas quality and safety issues.

Ofgem recently completed its first gas distribution price control review (RIIO-GD1), in which the regulator addressed two key barriers to entry for biogas<sup>320</sup> connections: the provision of adequate information to potential entrants (particularly relating to local network constraints and associated costs) and the current connection charging regime<sup>321</sup>. As a result, Ofgem introduced a licence obligation for gas distribution network companies (GDNs) to produce a common industry 'Distributed Gas Connections Guide' and implemented requirements to set out a distributed gas information strategy relating to distributed gas connections. Ofgem also advised GDNs to review their connection charging methodologies for entry customers and to propose changes to the Uniform Network Code (UNC) if there were an objective rationale for doing so.

### Connection charging for biomethane entry

The current, common connection policy for gas distribution in the United Kingdom is based on a 'deep' connection approach, with those connecting to the network required to meet the full cost of all the work necessary to support that connection. This includes connection costs originating both at the connection point itself and deeper within the network, to the extent that investment is necessary to meet the requirements specified by the connecting party.

This policy requires the biomethane connectee to meet the costs associated with developing the entry facility and those associated with gas input flow rate and pressure control management. In terms of deeper, within-network, investment, the only potential cost is when there is insufficient downstream demand to accommodate the planned biomethane flow into the distribution network. In these cases, it may be possible for the planned flow to be accepted following investment in the network, such as compression, to support a change in flow patterns, with gas being moved upstream. Industry stakeholders through the EMIB group accepted that, at present, it would be appropriate for any such investment to be funded by those benefiting from the change (that is, the connectee/s). It concluded that a deep connection policy remains appropriate at the present time and is not an undue barrier to entry.

318 See: <http://www.gasgovernance.co.uk/emib>

319 See: <http://www.gasgovernance.co.uk/sites/default/files/EMIB%20Report%20V0.1.pdf>

320 The terms 'biogas' and 'biomethane' are used interchangeably in this section. Biogas is a renewable source of gas produced from the breakdown of organic matter via anaerobic digestion. Biogas has a variety of applications, but is predominantly used in GB to generate electricity. To inject gas into the grid, the former must first be converted into biomethane by removing the oxygen. Distributed gas refers to non-renewable sources of gas (such as shale gas), as well as renewable sources (biomethane).

321 See: <https://www.ofgem.gov.uk/ofgem-publications/48206/gd1-initial-proposals-overview-27july12.pdf>

However, through this review of connection charging, it became clear that the existing transportation charging methodology could result in biomethane entrants being charged for systems that they did not fully utilise.

GDNs therefore put forward a Uniform Network Code (UNC) Modification<sup>322</sup> which introduced changes to the Local Distribution Zone (LDZ) System Charging Methodology in order to more accurately reflect the costs associated with the grid injection of distributed gas. A description of the methodology used by Ofgem can be found here: <http://www.gasgovernance.co.uk/sites/default/files/Final%20Modification%20Report%200391%20v2.0.pdf>

The progress achieved in Britain to date has gone a long way to facilitate the connection of biomethane to distribution networks. The initiatives taken to address the outstanding issues posed by gas quality and safety regulations were also well advanced at the time of writing.

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<sup>322</sup> See: <http://www.gasgovernance.co.uk/sites/default/files/Final%20Modification%20Report%200391%20v2.0.pdf> and <http://www.ofgem.gov.uk/Licensing/GasCodes/UNC/Mods/Documents1/UNC391D.pdf>

## 5.6 Barriers to completing the internal market

- 550 In 2012, the amount of traded volumes at European hubs grew – with the partial exception of NBP if ICE trades are not accounted for – and the level of price convergence between hubs increased. Contractual congestion between entry/exit zones decreased, given overall demand reduction and the availability of new interconnection capacity, although seasonal contractual congestion remains at times. In most MSs, several barriers to completing the internal market persisted.
- 551 In this subsection, the most relevant findings are summarised, and recommendations are made on how to address existing barriers.
- 552 According to the evidence collected by the Agency, in 2012 these barriers generated an estimated gross welfare loss of between EUR11bn/year and EUR18bn/year across the EU-27. An EU-wide internal market can be achieved only by ensuring greater reactivity of gas flows to wholesale price differences across MSs. In 2012, full price reactivity was still far from being achieved. The following barriers, more or less pronounced in different zones, were identified as affecting the completion of the internal market: lack of adequate gas transportation infrastructure; lack of liquid wholesale markets; lack of transparency in wholesale price formation; long-term commitments for gas supply; cross-border and storage capacity hoarding; and pronounced discrepancies in regulatory regimes and tariffs, not always justified by solid underlying demand and/or network cost reasons.

### 5.6.1 Lack of adequate gas transportation infrastructure

- 553 The lack of adequate gas transportation infrastructure (flexible cross-border pipeline capacity and LNG terminals) in specific MSs is severely affecting the creation of an EU-wide internal market. In Estonia, Finland, Lithuania, Latvia, Bulgaria, Romania, Slovakia and the Czech Republic, a lack of infrastructure flexibility makes it either impossible, difficult or very expensive to redirect gas flows to follow price signals.
- 554 In order to mitigate this barrier, Regulation (EC) No 347/2013 identified twelve priority corridors<sup>323</sup> – four for gas – and thematic areas. To translate these corridors and areas into concrete projects, the Regulation established a new way of identifying energy infrastructure projects which can receive the title of ‘Projects of Common Interest’ (PCIs)<sup>324</sup>. Draft regional lists of potential PCIs were established at the end of 2012 and approved by MSs in July 2013, after being reviewed by the Agency. The final, EU-wide, PCI list was adopted in October 2013.

323 In this context, the term ‘energy infrastructure’ covers electricity transmission lines, gas, CO<sub>2</sub> and oil pipelines, Compressed Natural Gas (CNG), Liquefied Natural Gas (LNG) reception facilities, and electricity and gas storage.

324 The starting point for project selection will be the Ten-Year Network Development Plans (TYNDPs) prepared by ENTSO-E and ENTSO-G. However, initially, projects which are not part of the TYNDPs will also be considered. The guidelines also prescribe a cost-benefit analysis (CBA) to clearly demonstrate cross-border benefits and provide the possibility to allocate costs across borders as a proportion of the benefits. In addition, they prescribe that national regulatory authorities provide regulatory incentives commensurate to the risks incurred by such projects.

555 Under this umbrella, several projects have been presented to address some of the barriers identified in Section 5.4.3:

- a new interconnector between Poland and Lithuania;
- Baltic Pipe: gas interconnection between Denmark and Poland;
- interconnection between Norway and Denmark;
- Baltic Connector: gas interconnection between Finland and Estonia;
- a regional LNG terminal for the Eastern Baltic region and internal network reinforcements;
- interconnection upgrade and reverse flow between Germany and Denmark;
- gas transmission infrastructure, including new pipelines across Turkey and/or transmission solutions across the Black Sea, to connect gas producing countries in the Caspian (e.g. Azerbaijan, Turkmenistan) and the Middle East (e.g. Iraq) to EU MSs;
- gas transmission infrastructure required for connecting EU MSs to gas suppliers in the Eastern Mediterranean and the Middle East;
- a new interconnection between Slovakia and Hungary;
- interconnections linking Slovenia, Italy and Austria;
- interconnection upgrades between the Czech Republic and Poland; and
- reverse flow upgrades between Bulgaria and Romania, Hungary and Romania, and Bulgaria and Greece.

556 Due to their complexity and need for MS agreement, most of these projects will not be implemented in the short run.

### 5.6.2 Lack of liquid wholesale markets

557 According to most NRAs<sup>325</sup>, a major barrier to a greater degree of gas market integration at wholesale level is the lack of liquid wholesale markets in most of continental Europe. As analysed in Section 5.2.3, in 2012, only two hubs (NBP and TTF) had relevant levels of liquidity required to function properly; others still rely on a day-ahead and/or balancing coverage role. Vertically integrated incumbent players have no strong incentive to provide liquidity in upstream markets, because more liquidity could stimulate retail market entry by smaller suppliers. Storage access by incumbents usually allows them to balance their positions without the need for using or creating balancing markets. In most MSs, balancing markets were designed with the largest players in mind and may be characterised by artificial economies of scale. Smaller participants have difficulties in accommodating large fixed entry costs, which in some cases are sunk. This affects smaller players much more than larger ones, and vertically de-integrated companies more than vertically integrated ones.



- 558 Without a liquid wholesale market, smaller players may have difficulties in entering retail markets because gas supplies would not be sourced at an efficient scale. In countries where open access and non-congested LNG facilities are available, entry may be feasible only for players with a larger consumer base because, in the absence of liquid wholesale markets, it may not be possible for smaller players to cost-effectively balance their positions.
- 559 Aggregating pools of liquidity by merging cross-border zones and virtual hubs may be a solution. Some EU MSs are still creating virtual hubs at a domestic level. An exception might be the virtual point currently planned for the all-Iberian gas market and similar developments in Central Europe.

### 5.6.3 Lack of wholesale market transparency

- 560 In Section 5.4.3, not only low wholesale market liquidity, but also a lack of wholesale market transparency was identified as a relevant barrier to market integration at wholesale and network level, pointing to flows against price differentials between selected European hubs.
- 561 In most European wholesale markets, shippers do not enjoy stable and robust price signals: this hampers their ability to make efficient trading decisions. Hub-based transactions tend to represent a small fraction of total (OTC) first-sale activity. Lack of liquidity may also create conditions for market manipulation, as individual trades within a small population of transactions can significantly influence prices.
- 562 Wholesale energy markets provide key price signals which affect the choices of producers and consumers, as well as investment decisions in production facilities and transport infrastructure. Therefore, it is essential that these signals reflect the real conditions of energy supply and demand. Greater transparency in wholesale energy markets reduces the risk of markets being manipulated and price signals distorted. Therefore, transparency in wholesale energy markets is crucial to ensuring that consumers pay a fair price for their energy. It also helps create equal conditions for all market participants.
- 563 In order to mitigate the lack of transparency in wholesale markets, Regulation (EC) No 1227/2011 on wholesale energy market integrity and transparency (REMIT) prohibits insider trading and market abuse in wholesale energy markets across Europe and establishes a monitoring regime for wholesale energy trading. It also requires MSs to establish an enforcement and penalty regime for anyone breaching the Regulation.
- 564 REMIT entered into force on 28 December 2011. However, in 2012 the penalty regime for breaches of the Regulation was not in place in most MSs. The Regulation's Implementing Acts are still pending, and are expected to be issued by the EC in the second half of 2013.
- 565 An in-depth analysis of the barriers created by the lack of wholesale market transparency is provided separately in the Agency's first Annual Report on REMIT-related activities.

#### 5.6.4 Long-term commitments for gas supply, cross-border capacity and storage reservations

- 566 As shown in Sections 5.2.1 and 5.4.1, long-term commitments for gas supply, cross-border capacity and storage hoarding are still important barriers to the completion of the internal market.
- 567 Seasonal contractual congestion still affects a significant part of Europe's cross-border interconnections. Given the difficulties of ensuring reliable and stable capacity on a short-term basis, it is often impossible to optimise certain hub trades.
- 568 In order to address this barrier, the CAM Network Code on cross-border capacity was developed. However, the implementation of this Network Code is not legally required until November 2015. This can further delay progress in terms of efficient capacity allocation. It would be desirable for individual MSs not to limit themselves to the *de minimis* specifications contained in the Network Code, but to exceed them where possible through the bundling of capacity products at relevant border points and the suppression of pancaking.
- 569 As a consequence, the Agency recommends that MSs start with the early, voluntary implementation of the CAM Network Code at national and/or cross-border level. The PRISMA capacity platform is an instance of this.

#### 5.6.5 Harmonisation of tariff regimes

- 570 As shown in Sections 4.4.2.4, network access costs are very different across the EU-27. Also, network costs related to cross-border connections (see Section 5.3.1) unveil very different methodologies for cost allocation. In certain cases, the magnitude of cross-border tariff differences throughout the EU is impressive, and there is no evidence so far as to whether such discrepancies are justified by solid underlying demand and/or cost reasons. In certain particular cases whereby significant differences exist at different entry and exit points from and to the same country, some suspicion might arise about whether cross-border tariffs are designed based on the same cost-based principles used for domestic ones without being discriminatory against cross-border users.
- 571 Some harmonisation of cost allocation methodologies and international cost efficiency analysis of transmission activities (similarly to what is observed in electricity and other network industries) might be needed to progress towards internal market integration. The partial harmonisation of regulatory regimes in terms of network regulation might also help retail market integration.
- 572 Regarding cross-border network tariffs, barriers to market integration can be limited by introducing harmonised and non-discriminatory methodologies, which should be applied in a transparent way. This is the aim of the Framework Guidelines on Harmonised Gas Transmission Tariff Structures and the corresponding Network Code.

## 5.7 Conclusions and recommendations

- 573 Gas consumption in 2012 decreased by 4.1% in comparison with 2011 in the EU-27, mostly as a result of the continuing economic downturn. A significant fraction of this reduction was observed in gas-fired electricity generation - given the escalation of coal as the commodity of choice and the increasing penetration of renewable sources for electricity production. Even if subdued demand should have pushed prices down by releasing supply and transportation capacity, EU gas prices continued to grow as demand decreased. Three factors explain this: the lack of competition in terms of geographical source, the influence of LNG premiums paid in East Asia over EU prices and the continuing (albeit declining) indexation of long-term contracts to oil prices.
- 574 The global nature of the gas market is such that European policies by themselves do not necessarily impact European prices. However, gas-on-gas competition improved during the year, as more gas was traded at hubs. Average hub prices were lower than long-term contract ones. Hub price convergence is by now a fait accompli in North-West Europe, although some instances of wintertime price decoupling still occur in response to seasonal demand needs and residual issues of contractual congestion at specific borders. Central-Southern Europe, especially Austria and Italy, has experienced price convergence with the North-West since the first quarter of 2012 against a background of rising wholesale prices.
- 575 Liquidity in organised markets generally increased in 2012 as a result of a risk-hedging flight towards spot trading and the continuing renegotiation of long-term, oil-indexed contracts spurred by two liquid and lower-priced hubs (NBP and TTF). The majority of traded volumes are still negotiated OTC.
- 576 However, except for Great Britain and the Netherlands, less liquid and/or uncompetitive wholesale markets, coupled with some congested IPs, still represent a major hurdle in many MSs. In 2012, limited progress was made in terms of aggregating pools of liquidity by merging cross-border zones and virtual hubs. Most MSs still adopt national approaches by either creating or repowering purely domestic (either physical or virtual) hubs. Further analysis performed by the Agency this year shows that cross-border interconnection tariffs are extremely heterogeneous and only partially transparent. In a number of cases, costing and pricing methodologies are not fully published by TSOs or NRAs. In the absence of underlying cost data, tariff discrimination in an economic sense cannot be definitively diagnosed, but it can be hinted at, given the extreme differences in interconnection tariffs (either at the same or at adjacent borders) for gas flowing in opposite directions. Important tariff-making issues at cross-border level are addressed in the Framework Guidelines and ensuing Network Code on Harmonised Gas Transmission Tariff Structures.
- 577 Interconnection efficiency (or lack thereof) and the extent to which gas moves in the appropriate direction are linked to the responsiveness of shippers to tariff and capacity design. Price responsiveness is hampered by the persistence of long-term contracts, which may give rise to inconsistent gas flows with respect to hub prices. Improved information on tariffs and auction designs/outcomes is needed in order to understand the extent to which such factors constitute a barrier to the efficient functioning of interconnectors, irrespective of the presence of underlying technical constraints. This analysis, already present in last year's report, is expanded in the present document, both at pan-European level (in terms of wrong-way flows) and with special respect to Continent-GB interconnectors, after three energy regulators from North-West Europe jointly published the results of a 'flows against price differentials' (FAPDs) evaluation in 2012-13.

- 578 Consistently with its mandate to promote cross-border trade and EU market integration, the Agency is working on implementing the key principles of the Gas Target Model (GTM) through its Framework Guidelines and the resulting binding Network Codes on capacity allocation mechanisms, balancing, cross-border tariffs, and interoperability. The Comitology Guidelines on Congestion Management Procedures (CMP) are now in place. The timely adoption of these European rules, along with the full transposition of the 3<sup>rd</sup> Package, will ensure that European consumers benefit from an integrated internal gas market.
- 579 The timely availability of information is always a critical element of any functioning competitive market. Although full transparency compliance is yet to be achieved in the gas sector, a fairly high degree of accomplishment has been observed at TSO level. Steps are now being taken in those areas where room for improvement remains, particularly on information “nearer real time”. ENTSOG is improving its Transparency Platform with respect to gas interconnection point capacity and price data, including the availability of storable time series on capacity and bookings. A somehow revised version of the existing Transparency Platform went live on 1 October 2013.
- 580 The Transparency Platform should continuously evolve and contain up-to-date and unit-consistent, fully and readily comparable information on cross-border transportation tariffs and on the general terms and conditions of international gas transmission at all interconnection points, including the consistent availability of time-series data.

