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CEER Report on Investment Conditions in European Countries

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INFORMATION PAGE

Abstract

This document (Ref. C16-IRB-29-03) presents CEER report on investment conditions 2016 in European countries.

High quality regulation is a fundamental requirement for a sound investment climate, which, in itself, is a pre-requisite for an adequate flow of the new investments needed to develop secure, competitive and sustainable energy infrastructure and markets. Predictable independent regulation also helps to reduce regulatory and legal risks for investors, and hence lowers the cost of capital.

This report provides a general overview of the regulatory regimes applied in 2016, the required efficiency developments and analyses the overall determination of capital costs in EU Member States and Norway. A major focus is placed on the calculation of an adequate rate of return, the determination of the regulatory asset base (RAB) and the depreciation of assets in the different regulatory regimes. Other important, individual parameters and new incentive mechanisms presented in this study have to be interpreted in the context of a whole country-specific regulatory regime. Some figures only reflect an ex ante approach for 2016, while ex post calculations still are to be executed.

This report also serves as a background paper to CEER work on incentives, both in a quantitative as in a qualitative way.

Target Audience

European Commission, energy suppliers, traders, gas/electricity customers, gas/electricity industry, consumer representative groups, network operators, Member States, academics and other interested parties.

Keywords

Investment conditions, networks, rate-of-eturn regulation, regulatory asset base, cost of capital,incentive mechanisms and Projects of Common Interest (PCIs)

If you have any queries relating to this paper please contact:
CEER Secretariat
Tel.: +32 (0)2 788 73 30
Email: brussels@ceer.eu

Related Documents

CEER documents

- CEER Report on Investment Conditions in European Countries in 2015 , Ref. C15-IRB-28-03, 14 March 2016
- CEER Memo on regulatory aspects of energy investment conditions in European countries, Ref: C14-IRB-23-03a, 27 April 2015
- CEER Memo on regulatory aspects of energy investment conditions in European countries, Ref: C13-IRB-17-03, 7 March 2014
- CEER Memo on regulatory aspects of energy investment conditions in European countries, Ref: C13-EFB-09-03, 4 July 2013

External documents

- Regulatory Accounting, Principles of Implementation and Best Practice for WACC calculation, Independent Regulators Group (2007)
- Essentials of Corporate Finance: Ross, Stephen; Westerfield, Randolph; Jordan, Bradford, The Mcgraw-Hill/Irwin Series in Finance, Insurance, and Real Estate, (2016)

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1 Introduction

The scope of this report is to analyse the conditions for investments in electricity and gas networks in individual EU Member States and Norway. It provides a general overview of the regulatory regimes, the required efficiency developments and analyses the overall determination of capital costs. A major focus is placed on the calculation of a classic and adequate rate of return, the determination of the regulatory asset base (RAB) and the depreciation of assets in the different regulatory regimes. Regulators are aware that investors base their decision on a wide range of important factors, including, for example, the time required for permitting processes or the overall stability of the implemented regime. However, these equally important aspects go beyond the scope of this report and are therefore not covered in this analysis. In respect of this, the reader should be aware that the parameters presented in this study have to be interpreted in the context of a whole country-specific regulatory regime. They further reflect the development of country-specific incentives, related directly or indirectly to planned investment portfolio's.

The Council of European Energy Regulators considers (CEER) that in a system with a mature regulatory framework, the regulatory review will generally be a package of different decisions which need to form a coherent whole. Investors will have built up an understanding of the regulatory environment, and will be concerned about any changes which would upset the balance or put at risk past investments (e.g. by questioning how the regulatory asset base is valued, or the return applied to it). Generally, it would not be sensible to try to harmonise one component without changing the whole package in each system, which could be highly disruptive to regulatory predictability. It is important to note that national investment conditions can only be compared with each other to a certain extent.

As tariff regulation schemes are highly complex, a direct comparison of certain parameters, such as capital costs, is difficult and should only be done in the context of the whole regulatory system.

CEER addressed this challenge by undertaking a survey among CEER members, which focused on the main elements for determining allowed revenues. This data was then subject to a basic comparison and a number of conclusions were drawn.

This report includes data submitted by Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain (GB), Greece, Hungary, Italy, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovenia, Spain and Sweden.

For analysis of the weighted average cost of capital (WACC) the report includes data submitted by Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, GB, Greece, Hungary, Italy, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovenia, and Sweden. The data collection, covering investments in 2016, took place in summer 2016.

This report first sets out the regulatory system in place in the Member States. Then, it addresses the individual elements of the regulatory formula, i.e. OPEX, CAPEX, efficiency requirements, rules for the calculation of the rate of return and for the regulated asset base, its adjustment and depreciation. Especially for the Distribution of Electricity and Gas, this report contains the last uniform elements for Belgium: the competent authorities for their private tariff methodologies and so for the determination of the investment conditions will be the Regulatos of the three regiosn, viz. the Flanders region, the Walloon Region and the Brussles region.

Finally, the report compares the different systems and draws some conclusions with regard to network tariff regulation and the comparability of the elements and the results.

In comparison to the previous reports 2014 and 2015, no major changes were found in respect of the most important parameters; for further details regarding differences or developments CEER members can consult last year's report. The annual report will be published every year in future.

2 Economic theory and the regulatory framework

In the past, cost-based regulation approaches (rate-of-return regulation or cost-plus regulation) were widely used for tariff regulation purposes. The rate-of-return model guarantees the regulated company a certain pre-defined rate of return on its regulatory asset base. Another approach is cost-plus regulation, in which a pre-defined profit margin is added to the costs of the company. Obviously, the regulated company has no incentive to minimise its costs under a cost-based regulation framework, because it can increase its profits by simply expanding the asset or cost base. Under cost-plus regulation a company may have an incentive to signal incorrect costs to the regulator or to even opt for wasting resources in order to increase the cost base ("gold-plating").

As a response to the major drawbacks of the cost-based regulation, incentive-based approaches to tariff regulation were first developed in Great Britain (GB) and are currently applied in many countries.

Incentive-based regulation can be characterised by the use of financial rewards and penalties to induce the regulated company to achieve the desired goals (generally in form of an efficient cost base) whereby the company is allowed some discretion in how to achieve them. Rewards and penalties replace a 'command and control' form of regulation and provide incentives to the company to achieve the goals by allowing it to share the 'extra profit' in case it over-fulfils the targets set by the regulator, in general aiming cost control – so that grid users later could benefit form them in a quantitative way through lower tariffs in the future.

In 2016, we also identified a number of rather qualitaty oriented incentives. Fro the beginning of the new regulatory period 2016-2019, Belgium introduced for the transmission of Electricity a considerable number and amount of extra incentives to increase efficiencies, foster market integration and securitiy of supply and support the related research activities. The TSO has strongly taken those into account.

2.1 Regulatory system in place

2.1.1 Electricity transmission

The table below shows that electricity transmission is regulated by incentive methods in 14 Member States while 4 National Regulatory Authorities (NRAs) apply combined models of incentive and cost based methods and 4 NRAs apply "pure" cost based methods.

Country	What regulatory system is in place? (Cost-plus/ Rate-of-Return Regulation, Incentive-based Regulation [Price-Cap/ Revenue-Cap, mixture])
AT	Rate-of-Return
BE	Revenue Cap + cost control incentives + quality related incentives
CZ	Revenue Cap
DE	Revenue Cap – incentive based
DK	Other
EE	Rate-of-Return
FI	Revenue Cap
FR	Revenue Cap, incentive based with pass through
GB	Revenue Cap based on Rate-of-Return with Incentive-based Regulation
GR	Revenue Cap
HU	Other
IE	Revenue Cap based on Rate-of-Return with Incentive-based Regulation
IS	Revenue Cap
IT	Combined model of Price Cap (OPEX) and Rate-of-Return (CAPEX)
LV	Rate-of-Return
LT	50/50 Price/Revenue Cap – Hybrid Cap
LU	Revenue Cap
NO	Revenue Cap – incentive based
PL	Cost of service (with elements of Revenue Cap)
PT	Combined model of Price Cap (OPEX), standard costs in new investments and Rate-of-Return (CAPEX)
SI	Revenue Cap
ES	Rate-of-Return .
SE	Revenue Cap
NL	Revenue Cap

Table 1 – Regulatory system for electricity transmission

2.1.2 Electricity distribution

In electricity distribution, the trend towards incentive based methods is even more apparent. 15 NRAs apply incentive regulation, 4 NRAs use a mix of incentive and cost based methods and 4 NRAs use a Rate-of-Return regulation.

Country	What regulatory system is in place? (Cost-plus/ Rate-of-Return Regulation, Incentive-based Regulation [Price-Cap/ Revenue-Cap, mixture])
AT	Price Cap
BE	Revenue Cap
CZ	Revenue Cap
DE	Revenue Cap – incentive based
DK	Revenue Cap
EE	Rate-of-Return
ES	Rate-of-Return
FI	Revenue Cap
FR	Revenue Cap, incentive based with pass through
GB	Revenue Cap based on Rate-of-Return with Incentive-based Regulation
GR	Rate-of-Return
HU	Other
IE	Revenue Cap
IS	Revenue Cap
IT	Combined model of price cap (OPEX) and rate of return (CAPEX)
LT	50/50 Price/Revenue Cap – Hybrid Cap
LU	Revenue Cap
LV	Rate-of-Return
NL	Price Cap
NO	Revenue Cap – incentive based
PL	Mixed (Revenue Cap with elements of Incentive-based Regulation) with elements of quality regulation
PT	Combined model of Price Cap (OPEX) and Rate-of-Return (CAPEX)
SE	Revenue Cap
SI	Revenue Cap

Table 2 – Regulatory system for electricity distribution

2.1.3 Gas transmission

The table below shows that gas transmission is regulated by incentive methods in 14 countries and combined models of incentive and cost based methods are applied by 4 NRAs while 2 regulators use only a cost based method.

Country	What regulatory system is in place? (Cost-plus/ Rate-of-Return Regulation, Incentive-based Regulation [Price-Cap/ Revenue-Cap, mixture])
AT	Combined model of Price Cap (OPEX) and Rate-of-Return (CAPEX)
BE	Revenue Cap + cost control incentives
CZ	Revenue Cap
DE	Revenue Cap – incentive based
DK	Other
EE	Rate-of-Return
ES	Combined model. Revenue Cap for investments before 2001. Standard costs in new investments and rate of return after 2001. Since 2014, in addition to standard costs there is a new concept that considers Continuity of Supply.
FI	Revenue Cap
FR	Revenue cap, incentive based with pass through
GB	Revenue Cap based on Rate-of-Return with Incentive-based Regulation
GR	Rate-of-Return
HU	Revenue Cap
IE	Revenue Cap based on Rate-of-Return with Incentive-based Regulation
IT	Combined model of Price Cap (OPEX) and Rate-of-Return (CAPEX)
LT	Price Cap
LU	Revenue Cap
LV	Price Cap
NL	Revenue Cap
PL	Cost of service (with elements of Revenue Cap)
PT	Combined model of Price Cap (OPEX) and Rate-of-Return (CAPEX)
SE	Revenue Cap
SI	Revenue Cap

Table 3 - Regulatory system for gas transmission

2.1.4 Gas distribution

In gas distribution incentive based methods are applied by 18 countries, rate of return regulation in 2 countries and only in one country a mixture of incentive and cost based methods is applied.

Country	What regulatory system is in place? (Cost-plus/ Rate-of-Return Regulation, Incentive-based Regulation [Price-Cap/ Revenue-Cap, mixture])
AT	Price Cap
BE	Revenue Cap
CZ	Revenue Cap
DE	Revenue Cap – incentive based
DK	Revenue Cap
EE	Rate-of-Return
ES	Revenue Cap
FI	Revenue Cap
FR	Revenue Cap, incentive based with pass through
GB	Revenue Cap based on Rate-of-Return with Incentive-based Regulation
GR	Revenue Cap, due to recent modifications in the relative legislation, the regulatory system for gas distribution is going to change to Rate of Return system, by the end of 2016
HU	Revenue Cap
IE	Revenue Cap based on Rate-of-Return with Incentive-based Regulation
IT	Combined model of price cap (OPEX) and rate of return (CAPEX)
LT	Price Cap
LU	Revenue Cap
LV	Price Cap
NL	Price Cap
PL	Cost of service (with elements of revenue cap)
PT	Combined model of price cap (OPEX) and rate of return (CAPEX)
SE	Revenue Cap
SI	Revenue Cap

Table 4 - Regulatory system for gas distribution

2.2 Efficiency requirements

The tables below show whether the NRAs set efficiency requirements ('X-factors') on OPEX and CAPEX. The survey revealed that a majority of the regulators in electricity and gas alike require the cost saving mainly on the OPEX side. On the CAPEX side, nearly 40% of respondents have efficiency requirements applied. Moreover, some countries, including Great Britain and Ireland, evaluate the CAPEX-efficiency ex-ante, whereby a "building blocks" approach is often employed.

2.2.1 Electricity transmission

Country	Is an X-factor/ efficiency requirement applied on the CAPEX?	Is an X-factor/ efficiency requirement applied on the OPEX (if yes please describe your approach)?
AT	No	Yes General and individual (based on international benchmarking) efficiency requirement addressed to influenceable OPEX.
BE	No, but from 2016 ex ante CAPEX budgets are subject to an accrued verification by the NRA. In view of more efficient investment both the justification of the project, the individual project CAPEX costs and the intime realisation of the project are strictly verified	No
CZ	No	Yes (1,01% annually)
DE	Yes	Yes Efficiency requirement (international efficiency benchmark) is applied on the influenceable costs (more than the half of the OPEX).
DK	N.A. - see table 3.1.1.	N.A. - see table 3.1.1.
EE	No	No
ES	Yes (New investments standard unitary costs updated with and X, Y factors).	Yes (New investments standard unitary costs updated with and X, Y factors).
FI	No	Yes, efficiency requirement based on TSO's own historical costs
FR	No	Yes Efficiency requirement applied on manageable OPEXs.
GB	No	No
GR	No	No
HU	The same X factor is applied for CAPEX and OPEX.	No (and there is no inflation indexation).
IE	Yes The investment plans are evaluated in advance of the regulatory period. The regulator then decides what revenue can be collected to cover the cost of these plans. In the case of the current review, the regulator factored in efficiencies when determining the appropriate level of revenue to cover the cost of providing the assets. These efficiencies were not applied across the board, rather there were targeted reductions in the requested unit	The efficiency factor (X) is set at 0, the CER has profiled allowed opex to reflect increased efficiencies year on year. This in practice will have the same effect as putting a value on X and profiling the allowed revenues over the Price Review period to drive efficiencies. OPEX costs are evaluated in advance of the regulatory period. The non-controllable costs are accepted to be outside the utilities con-

	costs for a range of expenditures.	trol and the regulator allows these as pass through costs. Incentives to minimise pass through are applied where practical. Furthermore, the regulator reviews certain pass through Opex costs (Ancillary Services, Local Authority Rates etc.) on an annual basis. The regulator may apply cuts to the OPEX requested by utilities ex-ante where appropriate, for instance where there has been insufficient justification for the costs. Controllablel operating costs are fixed for a five year period. If the utility spends more than it is allowed, it bears the cost, except if the costs are efficient. On the other hand if the utility spends below what it is allowed it can keep the surplus made any one year for a period of five years as a means of incentivising efficiency and provided such savings have not been made at the expense of performance/ inefficiency and quality of service or as a result of poor forecasting. Customers benefit in the medium term by the progressive decrease in operating costs allowed at subsequent Revenue Controls.N.A.
IS	No	No
IT	No	Yes (1%)
LV	No	No
LT	No	Yes
LU	For investment projects that cost over 50,000€ the TSO must deliver a detailed investment plan split into the following categories: material, manpower, external costs transport and overhead costs. The TSO also has to indicate a detailed cash flow plan per year and the year in which the project is going to be activated. The difference between the planned and the real cash flow is not corrected over the regulatory period. This non-consideration of deviations in the tariffs during the regulatory period gives the TSO an incentive to ensure appropriate planning in order to stay within the planned budget. For investments in cross-border interconnections which improve security of supply, the WACC is increased by 0.6% at the moment of immobilization of the asset, for a period of ten years, if the final investment decision is notified to the NRA by 30 June 2013. The increase of the WACC is reduced by a quarter for every year of delay of the notification of the final investment decision. All other investments are considered at cost.	X-factor 1.5% annually.