PART III  
Consumer  
empowerment and  
protection



## 6 Consumer empowerment and protection

### 6.1 Introduction

581 This Part provides the results of the European regulators' assessment of the level of compliance with provisions related to consumer rights in the 3<sup>rd</sup> Package (universal service, supplier switching, protection of vulnerable consumers, consumer information requirements and alternative dispute resolution) and of an analysis of complaint data and smart meter roll-out in Europe.

### 6.2 Implementation of consumer rights

582 Strengthening consumer rights is one of the major pillars of the 3<sup>rd</sup> Package. Stronger consumer rights should particularly benefit households, who are the weakest players in the market.

583 The need for stronger consumer rights is mentioned by Directives 2009/72/EC and 2009/73/EC; Article 3 and Annex 1 of these Directives particularly focus on protecting and empowering consumers, while assigning individual tasks in this field to different market players. In addition, "helping to ensure [...] that the consumer protection measures [...] are effective and enforced"<sup>326</sup> is listed among the duties of regulatory authorities.

584 Consistent with this duty, this Section analyses the status of five elements of consumer protection, which together form a safety net for consumers in the liberalised market: (i) universal service, entailing the right to be connected to the electricity grid and to be supplied with electricity at reasonable prices<sup>327</sup>; (ii) supplier switching, enabling consumers to play an active role in the market and exercise choice; (iii) vulnerable consumers protection; (iv) information requirements, and (v) alternative dispute resolution mechanisms, aimed at resolving conflicts through rapid and straightforward procedures without recourse to the courts.

#### 6.2.1 Universal service

585 Article 3(3) of Directive 2009/72/EC stipulates that all households are under the umbrella of universal service and have "the right to be supplied with electricity of a specified quality within their territory at reasonable, easily and clearly comparable, transparent and non-discriminatory prices". The text goes on to suggest that appointing a supplier of last resort might be one option to ensure universal service. Although universal service obligations are not mentioned in Directive 2009/73/EC, appointing a supplier of last resort for gas consumers that are connected to the grid is still mentioned as an option in Article 3(3)<sup>328</sup>.

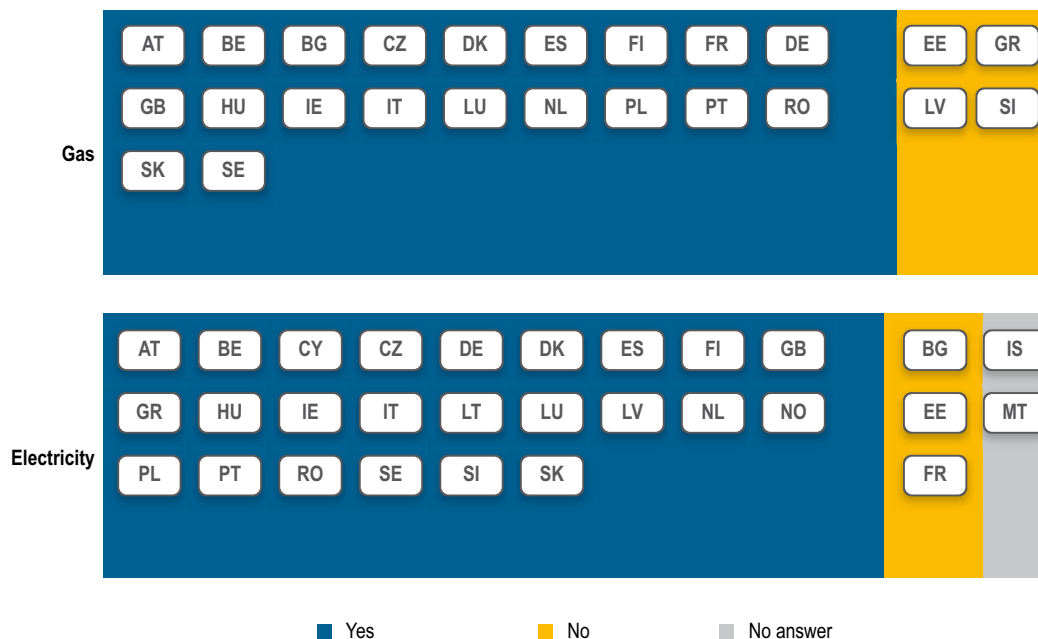
326 Article 37(1)(n) of Directive 2009/72/EC and Article 41(1)(o) of Directive 2009/73/EC.

327 Generally, gas provision is not subject to universal service obligations.

328 Electricity supply is regarded as irreplaceable, while gas is more easily substitutable. Even so, consumers that are connected to the gas grid are likely to depend heavily on this fuel, and this circumstance is acknowledged by Directive 2009/73/EC in the supplier of last resort stipulation.

586 Directive 2009/72/EC does not give further guidance on what form the universal service should take. It is not surprising, therefore, that the definitions and conditions applied in Europe<sup>329</sup> vary widely<sup>330</sup>. However the data reveal that most countries have designated suppliers of last resort for both gas and electricity (Figure 79).

Figure 79: Countries with and without suppliers of last resort



Source: CEER national indicators database (2013)

587 The function of the supplier of last resort varies considerably, which limits the comparability of the figures. For example, in Austria the NRA requires the suppliers of last resort to take on consumers who cannot find any other supplier in the market. In France, only a specific group of gas consumers carrying out functions of common interest (e.g. hospitals) can access a supplier of last resort. The Hungarian NRA appoints a supplier of last resort only when another supplier goes bankrupt; the former takes over the latter’s customers.

588 In Portugal, until September 2012 the concept of last resort supply was tied only to vulnerable consumers who are eligible for social tariffs. However, there is no legal requirement for the last resort tariff to be particularly low, as long as it is reasonable, transparent, and clearly comparable. Therefore, the universal service provision per se does not provide so much protection from high electricity prices, but rather ensures that consumers can still be supplied. Since October 2012, the supplier of last resort has also been obliged to supply consumers who cannot find a supplier and those whose supplier has gone bankrupt.

329 Please note that the data used in this chapter are sourced from CEER’s database of national indicators. At the end of 2012, CEER’s membership base included the (then) EU-27 MSs, plus Iceland and Norway. The electricity figures presented here refer to all CEER member countries; the gas figures do not include Malta, Cyprus, Norway and Iceland, which do not have commercial gas networks with the exception of a local gas distribution network in the Norwegian city of Stavanger.

330 For a detailed analysis, see: “, Ref: C12-CEM-55-04. (2012) [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Customers/Tab3/C12-CEM-55-04\\_SR-3rd-Pack-customers\\_7-Nov-2012.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/Tab3/C12-CEM-55-04_SR-3rd-Pack-customers_7-Nov-2012.pdf).

589 Only in a few countries (eight for electricity and six for gas) does the NRA have data on how many consumers fall under the supplier of last resort regime. Comparing 2012 with 2011, the Lithuanian situation seems extraordinary, as the country's electricity market saw an increase in consumers serviced by suppliers of last resort by more than 250%.

## 6.2.2 Supplier switching

590 Supplier switching is the most direct possibility for consumers to reap the benefits of a liberalised market<sup>331</sup>. As pointed out in Sections 2.4.2.1 and 4.2.2.1, low switching rates and consumer switching behaviour act as barriers to entry for potential new retail market players and have an impact on the development of competition as a whole. However, market conditions can also have an impact on supplier switching. Recognising the importance of this process, the legislative requirement for MSs to open their electricity and gas markets to all consumers, including households, from 2007 stated that the switching process shall attract no charges<sup>332</sup>. The Directives stipulate that eligible consumers must be able to switch supplier easily<sup>333</sup> and within a time horizon of three weeks<sup>334</sup>.

591 In its Guidelines of Good Practice on electricity and retail gas market design<sup>335</sup>, CEER argued that the switching process might be reduced to 24 hours and might take place on any day of the week.

592 Figure 80 shows that in 18 countries, the three-week switching period is already a reality or a legal requirement for gas consumers, while electricity consumers benefit from a three-week switching period in 23 countries. Italy is about to implement this requirement in both electricity and gas. Great Britain has introduced a licence condition on suppliers that imposes three-week switching - industry systems are capable of achieving this in electricity, but not yet in gas, where the necessary changes are due to be implemented in November 2013. France already applies the CEER recommendations, as a supplier switch can be carried out in 24 hours for electricity. In gas, switching takes four days.

593 In Romania, according to the new Electricity and Natural Gas Act passed in July 2012, final consumers are entitled to switch supplier according to procedures approved by the NRA, guaranteeing that the switching process should take a maximum of three weeks.

331 Demand response and the increasing involvement of consumers in the market as 'prosumers', who consume, but also feed electricity (e.g., from rooftop solar panels) into the grid, combined with the necessary technological change, are also promising in terms of consumer involvement (see also Section 6.4).

332 Point 1(e) of Annex I to Directive 2009/72/EC and Directive 2009/73/EC.

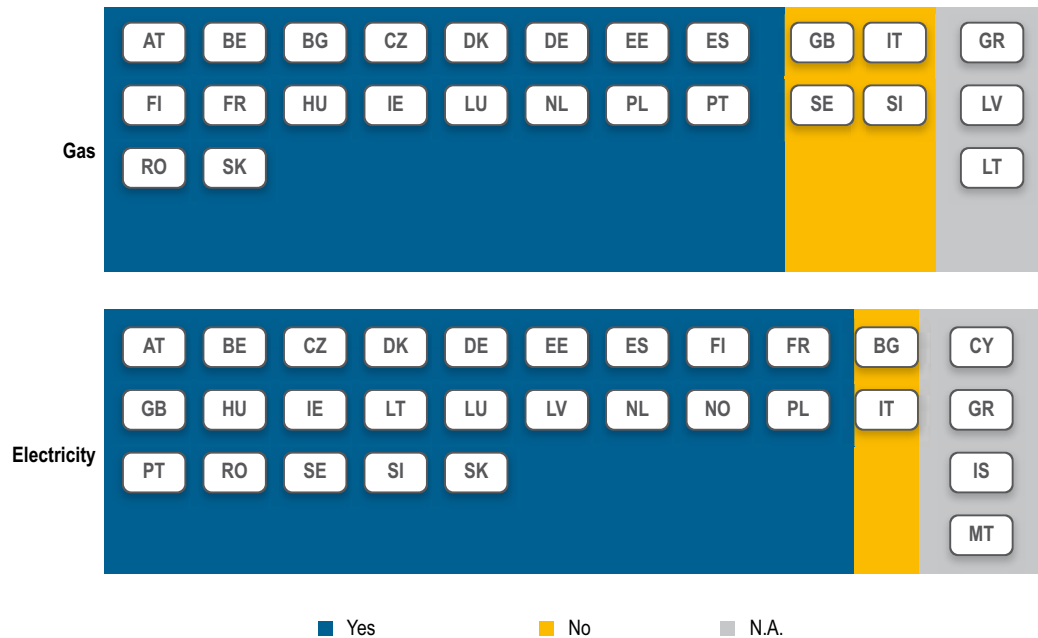
333 Article 3(5) of Directive 2009/72/EC and Article 3(6) of Directive 2009/73/EC.

334 Article 3(5)(a) of Directive 2009/72/EC and Article 3(6)(a) of Directive 2009/73/EC.

335 CEER, 'Electricity and retail gas market design, with a focus on supplier switching and billing. Guidelines of Good Practice' Ref: C11-RMF-39-09. (2012), available at: [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Customers/Tab3/C11-RMF-39-03\\_GGP-Retail-Market-Design\\_24-Jan-2012.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/Tab3/C11-RMF-39-03_GGP-Retail-Market-Design_24-Jan-2012.pdf)



Figure 80: Consumer ability to benefit from the three-week supplier switching period



Source: CEER national indicators database (2013)

- 594 Sections 2.4.2.1 and 4.2.2.2 also pointed to the wide variety of switching barriers. Leaving aside the (considerable) percentage of consumers who are unaware of the possibility of switching supplier, it appears that the benefits consumers could reap by switching to the cheapest supplier available are either not sufficient to prompt them to act or are offset by other, non-financial factors. Furthermore, consumers are deterred from switching by, for example, regulated prices, difficulty in comparing prices, complex switching procedures and unfair commercial practices such as misleading branding<sup>336</sup> and communication strategies applied by integrated DSO/retail suppliers.
- 595 Consumer switching behaviour seems to be driven by a number of factors, with potential savings being only one of them (see Sections 2.4.2.1 and 4.2.2.2). Apart from price, energy services are characterised by service quality, which is not always easily observable or approximated by price. However, price comparison websites are key in informing consumers, especially when they convey non-price information as well<sup>337</sup>. However, as offers increasingly expand to cover non-price aspects, it is important that such consumer information services ensure comparability.

336 DSO (re)branding issues are examined in CEER’s Report (2013), Ref: C12-UR-47-03, available at: [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Cross-Sectoral/Tab/C12-UR-47-03\\_DSO-Unbundling\\_Status%20Review\\_Public.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Cross-Sectoral/Tab/C12-UR-47-03_DSO-Unbundling_Status%20Review_Public.pdf)

337 Cf. also CEER (2012). Ref.: C12-CEM-54-03. Available at: [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Customers/Tab3/C12-CEM-54-03\\_GGP-PCT\\_09Jul2012.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/Tab3/C12-CEM-54-03_GGP-PCT_09Jul2012.pdf)

596 The 3<sup>rd</sup> Package makes an effort to improve the consumer switching experience by enhancing the quality of the information provided. It requires that a final closure account be sent to the consumer no later than six weeks after a change of supplier<sup>338,339</sup>. This event formally closes the switching process from the consumer perspective and is, therefore, an important signal. Overall, in 2012, 80% of countries had implemented this requirement for gas consumers, while electricity consumers benefit from a six-week account closure time window in approximately 70% of countries (Figure 81).

Figure 81: Implementation of the six-week deadline for account closure



Source: CEER national indicators database (2013)

### 6.2.3 Vulnerable consumers

597 The 3<sup>rd</sup> Package ensures protection for those consumers who are most immediately affected by adverse circumstances and therefore experience, or are exposed to, the risk of ‘energy poverty’<sup>340</sup>. Before taking any other step, MSs are asked to ‘define the concept of vulnerable consumers which may refer to energy poverty’.

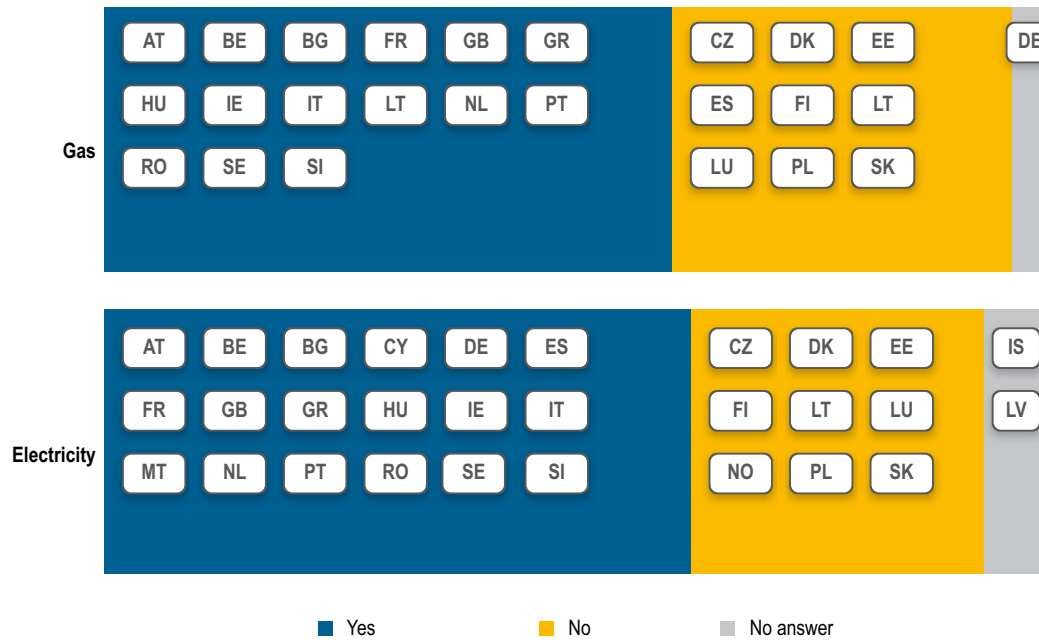
598 Looking at the data provided by NRAs, it seems that a proper definition of ‘vulnerable customers’ is not yet widespread. In 2012, only 15 countries had a concept of vulnerable gas consumers in place, while for electricity this was the case in only 18 countries (Figure 82).

338 Point 1(j) in Annex I of Directive 2009/72/EC and Directive 2009/73/EC.

339 According to the French Consumer Code, the consumer must receive a final bill within four weeks of contract termination. Any overpayment is reimbursed within a maximum of two weeks after the final bill is issued.

340 Article 3(7) of Directive 2009/72/EC and Article 3(3) of Directive 2009/73/EC.

Figure 82: Countries with a defined concept of ‘vulnerable consumers’



Source: CEER national indicators database (2013)

- 599 Large disparities in the definition of ‘vulnerable consumers’ are found across MSs because this notion relates to multiple overlapping policy areas including energy, economic and social aspects. For instance, while in Great Britain the concept captures all consumers who are of pensionable age, are chronically sick, have a disability, have low incomes or live in rural areas<sup>341</sup>, in the Slovak Republic all electricity and gas consumers in households and small businesses are considered vulnerable. It is not surprising, therefore, that the percentages of consumers captured by the vulnerability concept vary widely. A number of countries link vulnerability to social tariffs (e.g. in Belgium, France, Greece, Romania and Spain), while in other cases vulnerability is defined as a wider concept (e.g. in Cyprus and Italy).
- 600 Half of the countries which provided data have a national action plan for securing supply to vulnerable electricity consumers (14 out of 28). For gas, there is an action plan in 16 out of 25 countries providing data. The differences are due to heterogeneous attitudes towards the definition of vulnerable consumers and the deployment of ‘action plans’.
- 601 The Netherlands applies a no-disconnection policy during winter months for electricity and, in extreme (life-threatening) cases, for gas. Greece takes a similar approach and protects gas consumers with special medical needs. The Irish code of practice includes rules about supply, disconnection and communication policies regarding vulnerable consumers. Some countries, for instance Germany and Sweden, provide support for vulnerable consumers only through the social security system. In France, there is a prohibition on disconnecting electricity and gas households for non-payment in winter (from 1 November to 15 March). Capacity restrictions are – however – allowed, except for consumers on social tariffs.

341 This is the current situation, which is under revision to recognise the potentially dynamic and multidimensional nature of vulnerability.

### Identifying vulnerable consumers in Romania

The Romanian Electricity and Natural Gas Act defines vulnerable consumers as end users belonging to a category of household consumers who for reasons of age, health or low income are at risk of social exclusion and, to prevent this risk, benefit from social protection measures, including financial ones. Social protection measures and eligibility criteria are established by regulations.

At the moment, electricity consumers are eligible for social tariffs if the average income per family member is less than or equal to the minimum wage. They can benefit from social tariffs only at one location (household).

While this applies only to electricity, gas consumers with incomes below different thresholds receive different social support from the state budget.

The Romanian energy regulator ANRE is currently in the process of adding other categories of vulnerable consumer, such as those with health and age problems, in order to identify suitable means of protection for them

- 602 In Annex I ('Action Plan for Europe') to the Internal Energy Market Communication<sup>342</sup>, the European Commission announced that it would issue guidance on defining the concept of vulnerable consumers in 2013.
- 603 Once MSs have a concept in place for consumers requiring particular attention, they will be asked to decide which kind of measures should apply. Such measures must be 'appropriate' and have 'adequate safeguards' (it is suggested that vulnerable consumers be protected from being disconnected at critical times)<sup>343</sup>.
- 604 The legal text implies a targeted solution to assist a particular group of consumers. In its IEM Communication<sup>344</sup>, the European Commission states that subsidies or regulation aimed at lowering overall energy prices tend to reduce incentives for energy-efficient behaviour, do not specifically target the most in need and can distort competition. While assistance to vulnerable consumers by financial measures may be part of social policy, support for energy efficiency improvements represents a cost-effective form of assistance. The Directives also recognise that support for vulnerable consumers may come from a range of measures, including energy efficiency, as well as from the social security system<sup>345</sup>.
- 605 Therefore, it is for each MS to decide on the scope of consumer protection and define 'vulnerable consumers'. However, protecting 'vulnerable consumers' should not be confused with maintaining regulated energy prices for all (or certain wide categories of) consumers<sup>346,347</sup>.

342 European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. (2012). See: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0663:FIN:EN:PDF>

343 Article 3(7) of Directive 2009/72/EC and Article 3(3) of Directive 2009/73/EC. In electricity, this is closely connected to universal service obligations.

344 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52012DC0663:EN:NOT>

345 Article 3(8) of Directive 2009/72/EC and Article 3(4) of Directive 2009/73/EC.

346 ERGEG Position paper on end-user price regulation. Ref.: E07-CPR-10-03.

347 Court of Justice Case C-265/08: Federutility and Others versus Autorita' per l'Energia Elettrica ed il Gas (AEEG), 2010.

- 606 While social tariffs are widely applied mechanisms for protecting the most vulnerable, the legal text immediately associates another type of protection with the requirement to define the concept of vulnerability: prohibiting disconnection at critical times<sup>348</sup>.
- 607 Examining the issue of disconnection more closely, it is evident that electricity consumer complaints about disconnections exceeded the 5% threshold in almost three times as many countries in 2012 as in 2011, while they doubled for gas (see also Section 6.3.2).

#### 6.2.4 Consumer information requirements

- 608 The 3<sup>rd</sup> Package views information provided to consumers as an essential element of consumer protection<sup>349</sup>. Article 3 of the Directives contains a number of rights and measures related to information requirements for consumer protection, while details on how these are designed are left to the discretion of MSs.
- 609 Fuel mix and environmental impact: Suppliers must be transparent about their fuel mix and its environmental impact<sup>350</sup>. The former must be provided on bills and promotional materials directly, while for the latter the consumer must at least be informed about where this information can be found. Most MSs (23 out of 26 responses) comply with this requirement, although there are some limitations (e.g., in the Czech Republic, compliance is restricted to disclosing the fuel mix, not the environmental impact).
- 610 Single point of contact: MSs must establish a single point of contact to which consumers can address all their questions<sup>351</sup>. Most countries already offer such a service to consumers: 23 out of 25 have a single point of contact for electricity and 22 out of 25 have one for gas.

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348 Article 3(7) of Directive 2009/72/EC and Article 3(3) of Directive 2009/73/EC.

349 Cf. Article 3(7) of Directive 2009/72/EC and Article 3(3) of Directive 2009/73/EC.

350 Article 3(9)(a) and (b) of Directive 2009/72/EC; this requirement only applies to electricity.

351 Article 3(12) of Directive 2009/72/EC and Article 3(9) of Directive 2009/73/EC.

### Service outreach in Austria

In October 2012 E-Control (the energy regulator) was appointed as the single point of contact in Austria. It launched a series of local energy consultation events designed to inform consumers about their rights in the liberalised gas and electricity markets<sup>352</sup>. A total of 284 district councils expressed an interest in this service and events for 137 districts had been staged by May 2013 (the programme is scheduled to continue in the autumn). In face-to-face advice sessions, E-Control representatives highlighted ways for consumers to cut their energy costs. Besides supplier switching and potential savings, including the use of the regulator's tariff calculator for comparing prices, the attendees were mainly interested in:

- how the energy market works and the role of the regulator;
- how to proceed if they want to install rooftop PV and receive feed-in tariffs;
- having their electricity and gas bills checked and explained; and
- how to save energy.

Apart from individual consumers, the major beneficiaries of such events were district councils in their own capacity as energy consumers. At the same time, district council employees disseminated information at local level.

611 The energy consumer checklist: There must be a checklist providing practical information relating to energy consumer rights<sup>353</sup>. A total of 17 (out of 24) countries stated that this is the case in their national electricity markets, and 16 (out of 23) did so for gas. However, these numbers should be interpreted with caution, given that some countries consider the obligation fulfilled if consumer rights information is available on websites or at points of contact, while others respond negatively in such situations. Hungary is about to create a consumer checklist, following a three-stage process: the Hungarian Consumer Protection Authority updates the energy consumer checklist established by the European Commission by providing further information on consumers rights. Afterwards, the Consumer Protection Authority sends a copy to all suppliers, which will be required to publish the final checklist on their websites. The coordination process with electricity suppliers and DSOs should start soon.

612 In addition to the above, Annex I of the two Directives, on 'Measures on consumer protection', focuses on a number of information requirements:

- Contractual changes: Point 1(b) stipulates that consumers must be notified if their existing contracts are modified in any way, including if prices are increased. Consumers are informed of any contractual modification in 26 countries for electricity and 24 for gas; however, the practical implementation of this requirement varies widely. Where minimum notice periods have been set, these are mostly in the range of 30 calendar days (11 countries for electricity, 13 for gas), but some (e.g. Italy, Denmark, Estonia – the latter for electricity only) have set it as far ahead as 90 days. The rule for electricity consumers in the Netherlands simply says that 'reasonable' notice is to be given, while in Spain this is not regulated, but left to the market.

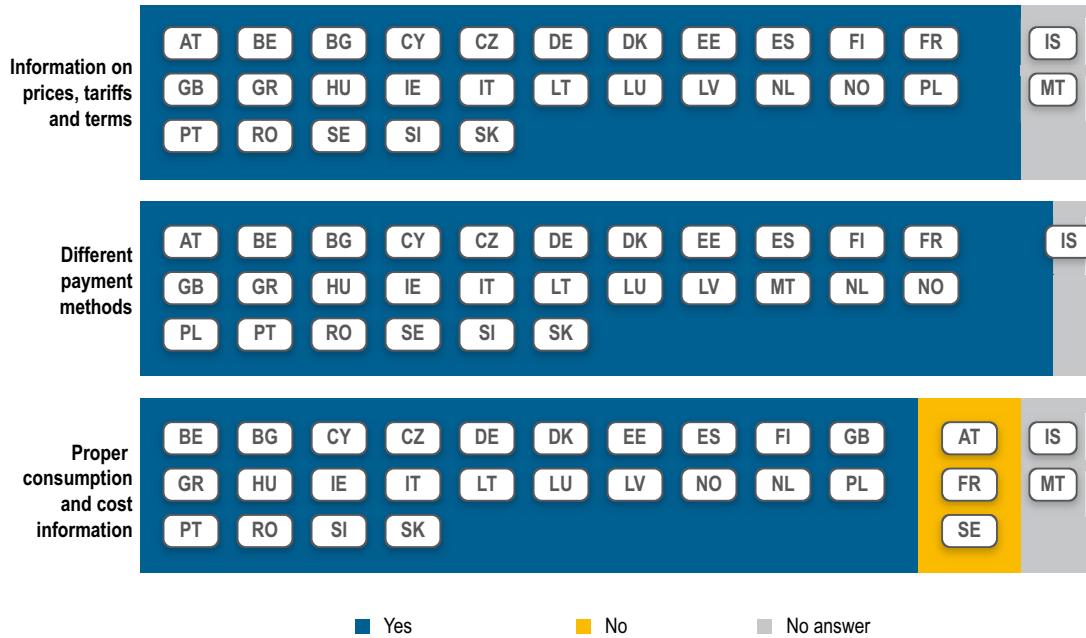
352 A similar initiative was taken by Ofgem in Great Britain in previous years.

353 Article 3(16) of Directive 2009/72/EC and Article 3(12) of Directive 2009/73/EC.

613 In this immediate context, the Directives also ensure that consumers are entitled to withdraw from their contract, if unilaterally modified, should they not agree with the changes. This seems to be the case in almost all MSs. In Spain, the electricity market is left to take care of this, but a withdrawal option is usually included in contracts. In accordance with these findings, the same countries, with the exception of Bulgaria (for electricity), also stated that consumers are informed about this termination right.

- Price information: Point 1(c) states that consumers must receive transparent information on applicable prices and tariffs, and on the standard terms and conditions for electricity/gas services. As shown in Figure 83 (for the electricity market) and Figure 84 (for the gas market), compliance with this requirement is full.
- Choice of payment method: Suppliers are obliged, according to point 1(d), to let consumers choose from a wide variety of payment methods. As an example, one might think of prepayment systems. All respondents confirmed that consumers can choose, with Latvia being the only exception for gas.
- Consumption information: Acknowledging the fact that consumers need to know how much they consume in order to be able to become active, point 1(i) requires that they receive information about their consumption and expenditure frequently enough for them to react. Compliance with this requirement is not yet complete. In electricity, in 24 out of 29 countries NRAs consider that their jurisdictions comply with the legal requirement, while in gas this is true in 18 out of 25 countries. This issue is closely connected with the frequency of meter reading, which varies widely, and the interpretation that each regulator makes of point 1(i): 'frequently enough to enable them [consumers] to regulate their own electricity consumption'. For instance, French consumers receive this information either annually (by law) or every semester (in practice), with an option of reading meters themselves and receive more frequent information, but the French regulator does not consider this as an acceptable frequency (Figure 83 and Figure 84). Some countries (e.g. Austria and the Netherlands) link the provision of frequent consumption and cost information to the installation of smart meters. The 3<sup>rd</sup> Package also makes reference to the capabilities of the consumer's metering equipment (see Section 6.3).

Figure 83: Compliance with consumer information requirements in the electricity market



Source: CEER national indicators database (2013)

Figure 84: Compliance with consumer information requirements in the gas market



Source: CEER national indicators database (2013)

614 Energy regulators, through the CEER/BEUC 2020 vision for energy consumers<sup>354</sup>, place considerable emphasis on consumer empowerment. Consumer empowerment aims to enable consumers to become active and make use of wider action possibilities.

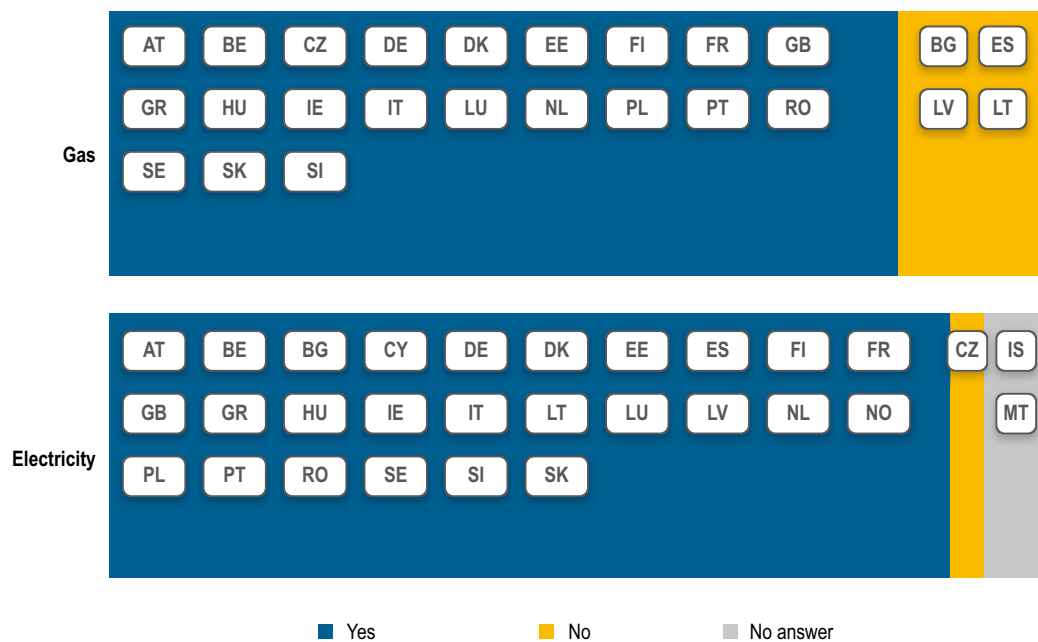


615 For this purpose, several initiatives have been either launched or announced for the future. For instance, the European Commission, in its IEM Communication, states that “the Commission will launch web-based guidance on energy consumer rights and on sources of consumer information and protection in individual MSs’ energy markets”<sup>355</sup>. A similar effort was made by CEER in late 2012, when a dedicated website section was created with information about energy markets in general, consumer rights and the single point of contact in each MS<sup>356</sup>.

### 6.2.5 Alternative dispute resolution

616 Out-of-court dispute settlement is a valuable option for consumers to deal with any difficulties that might arise with respect to energy supply. The Directives approach this in two ways. Firstly, they require MSs to set up independent mechanisms for out-of-court dispute settlement<sup>357</sup>. Most countries confirmed that they have such a mechanism in place (21 for gas and 26 for electricity; see Figure 85). In Austria and Ireland, ADR is dealt with through the NRA. Several other countries assign the ADR role to consumer associations and advisory bodies which are not necessarily specific to energy (e.g. Spain and, again, Ireland).