NO	Yes	Yes
	The TSOs revenue cap consist of 40 % actual costs and 60 % of a cost norm, where a benchmarking model is used. Both CAPEX and OPEX are included in the benchmarking model.	The TSOs revenue cap consist of 40 % actual cost and 60 % of a cost norm, where a benchmarking model is applied. Both CAPEX and OPEX are included in the benchmarking model.
PL	No	Yes (works are conducted on assumptions for long-term tariff)
PT	Yes	Yes
	Investments valued at standard costs can have a remuneration premium (+75 basis points), as well as an efficiency factor (1.5% - lines, 3.0% - substations) in 2016.	It is applied a X-factor for each year (1.5%) to the controllable costs.
SI	No	Yes
		Efficiency requirement= general
SE	No	Yes
NL	Yes	Yes
		The efficiency requirement is applied on the TOTEX.

Table 5 - Efficiency requirements on OPEX and CAPEX in electricity transmission

2.2.2 Electricity distribution

Country	Is an X-factor/ efficiency requirement applied on the CAPEX?	Is an X-factor/ efficiency requirement applied on the OPEX (if yes please describe your approach)?
AT	Yes Individual (based on benchmarking) on TOTEX and in addition general productivity offset (1.25% p. a.) on OPEX.	Yes Individual (based on benchmarking) on TOTEX and in addition general productivity offset (1.25% p. a.) on OPEX.
BE	No	Yes Negotiated
CZ	No	Yes (1,01% annually)
DE	Yes	Yes Efficiency requirement (national efficiency benchmark) is applied on the influenceable costs.
DK	Yes Through benchmarking.	Yes Through benchmarking.
EE	No	No
ES	Yes	Yes
FI	No	Yes, company-specific target based on benchmarking (StoNED method). General annual productivity target of 0%
FR	No	Yes Efficiency requirement applied on manageable OPEXs.
GB	No	No
GR	No	No
HU	The same X-factor is applied for CAPEX and OPEX.	No (and there is no inflation indexation).
IE	Yes The investment plans are evaluated in advance of the regulatory period. The regulator then decides what revenue can be collected to cover the cost of these plans. In the case of the current review, the regulator factored in efficiencies when determining the appropriate level of revenue to cover the cost of providing the assets. These efficiencies were not applied across the board, rather there were targeted reductions in the requested unit costs for a range of expenditures.	As for transmission above. The efficiency factor (X) is set at 0, the CER has profiled allowed opex to reflect increased efficiencies year on year. This in practice will have the same effect as putting a value on X and profiling the allowed revenues over the Price Review period to drive efficiencies.
IS	No	No
IT	No	Yes (1,9%)
LV	No	No
LT	No	Yes

LU	For investment projects that cost over 1m € the DSO must deliver a detailed investment plan split into the following categories: material, manpower, external costs transport and overhead costs. The DSO also has to indicate a detailed cash flow plan per year and the year in which the project is going to be activated. The difference between the planned and the real cash flow is not corrected over the regulatory period. This non-consideration of deviations in the tariffs during the regulatory period gives the DSO an incentive to ensure appropriate planning in order to stay within the planned budget. All other investments are considered at cost.	X-factor 1.5% annually.
NO	Yes	Yes
	Thes DSOs revenue cap consist of 40 % actual costs and 60 % of a cost norm, where a benchmarking model is applied. Both CAPEX and OPEX are included in the benchmarking model.	The DSOs revenue cap consist of 40 % actual costs and 60 % of a cost norm, where a benchmarking model is applied. Both CAPEX and OPEX are included in the benchmarking model.
PL	No	Yes (new regulatory period 2016-2020)
PT	No	Yes
		It is applied a X-factor of 2.5%.
SI	No	Yes
		Efficiency requirement = general and individual efficiency is result of benchmarking.
SE	No	Yes
NL	Yes	Yes
		The efficiency requirement is applied on the TOTEX.

Table 6 - Efficiency requirements on OPEX and CAPEX in electricity distribution

2.2.3 Gas transmission

Country	Is an X-factor/ efficiency requirement applied on the CAPEX?	Is an X-factor/ efficiency requirement applied on the OPEX (if yes please describe your approach)?
AT	No	There is a general productivity offset of 2.5% for OPEX, but the NRA does not explicitly check the efficiency of investments.
BE	No	No
CZ	No	Yes (1,01% annually)
DE	Yes	Yes Efficiency requirement (national efficiency benchmark) is applied on the influenceable costs.
DK	N.A. - see Q 1.111	N.A. - see Q 1.111
EE	No	No
ES	Yes (The efficiency mechanism is applied in the Continuity of Supply concept).	No
FI	No	Yes, efficiency requirement based on TSO's own historical costs
FR	No	Yes CPI+X on total net OPEXs
GB	No	No
GR	No	No
HU	Yes	No
IE	Yes	Yes We set opex, then apply a further efficiency factor on top of this.
IT	No	Yes, differentiated for each company
LT	No	Yes
LU	For investment projects that cost over 50,000€ the TSO must deliver a detailed investment plan split into the following categories: material, manpower, external costs transport and overhead costs. The TSO also has to indicate a detailed cash flow plan per year and the year in which the project is going to be activated. The difference between the planned and the real cash flow is not corrected over the regulatory period. This non-consideration of deviations in the tariffs during the regulatory period gives the TSO an incentive to do an appropriate planning in order to stay within the planned budget. For investments in cross-border interconnections which improve security of supply, the WACC is increased by 0.6% at the moment of immobilization of the asset, for a period of ten years, if the final investment decision is notified to the NRA by 30 June 2013. The increase of the WACC is reduced by a quarter for every year of delay of the notification of	X-factor 1.5% annually.

	the final investment decision. All other investments are considered at cost.	
PL	No	No
PT	No	Yes
		In 2016 a new regulatory period has began. For this reason we set up a new cost base, and will be applied in the following years an annual X-factor of 3%.
SI	No	Yes
		Efficiency requirement = general
SE	No	Yes
NL	Yes	Yes
		The efficiency requirement is applied on the TOTEX.

Table 7 - Efficiency requirements on OPEX and CAPEX in gas transmission

2.2.4 Gas distribution

Country	Is an X-factor/ efficiency requirement applied on the CAPEX?	Is an X-factor/ efficiency requirement applied on the OPEX (if yes please describe your approach)?
AT	Yes	Yes
	Individual (based on benchmarking) and general productivity offset (1.95% p.a.) on TOTEX.	Individual (based on benchmarking) and general productivity offset (1.95% p.a.) on TOTEX.
BE	No	Yes
		Negotiated
CZ	No	Yes (1,01% annually)
DE	Yes	Yes
		Efficiency requirement (national efficiency benchmark) is applied on the influenceable costs.
DK	No	Yes
		Every fourth year a benchmarking of the operational and depreciation costs is made. The Danish benchmarking model is a kind of index model called the network volume model. A fundamental assumption is that it should be possible to operate the companies equally efficiently after taking the differences in the composition of the grid into account. We also take certain other factors like consumer density into account. The benchmarking results in company-specific efficiency requirements, which are put into practice as permanent reductions of the revenue cap.
EE	No	No
ES	Yes (The efficiency requirement is applied on the TOTEX).	No
FI	No	No
FR	No	Yes
		CPI+Y applied on net OPEX
GB	No	No
GR	No	No
HU	Yes	No
IE	Yes	Yes We set opex, then apply a further efficiency factor on top of this.
IT	No	Yes
		The X-factor is diffentiated according to the size of companies (small and medium sized: 2,5%; large sized: 1,7%)
LT	No	Yes
LU	For investment projects that cost over 500.000€ the DSO must deliver a detailed investment plan split into the following categories: material, manpower, external costs transport and overhead costs. The DSO also has to indicate a detailed cash flow plan per year and the year in which the project is going to be activated. The difference between	X factor 1.5% annually.

	the planned and the real cash flow is not corrected over the regulatory period. This non-consideration of deviations in the tariffs during the regulatory period gives the DSO an incentive to do an appropriate planning in order to stay within the planned budget. All other investments are considered at cost.	
PL	Yes (The efficiency requirement is applied on the TOTEX).	Yes (The efficiency requirement is applied on the TOTEX).
PT	No	Yes
		Based on a previous DEA analysis the regulator defines different efficiency target for each company considering size, maturity and other external factors.
SI	No	Yes
		Efficiency requirement = general and individual efficiency is result of benchmarking.
SE	No	Yes
NL	Yes	Yes
		The efficiency requirement is applied on the TOTEX.

Table 8 - Efficiency requirements on OPEX and CAPEX in gas distribution

3 Calculation of the Rate of Return

3.1 Method used for Calculation of the Rate of Return

The tables below show the methods used by NRAs in order to calculate the rate of return.

3.1.1 Electricity transmission

Country	WACC nominal			WACC real		
	pre-tax	post-tax	Vanilla	pre-tax	post-tax	Vanilla
AT	✓					
BE	There is no use of a classic WACC. The tariff methodology provides a return on that part of the RAB that is financed by equity. As defined by law, the reasonable cost of debt is part of the income and so is covered by the tariffs. The return on the part of the RAB that is financane trough equity is defined as post-tax.					
CZ	✓					
DE	There is no use of WACC. The regulatory authority sets the costs of capital. The cost of debt is defined by law. Equity is valuated at an interest of 9.05% (nominal interest) and 7.14% (real interest rate) depending on the share of new and old assets in the RAB. Cost of borrowing is treated seperately**.**					
DK	Energinet.dk is the Danish TSO, a 100% state owned company through the Danish Ministry of Climate, Energy and Building. The general provisions and the main objectives of the regulation are to promote and ensure security of supply, efficiency, consumer protection and reasonable consumer prices. The special provisions for Energinet.dk are established through a law on Energinet.dk and an executive order on economic regulation of Energinet.dk. The TSO is regulated in accordance with a non-profit principle, whereby the company's tariffs may only cover the necessary costs incurred at efficient operation and an interest rate to ensure the real value of the company's capital base as of 1 January 2005. The regulation does not facilitate the determination of general efficiency requirements for Energinet.dk. However, DERA may determine that a specific cost - or the amount thereof - does not constitute a necessary cost at efficient operation and therefore may not be included (or only partially included) in Energinet.dk's tariffs.					
EE	✓					
ES	There is no use of WACC. Use rate of return, pre-tax, linked to 10-year maturity State Bonds plus 100 basic points (For 2013 since July 2013). For 2014 on, a spread of 200 basic will apply, according to R.D.-Law 9/2013					
FI	✓					
FR	✓					
GB						✓
GR	A rate of return (real pre-tax) is calculated, based on WACC.					
HU				✓		
IE				✓		
IT				✓		
LV			✓			
LT	✓					
LU	✓					
NO	✓					
PL	✓					
PT	✓					
SI	✓					
SE				✓		
NL				✓		

Table 9 - Type of rate of return used in the regulation of electricity TSOs

3.1.2 Electricity distribution

Country	WACC nominal			WACC real		
	pre-tax	post-tax	Vanilla	pre-tax	post-tax	Vanilla
AT	✓					
BE	✓		✓			
CZ	✓					
DE	There is no use of WACC. The regulatory authority sets the costs of capital. The cost of debt is defined by law. Equity is valuated at an interest of 9.05% (nominal interest) and 7.14% (real interest rate) depending on the share of new and old assets in the RAB. Cost of borrowing is treated separately.					
DK	N.A.					
EE	✓					
ES	There is no use of WACC. Use rate of return, pre-tax, linked to 10-year maturity State Bonds plus 100 basic points (for 2013 since July 2013). From 2014 onwards, a spread of 200 basic will apply, according to R.D.-Law 9/2013.					
FI	✓					
FR	N.A.					
GB						✓
GR	A rate of return (nominal pre-tax) is calculated, taking into account some of the WACC parameters, such as cost of debt and gearing.					
HU				✓		
IE				✓		
IT				✓		
LV			✓			
LT	✓					
LU	✓					
NO	✓					
PL	✓					
PT	✓					
SI	✓					
SE				✓		
NL				✓		

Table 10 - Type of rate of return used in the regulation of electricity DSOs

3.1.3 Gas transmission

Country	WACC nominal			WACC real		
	pre-tax	post-tax	Vanilla	pre-tax	post-tax	Vanilla
AT	for debt financed assets			for equity financed assets		
BE	There is no use of a classi WACC. The tariff methodology provides a return on that part of the RAB that is financed by equity. As defined by law, the reasonable cost of debt is part of the income and so is covered by the tariffs. The return on the part of the RAB that is financed trough equity, is defined as post-tax					
CZ	✓					
DE	There is no use of WACC. The regulatory authority sets the costs of capital. The cost of debt is defined by law. Equity is valuated at an interest of 9.05% (nominal interest) and 7.14% (real interest rate) depending on the share of new and old assets in the RAB. Cost of borrowing is treated separately.					
DK	Energinet.dk is the Danish TSO, a 100% state owned company through the Danish Ministry of Climate, Energy and Building.The general provisions and the main objectives of the regulation are to promote and ensure security of supply, efficiency, consumer protection and reasonable consumer prices. The special provisions for Energinet.dk are established through law on Energinet.dk and executive order on economic regulation of Energinet.dk The TSO is regulated in accordance with a non-profit principle, whereby the company's tariffs may only cover the necessary costs incurred at efficient operation and an interest rate to ensure the real value of the company's capital base as of 1 January 2005. The regulation does not facilitate the determination of general efficiency requirements for Energinet.dk. However, DERA may determine that a specific cost - or the amount thereof - does not constitute a necessary cost at efficient operation and therefore may not be included (or only partially included) in Energinet.dk's tariffs.					
EE	✓					
ES	There is no use of WACC. Use rate of return, pre-tax, linked to 10-year maturity State Bonds plus 50 basic points (Since 2014 to 2020). A new remuneration term ("Remuneration for the continuity of supply") increases the implicit return on transmission assets.					
FI	✓					
FR				✓		
GB						✓
GR	Nominal pre tax			✓		
PL	Nominal pre tax					
PT	✓					
IE				✓		
IT				✓		
LT	Nominal pre-tax			✓		
NL				✓		
LU	✓					
SI	✓					

Table 11 - Type of rate of return used in the regulation of gas TSOs

3.1.4 Gas distribution

Country	WACC nominal			WACC real		
	pre-tax	post-tax	Vanilla	pre-tax	post-tax	Vanilla
AT	✓					
BE	✓		✓			
CZ	✓					
DE	There is no use of WACC. The regulatory authority sets the costs of capital. The cost of debt is defined by law. Equity is valuated at an interest of 9.05% (nominal interest) and 7.14% (real interest rate) depending on the share of new/old assets in the RAB. Cost of borrowing is treated separately.					
DK		✓				
EE	✓					
ES	There is no use of WACC.					
FI	✓					
FR				✓		
GB						✓
GR	There is no use of WACC or any rate of return.					
HU				✓		
IE				✓		
IT				✓		
LV			✓			
LT	✓					
LU	✓					
PL	✓					
PT	✓					
SI	✓					
SE				✓		
NL				✓		

Table 12 -Type of rate of return used in the regulation of gas DSOs

In conclusion, for electricity network regulation, the most popular approach is to use nominal weighted average cost of capital before taxation. In the gas sector, this approach is popular as well, however the real weighted average cost of capital before taxation is also frequently used.

3.2 Year of rate of return estimation and length of regulatory period

The tables below show the duration of the regulatory period and the 'photo' years in which the rate of return parameters were evaluated or adjusted.

3.2.1 Electricity transmission

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AT						E						
BE	Ex-post recalculation of RoR	Regulatory period 2008-2011 Ex-post recalculation of RoR				Regulatory period 2012-2015 Ex-post recalculation of RoR				Regulatory period 2016-2019 Ex-post recalculation of RoR		
CZ									E	2016-2018		
DE					E				(to 2018)			
DK	NA	NA	NA	NA	NA	NA	NA	NA	NA			
EE	E	E	E	E	E	E	E	E	E			
ES										E First regulatory period up to 2019. Six year regulatory periods in advance.		
FI									E WACC parameters confirmed in 2016. Risk free rate updated annually	Regulatory period: 1.1.2016 – 31.12.2019		
FR							(mid 2013- mid 2017)					
GB						E			(to 2021)			
GR								E	(to 2017)			
HU												
IE									E	(2016 to 2020)		
IT										E A regulatory period of WACC (PWACC), common to all regulated sectors was introduced in 2016. It lasts 6 years, with an interim review after three years. The PWACC defines all parameters for the calculation of WACC, except beta and D/E ratio, that are specific for each sector	E (to 2023)	

LV	The period is not defined. The parameters are not set for a certain period. According to the tariff calculation methodology, the operator submits to the regulator a request to be determined for each company seperately, which is then used in subsequent tariff calculations until a new request for determining rate of return is submitted to the NRA.											
LT										E	E (to 2020)	
LU					E							
NO								E Several of the parameters are updated annually. Some are fixed.				
PL									E (2016-2020)			
PT									E Due to the uncertain and financially unstable environment, the rate of return is updated ex-post (each year) in order to reflect the evolution of the financial market conditions (between 2015-2017).			
SI										2016 - 2018		
SE					E							
NL							E					

	Regulatory period / tariff year
E	Tariff year

Table 13 - Duration of regulatory period and year of rate of return evaluation adjustment for electricity TSOs

3.2.2 Electricity distribution

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AT						E		(2014-2018)				
BE					E							
CZ									E			
DE					E							
DK	E	E	E	E	E	E	E	E	E			
EE	E	E	E	E	E	E	E	E	E			
ES										E First regulatory period up to 2019 six years regulatory periods in advance.		
FI									E WACC parameters confirmed in 2016. Risk free rate updated annually	Regulatory period: 1.1.2016 – 31.12.2019		
FR								(2014 – 2017)				
GB			E					E	(to 2023)			
GR								E				
HU									(to 2016)			
IE									E	(2016 to 2020)		
IT										E A regulatory period of WACC (PWACC), common to all regulated sectors, was introduced in 2016. It lasts 6 years, with an interim review after three years. The PWACC defines all parameters for the calculation of WACC, except beta and D/E ratio, that are specific for each sector	E	E (to 2023)
LV	The period is not defined. The parametrs are not set for a certain period. According to the tariff calculation methodology, the operator submits to the regulator a request to determined for each company seperately, which is then used in subsequent tariff calculations until a new request for determining rate of return is submitted to NRA.											

LT										E	E	E (to 2020)
LU					E				(to 2016)			
NO								E Several of the parameters are updated annually and some are fixed.				
PL							E			E (2016-2020)		
PT									E Due to the uncertain and financially unstable environment, the rate of return is updated ex-post (each year) in order to reflect the evolution of the financial market conditions. (between 2015-2017)			
SI										2016-2018		
SE					E							
NL							E					

	Regulatory period / tariff year
E	Evaluation year

Table 14 - Duration of regulatory period and year of rate of return evaluationadjustment for electricity DSOs

3.2.3 Gas transmission

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	201
AT		The tariff calculation method is reviewed every 4 years.(last evaluation 2012) Actually tariffs are set for 2013 to 2016.									
BE						E				Tariff period 2016-2019 Ex-post recalculation of RoR	
CZ									E		
DE				E					E		
DK	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EE	E	E	E	E	E	E	E	E	E	E	E
FI				E WACC parameters confirmed in 2016. Risk free updated annually						Regulatory period: 1.1.2016 – 31.12.2019	
FR											
GB					E					(to 2021)	
GR	The regulatory period for which tariffs are calculated is 20 years. Tariffs are reviewed every 4 years.										
HU											
IE	E					E					E 5 Year R Period (20 2021
IT								E	E	E A regulatory period of WACC (PWACC), common to all regulated sectors, was introduced in 2016. It lasts 6 years, with an interim review after three years. The PWACC defines all parameters for the calculation of WACC, except beta ans D/E ratio, that are sepecifc for each sector	E
LV	The period is not defined. The parameters are not set for a certain period. According to the tariff calculation methodology, the operator submits to the regulator a request to determined for each company separately, which is the used in subsequent tariff calculations until a new request for determining rate of return is submitted to the NRA.										
LT							E	Every year NRA set WACC for 5 years regulatory period. However, now WACC for transmission company is set 8.05 % for the period of 2009-2013.			
LU					E						
PL									E		
PT							Due to the uncertain and financially unstable environment, the rate of return is updated ex-post (each “gas” year) in order to reflect the evolution of the financial market conditions				
							1st indexed period: July 2013 and June 2016.			2nd indexed period: July 2016 and June 2019.	
SI										2016 - 2018	
ES								(2014-2020)			
SE				E							
NL							E				
	Regulatory period / tariff year										
E	Tariff year										

Table 15 - Duration of regulatory period and year of rate of return evaluation adjustment for gas TSOs

3.2.4 Gas distribution

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
AT						E					
BE					E						
CZ									E	2016-2018	
DE				E					E		
DK											
EE	E	E	E	E	E	E	E	E	E	E	E
ES								(2014-2020)			
FI				E WACC parameters confirmed in 2016. Risk free updated annually						Regulatory period: 1.1.2016 – 31.12.2019	
FR											To
GB						E					(to
GR	Non applicable										
HU											
IE	E				E						E 5 Year F Period (2 2021
IT								E	E	E A regulatory period of WACC (PWACC), common to all regulated sectors was introduced in 2016. It lasts 6 years with an interim review after three years. The PWACC defines all parameters for the calculation of WACC, except beta and D/E ratio, that are specific for each sector	E (to 2
LT									Every year NRA set the WACC for 5 years regulatory period. At present, the WACC for the biggest distribution company is set 8.08 % for the period of 2009-2013.		
LU					E						
LV	The period is not defined. The parameters are not set for a certain period. According to the tariff calculation methodology, the operator submits to the regulator a request to determined for each company seperately, which is then used in subsequent tariff calculations until a new request for determining rate of return is submited to the NRA.										
NL							E				
PL									E		
PT							Due to the uncertain and financially unstable environment, the rate of return is updated ex-post (each “gas” year) in order to reflect the evolution of the financial market conditions				
							1st indexed period: July 2013 and June 2016.			2nd indexed period: July 2016 and June 2019.	
SE				E							
SI										2016 - 2018	

	regulatory period / tariff year
E	Tariff year

Table 16 - Duration of regulatory period and year of rate of return evaluation adjustment for gas DSOs

In conclusion, the majority of NRAs evaluate (or adjust) the rate of return parameters in the year before the regulatory period starts. The year before the regulatory period starts is used as ‘photo’ year in which the rate of return parameters are evaluated or adjusted for TSOs as well as for DSOs. Most NRAs make no distinction between gas and electricity. The typical regulatory period is between 3 and 5 years.

3.3 Rate of interest

3.3.1 Risk free rate

3.3.1.1 Definition

The risk free rate is the expected return on an asset, which bears in theory no risk at all, i.e. whose expected returns are certain[1]. In other words, the risk-free rate is the minimum return an investor should expect for any investment, as any amount of risk would not be tolerated unless the expected rate of return was greater than the risk-free rate.

The risk free rate can be described as either “nominal” or “real”. The nominal interest rate is the amount, in money terms, of interest payable. The real risk free rate excludes inflation and reflects the pure time value of money to an investor. The relationship between nominal and real risk free rates and inflation can be expressed as follows[2]:

(1 + nominal risk free rate) = (1 + real risk free rate) x (1 + inflation)

In practice, it is not possible to find an investment that is free of all risks. However, freely traded investment-grade government bonds can generally be regarded as having close to zero default risk and zero liquidity risk.

[1] IRG – Regulatory Accounting, Principles of Implementation and Best Practice for WACC calculation, February 2007, www.erg.eu.int/doc/publications/erg_07_05_pib_s_on_wacc.pdf;

[2] S. Ross, R. Westerfield, B. Jordan, Essentials of Corporate Finance, Irwin/McGraw-Hill, 1996, p. 248

3.3.1.2 Evaluating risk free rates

The tables below show how regulators evaluate risk free rates.

3.3.1.2.1 Electricity transmission

	Years to maturity						
	1	2	5	10	20	30	
AT				h5			Government bonds, use of secondary market yield – mix of government bonds with different maturity; on average the maturity is 8 years.
BE				h1			Public bonds on 10 years of the year itself
CZ				h10			Government bonds (median of daily interest rates for past ten years)
DE	h10	h10	h10	h10	h10	h10	Bills and bonds of national emitents; there is no limitation to a specific maturity. all maturities are taken in account; maturity may last longer than 30 years .
DK							N.A.
EE				h5			German government bonds
ES							
FI				h6m			In 2016 - 2019 the risk free rate is calculated as following, it will be higher of: 1. Finnish 10 year government bond yield, average of previous year April - September daily rates, or, 2. Finnish 10 year government bond yield, average of previous 10 years daily rates. For example in 2016 risk free rate is calculated as an average of October 2005 - September 2015 daily rates.
FR							
GB							Government bonds
GR							The lowest yield of 10-year government bonds in Eurozone.
HU							Foreign government bonds + Country risk premium
IE							A Eurozone-wide risk free rate is used. We determined that a forward looking rate of 1.75-2.0 per cent was appropriate.
IT				h1			Government bonds of AA (or higher) rated countries
LV							OECD government bonds
LT				h10			Government bonds, maturity period of no less than 3468 days.
LU							LU interest rate published by ECB
NL				h3			Dutch and German government bonds
NO							Two different "risk-free" rates are used; one in the calculation of cost of equity and a different for debt. For equity the rate is fixed at 2.5% + inflation. For debt the annual 5-year swap rate is used. The swap rate is nominal and include some risk.
PL				h18m			Government bonds
PT				h5			Government bonds of the Euro zone countries with AAA rating (Germany, Finland, Austria and Netherlands).
SI							Goverment bonds
SE							Goverment bonds
h - historical average							
1, 2, 5 - years of historical analysis							
1m, 2m, - months of historical analysis							

Table 17 - Evaluation of risk free rates in the regulation of electricity TSOs

3.3.1.2.2 Electricity distribution

	Years to maturity						
	1	2	5	10	20	30	
AT				h5			Government bonds; use of secondary market yield – mix of government bonds with different maturity; on average the maturity is 8 years.
BE							Public bonds
CZ				h10			Government bonds (median of daily interest rates for past ten years)
DE	h10	h10	h10	h10	h10	h10	Bills and bonds of national emitents; there is no limitation to a specific maturity. all maturities are taken in account; maturity may last longer than 30 years.
DK							N.A.
EE				h5			German government bonds
ES							
FI				h6m			In 2016 - 2019 the risk free rate is calculated as following, it will be higher of: 1. Finnish 10 year government bond yield, average of previous year April - September daily rates, or, 2. Finnish 10 year government bond yield, average of previous 10 years daily rates. For example in 2016 risk free rate is calculated as an average of October 2005 - September 2015 daily rates.
GB							Government bonds
GR				H12m			The lowest yield of 10-year government bonds in Eurozone
HU							Foreign government bonds + Country risk premium
IE							A Eurozone-wide risk free rate is used. We determined that a forward looking rate of 1.75-2.0 per cent was appropriate
IT				h1			Government bonds of AA (or higher) rated countries
LV							OECD government bonds
LT				h10			Government bonds, maturity period of no less than 3468 days.
LU							LU interest rate published by ECB
NL				h3			Dutch and German government bonds
NO							Two different "risk-free" rates are used; one in the calculation of cost of equity and a different for debt. For equity the rate is fixed at 2,5% + inflation. For debt the annual 5-year swap rate is used. The swap rate is nominal and include some risk.
PL				h18m			Government bonds
PT				h5			Government bonds of the Euro zone countries with AAA rating (Germany, Finland, Austria and Netherlands).
SI							Goverment bonds
SE							Goverment bonds

h - historical average
1, 2, 5 - years of historical analysis
1m, 2m, - months of historical analysis

Table 18 - Evaluation of risk free rates in the regulation of electricity DSOs

3.3.1.2.3 Gas transmission

	Years to maturity						
	1	2	5	10	20	30	
AT				h5			Government bonds; use of secondary market yield – mix of government bonds with different maturity; on average the maturity is 8 years.
BE				h1			Public bonds on 10 years of the year itself
CZ				h10			Government bonds (median of daily interest rates for past ten years)
DE	h10	h10	h10	h10	h10	h10	Bills and bonds of national emitents; there is no limitation to a specific maturity. all maturities are taken in account; maturity may last longer than 30 years.
DK							N.A.
EE				h5			German government bonds
ES							
FI				h6m			In 2016 - 2019 the risk free rate is calculated as following, it will be higher of: 1. Finnish 10 year government bond yield, average of previous year April - September daily rates, or, 2. Finnish 10 year government bond yield, average of previous 10 years daily rates. For example in 2016 risk free rate is calculated as an average of October 2005 - September 2015 daily rates.
FR							
GB							Government bonds
GR	At least 3 years						Government bonds of OECD or EU countries
HU							
IE							Government bonds
IT				h1			Government bonds of AA (or higher) rated countries
LV							OECD government bonds
LT				h10			Government bonds
LU							LU interest rate published by ECB
NL				h3			Dutch and German government bonds
PL				h1			Government bonds
PT				h5			Government bonds of the Euro zone countries with AAA rating (Germany, Fin-land, Austria and Netherlands).
SI							Goverment bonds
SE							Goverment bonds

h - historical average
1, 2, 5 - years of historical analysis
1m, 2m, - months of historical analysis

Table 19 - Evaluation of risk free rates in the regulation of gas TSOs

3.3.1.2.4 Gas distribution

	Years to maturity						
	1	2	5	10	20	30	
AT				h5			Government bonds; use of secondary market yield – mix of government bonds with different maturity; on average the maturity is 8 years.
BE							Public bonds
CZ				h10			Government bonds (median of daily interest rates for past ten years)
DE	h10	h10	h10	h10	h10	h10	Bills and bonds of national emitents; there is no limitation to a specific maturity. all maturities are taken into account; maturity may last longer than 30 years.
DK							N.A.
EE				h5			German government bonds
ES							
FI				h6m			In 2016 - 2019 the risk free rate is calculated as following, it will be higher of: 1. Finnish 10 year government bond yield, average of previous year April - September daily rates, or, 2. Finnish 10 year government bond yield, average of previous 10 years daily rates. For example in 2016 risk free rate is calculated as an average of October 2005 - September 2015 daily rates.
FR							
GB							Government bonds
GR							N.A.
HU							
IE							Government bonds
IT				h1			Government bonds od AA (or higher) rated countries
LV							OECD government bonds
LT				h10			Government bonds
LU							LU interest rate published by ECB.
NL				h3			Dutch and German government bonds
NO							
PL				h1			Government bonds
PT				h5			Government bonds of the Euro zone countries with AAA rating (Germany, Finland, Austria and Netherlands).
SI							Goverment bonds
SE							Government bonds

h - historical average
1, 2, 5 - years of historical analysis
1m, 2m, - months of historical analysis

Table 20 - Evaluation of risk free rates in the regulation of gas DSOs

Most NRAs evaluate risk free rate on the basis of government bonds interest rates. In most cases, they use the same methodology for all network operators, but in some countries there are differences in approaches between both electricity and gas sector, and between transmission and distribution. The main reason for such differences is that the risk free rates have not been evaluated at the same time.

The most frequently used bonds have maturities of 10 years, but 5-year bonds (and even 1-year ones) as well as 30-year bonds appear.

The risk free rates are usually evaluated on the basis of the national government bond interest rates. Some regulators however use the interest rates based on the government bonds of selected foreign countries or OECD averages.

3.3.1.3 Values of nominal and real risk free rates

The tables below show the values of nominal and real risk free rates used by regulators. In order to compare the value of risk free rates, the real risk free rates should be used. To make the survey data comparable, nominal risk free rates submitted were transformed into real ones by applying the following formula:

Real risk free rate = [(1 + nominal risk free rate) / (1 + inflation)] – 1

The calculated real risk free rates are dependent on the value of inflation. For that, the inflation rate in each country is taken into the account.