Figure 85: Existence of independent dispute settlement mechanisms



Source: CEER national indicators database (2013)

355 [http://ec.europa.eu/energy/gas\\_electricity/consumer/rights\\_en.htm](http://ec.europa.eu/energy/gas_electricity/consumer/rights_en.htm)

356 [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/ENERGY\\_CUSTOMERS](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/ENERGY_CUSTOMERS)

357 Article 3(13) of Directive 2009/72/EC and Article 3(9) of Directive 2009/73/EC.

- 617 Secondly, the Directives stipulate that suppliers themselves must also provide for mechanisms to handle complaints<sup>358</sup>, within three months, if possible. All respondents (28 for electricity and 25 for gas) indicated the existence of such procedures for handling complaints, albeit not necessarily dealt with through the retail supplier. In most countries, a decision is reached within the three-month time limit (19 out of 22 for gas and 18 out of 23 for electricity), and in some cases statutory deadlines are shorter (e.g., two months for electricity disputes in Ireland and Great Britain and only 15 days in Hungary).
- 618 In terms of informing consumers about these options, there is again an obligation for suppliers to include this in bills and promotional material. Although this happens in 22 out of 27 countries for electricity and in 20 out of 23 countries for gas, standards vary widely. For example, information is provided only on bills, but not on promotional material (Austria); or either full contact details (Great Britain) or only phone numbers are given (Spain).

### Energie-Info in France

In France, Energie-Info is the single point of contact, the alternative dispute resolution tool as defined by the Directives, and also offers a price comparison tool.

For both electricity and gas consumers, Energie-Info provides a website<sup>359</sup> and a service centre giving consumer information over the phone or in writing (by e-mail, fax or post). It has offered its services free of charge to residential and small business energy consumers since 1 July 2007. In addition to providing information, the service also assists consumers in case of disputes with energy suppliers. In November 2009, the service range was expanded with the addition of a price/offer comparison tool.

Energie-Info is co-led and co-financed by the NRA and the Public Energy Ombudsman. The information on consumer rights is updated in coordination with the ministries responsible for consumers and energy.

In 2012, 371,000 consumers made use of the telephone information service (64% of whom were asking for the address and phone number of various suppliers) and the website received 592,000 visits.

358 Point 1(f) of Annex I in both Directives.

359 [www.energie-info.fr](http://www.energie-info.fr)

## 6.3 Consumer complaints

- 619 Directives 72/2009/EC and 73/2009/EC state that NRAs have, inter alia, a duty to monitor complaints made by consumers. Where a MS has assigned monitoring duties to another authority, the information resulting from such monitoring must be made available to the NRA as soon as possible.
- 620 In a recommendation made in 2010<sup>360</sup>, European energy regulators suggested including the number of consumer complaints by category as an indicator of consumer (dis)satisfaction when monitoring energy retail market functioning. They suggested that data be collected at least annually from DSOs, suppliers and third party bodies, depending on which sources are considered the most suitable.
- 621 Sound consumer protection must be based on effective means of dispute settlement for all consumers and on speedy and effective procedures for handling complaints. It appears that all MSs collect data on consumer complaints. The number of, and reasons for, reported complaints help detect market dysfunctions and assess the degree of consumer satisfaction.
- 622 There are differences in European regulatory authorities' methods of data collection, depending on whether the authority is the Single Point of Contact and is responsible for collecting data directly or via third parties, such as consumer organisations or energy companies.
- 623 The British regulatory authority, for example, does not deal with consumer complaints directly, but rather collects all information from the six main energy suppliers and from the national energy Ombudsman. In Italy, the regulatory authority collects complaint information from suppliers and DSOs.
- 624 In other MSs, data come either from consumer information hotlines or dispute resolution bodies, which are usually set up either within or alongside the regulator, for instance the Alternative Dispute Resolution Board in Austria or the Energy Arbitration Board in Germany. In France, the regulator uses data provided by Energie-Info (see box above).
- 625 Due to methodological differences in data collection, the results reported here are not comparable across all MSs. In any case, extra care should be taken in interpreting complaint data. Low numbers may indicate satisfaction, but also the complexity of complaint handling procedures. High numbers may suggest dissatisfaction, but also strong consumer engagement in the retail energy market, together with cultural differences. Therefore, in what follows the focus is on trends, not on absolute levels.

### The German Energy Arbitration Board

Since October 2011 the German Energy Arbitration Board, set up under private law, has been working independently and free of charge in finding out-of-court consensual agreements in case of disputes between (private individual) consumers, suppliers and other stakeholders. Its creators consulted and involved a wide range of stakeholders, including ministries, supplier associations and consumer organisations. The overall aim is to increase consumer satisfaction and lighten the workload of courts. The NRA does not supervise the Arbitration Board, although statistics on the number and types of complaints must be reported to the regulator.

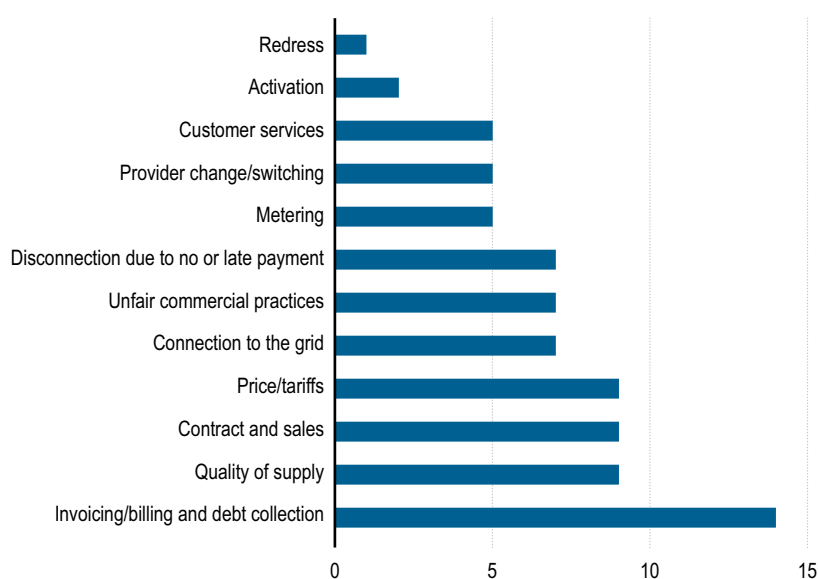
360 Final GGP on Indicators for Retail Market Monitoring. Ref.: E10-RMF-27-03.

### 6.3.1 The number of consumer complaints

626 The number of consumer complaints increased significantly in the majority of EU MSs in 2012, compared with 2011. This is particularly true of Greece, Lithuania, Austria, Portugal and the Czech Republic.

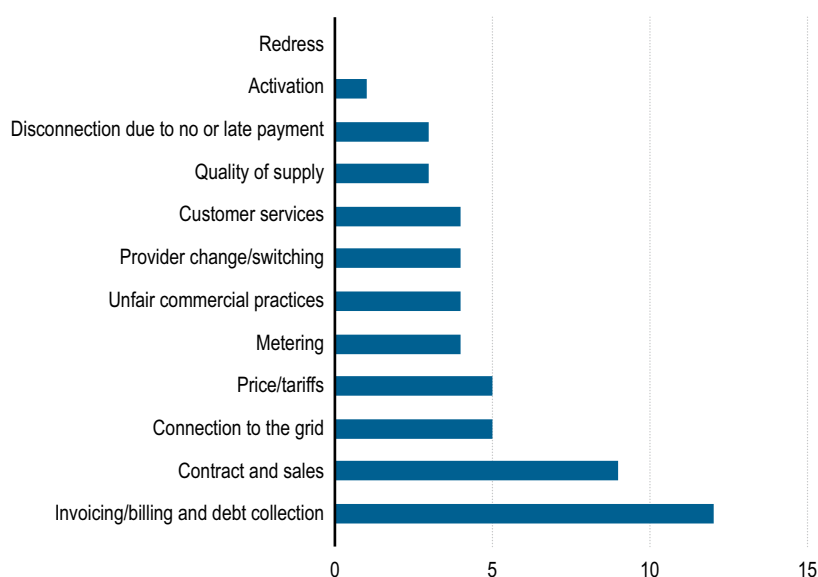
627 In the Netherlands, there has been a reduction in complaints since an online national contact point – Consuwijzer.nl – was created.

Figure 86: Number of countries where electricity complaints (by category) exceeded 5% of the total number of complaints received by NRAs – 2012



Source: CEER national indicators database (2013)

Figure 87: Number of countries where gas complaints (by category) exceeded 5% of the total number of complaints received by NRAs – 2012



Source: CEER national indicators database (2013)

### 6.3.2 Classification of consumer complaints

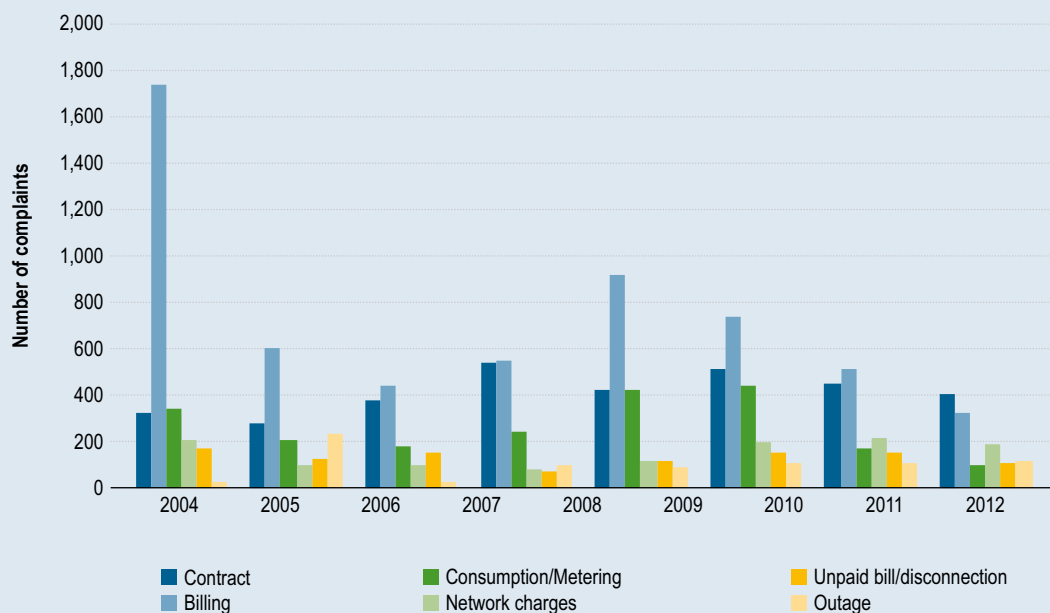
- 628 In comparison with the previous year, most MSs adopted the European energy regulators' proposal of 2010 as a basis for their consumer complaint classification system, including the following 14 categories for suppliers and DSOs<sup>361</sup>:
- Connections (only DSO);
  - Metering (only DSO);
  - Quality of supply (only DSO);
  - Unfair commercial practices;
  - Contracts and sales;
  - Activation;
  - Disconnection due to delayed payment;
  - Invoicing/billing and debt collection;
  - Insufficient payment methods;
  - Prices/tariffs;
  - Redress;
  - Provider change/switching;
  - Termination of contract due to the refusal to accept the supplier's new conditions; and
  - Customer service.
- 629 In some countries, these categories are grouped under the following main headings: invoicing (billing, metering), contracts and sales (insufficient payment methods, terms of contract) and provider change/switching. Figures 86 and 87 provide an overview of the types of consumer complaint that occurred most often, using the ERGEG classification (i.e. counting the number of countries where a category accounted for more than 5% of all complaints registered).
- 630 In some countries, a particular complaint procedure is envisaged in case of consumer dissatisfaction with quality of supply. The consumer should address this complaint directly to the DSO (or TSO) to which they are connected. In case of disagreement between the consumer and grid operators, the energy regulator decides.
- 631 Complaints are more frequent in the electricity sector than in the gas sector. Figures 86 and 87 suggest that complaints are mainly related to invoicing (billing), network quality, and contracts.

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361 (2010). Ref.: E10-CEM-33-05, see: [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Customers/Tab1/E10-CEM-33-05\\_GGP-ComplaintHandling\\_10-Jun-2010.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/Tab1/E10-CEM-33-05_GGP-ComplaintHandling_10-Jun-2010.pdf)  
The use of such standards was reviewed in: CEER, Status Review of the Implementation of the GGP on Complaint Handling, Reporting and Classification as of 1 January 2011 (2011). See: C11-CEM-45-03, [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Customers/Tab2/C11-CEM-45-03\\_SR-GGP-Complaint%20Handling\\_05-Sept-2011.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/Tab2/C11-CEM-45-03_SR-GGP-Complaint%20Handling_05-Sept-2011.pdf)

### Evolution of consumer complaints and introduction of smart meters in Sweden

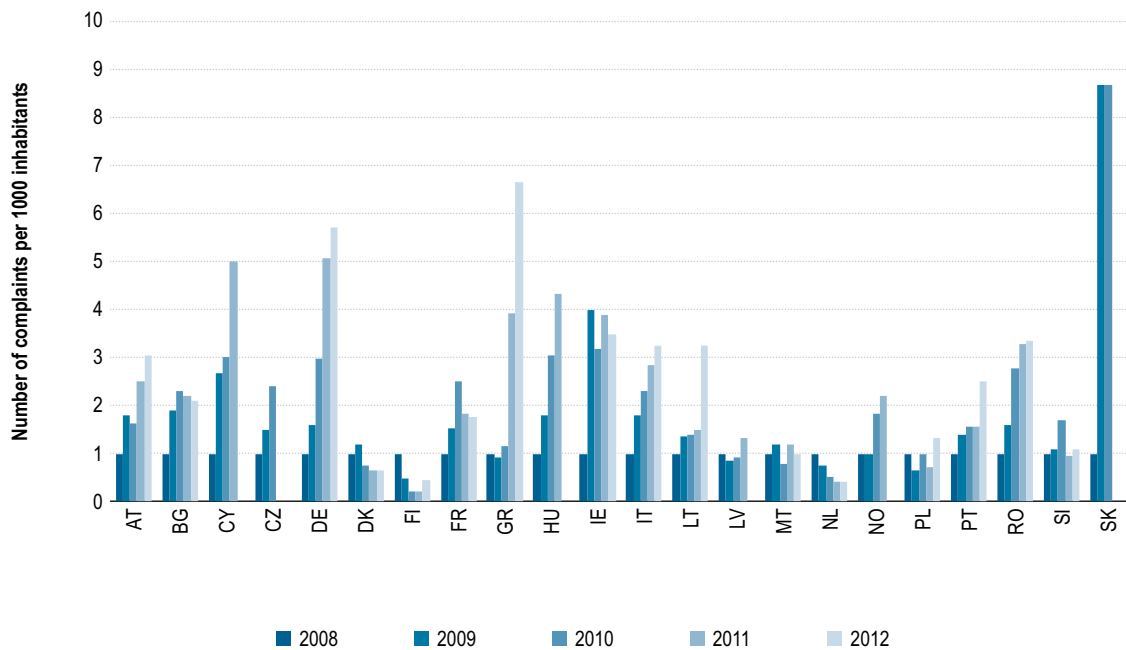
Figure i: Information from the Swedish Consumer Energy Markets Bureau – complaints during the period 2004-2011



Source: Swedish Consumer Energy Markets Bureau

In Sweden, a significant reduction in consumer complaints can be observed since mandatory monthly (instead of annual) meter readings were introduced in July 2009. Monthly readings and actual consumption-based billing have led to more trust in metering and more understandable bills. Most DSOs in Sweden carry out remote meter readings, although this is not mandatory.

Figure 88: Evolution in the number of complaints per country



Source: CEER national indicators database (2013)

### 6.3.3 Complaints procedure

- 632 European energy regulators have always underlined the importance of an independent and transparent procedure for handling complaints, allowing consumers to directly communicate their needs and concerns<sup>362</sup>. Consequently, most EU MSs have put mechanisms in place for handling complaints. While the mandate and authority of the different mechanisms vary across MSs, only one NRA (Poland) stated that no effective complaint mechanism was implemented, even if formal structures with respect to dispute settlement exist. The complaint procedure is often described in the retail bill by giving the name and contact details of the competent body.
- 633 Furthermore, most MSs have a clearly defined complaints procedure for residential consumers. Energy companies in Germany are legally obliged to answer (in writing) consumer complaints related to contracts and quality of service within four weeks and to forward them to the Arbitration Board in case of disagreement. In the Netherlands, an adequate procedure for handling complaints is a prerequisite for the supplier to be granted a license. In France, complaints received by the NRA have been handled through a standard procedure, in coordination with the Energy Ombudsman, since 2007. The public Ombudsman issues non-binding recommendations to suppliers and DSOs. More recently, a dispute settlement body ('Cordis') was established within the national regulator to resolve disputes between all grid users, including residential consumers, producers/consumers and grid operators. In Great Britain and Denmark, there is a procedure in place to complain only to suppliers, not to the NRA.
- 634 In countries where complaint bodies have been set up outside the NRA (e.g., Ombudsmen), no concern has been raised so far as to their independence from suppliers or national regulators.