3.3.1.3.1 Electricity transmission

	Real		Inflation		Nominal	
	Value	Year	Value	Year	Value	Year
AT	1.25%	cal.	2.04%	2013	3.27%	2013
BE					0,70% ex ante	2016
CZ	3,51%	cal.	0,3%	2015	3,82%	2015
DE	2.24%	cal.	1.56%		3.80%	2010
DK	N.A.		N.A.		NA	
EE					1.47%	2016
ES						N.A.
FI	2,12%	2016	0,73%	CPI change in January – July 2016	2,87%	2016
FR					4.00%	2013
GB	2.00%	2012				
GR			1,1%	2015	1%	2015
HU	3.7%	2012			Real risk free rate is used and estimated.	2008
IE	1.90%	2015				
IT	0,5% The rate ist the maximum between the real rate and a floor value of 0,5 %	cal	1.39%		0,79%	2016
LV	4.80%				4.80%	2008
LT	3.6%	Cal.	-0.1%	2015	3.5%	2015
LU	1.27%	cal.	2.6%		3.90%	2011
NL	0.49%	cal.	2%	2013	2.5%	2013
NO	Equity:2.5%	2016	2.15%	2015-2018	Equity:4.65% Debt: 2.37%	2016
PL	1,231%	cal.	1,7%	2016	2,952%	2012
PT	N.A.	N.A.	N.A.	N.A.	2.41%	2014
SI	2.10%	cal.	1.4%		3.53%	2015
SE	2.04%		1.9%		4.00%	

Table 21 - Risk free rates in the regulation of electricity TSOs

3.3.1.3.2 Electricity distribution

	Real		Inflation		Nominal	
	Value	Year	Value	Year	Value	Year
AT	1.25%	cal.	2.0%	2013	3.27%	2013
BE	4.20%	cal.			0%	2009
CZ	3,51%	cal.	0,3%	2015	3,82%	2015
DE	2.24%	cal.	1.56%		3.80%	2010
DK	N.A.		N.A.		N.A.	
EE					1,47 %	2016
ES						N.A.
FI	2,12%	2016	0,73%	CPI change in January – July 2016	2,87%	2016
FR					4%	2013
GB	Ofgem estimated the cost of equity with reference to a total equity market return but does not make a point estimate of the risk-free rate. It stated that it will consider introducing a cost of equity index, updated each year in light of move-ments in yields on benchmark government bonds					
GR			0 %	2016	0,91 %	2016
HU	3.7%	2012			Real risk free rate is used and estimat-ed.	2008
IE	1.90%	2015				
IT	0,5% The rate is the maximum be-tween the real rate and a floor value of 0,5 %	cal	1.39%		0,79%	2016
LV	3.80%				3.80%	
LT	3.6%	2015	-0.1%	2015	3.5%	2015
LU	1.27%	cal.	2.6%		3.90%	2011
NO	Equity: 2.5%	2016	2.15%	2015-2018	Equity:4.65% Debt: 2.37%	2016
NL	0.49%	cal.	2%	2013	2.5%	2013
PL	1,231%	cal.	1,7%	2016	2,952%	2016
PT	N.A.	N.A.	N.A.	N.A.	2.41%	2014
SI	2.10%	cal.	1.40%		3.53%	2015
SE	2.04%	cal.	1.9%		4.00%	2009

Table 22 - Risk free rates in the regulation of electricity DSOs

3.3.1.3.3 Gas transmission

	Real		Inflation		Nominal	
	Value	Year	Value	Year	Value	Year
AT	1.25%	cal.	2.0%	2013	3.27%	2013
BE					0,9% ex ante	2016
CZ	3,51%	cal.	0,3%	2015	3,82%	2015
DE	2.24%	cal.	1.56%		3.80%	2010
DK	N.A.		N.A.		N.A.	
EE					1.47%	2016
ES						N.A.
FI	2,12%	2016	0,73%	CPI change in January – July 2016	2,87%	2016
FR	2.0%	2013				
GB	2.00%	2012				
GR	0.85%	2012	1.5%	2012	0.63%	2013
HU	4.1%	2009				2009
IE	3.5 – 5.5 %	2012				
IT	0,5% The rate is the maximum between the real rate and a floor value of 0,5 %	cal	1.39%		0,79%	2016
LV	4.80%				2.87%	2008
LT	0.93%	2012	3%	2012	4%	2012
LU	1.27%	cal.	2.6%		3.90%	2011
NL	0.49%	cal.	2%	2013	2.5%	2013
PL	2.56%	cal.	1.2%	2015	3.79%	2015
PT	N.A.	N.A.	N.A.	N.A.	1.73%	2016
SI	2.10%	cal.	1.4%		3.53%	2015
SE	1.43%	cal.	1.9%		3.33 %	2009

Table 23 - Risk free rates in the regulation of gas TSOs

3.3.1.3.4 Gas distribution

	Real		Inflation		Nominal	
	Value	Year	Value	Year	Value	Year
AT	1.25%	cal.	2.0%	2013	3.27%	2013
BE	4.20%	cal.			0%	2009
CZ	3,51%	cal.	0,3%	2015	3,82%	2015
DE	2.24%	cal.	1.56%		3.80%	2010
DK					0.88%	2009
EE					1.47%	2016
ES						N.A.
FI	2,12%	2016	0,73%	CPI change in January – July 2016	2,87%	2016
FR	1.6%	2016			2.8%	2016
GB	2.00%	2012				
GR	NA					
HU		2009	3.9%			2009
IE	3.5-5.5%	2007				
IT	0,5% The rate is the maximum between the real rate and a floor value of 0,5 %	cal.	1.39%		0,79%	2016
LV	4.80%				2.87%	2008
LT	0.93%	2012	3.00%	2012	4%	2012
LU	1.27%	cal.	2.6%		3.90%	2011
NL	0.49%	cal.	2%	2013	2.5%	2013
PL	2.76%	cal.	1.2%	2015	3.996 %	2015
PT	N.A.	N.A.	N.A.	N.A.	1.73%	2016
SI	2.10%	cal.	1.4%		3.53%	2015
SE	1.43%	cal.	1.9%		3.33%	2009

Table 24 - Risk free rates in the regulation of gas DSOs

The chart below presents the values of real risk free rates, both original values used by the regulators and calculated values. Taking into account that calculated real risk free rates are dependent on the value of inflation, the following conclusions could be drawn:

- the typical value of real risk free rate is between 1.5 and 3.0%;
- the real risk free rate is higher in the countries with less developed economy;
- the lowest value of the real risk free rate is in countries with well developed and stabile economy;
- the values of the real risk free rates also depends on the year of assessment.

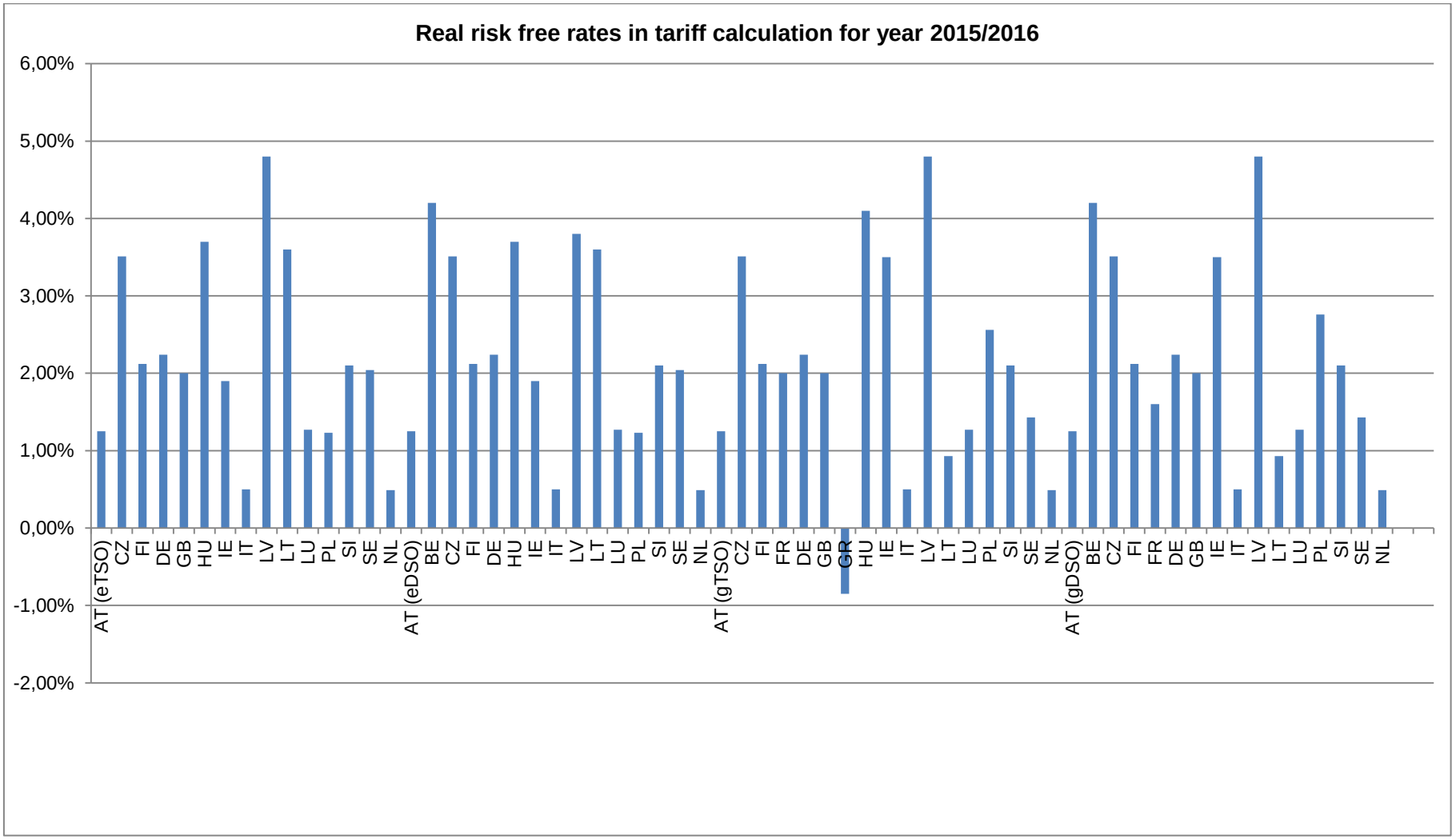

Table 25 – Real risk free rates in tariff calculation for year 2015/ 2016
Source: NRA survey

3.3.2 Debt premiums

3.3.2.1 Definition

In corporate debt finance, the debt risk premium is the expected rate of return above a (determined) risk-free interest rate. The premium determined as the margin between the risk-free rate and the corporate bond rate is the risk premium.

3.3.2.2 Evaluating debt premiums

The tables below show the approach towards debt premiums (where applied), their value, the applicable year and a short description of the evaluation.

3.3.2.2.1 Electricity transmission

	Debt premium		Short description of evaluation
	Value	Year	
AT	1.45%	2012	Based on expert report.
BE	0.70%	2016	N.A.
CZ	1,38%	2015	Margin between 10Y EUR Corporate Bonds BBB and 10Y Euro Bonds Souvereign
DE			N.A. No evaluation necessary. NRA accepts actual cost of debt when TSO provides evidence of customary interest rate.
DK			N.A.
EE	1,86	2016	The debt premium is the sum of the Estonian country risk premium and the debt risk premium of an undertaking. The Estonian country risk (0.78%) is based on the country rating (Default Spread) by the Moody´s rating A1 (Damodaran: Ratings, Interest Coverage Ratios and Default Spread[3]).
ES			N.A.
FI	1.40%	2016-2019	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks), 10.10.2014
FR	0.60%	2013	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	0.92%	2012	Variable: GB uses an iBoxx 10-year simple trailing average index to calculate the cost of debt. The value of the cost of debt index varies during the price control period, so the debt risk premium implicitly may vary too.
GR	4%	2015	An estimation of Country Risk Premium (CRP), taking into account financial conditions of the country, the degree of the Operator's exposure to them and the return of Greek government bonds, compared to Member States bonds as reported during the calculation of the Allowed Revenue.
HU	1.25%	2012	Real risk free rate: Average value of different methods.
IE	1.00%	2015	Based on spreads of European comparator company bonds.

[3] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/home.htm

IT	0.5%	2016	Debt premium is evaluated on the basis of market values and taking into account the cost of debt of regulated comanies
LV			The cost of debt is not calculated because company is not using long term loans.
LT			N.A.
LU	1.10%	2011	Mid term view based on a comparison sample, data by Thomson financial, HSBC bank plc.
NL	1.35%	2013	ACM uses the average of the debt premium over the last three years that was demanded on bonds of European utility companies with a single A-rating. This results in a debt premium of 1.2%. Furthermore ACM takes into account transaction costs associated with debt financing. This adds 15 bps to the debt premium with debt financing.
NO	1,28%	2016	Cost of debt: 5-years swap rate + credit spread for 5-year bonds for the power sector, minimum rate BBB+. In 2016 this amounts to: 1.09+1.28. The swap rate includes the "risk-free" rate and some debt premium.
PL	1%	2016	Analysis of premiums used by other regulators (intenational for energy and national for telecommunications) and analysts.
PT	2.00%	2015	Based on companies analysis.
SI	0.40%	2015	Debt premium for AAA rated companies (Source Aswath Damodaran Website).
SE	1.15%		Questions put to credit institutions (banks) on distribution companies cost for debts. A debt premium of 1.0 to 1.5 % for a stand-alone-company is the estimate from this questionnaire.

Table 26 - Debt premiums in the regulation of electricity TSO

3.3.2.2.2 Electricity distribution

	Debt premium		Short description of evaluation
	Value	Year	
AT	1.45%	2012	Based on expert report.
BE	0.70%	2009	Based on financial market conditions
CZ	1,38%	2015	Margin between 10Y EUR Corporate Bonds BBB and 10Y Euro Bonds Souvereign
DE			N.A.
DK			N.A.
EE	1,94%	2016	The debt premium is the sum of the Estonian country risk premium and the debt risk premium of an undertaking. The Estonian country risk (0.78%) is based on the country rating (Default Spread) by the Moody´s rating A1 (Damodaran: Ratings, Interest Coverage Ratios and Default Spread[4]).
ES			N.A.
FI	1.40%	2016-2019	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks), 10.10.2014
GB	1.60%	2009	Variable: GB uses an iBoxx 10 to 20-year extending trailing average index to calculate the cost of debt. The value of the cost of debt index varies during the price control period, so the debt risk premium implicitly may vary too.
HU	1.25%	2012	Based on: company ratings by international investor services (eg. S&P, Moody's), - financial and acounting data of electricity companies, standard deviation of BUBOR (Budapest Interbank Offered Rate), differences between prime rates (interest rates for strong international companies) and government bond rates, international regulatory practice.
IE	1.0%	2015	Based on spreads of European comparator company bonds
IT	0.5%	2016	Debt premium is evaluated on the basis of market values and taking into account the cost of debt of regulated companies
LV			See comments above.
LT			N.A.
LU	1.10%	2011	Mid term view based on a comparison sample, data by Thomson financial, HSBC bank plc.
NL	1.35%	2013	ACM uses the average of the debt premium over the last three years that was demanded on bonds of European utility companies with a single A-rating. This results in a debt premium of 1.2%. Furthermore ACM takes into account transaction costs associated with debt financing. This adds 15 bps to the debt premium with debt financing.
NO	1,28%	2016	Cost of debt: 5-years swap rate + credit spread for 5-year bonds for the power sector, minimum rate BBB+. In 2016 this amounts to: 1.09+1.28. The swap rate in-cludes the "risk-free" rate and some debt premium.
PL	1.00%	2016	Analysis of premiums used by other regulators (intenational for energy and national for telecomunication) and analysts.
PT	2.00%	2015	Based on companies analysis.
SI	0.40%	2015	Debt premium for AAA rated companies (Source Aswath Damodaran Website).
SE	1.15%	2009	Questions put to credit institutions (banks) on distribution companies cost for debts. A debt premium of 1.0 to 1.5 % for a stand-alone-company is the estimate from this questionnaire.

Table 27 - Debt premiums in the regulation of electricity DSOs

[4] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/home.htm

3.3.2.2.3 Gas transmission

	Debt premium		Short description of evaluation
	Value	Year	
AT	1.45%	2012	Based on expert report.
BE	0.70%	2016	N.A.
CZ	1,38%	2015	Margin between 10Y EUR Corporate Bonds BBB and 10Y Euro Bonds Souvereign
DE			N.A.
DK			N.A.
EE	1.95%	2016	The debt premium is the sum of the Estonian country risk premium and the debt risk premium of an undertaking. The Estonian country risk (0.78%) is based on the country rating (Default Spread) by the Moody´s rating A1 (Damodaran: Ratings, Interest Coverage Ratios and Default Spread[5]).
ES			N.A.
FI	1.40%	2016-2019	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks), 10.10.2014
FR	0.60%	2013	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	0.92%	2012	Variable: GB uses an iBoxx 10-year simple trailing average index to calculate the cost of debt. The value of the cost of debt index may vary during the price control period, so the debt risk premium may vary too.
GR	N.A.	2012	No calculation of the debt premium as it is already included in the cost of debt.
HU	1.80%	2009	Real risk free rate: standard deviation of yields of 5-year government bonds.
IE	N.A	2012	The debt premium reflects the difference between yields on comparator bonds and the risk free rate.
IT	0.5%	2016	Debt premium is evaluated on the basis of market values and taking into account the cost of debt of regulated companies
LV			the cost of debt is not calculated because company is not using long term loans.
LT			N.A.
LU	1.10%	2011	Mid term view based on a comparison sample, data by Thomson financial, HSBC bank plc.
NL	1.35%	2013	ACM uses the average of the debt premium over the last three years that was demanded on bonds of European utility companies with a single A-rating. This results in a debt premium of 1.2%. Furthermore ACM takes into account transaction costs associated with debt financing. This adds 15 bps to the debt premium with debt financing.
PL	1.00%	2015	analysis of premiums used by other regulators (intenational for energy and national for telecomunication) and analysts.
PT	2.50%	2016	Based on companies analysis.
SI	0.40%	2015	Debt premium for AAA rated companies (Source Aswath Damodaran Website).
SE	1.8%	2009	Questions put to credit institutions (banks) on distribution companies cost for debts. A debt premium of 1.0 to 1.5% for a stand-alone-company is the estimate from this questionnaire.

Table 28 - Debt premiums in the regulation of gas TSOs

[5] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/home.htm

3.3.2.2.4 Gas distribution

	Debt premium		Short description of evaluation
	Value	Year	
AT	1.45%	2012	Based on expert reports.
BE	0.70%	2009	Based on financial market conditions.
CZ	1,38%	2015	Margin between 10Y EUR Corporate Bonds BBB and 10Y Euro Bonds Souvereign
DE			N.A.
DK			Lies between 0.51 and 1.29% and depends on the individual DSO's risk.
EE	1.96%	2016	The debt premium is the sum of the Estonian country risk premium and the debt risk premium of an undertaking. The Estonian country risk (0.70%) is based on the country rating (Default Spread) by the Moody´s rating A1 (Damodaran: Ratings, Interest Coverage Ratios and Default Spread[6]).
ES			N.A.
FI	1.40%	2016	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks), 10.10.2014
FR	0.60%	2016	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	0.92%	2012	Variable: GB uses an iBoxx 10-year simple trailing average index to calculate the cost of debt. The value of the cost of debt index varies during the price control period, so the debt risk premium implicitly may vary too.
GR			N.A.
HU	1.80%	2009	Real risk free rate: standard deviation of yields of 5-year government bonds.
IE	N.A	2012	The debt premium reflects the difference between yields on comparator bonds and the risk free rate.
IT	0.5%	2016	Debt premium is evaluated on the basis of market values and taking into account the cost of debt of regulated companies
LV			the cost of debt is not calculated because company is not using long term loans.
LT			N.A.
LU	1.10%	2011	Mid term view based on a comparison sample, data by Thomson financial, HSBC bank plc.
NL	1.35%	2013	ACM uses the average of the debt premium over the last three years that was demanded on bonds of European utility companies with a single A-rating. This results in a debt premium of 1.2%. Furthermore ACM takes into account transaction costs associated with debt financing. This adds 15 bps to the debt premium

[6] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/home.htm

			with debt financing.
PL	1.00%	2015	analysis of premiums used by other regulators (intenational for energy and national for telecomunication) and analysts.
PT	2.50%	2016	Based on companies analysis.
SI	0.40%	2015	Debt premium for AAA rated companies (Source Aswath Damodaran Website).
SE	1.8%	2009	Questions put to credit institutions (banks) on distribution companies cost for debts. A debt premia on 1.0 to 1.5 % for a stand-alone-company is the estimate from this questionarie.

Table 29 - Debt premiums in the regulation of gas DSOs

The values of debt premiums are usually estimated on the basis of market analysis provided by external experts and internal comparative analysis conducted by the NRAs. The values rather reflect the borrowing conditions for network operators which are seen as companies with good ratings.

The typical value of the debt premium is between 0.45 and 1.5%. The chart below presents the values of debt premiums used by the regulators.

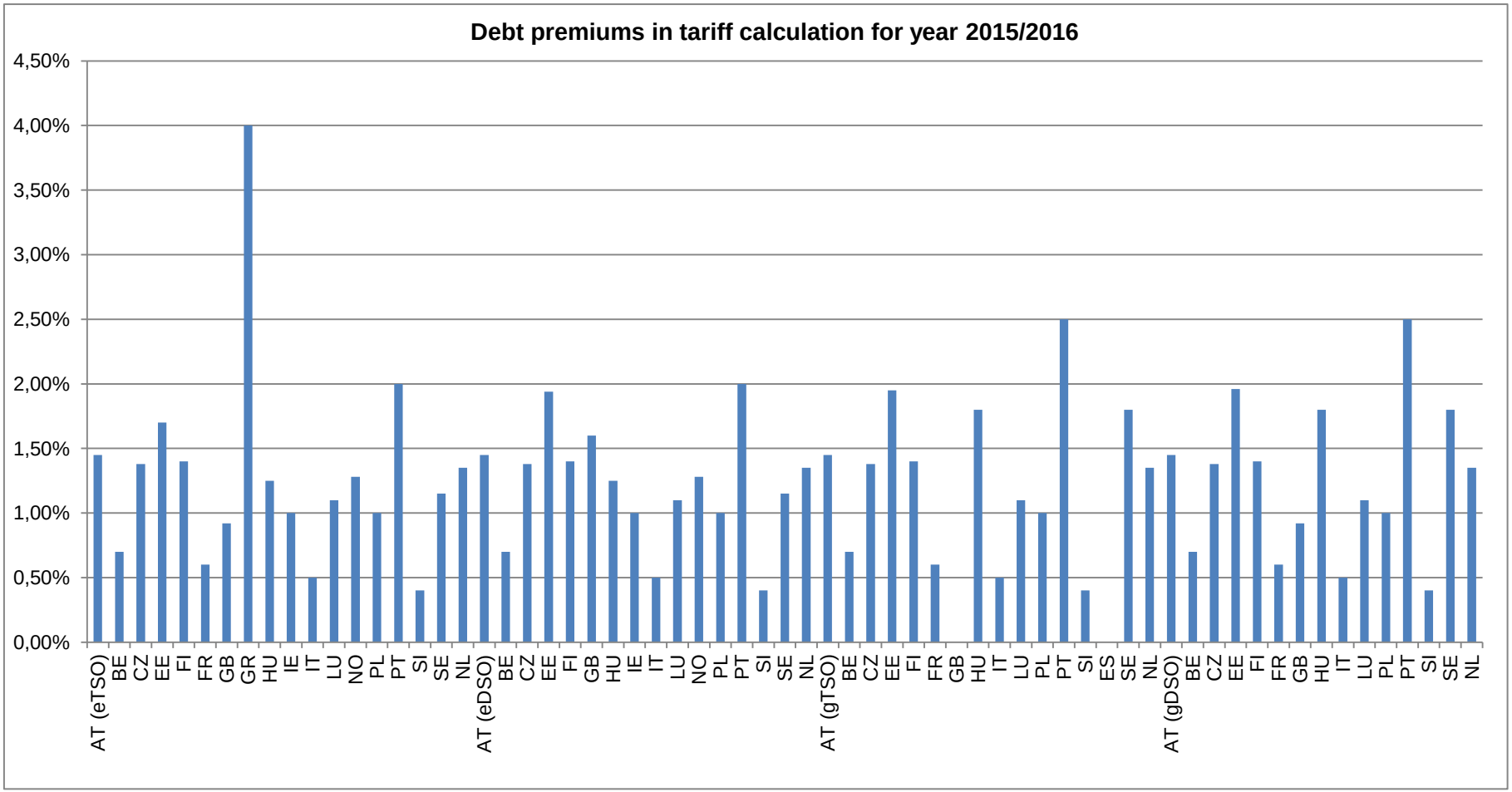

Table 30 - Debt premiums in tariff calculation for year 2015/2016
Source: NRA survey

3.3.2.3 Real cost of debt in tariff calculation

The tables below show the value of real cost of debt. In order to make the cost of debt applied by the NRAs more comparable, the debt premium was added to the real risk free rates. It should be noted that some of the values are based on the real risk free rates calculated above. In Belgium, the system of embedded financial debt covers the real costs of loans. The ex ante calculation of theses costs for 2016 amounts to 420% of the corresponding part of the RAB.

3.3.2.3.1 Electricity transmission

	Real risk free rate		Debt premium		Real cost of debt	
	Value	Year	Value	Year	Value	Year
AT	1.25%	2013	1.45%	2013	2.7%	2012, 2012
BE					4.20%	2016
CZ	3,51%	cal.	1,38%	2015	4,89%	cal.
DE	2.24%	2010				
DK	N.A.		N.A.		N.A.	
EE	1.47%	2016	1.86%	2016	3.66%	2016, 2016
ES						
FI	2,12%	2016	1.40%	2016	3,52%	2016
FR			0.60%	2013		
GB	2.00%	2012	Variable		2.92% for 2013-14 falling to 2.38% for 2016-172.55%	2012
GR					6,5%	
HU	3.7%	2012	1.25%	2012	4.95%	2012, 2012
IE	1.90%	2015	1.00%	2015	2.90%	2015
IT	0,5% The rate is the maximum between the real rate and a floor value of 0, 5%	2016	0.5%	2016	2,0% The rate is calculated as the sum of the real rate (with a floor value of 0,5%), a country risk premium ans a debt risk premium	2016
LV	4.80%	2008				
LT	3.6%	cal.				
LU	1.27%	2008	1.10%	2011	1.27%	2011, 2011
NL	0.49%	2013	1.35%	2013	1.84%	2013, 2013
NO	N.A.					
PL	1.231%	2016	1.00%	2016	1.231%	2016
PT	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
SI	2.10%	2015	0.40%	2015	2.50%	2015, 2015
SE	2.04%		1.15%		3.19%	

Table 31 - Estimation of real cost of debt used in the regulation of electricity TSOs

3.3.2.3.2 Electricity distribution

	Real risk free rate		Debt premium		Real cost of debt	
	value	Year	Value	Year	Value	Year
AT	1.25%	2013	1.45%	2013	2.7	2012, 2012
BE	4.20%	2009	0.70%	2009	4.90%	2009, 2009
CZ	3,51%	cal.	1,38%	2015	4,89%	cal.
DE	2.24%	2010				
DK	N.A.		N.A.		N.A.	
EE	1.47%	2016	1.94%	2016	3.41%	2016, 2016
ES						
FI	2,12%	2016	1.40%	2016	3,52%	2016
FR	N.A.					
GB	N.A.		Variable		22.55% for 2015-16 falling to 2.41% for 2016-17	2009, 2009
GR					5 %	2015
HU	3.7%	2012	1.25%	2012	4.95%	2012, 2012
IE	1.90%	2015	1.0%	2015	2.90%	2015
IT	0,5% The rate is the maximum between the real rate and a floor value of 0,5%	2016	0.5%	2016	2,0% The rate is calculated as the sum of the real rate (with a floor value of 0,5%), a country risk premium and a debt risk premium	2016
LV	3.80%					
LT	3.6%	cal.				
LU	1.27%	2008	1.10%	2011	1.27%	2011, 2011
NL	0.49%	2013	1.35%	2013	1.84%	2013, 2013
NO	N.A.					
PL	1.231%	2016	1.00%	2016	1.231%	2016
PT	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
SI	2.106%	2015	0.40%	2015	2.50%	2015, 2015
SE	2.04%	2009	1.15%	2009	5.86%	2009, 2009

Table 32 - Estimation of real cost of debt used in the regulation of electricity DSOs

3.3.2.3.3 Gas transmission

	Real risk free rate		Debt premium		Real cost of debt	
	Value	Year	Value	Year	Value	Year
AT	1.25%	2013	1.45%	2013	2.70%	2012, 2012
CZ	3,51%	cal.	1,38%	2015	4,89%	cal.
DE	2.24%	2010				
DK	N.A.		N.A.		N.A.	
EE	1.47%	2016	1.95%	2016	3.42%	2016, 2016
FI	2,12%	2016	1.40%	2016	3,52%	2016
FR	2.0%	2013	0.60%	2013	2.6%	2013, 2013
GB	2.0%	2012	Variable		2.92% for 2013-14 falling to 2.38% for 2016-17	
GR	N.A.	2012	N.A.	2012	4.38%	2012
HU	4.10%	2009	1.80%	2009	5.90%	2009, 2009
IE	3.5 – 5.5%	20012	N.A.	2012	N.A.	2012, 2012
IT	0,5% The rate is the maximum between the real rate and a floor value of 0,5%	2016	0.5%	2016	2,0% The rate is calculated as the sum of the real rate (with a floor value of 0,5%), a country risk premium and a debt risk premium	2016
LV	4.80%	2008				
LT	0.93%	2012			3.7%	
LU	1.27%	2008	1.10%	2011	1.27%	2011, 2011
NL	0.49%	2013	1.35%	2013	1.84%	2013, 2013
PL	2.56 %	2015	1%	2015	3.56%	2015
PT	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
SI	2.10%	2015	0.40%	2015	2.50%	2015, 2015
ES						
SE	0.67%	2009	1.15%	2009	5.13%	2009, 2009

Table 33 - Estimation of real cost of debt used in the regulation of gas TSOs

3.3.2.3.4 Gas distribution

	Real risk free rate		Debt premium		Real cost of debt	
	Value	Year	Value	Year	Value	Year
AT	1.25%	2013	1.45%	2012	2.70%	2012, 2012
BE	4.20%	2009	0.70%	2009	4.90%	2009, 2009
CZ	3,51%	cal.	1,38%	2015	4,89%	cal.
DE	2.24%	2010				
DK	3.13 %	2009	0.8 -1.7%	2011	3.93%	2009-2012
EE	1.47%	2016	1.96%	2016	3.43%	2016, 2016
FI	2,12%	2016	1.40%	2016	3,52%	2016
FR	1.6%	2016	0.60%	2016	2.5%	2016
GB	2.0%	2012	Variable		2.92% for 2013-14 falling to 2.38% for 2016-172.55%	
GR	N.A.					
HU	4.10%	2009	1.80%	2009	5.90%	2009, 2009
IE	3.5 – 5.5%	2012	N.A.	2012	N.A.	2012, 2012
IT	0,5% The rate is the maximum between the real rate and a floor value of 0,5%	2016	0.5%	2016	2,0% The rate is calculated as the sum of the real rate (with a floor value of 0,5%), a country risk premium and a debt risk premium	2016
LV	4.80%	2008				
LT	0.93%	2012			3.7%	
LU	1.27%	2008	1.10%	2011	1.27%	2011, 2011
NL	0.49%	2013	1.35%	2013	1.84%	2013, 2013
PL	2.76%	2015	1%	2015	3.76%	2015
PT	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
SI	2.10%	2015	0.40%	2015	2.50%	2015, 2015
ES						
SE	0.67%	2009	1.15%	2009	5.13%	2009, 2009

Table 34 - Estimation of real cost of debt used in the regulation of gas DSOs

For the majority of the analysed countries, the real cost of debt is in the range between 2.4 and 4.0%.