362 CEER Position Paper on the Commission's proposed Directive on consumer ADR, COM (2011) 793, Ref.: C12-CEM-49-05.

## 6.4 Rolling out smart meters

635 The 3<sup>rd</sup> Package provides for the introduction of smart metering as a measure intended to increase energy efficiency<sup>363</sup>. Intelligent metering systems are meant to help electricity and gas consumers optimise their energy use. In addition, smart metering should assist the active participation of consumers in the energy market<sup>364</sup>. The main advantages of smart meters for consumers will be (almost) real-time consumption information, a faster supplier switching process, the development of new (e.g., time-of-use) tariff models, advice on energy efficiency, and energy savings tailored to individual consumer needs. In short, consumers will be able to be informed about their energy consumption behaviour more easily than in the past.

### Great Britain – Smart Metering Installation Code of Practice

The Smart Metering Installation Code of Practice introduced in June 2013 is part of a range of measures designed to protect and empower domestic and small business energy consumers during the mandated roll-out of smart meters in Great Britain.

The two main objectives of the code, setting out detailed rules to which suppliers must adhere when installing smart metering equipment, are to:

- ensure that consumers remain protected during the installation process. In particular, the code sets out rules for marketing goods and services, and prohibits suppliers from completing a sale during domestic installation visits; and
- help consumers engage with their new smart metering system. In particular, the code requires installers to demonstrate the use of the new meter and related equipment. Suppliers must also provide information regarding energy efficiency during the installation process.

The installation visit provides a unique opportunity for suppliers to engage with their consumers and to introduce them to smart metering in their home or business. The aspiration is for the visit to act as a pivotal point in the roll-out, where consumers engage with smart metering and learn how to use the new equipment to help manage their energy usage more efficiently. To support this aspiration, it is important to avoid that consumers suffer any detriment during the installation visit through mis-selling practices.

Suppliers and consumer representatives are responsible for working together to monitor the application of the code in practice, and to update it as necessary during the course of the roll-out. The code requires suppliers to procure independent research on consumer experience of the installation process. The code also requires suppliers to provide an independent audit of their processes once the roll-out is under way.

Ofgem has approved the new code and is ultimately responsible for monitoring and enforcing it<sup>365</sup>.

363 Article 3(11) of Directive 2009/72/EC and Article 3(8) of Directive 2009/73/EC.

364 Point 2 of Annex I to the Directives.

365 The code itself and more detailed information about its content is available at [www.ofgem.gov.uk](http://www.ofgem.gov.uk).



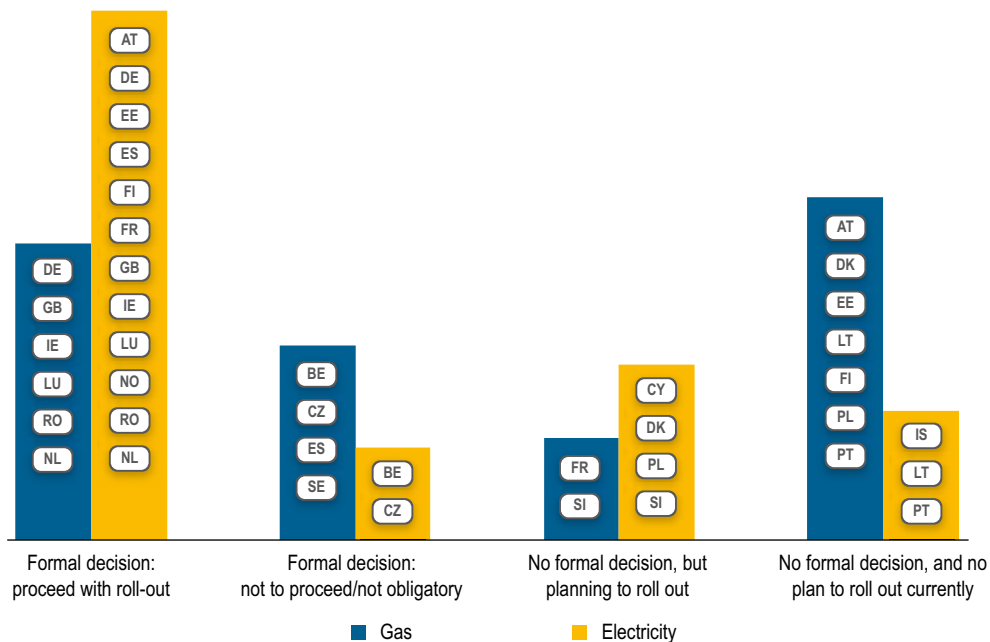
- 636 The 3<sup>rd</sup> Package envisaged the possibility for MSs to perform an economic assessment by 3 September 2012 to facilitate the decision on whether and how smart meters should be rolled out. Depending on the result of this assessment, the Directives prescribe that a timetable for smart metering roll-out be developed. For electricity, Directive 2009/72/EC additionally imposes the requirement that the timetable must not exceed ten years, and that at least 80% of consumers must be equipped with intelligent metering systems by 2020 where the roll-out is positively assessed on a cost-benefit basis.
- 637 Following up on these legislative requirements, on the Guidelines of Good Practice (GGP) for smart metering developed by ERGEG in 2011<sup>366</sup>, as well as on the European Commission's Recommendation 2012/148/EC of 9 April 2012 (developed from ERGEG's document), CEER published a Status Review<sup>367</sup> of the implementation of these GGP. The aim of the Status Review was to assess the extent to which MSs and NRAs are applying the recommendations included in the GGP, to assess how smart metering functionalities are handled, and to verify how the related economic and consumer assessments are carried out. The main findings of the Status Review are presented in what follows.
- 638 In electricity, only two countries have completed their roll-out (Sweden by 100% and Italy by 95%); one country (Finland) should reach the 80% target by the end of 2013, and 15 countries are rolling out or plan to roll out smart meters (11 of these will target 95% or more consumers; three countries will target 80% and one (Germany) will target 15%). The situation is less advanced in gas, where cost-benefit outcomes are sometimes not as clear-cut as in electricity. In fact, only one country (Italy) is rolling out smart meters and seven other countries are planning to do so. All of them will target 95% of consumers or more.
- 639 The countries which have not started rolling out smart meters can be categorised as follows: (a) countries which took a formal or legal decision to roll out smart meters, but have yet to do so to a significant extent<sup>368</sup>; (b) countries which took a formal decision not to roll out smart meters due to a negative cost-benefit analysis (CBA); (c) countries which intend to roll out smart meters, but have not yet taken a formal or legal decision to do so; and (d) countries which have no plans to roll out smart meters, but have not yet taken a formal or final decision not to do so. Figure 89 shows these decision stages.

366 ERGEG, 'Final Guidelines of Good Practice on the regulatory aspects of smart metering for electricity and gas' (2011), Ref.: E10-RMF-29-05.

367 CEER, 'Status Review of the regulatory aspects of smart metering, including an assessment of the roll-out as of 1 January 2013' (2013), Ref.: C13-RMF-54-04.

368 In many of these countries, smart meters have been introduced on a trial basis; consumers are free to request a smart meter, or smart meters are mandated for new installations, such as new or refurbished houses. However, a programme of large-scale replacement of existing meters is yet to begin.

Figure 89: Smart meter roll-out decisions



Source: CEER Status Review of the regulatory aspects of smart metering, including an assessment of roll-out as of 1 January 2013, Figure 2

640 The ERGEG recommendations from 2011 are generally applied. In particular, MSs and NRAs are generally using the recommendations in terms of conducting a CBA to determine whether or not to introduce smart meters.

641 All countries that have rolled out, are rolling out, or intend to roll out smart meters also gave an indication of their percentage roll-out targets<sup>369</sup>.

642 The technical design of smart metering systems varies from one country to another. Generally, and as a result of European-level efforts through CEN-CENELEC-ETSI, there is a common understanding of what capabilities/functionalities a smart meter should have, but often only a subset of these capabilities is chosen for their roll-out, depending on the relevant market arrangements and CBA. Despite many years spent assessing European standards, Europe faces a lack of common technical solutions to deliver the agreed capabilities/functionalities. This is detrimental to the achievement of economies of scale in smart meter production and is particularly relevant when considering point 2 of Annex I to Directive 2009/72/EC and Directive 2009/73/EC, requiring MSs or their designated competent authorities to ensure that their smart metering systems are interoperable and that due attention is paid to the use of appropriate standards and best practice.

369 With the exception of Slovenia, which has not yet decided on the percentage target, awaiting the results of the cost-benefit analysis (currently in progress).

## 6.5 Conclusions

- 643 Some disparity in the application of the consumer-related provisions of the 3<sup>rd</sup> Package is observed across MSs. Regarding vulnerable consumers, not all MSs have a specific definition of a 'vulnerable consumer' and measures to protect them may vary from one country to another. As far as consumer information is concerned, the level of compliance with the information requirements of the 3<sup>rd</sup> Package is very high across MSs. A large number of MSs have independent dispute settlement mechanisms in place (20 in gas and 25 in electricity). In some countries, ADR is specific to energy consumers, while in others it is dealt with by multi-sector consumer associations or advisory bodies.
- 644 As already mentioned in last year's MMR and in the conclusions of the CEER 2013 Annual Conference on Energy Consumers<sup>370</sup>, complaint data are important for market monitoring and critical for learning about consumer satisfaction and expectations. Consumer perception of retail energy markets can be monitored through the collection and analysis of consumer complaint data (alongside other market indicators). European regulatory authorities have issued recommendations about indicators for market monitoring<sup>371</sup> and complaint handling, reporting, and classification<sup>372</sup>. This MMR reveals that the lack of harmonisation in the way complaint data are collected in different MSs makes it very difficult to compare information across borders. More work is needed to better manage and analyse complaints data.
- 645 Smart metering systems are being (or will be) rolled out in more than half of MSs. This technology has the potential to play an important role in empowering consumers. Their trust in, and positive attitude towards, smart meters have significant relevance in order to achieve other goals, such as the large-scale integration of RES and increasing demand response and energy efficiency. While the European Commission's 2012 report on 'Smart grid projects in Europe: lessons learned and current developments'<sup>373</sup> notes that there is still insufficient consideration given to social and cultural implications in smart grid pilot projects, some MSs are taking steps to address this, as mentioned in Section 6.3, to make sure that consumers are well informed about the implications of having a smart meter in their home and are protected from the possibility of inappropriate sales and marketing activities connected with the technical introduction of smart meters.
- 646 Through CEER, European energy regulators will continue working to put smaller consumers at the heart of the energy market. In addition, CEER will monitor the implementation of its 2020 vision for Europe's energy customers.

370 [http://www.energy-regulators.eu/portal/page/portal/EER\\_HOME/EER\\_WORKSHOP/CEER-EREGE%20EVENTS/ENERGY%20CUSTOMERS%202013/Proceedings/CustomerConf2013\\_CEER\\_Print.pdf](http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_WORKSHOP/CEER-EREGE%20EVENTS/ENERGY%20CUSTOMERS%202013/Proceedings/CustomerConf2013_CEER_Print.pdf)

371 ERGEG, 'Final Guidelines of Good Practice on indicators for retail market monitoring for electricity and gas'. Ref.: E10-RMF-27-03, 12 October 2010.

372 ERGEG, 'Guidelines of Good Practice on complaint handling', reporting and classification. Ref.: E10-CEM-33-05.

373 See: [http://ec.europa.eu/energy/gas\\_electricity/smartgrids/doc/ld-na-25815-en-n\\_final\\_online\\_version\\_april\\_15\\_smart\\_grid\\_projects\\_in\\_europe\\_-\\_lessons\\_learned\\_and\\_current\\_developments\\_-2012\\_update.pdf](http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/ld-na-25815-en-n_final_online_version_april_15_smart_grid_projects_in_europe_-_lessons_learned_and_current_developments_-2012_update.pdf)





# Annexes

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## Annex 1: ACER and CEER

The Agency for the Cooperation of Energy Regulators (the Agency or ACER) is the European Union body created by the Third Energy Package to advance progress on the completion of the internal energy market for both electricity and natural gas.

The Agency was officially launched in March 2011, and has its seat in Ljubljana, Slovenia. As an independent European body which fosters cooperation among European energy regulators, the Agency ensures that market integration and the harmonisation of regulatory frameworks are implemented in respect of the EU's energy policy objectives.

The overall mission of the Agency, as stated in its founding regulation, is to complement and coordinate the work of national energy regulators at EU level and to work towards the completion of the single EU energy market for electricity and natural gas.

The Agency's missions and tasks are defined by the Directives and Regulations of the Third Energy Package, especially Regulation (EC) No 713/2009 establishing the Agency. In particular, the Agency plays a central role in the development of EU-wide network and market rules with a view to enhancing competition. It coordinates regional and cross-regional initiatives which favour market integration. It monitors the work of the two European networks of transmission system operators (ENTSOs) for electricity and gas, and notably their EU-wide network development plans. Finally, it monitors the functioning of gas and electricity markets in general, and of wholesale energy trading in particular.

In 2011, Regulation (EC) No 1227/2011 on wholesale energy market integrity and transparency (REMIT) introduced a new, sector-specific monitoring framework for detecting and preventing abusive behaviour in wholesale energy markets. The Agency is expected to play a central role in the implementation of this monitoring framework. More recently, Regulation (EU) No 347/2013 on guidelines for trans-European energy infrastructure assigned additional tasks to the Agency in connection with the selection of infrastructure Projects of Common Interest.

The Council of European Energy Regulators (CEER) is the voice of Europe's national regulators of electricity and gas at EU and international level. Through CEER, a not-for-profit association, national regulators cooperate and exchange best practice within and beyond Europe's borders. CEER includes national regulatory authorities from 31 European countries (the EU-27, Iceland, Norway, Switzerland, FYROM and is growing).

One of CEER's key objectives is to facilitate the creation of a single, competitive, efficient and sustainable EU internal energy market that works in the public interest. More specifically, CEER is committed to placing consumers at the core of EU energy policy. CEER believes that a competitive and secure EU single energy market is not a goal in itself, but should deliver benefits for energy consumers.

CEER works closely with (and supports) the Agency. CEER, based in Brussels, deals with many complementary (and not overlapping) issues to the Agency's work, such as international issues, smart grids, sustainability and consumer issues. European energy regulators are committed to a complementary approach to energy regulation in Europe, with the Agency primarily focusing on its statutory tasks related to EU cross-border market development and oversight, with CEER pursuing several broader issues, including international and customer policies.