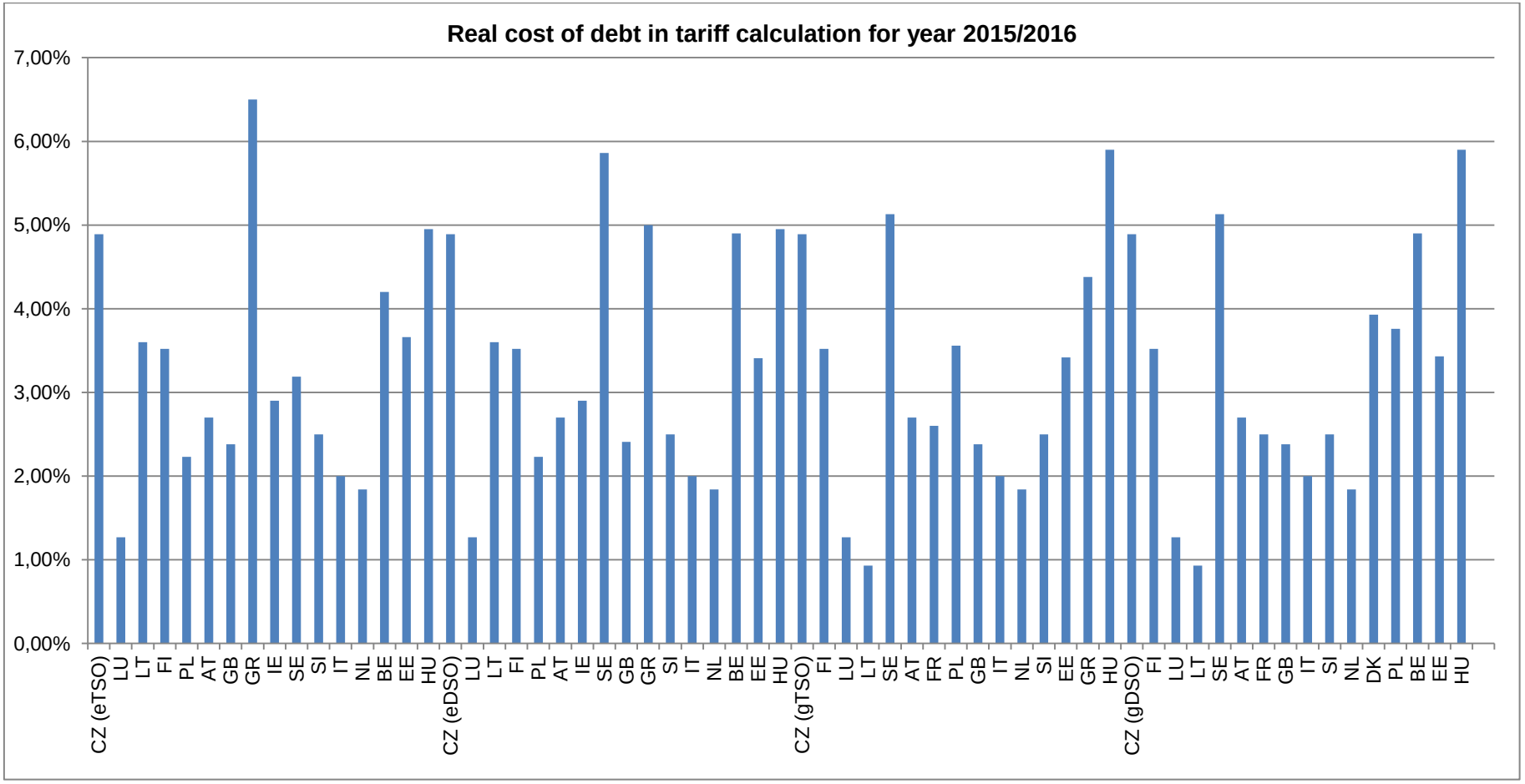

Table 35 –Real cost of debt in tariff calculation for year 2015/ 2016
Source: NRA survey

3.3.3 Market risk premiums

3.3.3.1 Definition

Market risk premium could be defined as the excess return that the overall stock market provides over an investment at the risk-free rate. Thus, determined by comparing the returns on equity and the returns on risk-free investments. This excess return compensates investors for taking on the relatively higher risk of the equity market. The size of the premium will vary as the risk, in the stock market as a whole, changes; high-risk investments are compensated with a higher premium.

3.3.3.2 Evaluating market risk premiums

The tables below show the value of the market risk premium and the NRAs approach for evaluating it.

3.3.3.2.1 Electricity transmission

	market risk pr.		short description of evaluation
	value	year	
AT	5.00%	2012	In 2012 the entire WACC calculation was re-evaluated and according to a new expert report which is using the database of Dimson, Marsh und Staunton for historic market risk premiums, the market risk premium remained on the old value of 5%.
BE	3.50%	2016	Average of the arithmetic and geometric mean of Belgian stock exchange market premium over the period 1900-2013 in the DMS database.
CZ	5%	2015	Value based on US stock market (data from 1920)
DE	4.55%	2008	The NRA uses a worldwide approach and data from the Dimson/Marsh/Staunton (DMS)Global Investment Returns Yearbook 2008. DMS define an arithmetic mean of 5.1 % and a geometric mean of 4% for a period from 1900 to 2007. Due to a lack of reasons to focus on either arithmetic or geometric mean,the NRA sets an average MRP of 4.55%.
DK			N.A.
EE	5.00%	2016	The NRA has in practice taken a value of 5% for the equity market risk premium, which corresponds to the recommendations of McKinsey and also takes into account experience of the market regulators of other EU Member States. For cost of equity the NRA employs the CAPM model.
ES			N.A.
FI	5.00%	2016	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks), 10.10.2014, Market Court decision (MAO:635-688/10), and experience from previous regulatory periods.
FR	5.00%	2013	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	5.25%	2012	The average long term differences between the returns on equities and returns on bonds (from DMS).
GR	4.00 %	2015	The premium due to Market Risk, based on historical data and future estimations of evolution of market return against government bonds.

HU	4.00%	2008	Based on: databases with historical data and studies, questionnare studies of expected equity risk premium, international regulatory practice.
IE	4.75%	2015	Based on experts' reports (DMS).
IT	5,5%	2016	The value was calculated as the difference between a total market return (determined considering average long-term returns in high rated countries) and the rsik-free rate
LV	3.00%	2008	Risk premium includes country risk premium and sector-specific risk premium estimates.
LT	5.08%	2015	Sum of equity risk premium of developed capital country (the US) (last 20 years) and additional risk premium of Lithuanian market (difference between risk rate of the Lithuanian credit rating and developed capital market by publicly available data). Beta is set on the basis of the Annual CEER Report on the Investment conditions in the European countries as the arithmetic mean of the risk ratio in the electricity transmission sector of the European Union member states.
LU	4.60%	2011	Based on DMS, Credit Suisse Global Investment Returns Sourcebook 2011
NL	5.00%	2013	In determining the market risk premium, ACM uses the study by Dimson, Marsh and Staunton. From this extensive investigation of the level of market risk during the period 1900- 2012, ACM uses the average of the geometric and the arithmetic mean of the Eurozone. ACM takes into account the higher expected future MRP by not applying the downward adjustment of historical results as proposed by DMS. The final result is 5%.
NO	5.00%	2016	Evaluated in 2013. Based on evaluations from PwC, experts and the CEER investment-report.
PL	4.2%	2016	Analysis of premiums used by other regulators and analysts, the following value is expected: 4,2% for years 2016-2020.
PT	6.25%	2014	Based on benchmarking and on international market analysis. Market risk premium = Risk premium for mature market Country risk spread.
SI	5.00%	2015	Based on the assessment of data sources: Duff & Phelps - 2014 Valuation handbook, Credit Suisse - Global Investment Return Yearbook 2014, Pablo Fernandez – Market Risk premium used in 88 countries in 2014.
SE	5.00%		The premium is based on inquries on risk premia on the Swedish stock market (PWC).

Table 36 - Market premiums in the regulation of electricity TSOs

3.3.3.2.2 Electricity distribution

	Market risk pr.		Short description of evaluation
	Value	Year	
AT	5.00%	2012	In 2012 the entire WACC calculation was re-evaluated and according to a new expert report which is using the database of Dimson, Marsh und Staunton for historic market risk premiums, the market risk premium remained on the old value of 5%.
BE	3.50%	2009	N.A.
CZ	5%	2015	Value based on US stock market (data from 1920)
DE	4.55%	2008	The NRA employs a worldwide approach and data from the DMSGlobal Investment Returns Yearbook 2008. DMS define an arithmetic mean of 5.1 % and a geometric mean of 4% for a period from 1900 to 2007. Because of a lack of reasons to focus on either arithmetic or geometric mean we set an average MRP of 4.55%.
DK			N.A.
EE	5.00%	2016	The NRA has taken in practice for the equity market risk premium the value of 5%, which corresponds to the recommendations of McKinsey and also takes into account experience of the market regulators of other EU Member States. For cost of equity the NRA employs the CAPM model.
ES			N.A.
FI	5.00%	2016	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks), 10.10.2014, Market Court decision (MAO:635-688/10), and experience from previous regulatory periods.
FR	5%		CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	N.A.	2014	Ofgem estimates the cost of equity with reference to a total equity market return, but does not make a point estimate of the risk-free rate. It stated that it will consider introducing a cost of equity index, updated each year in light of movements in yields on benchmark government bonds.
GR	4.00 %	2015	The premium due to Market Risk, based on historical data and future estimeations of evolution of market return against government bonds
HU	4.00%	2012	Based on: databases with historical data and studies, questionnare studies of expected equity risk premium, international regulatory practice.
IE	4.75%	2015	Based on experts' reports (DMS).
IT	5,5%	2016	The value was calculated as the difference between a total maket return (determined considering average long-term returns in high rated countries) and the risk-free rate
LV	3.80%	2008/10	Risk premium includes country risk premium and sector-specific risk premium estimates.
LT	5.08%	2015	Sum of equity risk premium of developed capital country(the US) (last 20 years) and additional risk premium of Lithuanian market (difference between risk rate of the Lithuanian credit rating and developed capital market by publicly available data). Beta is set on the basis of the Annual CEER Report on the Investment conditions in the European countries as the arithmetic mean of the risk ratio in the electricity distribution sector of the European Union member states.
LU	4.60%	2011	Based on a study by DMS, Credit Suisse Global Investment Returns Sourcebook 2011.

NL	5.00%	2013	In determining the market risk premium, ACM uses the study by Dimson, Marsh and Staunton. From this extensive investigation of the level of market risk during the period 1900- 2012, ACM uses the average of the geometric and the arithmetic mean of the Eurozone. ACM takes into account the higher expected future MRP by not applying the downward adjustment of historical results as proposed by DMS. The final result is 5%.
NO	5.00%	2016	Evaluated in 2013. Based on evaluations from PwC, experts and the CEER investment-report.
PL	4.2%	2016	Analysis of premiums used by other regulators and analysts, the following value is expected: 4,2% for years 2016-2020.
PT	6.25%	2014	Based on benchmarking and on international market analysis. Market risk premium = Risk premium for mature market. Country risk spread.
SI	5.00%	2015	Based on the assessment of data sources: Duff & Phelps - 2014 Valuation handbook, Credit Suisse - Global Investment Return Yearbook 2014, Pablo Fernandez – Market Risk premium used in 88 countries in 2014.
SE	0.50%	2009	The premium is based on inquries on risk premia on the Swedish stock market (PWC).

Table 37 - Market premiums in the regulation of electricity DSOs

3.3.3.2.3 Gas transmission

	Market risk pr.		Short description of evaluation
	Value	Year	
AT	5.00%	2012	In 2012 the entire WACC calculation was re-evaluated and according to a new expert report which is using the database of Dimson, Marsh und Staunton for historic market risk premiums, the market risk premium remained on the old value of 5%.
BE	3.50%	2016	Average of the arithmetic and geometric mean of Belgian stock exchange market premium over the period 1900-2013 in the DMS database.
CZ	5%	2015	Value based on US stock market (data from 1920)
DE	4.55%	2008	The NRA employs a worldwide approach and data from the DMS Global Investment Returns Yearbook 2008. DMS define an arithmetic mean of 5.1 % and a geometric mean of 4% for a period from 1900 to 2007. Because of a lack of reasons to focus on either arithmetic or geometric mean we set an average MRP of 4.55%.
DK			N.A..
EE	5.00%	2016	The NRA has in practice taken a value of 5% for the equity market risk premium, which corresponds to the recommendations of McKinsey and also takes into account experience of the market regulators of other EU Member States. For cost of equity the NRA employs the CAPM model.
ES			N.A.
FI	5.00%	2016	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks), 10.10.2014, Market Court decision (MAO:635-688/10), and experience from previous regulatory periods.
FR	5.00%	2013	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	5.25%	2012	The average long term differences between the returns on equities and returns on bonds (from DMS).
GR	5.90%	2014	The average long term differences between the return on equities and the returns on government bonds.
HU	6.60%	2009	ERP is an aritmethical average of the differences between the treasury bond rate in the beginning of the year and the annual yield of the stock exchange.
IE	5.00 – 6.00%	2012	Based on experts' reports (DMS).
IT	5,5%	2016	The value was calculated as the difference between a total market return (determined considering average long-term returns in high rated countries) and the risk-free rate
LV	3.20%	2008	Risk premium includes country risk premium and sector-specific risk premium estimates.
LT	6.79%	2012	Sum of equity risk premium of developed capital country (last 20 years) and additional risk premium of Lithuanian market (difference between risk rate of the Lithuanian credit rating and developed capital market by publicly available data. Beta is set by the weighted average of gas industry risk rate of developed capital country by publicly available data.
LU	4.60%	2011	Based on a study by DMS, Credit Suisse Global Investment Returns Sourcebook 2011.

NL	5.00%	2013	In determining the market risk premium, ACM uses the study by Dimson, Marsh and Staunton. From this extensive investigation of the level of market risk during the period 1900- 2012, ACM uses the average of the geometric and the arithmetic mean of the Eurozone. ACM takes into account the higher expected future MRP by not applying the downward adjustment of historical results as proposed by DMS. The final result is 5%.
PL	4.7 %	2015	Analysis of premiums used by other regulators and analysts.
PT	6.09%	2016	Based on benchmarking and on international market analysis. Market risk premium = Risk premium for mature market Country risk spread
SI	5.00%	2015	Based on the assessment of data sources: Duff & Phelps - 2014 Valuation handbook, Credit Suisse - Global Investment Return Yearbook 2014, Pablo Fernandez – Market Risk premium used in 88 countries in 2014.
SE	1.50%	2009	The premium is based on inquries on risk premia on the Swedish stock market (PWC).

Table 38 - Market premiums in the regulation of gas TSOs

3.3.3.2.4 Gas distribution

	Market risk pr.		Short description of evaluation
	Value	Year	
AT	5.00%	2012	In 2012 the entire WACC calculation was evaluated and according to a new expert report which is using the database of Dimson, Marsh und Staunton for historic market risk premiums,the market risk premium remained on the old value of 5%.
BE	3.50%	2009	N.A.
CZ	5%	2015	Value based on US stock market (data from 1920)
DE	4.55%	2008	The NRA employs a worldwide approach and data from the DMS Global Investment Returns Yearbook 2008. DMS define an arithmetic mean of 5.1 % and a geometric mean of 4% for a period from 1900 to 2007. Because of a lack of reasons to focus on either arithmetic or geometric mean we set an average MRP of 4.55%.
DK	4.75 %		Historical market risk premium.
EE	5.00%	2016	The NRA has in practice taken a the value of 5% for the equity market risk premium, which corresponds to the recommendations of McKinsey and also takes into account experience of the market regulators of other EU Member States. For cost of equity the NRA employs the CAPM model.
ES			N.A.
FI	5.00%	2016	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks), 10.10.2014, Market Court decision (MAO:635-688/10), and experience from previous regulatory periods.
FR	5.00%	2016	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	5.25%	2012	The average long term differences between the returns on equities and returns on bonds (from DMS).
GR			N.A.
HU	6.60%	2009	ERP is an aritmethical average of the differences between the treasury bond rate in the beginning of the year and the annual yield of the stock exchange.
IE	5.00 – 6.50%	2012	Based on experts' reports (DMS).
IT	5,5%	2016	The value was calculated as the difference between a total market return (determined considering average long-term returns in high rated countries) and the risk-free rate
LV	3.20%	2008	Risk premium includes country risk premium and sector-specific risk premium estimates.
LT	6.79%	2012	Same as for TSO.
LU	4.60%	2011	Based on a study by DMS, Credit Suisse Global Investment Returns Sourcebook 2011.

NL	5.00%	2013	In determining the market risk premium, ACM uses the study by Dimson, Marsh and Staunton. From this extensive investigation of the level of market risk during the period 1900- 2012, ACM uses the average of the geometric and the arithmetic mean of the Eurozone. ACM takes into account the higher expected future MRP by not applying the downward adjustment of historical results as proposed by DMS. The final result is 5%.
PL	4.7 %	2015	Analysis of premiums used by other regulators and analysts.
PT	6.09 %	2016	Based on benchmarking and on international market analysis. Market risk premium = Risk premium for mature market Country risk spread
SI	5.00%	2015	Based on the assessment of data sources: Duff & Phelps - 2014 Valuation handbook, Credit Suisse - Global Investment Return Yearbook 2014, Pablo Fernandez – Market Risk premium used in 88 countries in 2014.
SE	1.50%	2009	The premium is based on inquries on risk premia on the Swedish stock market (PWC).

Table 39 - Market premiums in the regulation of gas DSOs

As in the case of debt premiums, the values of market risk premiums are also based on a market analysis. The NRAs also use the reports prepared by expert group Dimson, Marsh, Staunton and the analysis provided by Damodaran.

The value of market risk premium is often in the range of 4.0 and 5.5%, but there are NRAs which use lower and higher values.

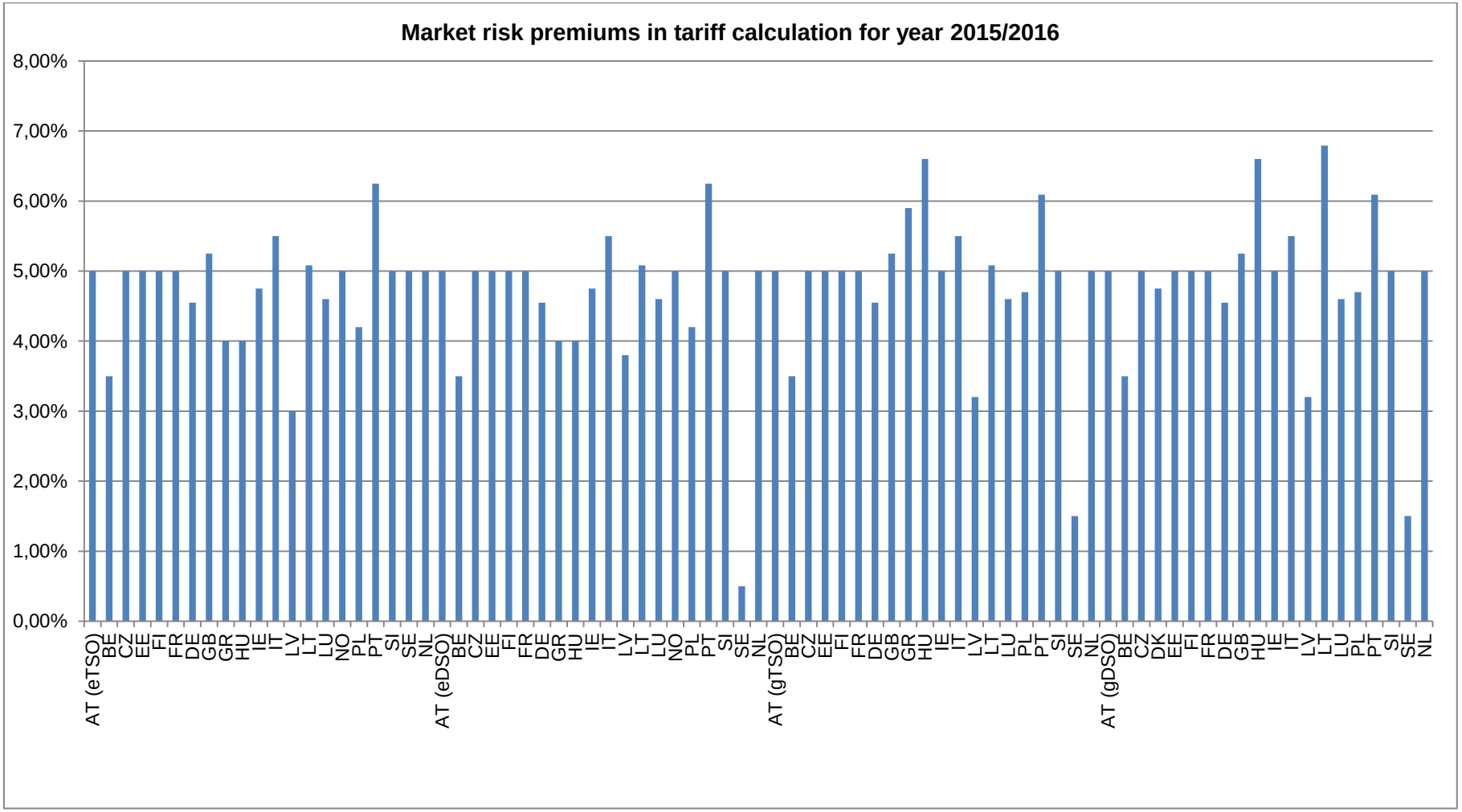

Table 40 - Market risk premiums in tariff calculation for year 2015/ 2016
Source: NRA survey

3.3.4 Capital gearing

3.3.4.1 Definition

The gearing ratio could be defined as the proportion of assets that were funded from borrowing funds.

3.3.4.2 Evaluating the gearing ratio

The tables below show the values of the gearing ratio and describe the methods of their evaluation by the NRAs.

3.3.4.2.1 Electricity transmission

	Gearing		Short description of evaluation
	Value	Year	
AT	60.0%	2012	On the basis of expert reports. In 2012 the entire WACC calculation was re-evaluated.
BE	67%	2016	Every year, the real gearing is applied in determing the fair margin.
CZ	45,75%	2015	The analysis of the European publicly traded companies from electricity sector (for a past ten years).
DE	60.0%	2011	The gearing ratio is specifically evaluated. The minimum limit is 60%.
DK			N.A.
EE	50.0%	2016	Tartu University economists consider that the structure of capital (50% of debt and 50% of equity capital) has a very little impact on WACC as the ratio does not affect significantly the value of WACC. On this basis,the NRA uses the capital structure in which 50% debt capital and 50% is equity capital.
ES			N.A.
FI	50.0%	2016	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks), 10.10.2014
FR	60.0%	2013	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	55.0 - 60.0%	2012	In setting notional gearing, the NRA considered financeability, return on regulatory equity, regulatory precedent, actual gearing and the ratio of investment to RAB. Notional Gearing set at 60% for the main TSO and set at 55% for two small regional TOs with large planned investment relative to RAB.
GR	32%	2015	An estimation of the ratio Bases on own analysis (D/D+E), according to historical values and Operator's Business Plan. Balance sheet figures. Estimation based on the relevant ratio in 2014.
HU	45.0%	2012	Benchmarking.

IE	55.0%	2015	Theoretical optimal value.
IT	44.4%	2016	Theoretical value based on market analysis.
LV		2008	According to the tariff calculation methodology, the rate of return on capital shall be determined so that as not to influence the choice of a service provider between the use of the equity capital and the borrowed capital. For the calculations, the actual capital structure ratios calculated from the balance sheet values of equity and long term debt capital are used.
LT	60.0%	2015	Taking into account the reduced risk of energy sector and comparison of other countries.
LU	50.0%	2011	Discrete, efficient capital structure.
NL	50.0%	2013	Based on peer group.
NO	60.0%	2016	We defined a long-term equity share by finding the weighted average of equity share in Norwegian network companies, based on five years of observations. This average was compared to the equity share in other international regulation. Based on the average and the comparing the equity share was assumed to be 40%.
PL	50%	2016	Theoretical value expected by the NRA, based on real ratios and future investments plans, the following values were expected: 34% (for tariff year 2011), 38% (2012), 42% (2013), 46% (2014), 50% (2015). Taking into account balancing the interests of electricity consumers and energy entities, as well as the optimization of the financing structure of the assets of these entities 50% of gearing ratio is considred as justified for years 2016-2020
PT	55.0%	2014	Theorical optimal value applied during the 2015-2017 regulatory period.
SI	60.0%	2015	Value expected by the NRA, based on various comparisons.
SE	50.0%		Estimations on international energy companies capital structure.

Table 41 - Gearing in the regulation of electricity TSOs

3.3.4.2.2 Electricity distribution

	Gearing		Short description of evaluation
	Value	Year	
AT	60.0%	2012	On the basis of expert reports. In 2012 the entire WACC calculation was re-evaluated.
BE			N.A.
CZ	45,75%	2015	The analysis of the European publicly traded companies from electricity sector (for a past ten years).
DE	60.0%	2011	The gearing ratio is specifically evaluated. The minimum limit is 60%.
DK			N.A.
EE	50.0%	2016	Tartu University economists consider that the structure of capital (50% of debt and 50% of equity capital) has a very little impact on WACC as the ratio does not affect significantly the value of WACC. On this basis, the NRA uses the capital structure in which 50% debt capital and 50% is equity capital.
FI	40.0%	2016	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks), 10.10.2014
FR	NA		N.A.
GB	65.0%	2014	The NRA set a notional gearing level consistent with a credit rating that is comfortably investment grade.
GR	39 %	2016	Operator's Business Plan.The formular is D/D+E, where D: total dept, and E: total equity.
HU	45.0%	2012	Benchmarking.
IE	55.0%	2015	Theoretical optimal value.
IT	44.4%	2016	Theoretical value based on market analysis.
LV		2008/10	According to the tariff calculation methodology, the rate of return on capital shall be determined so that as not to influencethe choice of a service provider between the use of the equity capital and the borrowed capital. For the calculations, the actual capital structure ratios calculated from the balance sheet values of equity and long term debt capital are used.
LT	60.0%	2015	Same as for TSO.
LU	50.0%	2011	Discrete, efficient capital structure.
NO	60.0%	2016	We defined a long-term equity share by finding the weighted average of equity share in Norwegian network companies, based on five years of observations. This average was compared to the equity share in other international regulation. Based on the average and the comparing the equity share was assumed to be 40%.
PL	50.0%	2016	Theoretical value expected by the NRA, based on real ratios and future investments plans, the following values were expected: 34% (for tariff year 2011), 38% (2012), 42% (2013), 46% (2014), 50% (2015). Taking into account balancing the interests of electricity consumers and energy entities, as well as the optimization of the financing structure of the assets of these entities 50% of gearing ratio is considred as justified for years 2016-2020.
PT	55.0%	2014	Theorical optimal value applied during the 2015-2017 regulatory period.
SI	60.0%	2015	Value expected by the NRA, based on various comparisons.
ES			N.A.
SE	50.0%	2009	Estimations on international energy companies capital structure.
NL	50.0%	2013	Based on peer group.

Table 42 - Gearing in the regulation of electricity DSOs

3.3.4.2.3 Gas transmission

	Gearing		Short description of evaluation
	Value	Year	
AT	60.0%	2012	In 2012 the entire WACC calculation was re-evaluated.
BE	67.0%	2016	Every year, the real gearing is applied in determing the fair margin.
CZ	38,48%	2015	The analysis of the European publicly traded companies from gas sector (for a past ten years).
DE	60.0%	2010	The gearing ratio is specifically evaluated. The minimum limit is 60%.
DK			Set by law.
EE	50.0%	2016	Tartu University economists consider that the structure of capital (50% of debt and 50% of equity capital) has a very little impact on WACC as the ratio does not affect significantly the value of WACC. On this basis the NRA uses the capital structure in which 50% debt capital and 50% is equity capital.
ES			N.A.
FI	40.0%	2016	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks)
FR	50.0%	2013	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	62.5%	2012	In setting notional gearing, the NRA considered financeability, return on regulatory equity, regulatory precedent and actual gearing.
GR	27.6%	2012	Actual gearing ratio of TSO.[7]
HU	40.0%	2009	Benchmarking.
IE	55.0%	2012	Theoretical optimal value.
IT	44.4%	2016	Theoretical value based on market analysis.
LV		2008	According to the tariff calculation methodology, the rate of return on capital shall be determined so that as not to influencethe choice of a service provider between the use of the equity capital and the borrowed capital. For the calculations, the actual capital structure ratios calculated from the balance sheet values of equity and long term debt capital are used.
LT	70.0%	2012	Taking into account the reduced risk of energy sector and comparison of other countries.
LU	50.0%	2011	Discrete, efficient capital structure.
NL	50.0%	2013	Based on peer group.
PL	23.27%	2015	Theorical optimal value based on analisys on regulated companies' capital structure.
PT	50.0%	2016	Analisys on regulated companies' capital structure.
SI	60.0%	2015	Value expected by NRA, based on various comparisons.
SE	47.0%	2009	Estimations on international energy companies capital structure.

Table 43 - Gearing in the regulation of gas TSOs

[7] The gearing ratio used for the tariffs set in 2012 was based on forecasts of gearing ratio as included in the Operator's business plan. The Average Rate Loan Rate (G) may not take a value greater than 50% according to the Tariff Regulation

3.3.4.2.4 Gas distribution

	Gearing		Short description of evaluation
	Value	Year	
AT	60.0%	2012	In 2012 the entire WACC calculation was evaluated and according to a new expert opinion gearing remained unchanged.
BE			Average of Belgian companies.
CZ	38,48%	2015	The analysis of the European publicly traded companies from gas sector (for a past ten years).
DE	60.0%	2010	The gearing ratio is specifically evaluated. The minimum limit is 60%.
DK	70.0%		Defined by law.
EE	50.0%	2016	Tartu University economists consider that the structure of capital (50% of debt and 50% of equity capital) has a very little impact on WACC as the ratio does not affect significantly the value of WACC. On this basis the NRA uses the capital structure in which 50% debt capital and 50% is equity capital.
ES			N.A.
FI	40.0%	2016	Based on consultancy report: Ernst & Young Oy, Kohtuullisen tuottoasteen määrittäminen sähkö- ja maakaasuverkkotoimintaan sitoutuneelle pääomalle (Measuring reasonable return for electricity- and gas networks)
FR	50.0%	2016	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	65.0%	2012	In setting notional gearing, the NRA considered finnceability, return on regulatory equity, regulatory precedent and actual gearing.
HU	40.0%	2009	Benchmarking.
IE	55.0%	2012	Theoretical optimal value.
IT	37.5%	2016	Theoretical value based on market analysis.
LV			According to the tariff calculation methodology, the rate of return on capital shall be determined so that as not to influencethe choice of a service provider between the use of the equity capital and the borrowed capital. For the calculations, the actual capital structure ratios calculated from the balance sheet values of equity and long term debt capital are used.
LT	70.0%	2012	Same as for TSO.
LU	50.0%	2011	Discrete, efficient capital structure.
NL	50.0%	2013	Based on peer group.
PL	22,36 %	2015	Planned ratio.
PT	50.0%	2016	Theorical optimal value based on analisys on regulated companies' capital structure.
SI	60.0%	2015	Value expected by regulator, based on various comparisons.
SE	47.0%	2009	Estimations on international energy companies capital structure.

Table 44 - Gearing in the regulation of gas DSOs

The analysis of the NRAs' approaches to the gearing ratio indicates two possible solutions: The first is based on the real gearing ratio observed in the network companies. The second is completely different and is based on the theoretical value which is seen as optimal as the effect of market analysis or is arising from the comparative analysis of similar companies.The gearing ratio most often employed by NRAs ranges between 30 and 60%, but there are some regulators which use other ratios. In this case the ratio is based on the real capital structure.