## Annex 2: List of abbreviations

Acronym	Definition
ACER	Agency for the Cooperation of Energy Regulators
ADR	Alternative Dispute Resolution
ATC	Available Transmission Capacity
CACM	Capacity Allocation and Congestion Management (Electricity)
CAGR	Compound Annual Growth Rate
CAM	Capacity Allocation Management (Gas)
CCG(T)	Combined Cycle Gas (Turbine)
CEE	Central-East Europe (electricity region)
CEER	Council of European Energy Regulators
CEGH	Central European Gas Hub (Austrian gas hub)
CGM	Common Grid Model
CHP	Combined Heat and Power
CMM	Capacity Management Module
CMP	Congestion Management Procedures (Gas)
CPI	Consumer Price Index
CRM	Capacity Remuneration Mechanism
CSE	Central South Europe (electricity region)
CWE	Central-West Europe (electricity region)
DA	Day-ahead
DSO	Distribution System Operator
DSR	Demand Side Response
E/E	Entry/exit
EC	European Commission
EEX	European Energy Exchange
EMIB	Energy Market Issues for Biomethane Projects
ENTSO-E	European Network of Transmission System Operators for Electricity
ENTSO-G	European Network of Transmission System Operators for Gas
ERGEG	European Regulators' Group for Electricity and Gas
ERI	Electricity Regional Initiative
ETS	Emissions Trading Scheme
EU	European Union
FAPDs	Flows Against Price Differentials
FCFS	First Come, First Served
FG	Framework Guidelines
FUI	France-UK-Ireland (electricity region)
GDP	Gross Domestic Product
GLE	Gas LNG Europe
GSK	Generation Shift Key
GTM	Gas Target Model
HH	Henry Hub (US)
HVDC	High-voltage direct current
ICE	Intercontinental Exchange (London)
IEA	International Energy Agency
IEM	Internal Energy Market
IP	Interconnection Point
LDZ	Local Distribution Zone
LNG	Liquefied Natural Gas
LSO	LNG System Operator

Acronym	Definition
LTCs	Long Term Contracts
mcm	Million cubic metres
MMR	Market Monitoring Report
MS	Member State
NBP	National Balancing Point (GB gas hub)
NC	Network Code
NCG	Net Connect Germany (one of Germany's gas hubs)
NRA	National Regulatory Authority
NTC	Net Transfer Capacity
OSP	Open Subscription Procedure
OTC	Over-the-counter
P2P	Point to Point
PCI	Project of Common Interest
PCR	Price Coupling Region
PEG	Point d'Echange de Gaz (the name of France's gas hubs; Nord, Sud and TIGF)
POTP	Post-Tax Total Price
PRISMA	Platform for European Gas Capacity Booking
PST	Phase-Shifting Transformer
PSV	Punto di Scambio Virtuale (the Italian gas hub)
PTDF	Power Transfer Distribution Factor
PTP	Pre-Tax Total Price
REMIT	Regulation on wholesale Energy Market Integrity and Transparency
RES	Renewable Energy Sources
RES-E	Electricity from Renewable Energy Sources
ROC	Renewable Obligation Certificate
RPI	Retail Price Index
SEE	South-East Europe (electricity region)
Sm <sup>3</sup>	Standard cubic metres
SME	Small and Medium-sized Enterprise
SO	System Operator
SOB	Shared Order Book
SoLR	Supplier of Last Resort
ST	Short Term
SWE	South-West Europe (electricity region)
TEN-E	Trans European Energy Networks
TEN-T	Trans European Transport Networks
TPA	Third Party Access
TSO	Transmission System Operator
TTF	Title Transfer Facility (the Dutch gas hub)
UIOLI	Use It or Lose It
UNC	Uniform Network Code
VAT	Value Added Tax
VIP	Virtual Interconnection Point
VTP	Virtual Trading Point
WDOs	Within Day Obligations
ZEE	Zeebrugge-Beach (the Belgian physical onshore interconnection point)
ZTP	Zeebrugge Trading Point, the new Belgian gas hub



## Annex 3: Tables summarising gas access regimes in the EU-27 - Footnotes

Table A- 1 (relating to Table 13 in the main text): Tariff regimes in EU25

1	The same transmission tariff is applied at all entry points, while tariffs at exit points are differentiated.
2	Differs among TSOs.
3	Target split 50/50, but with market area integration of bookable points; this is no longer the case for many TSOs.
4	Depending on TSO methodology.
5	Some interconnectors are out of the RAB, and an independent DFC model applies to them.
6	Currently, transmission tariffs are set using an average-cost pricing approach. CER will implement a pricing system based on long-term marginal cost and a matrix approach.
7	CER will implement a pricing system based on long-term marginal cost (LRMC). Revenues from entries and exits will be set at a 50:50 ratio (ignoring auction premiums).
8	In Latvia, tariffs include a fixed commodity price and a transmission and storage service charge (the latter until 2014).
9	Transmission tariffs are proportional to consumption. For cross-border transmission, a distance-based component applies.
10	Transit contract to Kaliningrad (RUS).
11	The Polish section of the Yamal pipeline, named TGPS, which supplies Russian gas to Poland and Western Europe.
12	Entry prices for the use of the transmission network may differ from one entry point to another, but exit prices are currently uniform. Long-run average incremental cost (LRAIC) is also used.
13	The proposal is approved after hearing the Tariff Council.
14	E/E system to be implemented in 2013, when a LRMC methodology will be applied.
15	No distinction between domestic and transit, but the tariff methodology does not apply to certain dedicated transmission lines.
16	P2P tariff based on distance for transmission transit and Postage Stamp for domestic exits.
17	New tariff methodology to be implemented in 2013.
18	Revenue is calculated based on the standardised cost of infrastructure.
19	At entry points, capacity charge. At exit points, capacity + commodity charge.
20	As the price for capacity will depend on utilisation, the resulting cost will correspond to a 0/100 split for zero utilisation and to a 100/0 split for full utilisation.
21	Preliminary objective, subject to auction revenues and network utilisation.
22	The commodity charge is levied on both entry and exit points; the entry commodity charge is only applied if a revenue shortfall from capacity auctions is forecast.
23	The price control mechanism consists of a revenue cap for OPEX and rate of return for CAPEX.
24	E/E system to be implemented in 2013, when a new methodology will be applied.
25	Starting in February 2013, there will be separate entry/exit charges according to the New Tariff Regulation approved in 2012.
26	The Tariff Regulation was approved in 2012. Entry/exit tariffs came into force on 1 February 2013.
27	Methodology and tariff calculation by the NRA.
28	Limited to data provision.
29	From 1 January 2013.
30	None of the methods is applicable. The 'asset allocation approach' is used as the primary tariff cost allocation methodology.
31	Transit pipelines are not subject to special conditions; transit assets are identified for the purpose of cost allocation.
32	From 1 <sup>st</sup> October 2013, capacity will start being booked. The multipliers will be: 1.3 for 3 months, 1.5 for 1 month, and 2 for day-ahead.

Table A- 2 (relating to Table 15 in the main text): CAM regimes in EU25

1	The old long-term transit contracts in force have priority access to cross-border capacity. The ratio of capacity needed to serve old contracts to total cross-border capacity is 100%.
2	Since Gasum is the only natural gas importer and sole TSO in Finland, there is no need for entry capacity management.
3	In line with CRE's decision of 9 February 2012, long-term capacity is no longer allocated by FCFS at Dunkerque, Taisnières B, Taisnières H, Obergailbach, and Oltingue. Open Season Procedures (OSP) are used as a transition step towards the implementation of LT auctions as envisaged in the CAM NC. The use of FCFS for the allocation of LT capacity between France and Spain has been maintained, because the change would have concerned Biriadou only, for a volume of just 2GWh/d. OSPs were the standard mechanism (in 2012). FCFS is applied if there is remaining capacity after OSP and before starting the next OSP (for shorter-time products). Finally, GRTgaz uses auctions for the allocation of the remaining day-ahead capacity (2012). In future: progressive implementation of auctions for all types of products in 2013 and 2014. Six-month products will no longer be offered, and quarterly products will be introduced in 2014-2015 (cf. PRISMA developments).
4	Capacity is bundled at the domestic IP b/w GRTgaz North and GRTgaz South and at the IP between GRTgaz South and TIGF. GRTgaz started to offer monthly and day-ahead bundled products at Obergailbach with GRTgaz Deutschland, and also day-ahead bundled products at Taisnières H with Fluxys, via the platform CAPSQUARE (this will probably converge to PRISMA). "Combined products" are offered between TIGF and Spain (not taken into account in the ratio). Bundling will progressively be introduced at x-border IPs for all types of products (cf. PRISMA developments). A VIP is implemented between GRTgaz North and GRTgaz South and between GRTgaz South and TIGF. In future: implementation of a VIP for the IPs with Spain.
5	Auctions as default rule. FCFS is used for certain products.
6	Long-term capacity bookings take priority during the allocation process, with capacity being first granted to long-term contracts with a take-or-pay clause signed before 10 August 1998. Annual capacity requests are prioritised over short-term bookings.
7	Latvijas Gāze is the only natural gas transmission, storage, distribution, and sales operator in the country. Its sole supplier is Gazprom.
8	Reserve of peak supply to residential consumers. Reserved volumes change with temperature.
9	OSP for some products at SP-FR IPs. Auctions at ES-PT borders for yearly and quarterly products.
10	Entry point capacity to Sweden is directly contracted in Denmark at the only entry point. End users book capacity at DSO level.
11	BELUX.
12	Fluxys Belgium offers DA capacity via PRISMA. All other products allocated on demand. Yearly, quarterly and monthly products will be on offer starting 01/01/2014.
13	Bundled products available at each interconnection point. First allocation of bundled products done for 2014: see <a href="http://en.gaz-system.pl/centrum-prasowe/aktualnosci/informacja/arttykul/201662/">http://en.gaz-system.pl/centrum-prasowe/aktualnosci/informacja/arttykul/201662/</a>
14	Auctions used in case of congestion.
15	Reservation of capacity done yearly.
16	To be in line with the NC on CAM, ERSE underwent a public regulation revision in April 2013. Later in 2013, a new system should have been implemented.
17	Users will pay for booked capacity, and annual, quarterly, monthly and daily products will be offered. Auctions will be the new CAM mechanism.
18	Legal implementation only, but not de facto.
19	Open subscription window.
20	CAM has partially been implemented in Hungary, the final deadline being 1 November 2015. An entry/exit regime is now in place on at least one border.

Table A- 3 (relating to Table 16 in the main text): CMP regimes in EU25

1	[4] [5] On the SGRI forum, PT, SP and FR are now discussing CMP methods (auctions, UIOLI) to be implemented in October 2013.
2	CMP since October 2012. Adaptations under consultation. Decision to be taken by CREG in Q4/2013.
3	Re-nominations are not restricted.
4	<p>Until 1 April 2013, a capacity return mechanism was in place at several IPs. This mechanism prescribes that those users holding more than 20% of firm technical annual capacity are obliged to return a share of such capacity to the TSO as soon as third-party shipper requests cannot be served. After the implementation of the CMP Annex, this mechanism will persist at Dunkerque only (sub-sea French/Norway IP).</p> <p>A short-term UIOLI mechanism is in place at all entry/exit points (excluding entry points from LNG terminals): when all firm capacities have been booked, booked but unused capacity will be commercialised on an interruptible basis. Since 1 April 2013, this mechanism has been enhanced and it now includes unsold capacity, too.</p> <p>Concerning capacity allocation mechanisms, auctions are used to allocate a fraction of day-ahead capacity. Early implementation of the CAM network code started on 1 April 2013 with PRISMA.</p>

Table A- 4 (relating to Table 17 in the main text): Balancing regimes in EU25

1	15% for biogas.
2	No direct imbalance charge, but deliveries above pre-booked volumes are sold by the sole gas wholesaler.
3	There is an incentive mechanism in place to motivate shippers to keep their balancing portfolios within a certain within-day dead band.
4	LNG FOB price + Commodity Charge of LNG TPA tariffs + levies and taxes.
5	If the supplier fails to balance its injections and off-takes for five consecutive days, the tolerance level is gradually reduced to zero.
6	Resulting from daily auctions.
7	The Dutch system does not have a balancing period. The Dutch/GTS regime uses near-real time information and, as long as the balance of the combined portfolios remains within an acceptable dead band, the TSO will not take any balancing action.
8	Prices change each month as a function of the wholesale market.
9	The current position at Sines LNG is taken into account when calculating transmission system imbalance values. Various cases apply. If there is no gas stored at LNG terminals, the maximum imbalance charge will be equal to 30% of the non-weighted Henry Hub versus NBP average price.
10	Tolerance level proportional to the OSP result for capacity allocation. Tolerance also depends on consumer type.
11	Imbalances are calculated by DSOs at regional level. The TSO does not apply imbalance charges, but compensates them, taking the Baumgarten (CEGH) price as reference.
12	Daily cumulative over the whole month.
13	9 -15% within the tolerance band, 26-51% outside the tolerance band.
14	Depending on the month; winter months have a lower tolerance level.
15	One balancing zone with eight physical balancing points.
16	There are some limitations to gas flow rates of change, and notice periods are required prior to any change in the notified rates.
17	Fluxys applies market-based, within-day obligations. In fact, all TSOs in Europe make use of within-day obligations (profiling on entry, limitations on ramp up/down on exits, TSO access to storage or LNG). The shippers active on the Fluxys network receive hourly information on their balancing account, thus making it possible to steer their balancing positions at any moment of the day. Without regular information on balancing positions, shippers cannot intervene directly and the TSO will remain the only entity responsible for within-day balancing (not market-based). This will usually lead to cross-subsidisation or socialisation of costs across entries and exits.
18	In Lithuania, there is an opportunity for line pack activity in the transmission system, but before the TSO starts managing line pack, it should inform the NRA (at the moment, the TSO does not provide this service).
19	If the end-of-day imbalance is more than +/- 2%, the shipper will have to pay an imbalance charge.
20	Testing period.
21	Indexed to tariffs in some cases.
22	Linepack is made available to network users only in the form of tolerances.

## Annex 4: EU-27 IP cross-border tariffs

This comparison – and the related map in Figure 72 – should be considered as a preliminary piece of analysis based on the information publicly available on individual TSO websites. The root data can be cross-checked and are in the public domain. The following caveats apply:

1. These tariffs do not reflect different purchasing powers, and for those countries not in the euro area, they are exposed to currency fluctuations;
2. These tariffs might reflect individual regulatory choices by MSs, for instance in terms of allowed total TSO revenues, regulatory rates of return, and valuation of the regulatory asset base;
3. These tariffs are a function of possibly diverging national cost allocation policies, which are being coordinated through the Agency's ongoing work on harmonised cross-border transportation tariffs;
4. Any network tariff will always be a function of potentially differing network cost drivers, such as network size (length/distance), configuration, maximum capacity, flows, topology, density, and other structural or regional factors;
5. Tariffs might have different underlying contractual conditions regarding force majeure, liabilities, credit, interruptions in case of emergency or extreme cold weather etc.
6. These tariffs represent firm products as published by TSOs. In Figure 72, charges for simulated flows were estimated on the basis of yearly contract duration, using charging units as published by TSOs. In those cases where tariff units were not published on a yearly basis, a direct conversion was performed. At some IPs, different tariffs may apply depending on capacity contracting periods; this possibility was not considered in the current exercise.

The IPs in our Table are listed following the ENTSOG sequence contained in ENTSOG's European Natural Gas Network Map. See: <http://www.entsog.eu/maps/transmission-capacity-map>

Table A- 5 EU Interconnection Point (IP) Cross-Border Tariffs (2013)

IP Name	Interconnection Point Description						Cost simulation for a certain consumption profile		
	Border and Direction	Flow Direction (TSO view)	Technical capacity GWh/d	Assumed GCV kWh/Nm <sup>3</sup>	TSO	Commodity related charges	Capacity related charges	TSO Charge Units	Cost of flowing 1 GWh/day/year through the IP in EUR
Zeebrugge IZT	UK to BE	Entry	632	11.3	Fluxys	0.02	8.9893	EUR/m <sup>3</sup> (n)/h/year	40,446
Zeebrugge IZT	BE to UK	Exit	805	11.3	Fluxys		35.6503	EUR/m <sup>3</sup> (n)/h/year	131,454
Interconnector	UK to BE	Exit	632	11.6	Interconnector		unknown		n.a
Interconnector	BE to UK	Entry	805	11.6	Interconnector		unknown		n.a
Bacton Interc	BE to UK	Entry	805	12.2	National Grid	0.0244	0.0086	pence per kWh - pence kWh/day	143,393
Bacton Interc	UK to BE	Exit	632	12.2	National Grid	0.0112	0.0001	pence per kWh - pence kWh/day	49,101
Zelzate	BE to NL	Entry	209	11.9	GTS		1.594	EUR/(kWh/h)/year	66,417
Zelzate	NL to BE	Exit	304	11.9	GTS		1.829	EUR/(kWh/h)/year	76,208
Zelzate	BE to NL	Exit	209	11.3	Fluxys	0.02	23.3476	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	93,390

Interconnection Point Description								Cost simulation for a certain consumption profile	
IP Name	Border and Direction	Flow Direction (TSO view)	Technical capacity GWh/d	Assumed GCV kWh/Nm <sup>3</sup>	TSO	Commodity related charges	Capacity related charges	TSO Charge Units	Cost of flowing 1 GWh/day/year through the IP in EUR
Zelzate	NL to BE	Entry	304	11.3	Fluxys	0.02	8.9893	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	40,446
Zandvliet	NL to BE	Exit	28	11.9	GTS		2.042	EUR/(kWh/h)/year	85,083
Zandvliet	NL to BE	Entry	28	11.3	Fluxys	0.02	8.9893	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	40,446
Hilvarenbeek	NL to BE	Exit	569	10.3	GTS		1.98	EUR/(kWh/h)/year	82,500
Hilvarenbeek	NL to BE	Entry	569	9.8	Fluxys	0.02	8.9893	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	45,520
's Gravenvoeren	NL to BE	Exit	352	10.3	GTS		1.532	EUR/(kWh/h)/year	63,833
's Gravenvoeren	NL to BE	Entry	352	11.3	Fluxys	0.02	8.9893	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	40,446
Obbicht	NL to BE	Exit	61	11.9	GTS		1.302	EUR/(kWh/h)/year	54,250
Obbicht	NL to BE	Entry	61	11.3	Fluxys	0.02	8.9893	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	40,446
Eynatten	BE to DE	Entry	137	11.2	Gascade		2.65	EUR/(kWh/h)/year	110,417
Eynatten	DE to BE	Exit	88	11.2	Gascade		2.56	EUR/(kWh/h)/year	106,667
Eynatten	BE to DE	Entry	2	11.2	Thyssengas		0.0071	EUR/(kWh/h)/d	108,333
Eynatten	BE to DE	Entry	38	11.3	Fluxys TENP		1.73	EUR/(kWh/h)/year	72,083
Eynatten	DE to BE	Exit	82	11.3	Fluxys TENP		1.42	EUR/(kWh/h)/year	59,167
Eynatten	BE to DE	Entry	91	11.2	Open Grid Europe		0.0064	EUR/(kWh/h)/day	97,485
Eynatten	DE to BE	Exit	282	11.2	Open Grid Europe		0.0084	EUR/(kWh/h)/day	128,206
Eynatten	DE to BE	Entry	451	11.3	Fluxys	0.02	8.9893	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	40,446
Eynatten	BE to DE	Exit	268	11.3	Fluxys	0.02	35.6503	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	138,754
Bras/Petange	BE to LU	Entry	50	11.6	CREOS		42.77	EUR/Sm <sup>3</sup> /h/a	153,232
Bras/Petange	BE to LU	Exit	50	11.3	Fluxys	0.02	14.9719	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	62,506
Remich	DE to LU	Entry	50	11.6	CREOS		42.77	EUR/Sm <sup>3</sup> /h/a	153,232
Remich	DE to LU	Exit	50	11.6	Open Grid Europe		0.0107	EUR/(kWh/h)/day	161,969
Blaregnies / Taisnieres (H)	BE to FR	Exit	570	11.3	Fluxys	0.02	19.7171	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	80,003
Blaregnies / Taisnieres (H)	BE to FR	Entry	570	11.6	GRTgaz		112.72	EUR/MWh/day per year	112,720
Bocholtz	NL to DE	Exit	450	11.5	GTS		1.532	EUR/(kWh/h)/year	63,833
Bocholtz	NL to DE	Entry	68	11.5	Open Grid Europe		0.0064	EUR/(kWh/h)/d	97,942
Bocholtz	NL to DE	Entry	367	11.3	Fluxys TENP		1.73	EUR/(kWh/h)/year	72,083
Bocholtz	NL to DE	Entry	16	11.5	Thyssengas		0.0071	EUR/(kWh/h)/d	108,333
Zevenaar	NL to DE	Exit	270	10.1	GTS		1.371	EUR/(kWh/h)/year	57,125
Zevenaar	NL to DE	Entry	224	10.1	Thyssengas		0.0053	EUR/(kWh/h)/d	80,604
Winterswijk	NL to DE	Exit	198	10.8	GTS		1.371	EUR/(kWh/h)/year	57,125
Winterswijk	NL to DE	Entry	198	10.8	Open Grid Europe		0.0065	EUR/(kWh/h)/d	98,854
Oude Statenzijl	NL to DE	Entry	37	11.5	Gascade		2.65	EUR/(kWh/h)/year	110,417
Oude Statenzijl	DE to NL	Exit	96	11.5	Gascade		2.56	EUR/(kWh/h)/year	106,667
Oude Statenzijl	NL to DE	Entry	72	12.2	Open Grid Europe		0.0081	EUR/(kWh/h)/d	123,796
Oude Statenzijl	DE to NL	Exit	243	12.2	Open Grid Europe		0.0066	EUR/(kWh/h)/d	100,375
Oude Statenzijl	NL to DE	Entry	71	11.9	Gasunie		0.7224	EURct/(kWh/h)/d	109,865
Oude Statenzijl	DE to NL	Exit	27	11.9	Gasunie		0.9225	EURct/(kWh/h)/d	140,297

Interconnection Point Description								Cost simulation for a certain consumption profile	
IP Name	Border and Direction	Flow Direction (TSO view)	Technical capacity GWh/d	Assumed GCV kWh/Nm <sup>3</sup>	TSO	Commodity related charges	Capacity related charges	TSO Charge Units	Cost of flowing 1 GWh/day/year through the IP in EUR
Oude Statenzijl	DE to NL	Entry	366	11.8	GTS		0.918	EUR/(kWh/h)/year	38,250
Oude Statenzijl	NL to DE	Exit	433	11.1	GTS		0.731	EUR/(kWh/h)/year	30,458
Oude Statenzijl L	NL to DE	Entry	76	9.8	GTG Nord		0.9766	EUR/(kWh/h)/year	40,692
Oude Statenzijl L	NL to DE	Entry	178	9.7	Gasunie		0.785	EURct/(kWh/h)/d	119,385
Julianadorp	NL to UK	Exit	454	12.2	GTS		1.143	EUR/(kWh/h)/year	47,625
BBL	NL to UK	Exit	454	12.2	BBL			Unknown	
Bacton-BBL	NL to UK	Entry	454	12.2	National Grid	0.0244	0.0081	pence per kWh pence kWh/day	141,220
Moffat	UK to IE	Exit	342	11.6	National Grid	0.0112	0.0014	pence per kWh pence kWh/day	54,750
Moffat	UK to IE	Entry	342	11.6	Gaslink	0.148	340.822	per MWh + EUR/ peak MWh/year fixed	68,221
Oberkappel	AT to DE	Exit	146	11.2	BOG		4.21	EUR kWh/h/year	175,417
Oberkappel	DE to AT	Entry	107	11.2	BOG		1.39	EUR kWh/h/year	57,917
Oberkappel	AT to DE	Entry	133	11.1	GRTgaz Deutschland		1.67	EUR kWh/h/year (EUR/kWh/h/day summer/winter)	69,583
Oberkappel	DE to AT	Exit	13	11.1	GRTgaz Deutschland		2.08	EUR kWh/h/year (EUR/kWh/h/day summer/winter)	86,667
Oberkappel	AT to DE	Entry	13	11.1	Open Grid Europe		0.0093	EUR/(kWh/h)/day	140,829
Oberkappel	DE to AT	Exit	94	11.1	Open Grid Europe		0.0107	EUR/(kWh/h)/day	161,969
Medelsheim / Obergaibach	DE to FR	Exit	450	11.3	GRTgaz Deutschland		2.08	EUR/kWh/h/day (summer /winter day) - kWh/h/year	86,667
Medelsheim / Obergaibach	DE to FR	Exit	117	11.3	Open Grid Europe		0.0084	EUR/(kWh/h)/d	128,206
Medelsheim / Obergaibach	DE to FR	Entry	567	11.3	GRTgaz		112.72	EUR/MWh/day per annum	112,720
Ueberackern / Burghausen	AT to DE	Exit	181	11.2	Gas Connect Austria		4.21	EUR kWh/h/year	175,417
Ueberackern / Burghausen	DE to AT	Entry	114	11.2	Gas Connect Austria		1.54	EUR kWh/h/year	64,167
Ueberackern / Burghausen	AT to DE	Entry	181	11.7	Bayernets		0.0062	EUR / kWh/h / day	94,231
Ueberackern / Burghausen	DE to AT	Exit	114	11.7	Bayernets		0.0062	EUR / kWh/h / day	94,231
Murfeld / Cersak	AT to SI	Exit	113	11.2	Gas Connect Austria		4.16	EUR kWh/h/year	173,333
Murfeld / Cersak	AT to SI	Entry	90	10.8	Plinovodi Slovenia		1.1	EUR/Sm <sup>3</sup> /day / year	102,326
Arnoldstein / Tarvisio	IT to AT	Entry	191	11.2	TAG		1.39	EUR kWh/h/year	57,917
Arnoldstein / Tarvisio	AT to IT	Exit	1135	11.2	TAG		5.26	EUR kWh/h/year	219,167
Arnoldstein / Tarvisio	AT to IT	Entry	1135	11.2	SNAM Rete Gas	0.0032261	0.9378	EUR/Sm <sup>3</sup> - EUR/Sm <sup>3</sup> /day per year	188,868
Arnoldstein / Tarvisio	IT to AT	Exit	191	11.2	SNAM Rete Gas		0.5993	EUR/Sm <sup>3</sup> - EUR/Sm <sup>3</sup> /day per year	53,505

Interconnection Point Description								Cost simulation for a certain consumption profile	
IP Name	Border and Direction	Flow Direction (TSO view)	Technical capacity GWh/d	Assumed GCV kWh/Nm <sup>3</sup>	TSO	Commodity related charges	Capacity related charges	TSO Charge Units	Cost of flowing 1 GWh/day/year through the IP in EUR
Passo Gries	CH to IT	Entry	639	11.4	SNAM Rete Gas	0.0032261	0.5334	EUR/Sm <sup>3</sup> EUR/Sm <sup>3</sup> /day/ year	149,818
Passo Gries	IT to CH	Exit	639	11.4	SNAM Rete Gas		1.8221	EUR/Sm <sup>3</sup> EUR/Sm <sup>3</sup> /day/ year	159,542
Passo Gries	CH to IT	Exit	639	11.4	FluxysSwiss / SwissGas		Auction/ unknown	-	
Wallbach	DE to CH	Exit	367	11.3	Fluxys TENP		1.64	EUR/(kWh/h)/year	68,333
Wallbach	DE to CH	Exit	295	11.5	Open Grid Europe		0.0107	EUR/(kWh/h)/day	161,969
Wallbach	DE to CH	Entry	590	11.5	FluxysSwiss / SwissGas		Auction/ unknown	-	
Gorizia/Sempeter	IT to SI	Exit	28	11.2	SNAM Rete Gas		1.4889	EUR/Sm <sup>3</sup> EUR/Sm <sup>3</sup> /day/ year	132,938
Gorizia/Sempeter	SI to IT	Entry	28	11.2	SNAM Rete Gas	0.0032261	0.6578	EUR/Sm <sup>3</sup> EUR/Sm <sup>3</sup> /day/ year	163,870
Gorizia/Sempeter	IT to SI	Entry	28	10.8	Plinovodi Slovenia		0.8	EUR/Sm <sup>3</sup> /day/ year	74,419
Rogatec	SI to HR	Transmission	102	11.2	Plinacro		5.13	kn/m <sup>3</sup> /day/year	64,061
Rogatec	SI to HR	Exit	28	11.2	Plinovodi Slovenia		0.92	EUR/Sm <sup>3</sup> /day/ year	82,143
Oltingue/ Rodorsdorf	FR to CH	Exit	223	11.4	GRTgaz		78.652	EUR/MWh/day year	78,652
Oltingue/ Rodorsdorf	FR to CH	Entry	223	11.4	ENI Gas International		Auction/ unknown	-	
Larrau	ES to FR	Entry	40	11.6	TIGF		62.16 / 44.4	MWh/day/season summer /winter season	106,560
Larrau	FR to ES	Exit	165	11.6	TIGF		225.97/ 161.4	MWh/day/season summer /winter season	387,370
Larrau	FR to ES	Entry	165	11.6	Enagas		10.604	EUR/(MWh/day)/ month	129,015
Larrau	ES to FR	Exit	40	11.6	Enagas		19.6091	EUR MWh/day/ month	238,577
Biriatou	ES to FR	Entry	4	11.6	TIGF		62.16 / 44.4	MWh/day/season summer /winter season	106,560
Biriatou	FR to ES	Exit	10	11.6	TIGF		225.97/ 161.4	MWh/day/season summer /winter season	387,370
Biriatou	FR to ES	Entry	10	11.6	Enagas		10.604	EUR/(MWh/day)/ month	129,015
Biriatou	ES to FR	Exit	4	11.6	Enagas		19.6091	EUR MWh/day/ month	238,577
Valença-Tui	ES to PT	Entry	57	11.9	REN		0.0086	EUR/(kWh/day)/ month	104,390
Valença-Tui	PT to ES	Exit	12	11.9	REN		0	EUR/(kWh/day)/ month	0
Valença-Tui	PT to ES	Entry	12	11.9	Enagas		10.604	EUR/(MWh/day)/ month	129,015
Valença-Tui	ES to PT	Exit	57	11.9	Enagas		19.6091	EUR MWh/day/ month	238,577

Interconnection Point Description								Cost simulation for a certain consumption profile	
IP Name	Border and Direction	Flow Direction (TSO view)	Technical capacity GWh/d	Assumed GCV kWh/Nm <sup>3</sup>	TSO	Commodity related charges	Capacity related charges	TSO Charge Units	Cost of flowing 1 GWh/day/year through the IP in EUR
Badajoz/Campo Maior	ES to PT	Entry	135	11.9	REN		0.0086	EUR/(kWh/day)/month	104,390
Badajoz/Campo Maior	PT to ES	Exit	53	11.9	REN		0	EUR/(kWh/day)/month	0
Badajoz/Campo Maior	PT to ES	Entry	53	11.9	Enagas		10.604	EUR/(MWh/day)/month	129,015
Badajoz/Campo Maior	ES to PT	Exit	134	11.9	Enagas		19.6091	EUR MWh/day/month	238,577
Ellund	DK to DE	Entry	37	12.1	Gasunie		0.7224	EURct/(kWh/h)/d	109,865
Ellund	DE to DK	Exit	11	12.1	Gasunie		0.9225	EURct/(kWh/h)/d	140,297
Ellund	DK to DE	Entry	4	12.1	OGE		0.012	EUR/(kWh/h)/d	182,652
Ellund	DE to DK	Exit	17	12.1	OGE		0.0107	EUR/(kWh/h)/d	161,969
Ellund	DK to DE	Exit	41	12.1	Energie dK	0.00109	9.48	DKK/kWh - DKK/kWh/hour/year	106,280
Ellund	DE to DK	Entry	28	12.1	Energie dK		9.48	DKK/kWh/hour/year	52,949
Dragor	DK to SE	Exit	106	12.2	Energie dK	0.00109	9.48	DKK/kWh - DKK/kWh/hour/year	106,280
Dragor	DK to SE	Entry	106	12.2	Swedegas			-	0
Mallnow	PL to DE	Entry	932	11.3	Gascade		2.65	EUR/(kWh/h)/year	104,167
Mallnow	PL to DE	Exit	932	11.3	TGPS Europol Gaz		23.21	PLN/1000m <sup>3</sup> /day	187,426
Lasow	DE to PL	Exit	43	11.1	ONTRAS-VNG		0.0085	EUR/(kWh/h)/day	129,271
Lasow	DE to PL	Entry	43	11.1	GAZ SYSTEM PL		0.0267	PLN m <sup>3</sup> /h per h	211,560
Hora Sv. Kateriny	CZ to DE	Entry	222	11.3	Gascade		2.65	EUR/(kWh/h)/year	110,417
Hora Sv.	DE to CZ	Exit	231	11.3	Gascade		2.56	EUR/(kWh/h)/year	106,667
Hora Sv. Kateriny	CZ to DE	Entry	270	11.5	ONTRAS-VNG		0.0091	EUR/(kWh/h)/day	138,396
Hora Sv. Kateriny	DE to CZ	Exit	108	11.5	ONTRAS-VNG		0.0069	EUR/(kWh/h)/day	104,938
Hora Sv. Kateriny	CZ to DE	Exit	492	11.5	Net4Gas	0.1925	4701.49	CZK/MWh - CZK/MWh/day/year	185,816
Hora Sv. Kateriny	DE to CZ	Entry	339	11.5	Net4Gas		727.12	CZK/MWh/day/year	28,315
Waidhaus	CZ to DE	Entry	552	11.1	Open Grid Europe		0.0073	EUR/(kWh/h)/day	111,629
Waidhaus	DE to CZ	Exit	200	11.1	Open Grid Europe		0.0084	EUR/(kWh/h)/day	128,206
Waidhaus	CZ to DE	Entry	458	11.1	GRTgaz Deutschland		1.67	EUR/kWh/h/day (summer /winter day) - kWh/h/year	69,583
Waidhaus	CZ to DE	Exit	1010	11.2	Net4Gas	0.1925	4675.31	CZK/MWh - CZK/MWh/day/year	184,796
Waidhaus	DE to CZ	Entry	201	11.2	Net4Gas		727.12	CZK/MWh/day/year	28,315
Cieszyn	CZ to PL	Exit	4	11.1	Net4Gas	0.1925	3740.6	CZK/MWh - CZK/MWh/day/year	148,398
Cieszyn	PL to CZ	Entry	0	11.1	Net4Gas		727.12	CZK/MWh/day/year	28,315
Lanzhot	CZ to SK	Entry	261	11.5	Eustream	0.025	102.76	EUR/MWh - EUR/MWh/day/year	111,885
Lanzhot	SK to CZ	Exit	783	11.5	Eustream	0.275	159.63	EUR/MWh - EUR/MWh/day/year	260,005
Lanzhot	CZ to SK	Exit	261	11.5	Net4Gas	0.1925	3740.6	CZK/MWh - CZK/MWh/day	148,398
Lanzhot	SK to CZ	Entry	783	11.5	Net4Gas		727.1200	CZK/MWh/day/year	28,315



Interconnection Point Description								Cost simulation for a certain consumption profile	
IP Name	Border and Direction	Flow Direction (TSO view)	Technical capacity GWh/d	Assumed GCV kWh/Nm <sup>3</sup>	TSO	Commodity related charges	Capacity related charges	TSO Charge Units	Cost of flowing 1 GWh/day/year through the IP in EUR
Baumgarten	SK to AT	Entry	392	11.2	Gas Connect Austria		0.7	EUR kWh/h/year	29,167
Baumgarten	SK to AT	Entry	463	11.2	BOG		0.7	EUR kWh/h/year	29,167
Baumgarten	SK to AT	Entry	1038	11.1	TAG		0.7	EUR kWh/h/year	29,167
Baumgarten	AT to SK	Exit	186	11.2	BOG		1.15	EUR kWh/h/year	47,917
Baumgarten	AT to SK	Entry	186	11.5	Eustream	0.035	79.39	EUR/MWh/day/year	92,165
Baumgarten	SK to AT	Exit	1612	11.5	Eustream	0.275	181.56	EUR/MWh/day/year	281,935
Mosommagyarovar	AT to HU	Exit	153	11.1	Gas Connect Austria		1.92	EUR kWh/h/year	80,000
Mosommagyarovar	AT to HU	Entry	153	11.1	FGSZ		33.81	HUF/MJ/d/y	414,000
Kula / Sidirokastro	BG to HE	Transmission	134	11.1	Bulgargastrans	n.a		BGN/1000 m <sup>3</sup>	0
Kula / Sidirokastro	BG to HE	Entry	134	11.1	DESFA	0.10204	135.5148	EUR/MWh - EUR/MWh/day/year	172,759
Negru Voda I / II	RO to BG	Transmission	820	11.1	Bulgargastrans	n.a		BGN/1000 m <sup>3</sup>	
Negru Voda I / II	RO to BG	Transmission	820	11.1	Transgaz	n.a	n.a	Leu MWh - Leu MWh/h	
Karksi	LV to EE	Transmission	73	11.1	Latvijas Gaze	n.a	n.a		
Karksi	LV to EE	Transmission	73	11.1	Vörguteenus	n.a	n.a		
Kiemenai	LV to LT	Transmission	55	11.1	Latvijas Gaze	n.a	n.a		
Kiemenai	LV to LT	Transmission	55	11.1	Lietuvos Dujos	n.a	n.a		
Csanadpalota	HU to RO	Exit	51	11.2	FGSZ	33.99	214.45	HUF/GJ - HUF/MJ/h/y	261,328
Csanadpalota	HU to RO	Transmission	51	11.2	Transgaz	n.a	n.a	Leu MWh - Leu MWh/h	
Dravaszerdahely	HU to HR	Exit	102	11.2	FGSZ	33.99	92.56	HUF/GJ - HUF/MJ/h/y	199,139
Dravaszerdahely	HU to HR	Transmission	102	11.2	Plinacro	-	5.13	kn/m <sup>3</sup> /day/year	64,061
Tampen Link	NO to UK	Exit	290	11.6	Gassco	0.0263747		NOK/Sm <sup>3</sup>	109,197
St Fergus	NO to UK	Entry	394	11.6	National Grid	0.0244	0.041	pence per kWh pence kWh/day	284,179
Dornum	NO to DE	Exit	460	11.4	Gassco	0.0263747		NOK/Sm <sup>3</sup>	111,112
Dornum	NO to DE	Entry	460	11.4	Open Grid Europe		0.0093	EUR/(kWh/h)/day	141,285
Emden (EPT)	NO to DE	Exit	217	11.1	Gassco	0.0263747		NOK/Sm <sup>3</sup>	114,115
Emden (EPT)	NO to DE	Entry	217	11.1	Open Grid Europe		0.0088	EUR/(kWh/h)/day	133,225
Emden (EPT)	NO to DE	Exit	219	11.6	Gassco	0.0263747		NOK/Sm <sup>3</sup>	109,197
Emden (EPT)	NO to DE	Entry	219	11.6	Gasunie		0.7224	EURct/(kWh/h)/d	109,865
Emden (EPT)	NO to NL	Exit	635	12.2	Gassco	0.0263747		NOK/Sm <sup>3</sup>	103,826
Emden (EPT)	NO to NL	Entry	635	12.2	GTS		0.918	EUR/(kWh/h)/year	38,250
Emden (EPT)	NO to DE	Exit	69	11.2	Gassco	0.0263747		NOK/Sm <sup>3</sup>	113,400
Emden (EPT)	NO to DE	Entry	69	11.2	Thyssengas		0.0071	EUR/(kWh/h)/d	108,333
Emden (NPT)	NO to DE	Exit	72	11.1	Gassco	0.0263747		NOK/Sm <sup>3</sup>	114,115
Emden (NPT)	NO to DE	Entry	72	11.1	Open Grid Europe		0.0088	EUR/(kWh/h)/day	133,225
Emden (NPT)	NO to DE	Exit	33	11.6	Gassco	0.0263747		NOK/Sm <sup>3</sup>	109,197
Emden (NPT)	NO to DE	Entry	33	11.6	Gasunie		0.7224	EURct/(kWh/h)/d	109,865

Interconnection Point Description								Cost simulation for a certain consumption profile	
IP Name	Border and Direction	Flow Direction (TSO view)	Technical capacity GWh/d	Assumed GCV kWh/Nm <sup>3</sup>	TSO	Commodity related charges	Capacity related charges	TSO Charge Units	Cost of flowing 1 GWh/day/year through the IP in EUR
Emden (NPT)	NO to NL	Exit	383	12.2	Gassco	0.0263747		NOK/Sm <sup>3</sup>	103,826
Emden (NPT)	NO to NL	Entry	383	12.2	GTS		0.918	EUR/(kWh/h)/year	38,250
Emden (NPT)	NO to DE	Exit	5	11.2	Gassco	0.0263747		NOK/Sm <sup>3</sup>	113,400
Emden (NPT)	NO to DE	Entry	5	11.2	Thyssengas		0.0071	EUR/(kWh/h)/d	108,333
Zeebrugge ZPT	NO to BE	Exit	502	11.6	Gassco	0.0263747		NOK/Sm <sup>3</sup>	109,197
Zeebrugge ZPT	NO to BE	Entry	502	11.3	Fluxys	0.02	8.9893	EUR/MWh - EUR/m <sup>3</sup> (n)/h/year	40,446
Dunkerque	NO to FR	Exit	585	11.5	Gassco	0.0263747		NOK/Sm <sup>3</sup>	110,146
Dunkerque	NO to FR	Entry	585	11.5	GRTgaz		112.72	EUR/MWh/day per annum at 0C	112,720
Easington	NO to UK	Exit	788	11.6	Gassco	0.0263747		NOK/Sm <sup>3</sup>	109,197
Easington	NO to UK	Entry	788	11.6	National Grid	0.0107	0.041	pence per kWh -- pence kWh/day	224,649
Tarifa	ALG to ES	Exit	355	11.6	GME			n.a	0
Tarifa	ALG to ES	Entry	355	11.6	Enagas		10.4604	EUR/(MWh/day)/month	129,015
Almeria	ALG to ES	Exit	266	11.6	Medgaz			n.a	0
Almeria	ALG to ES	Entry	266	11.6	Enagas		10.604	EUR/(MWh/day)/month	129,015
Mazara del Vallo	ALG to IT	Exit	1093	11.6	TPMC/Sonatrach			n.a	0
Mazara del Vallo	ALG to IT	Entry	1093	11.6	SNAM Rete Gas	0.003226	3.2401	EUR/Sm <sup>3</sup> --- EUR/Sm <sup>3</sup> /day/year	380,830
Gela	LY to IT	Exit	384	11.6	Green Stream			n.a	
Gela	LY to IT	Entry	384	11.6	SNAM Rete Gas	0.003226	2.9645	EUR/Sm <sup>3</sup> --- EUR/Nm <sup>3</sup> /day/year	357,070
Imatra	RU to FI	Exit	225	11.2	GAZPROM			n.a	
Imatra	RU to FI	Entry	225	11.2	Gasum			n.a	
Korneti	RU to LV	Exit	166	11.2	GAZPROM			n.a	
Korneti	RU to LV	Entry	166	11.2	Latvijas Gaze			n.a	
Kotlovka	BY to LT	Exit	323	11.2	Bieltransgaz			n.a	
Kotlovka	BY to LT	Entry	323	11.2	Lietuvos Dujos			n.a	
Kondrakti	BY to PL	Exit	1026	11.2	Bieltransgaz			n.a	
Kondrakti	BY to PL	Entry	1026	11.2	TGPS Europol Gaz		13.12	PLN/1000m <sup>3</sup> /day	106,893
Drozdowicze	UA to PL	Exit	133	11.1	Ukrtransgaz			n.a	
Drozdowicze	UA to PL	Entry	133	11.1	GAZ SYSTEM PL		0.0267	PLN m <sup>3</sup> /h	211,560
Velke Kapusany	UA to SK	Exit	3115	11.2	Ukrtransgaz			n.a	0
Velke Kapusany	UA to SK	Entry	3115	11.2	Eustream	0.15	160.53	EUR/MWh/day/year	215,280
Beregdaróc	UA to HU	Exit	594	11.1	Ukrtransgaz			n.a	
Beregdaróc	UA to HU	Entry	594	11.1	FGSZ		33.81	HUF/MJ/h/y	414,000
Isaccea	UA to RO	Exit	246	11.2	Ukrtransgaz			n.a	
Isaccea	UA to RO	Transmission	246	11.2	Transgaz	n.a	n.a	Leu MWh - Leu MWh/h	
Kipi	TK to HE	Exit	30	11.1	Botas			n.a	
Kipi	TK to HE	Entry	30	11.1	DESFA	0.0924	124.2238	EUR/MWh - EUR/MWh/day/year	157,950

Interconnection Point Description							Cost simulation for a certain consumption profile		
IP Name	Border and Direction	Flow Direction (TSO view)	Technical capacity GWh/d	Assumed GCV kWh/Nm <sup>3</sup>	TSO	Commodity related charges	Capacity related charges	TSO Charge Units	Cost of flowing 1 GWh/day/year through the IP in EUR
Varska	RU to EE	Exit	42	11.2	GAZPROM			n.a	
Varska	RU to EE	Entry	42	11.2	Vörguteenus			n.a	
Greifswald	RU to DE	Transmission	871	11.1	Nord Stream AG			n.a	
Greifswald	RU to DE	Entry	871	11.1	OPAL NEL		0.95	EUR/(kWh/h)/year	39,583
Kienbaum and Lampertheim	DE to DE	Entry	99	10.8	Open Grid Europe		0.0144	EUR/(kWh/h)/day	218,240
Kienbaum and Lampertheim	DE to DE	Exit	99	10.8	Gascade		2.5	EUR/(kWh/h)/year	104,167
Bunder-Tief	DE to DE	Entry	22	10.8	Open Grid Europe		0.008	EUR/(kWh/h)/day	121,667
Bunder-Tief	DE to DE	Exit	22	10.8	Gasunie		0.9225	EURct/(kWh/h)/d	140,297
Drohne and Emsburen	DE to DE	Entry	118	10.8	Open Grid Europe		0.0069	EUR/(kWh/h)/day	104,938
Drohne and Emsburen	DE to DE	Exit	118	10.8	Gasunie		0.9412	EURct/(kWh/h)/d	143,141
GRTGAZ link N to S	FR to FR	Entry	230	11.3	GRTgaz		208.04	EUR/MWh/day/year	208,040
GRTGAZ link S to N	FR to FR	Entry	230	11.3	GRTgaz		50	EUR/MWh/day/year	50,000
PIR MIDI	FR to FR	Entry	80	11.3	GRTgaz		55	EUR/MWh/day/year	55,000
PIR MIDI	FR to FR	Exit	385	11.3	GRTgaz		55	EUR/MWh/day/year	55,000
PIR MIDI	FR to FR	Entry	385	11.6	TIGF		26.25/ 18.75	MWh/day/season different values for summer /winter season	45,000
PIR MIDI	FR to FR	Exit	80	11.6	TIGF		26.25/ 18.75	MWh/day/season different values for summer /winter season	45,000
Petrzalka	AT to SK	Exit	27	11.2	Gas Connect Austria		1.97	EUR kWh/h/year	82,083

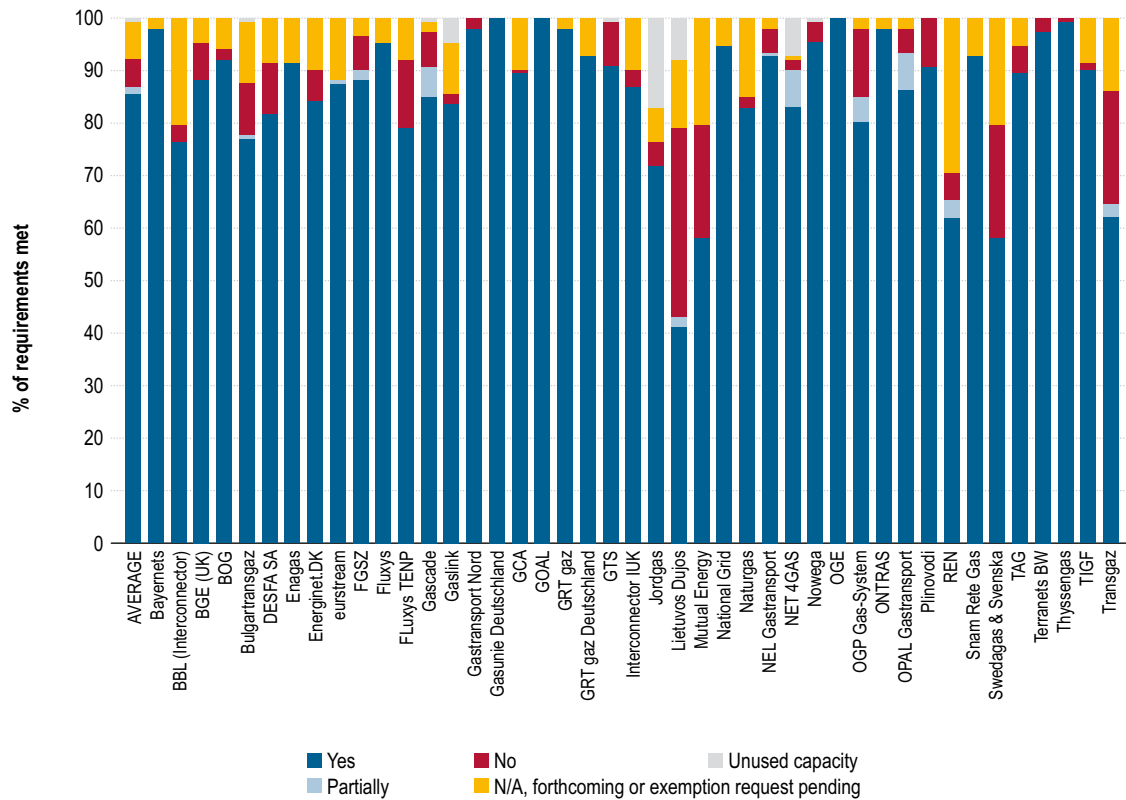
Note: A 60% discount is currently applied to commodity charges for gas flowing directly through the Italian national transmission network without crossing regional distribution networks.

## Annex 5: Transparency issues

For more information, see the Agency’s analysis of transparency in gas markets (carried out in cooperation with ENTSOG), which is intended to monitor TSO compliance with the transparency provisions listed in Regulation (EC) No 715/2009:

[http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Publication/ACER\\_Report\\_Gas\\_Transparency\\_Monitoring%209%20April%202013.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Report_Gas_Transparency_Monitoring%209%20April%202013.pdf)

Figure A-1: Level of compliance (TSO by TSO) with Annex I.3 of Regulation (EC) No 715/2009



Source: Agency survey carried out in 2013



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