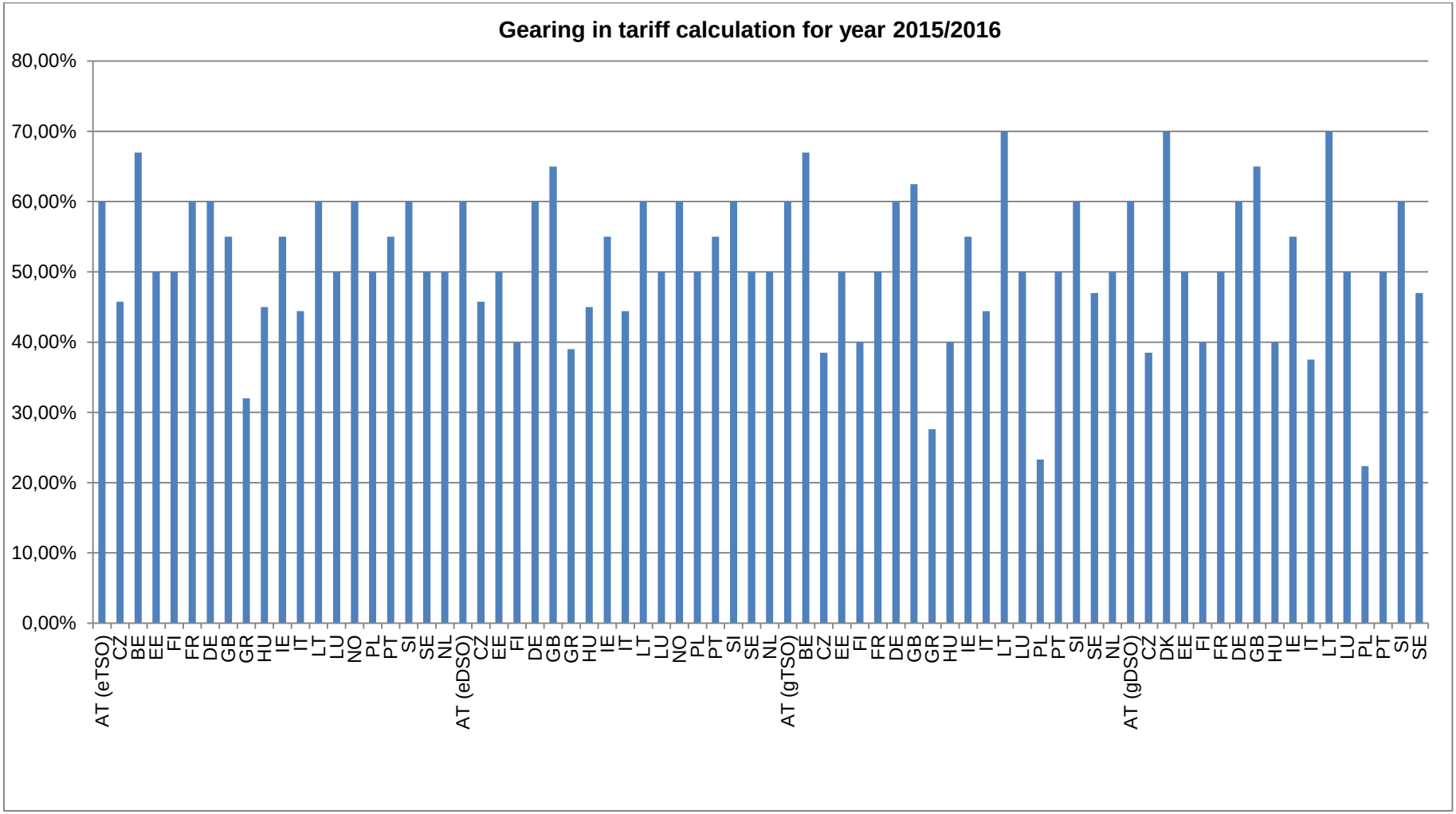

Table 45 - Gearing in tariff calculation for year 2015/ 2016
Source: NRA survey

3.3.5 Taxes

3.3.5.1 Definition

The tax value could be defined as the rate of income tax paid by the network operators.

3.3.5.2 Evaluating the tax value

The tables below show the value of the tax rates used by the NRAs in order to set the cost of capital.

3.3.5.2.1 Electricity transmission

	Taxes		short description of evaluation
	value	year	
AT	25.0%	2012	Corporate income tax as defined by law.
BE	25,86%	2016	The real taxes are covered by the tariffs. Tax reductions due to the mechanisms of 'national interest' are consequently in favour of the grid-users.
CZ	19.0%	2009	Law, corporate tax rate
DE	15.825%	2011	Only corporate income tax and solidarity tax. Within the context of determining grid costs, the trade tax appropriately allocable to the grid area may be recognised as a calculatory cost item. The calculatory equity yield therefore is multyplied by 3.5% and by a municipality-specific collection rate (e.g. 400%). This can be interpreted as an equity yield mark-up.
DK	NA		NA
EE	20.0%	2016	The tax rate is 20%. According to the Estonian law it is however applied only to dividends and not for profit and the NRA therefore does not use post-tax beta.
ES			N.A.
FI	20.0%	2016	Corporate tax.
FR	34.43%	2013	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	23.0%	2012	Corporate tax rate of 23% for 2013/14 and 21% from April 2014.
GR	29%	2015	Corporate tax rate (the tax rate since August 2015 is 29%).
HU	19.0%	2012	Corporate tax rate (31% extra profit tax is not taken into account).
IE	12.5%	2015	Based on corporate tax.
IT	34.4%	2016	Average corporate tax rate.
LV	0.0%	2008	Tax- related expenditures are calculated separately.
LT	15.0%	2015	Income tax rate set in the legal acts.
LU	30.4%	2011	Corporate tax rate 2011.
NL	25.0%	2013	Dutch corporate tax rate.
NO	25.0%	2016	Corporate income tax.
PL	19.0%	2015	Corporate income tax.
PT	31.5%	2014	National level at the start of the regulatory period.
SI	8.0%	2015	Based on the assessment of expected corporate income tax of regulated companies.
SE	20.0%		Nominal tax rate is 26.3%. This rate is modified to 20% due to untaxed reserves.

Table 46 - Taxes in the regulation of electricity TSOs

3.3.5.2.2 Electricity distribution

	Taxes		Short description of evaluation
	Value	Year	
AT	25.0%	2012	Corporate income tax as defined by law.
BE	34.0%	2009	Real taxes are covered by tariffs (tax reductions due to virtual remunof capital are in favour of grid usereration).
CZ	19.0%	2009	Law, corporate tax rate.
DE	15.825%	2011	Only corporate income tax and solidarity tax. Within the context of determining grid costs, the trade tax appropriately allocable to the grid area may be recognised as a calculatory cost item. Therefore the calculatory equity yield is multiplied by 3,5% and by a municipality-specific collection rate (e.g.400%). This can be interpreted as an equity yield mark-up.
DK	25.0%		Corporate income tax as defined by law.
EE	20.0%	2016	The tax rate is 20%. According to the Estonian law it is however applied only to dividends and not for profit and the NRA therefore does not use post-tax beta.
ES			N.A.
FI	20.0%	2016	Corporate tax.
FR	34.43%	2013	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	20.20%	2014	Corporate tax rate.
GR	29%	2016	Corporate tax rate (the tax rate since August 2015 is 29%).
HU	19.0%	2012	Corporate tax rate (31% extra profit tax is not taken into account)
IE	12.5%	2015	Corporation tax.
IT	34.4%	2016	Average corporate tax rate.
LV			Tax- related expenditures are calculated separately.
LT	15.0%	2015	Same as for TSO.
LU	30.4%	2011	Corporate tax rate 2011.
NL	25.0%	2013	Dutch corporate tax rate.
NO	25.0%	2016	Corporate income tax.
PL	19.0%	2015	Corporate income tax.
PT	31.5%	2014	National level in the beggining of the regulatory period.
SI	8.0%	2015	Based on the assessment of expected corporate income tax of regulated companies.
SE	26.3%	2009	Nominal tax rate is 26.3%. This rate is modified to 20% due to untaxed reserves.

Table 47 - Taxes in the regulation of electricity DSOs

3.3.5.2.3 Gas transmission

	Taxes		short description of evaluation
	value	year	
AT	25.0%	2012	Corporate income tax as defined by law.
BE	34.0%	2016	N.A.
CZ	19.0%	2009	Law, corporate tax rate
DE	15.825%	2010	Only corporate income tax and solidarity tax. Within the context of determining grid costs, the trade tax appropriately allocable to the grid area may be recognised as a calculatory cost item. Therefore the calculatory equity yield is multiplied by 3,5% and by a municipality-specific collection rate (e.g. 400%). This can be interpreted as an equity yield mark-up.
DK	N.A.		Set by law
EE	20.0%	2016	The tax rate is 20%. According to the Estonian law it is however applied only to dividends and not for profit and the NRA therefore does not use post-tax beta.
ES			N.A.
FI	20.0%	2016	Corporate tax.
FR	34.4%	2013	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	23.0%	2012	Corporate tax rate of 23% for 2013/14 and 21% from April 2014.
GR	20 %	2012	Corporate tax rate. As of 2015 the tax rate is 29%. However in WACC calculations, in the precious years, a 20% rate was used.
HU	19.0%	2009	Corporate tax rate.
IE	12.5%	2016	Corporation tax.
IT	34.4%	2016	Average corporate tax rate.
LV	N.A.	2008	Tax- related expenditures are calculated separately.
LT	15.0%	2012	Income tax rate set in the legal acts.
LU	30.4%	2011	Corporate tax rate 2011.
NL	25.0%	2013	Dutch corporate tax rate.
PL	19.0%	2015	Corporate income tax.
PT	29.5%	2016	National level in the beggining of the regulatory period.
SI	8.0%	2015	Based on the assessment of expected corporate income tax of regulated companies.
SE	26.3%	2009	Nominal tax rate is 26.3%. This rate is modified to 20% due to untaxed reserves.

Table 48 - Taxes in the regulation of gas TSOs

3.3.5.2.4 Gas distribution

	Taxes		Short description of evaluation
	Value	Year	
AT	25.0%	2012	Corporate income tax as defined by law.
BE	0.0%	2009	real taxes are covered by tariffs (tax reductions due to virtual remunof capital are in favour of grid userseration).
CZ	19.0%	2009	Law, corporate tax rate.
DE	15.825%	2010	Only corporate income tax and solidarity tax. Within the context of determining grid costs, the trade tax appropriately allocable to the grid area may be recognised as a calculatory cost item. Therefore the calculatory equity yield is multiplied by 3,5% and by a municipality-specific collection rate (e.g. 400%). This can be interpreted as an equity yield mark-up.
DK	22.0%		Corporate income tax as defined by law.
EE	20.0%	2016	The tax rate is 20%. According to the Estonian law it is however applied only to dividends and not for profit and the NRA therefore does not use post-tax beta.
ES			N.A.
FI	20.0%	2016	Corporate tax.
FR	34.43%	2016	CRE examines the different parameters used to calculate the WACC based on a historical and forward looking approach. An external consultant's study is commissioned. In-house assessments, discussions with operators and their shareholders are carried out. A range of admissible values for the WACC is then proposed to the commissioners who decided on the value of the WACC in this range.
GB	25.0%	2012	Corporate tax rate of 23% for 2013/14 and 21% from April 2014.
HU	19.0%	2009	Corporate tax rate.
IE	12.5%	2016	Corporation tax.
IT	34.4%	2016	Average corporate tax rate.
LV	0.0%		Tax- related expenditures are calculated separately.
LT	15.0%	2012	Same as for TSO.
LU	30.4%	2011	Corporate tax rate 2011.
NL	25.0%	2013	Dutch corporate tax rate.
PL	19.0%	2015	Corporate income tax.
PT	29.5%	2016	National level in the beggining of the regulatory period.
SI	8.0%	2015	Based on the assessment of expected corporate income tax of regulated companies.
SE	20.0%	2009	Nominal tax rate is 26,3%. This rate is modified to 20% due to untaxed reserves.

Table 49 - Taxes in the regulation of gas DSOs

The NRAs identified different titles for taxes but this is likely to be income tax rate which applies to the network companies. The value of income tax depends on the national tax system.

3.3.6 Beta

3.3.6.1 Definition

An asset beta could be described as a quantitative measure of the volatility of a given stock, mutual fund, or portfolio, relative to the overall market.

The asset beta therefore reflects the business risk in the specific market where the company operates. A beta of 1 corresponds to the expectations of the market as a whole, a beta above 1 is more volatile than the overall market, while a beta below 1 is less volatile.

The beta of a company is calculated after subtracting its debt obligations, thus measuring the non-diversifiable risk.

Asset (unlevered) beta removes the effects of leverage on the capital structure of a firm, since the use of debt can result in tax rate adjustments that benefit a company. Removing the debt component allows an investor to compare the base level of risk between various companies.

An equity beta could be defined as an indication of the systematic risk attached to the returns on ordinary stocks. Equity beta accounts for the combined effects of market and financial risks that the stockholders of a company have to face. It equates to the asset beta for an ungeared firm, or is adjusted upwards to reflect the extra riskyness of stocks in a geared firm.

The dependence between the asset and equity beta is usually presented by the following formula:

$$eß = aß*[1+(1-t)*(D/E)], \text{ where}$$

eß – equity beta
aß – asset beta
t – tax rate
D/E – gearing ratio

Sometimes in the calculation of the equity beta the influence of taxes is not taken into account. In this case the formula for calculation equity beta is as follows:

$$eß = aß*[1+D/E]$$

3.3.6.2 Evaluating the asset and equity beta

The tables below show the NRAs approach for evaluation of asset and equity beta.

3.3.6.2.1 Electricity transmission

	Short description of evaluation	Evaluation of asset and equity beta
AT	Based on experts' reports.	eß = aß*[1+(1-t)*(D/E)]
BE	Computed based on the TSO shares price and the BEL index over a 3 year period (‘t-2’),’t-1’ and ‘t’) with a guaranteed minimum level of 0,53	only eß
CZ	Based on expert's report. Analysis of similar energy companies from the Europe.	eß = aß*[1+(1-t)*(D/E)]
DE	Based on consultancy reports.	eß = aß*[1+(1-t)*(D/E)]
DK	N.A.	
EE	Based on CEER countries.	eß = aß*[1+D/E]
ES	N.A.	
FI	Based on consultancy report (market data).	eß = aß*[1+(1-t)*(D/E)]
FR	N.A.	eß = aß*[1+(1-t)*(D/E)]
GB	Based on consultancy reports and market data.	only eß
GR	Based on relevant values for similar to the operator’s foreign companies.	eß = aß*[1+D/E]
HU	Bottom up Beta estimate.	only eß
IE	Based on market data (domestic and European).	
IT	Beta is based on Bloomberg data of network companies operating in AA (or higher) rated countries	eß = aß*[1+(1-t)*(D/E)]
IE	Based on market data (domestic and European). The equity beta is derived by re-levering asset beta at the notional gearing level and assuming a debt beta of zero.	
LV	N.A.	
LT	Equity beta is set on the basis of the annual CEER Report on the Investment conditions in the European countries as the arithmetic mean of the risk ratio in the electricity transmission sector of the European Union member states.	
LU	Based on market data.	eß = aß*[1+(1-t)*(D/E)]
NL	Based on international market data on a peer group of comparable network operators.	eß = aß*[1+(1-t)*(D/E)]
NO	Evaluated in 2007. A sample international companies was used for establish asset beta. The average beta from the sample was compared to a local index and the world index and an interval between 0.25 to 0.49 was indicated. We compared the interval with an average of the beta used in the regulation in other countries. Based on this the asset beta was assumed to be 0.35. Based on the asset beta and the equity share (40 %) we were able to find the equity beta (0.875).	eß = aß*[1+D/E]
PL	Based on beta used by other regulators, analysts, analysis of Polish Stock Exchange.	eß = aß*[1+(1-t)+(D/E)]
PT	Benchmark for similar companies + stock market analysis (integrated company) + Adjusted Equity Beta calculated from raw betas (eßAdj = eßraw*2/3 + 1/3) + risk analysis based on bottom - up approach for activities integrated in companies quoted on stock market.	eß = aß*[1+(1-t)*(D/E)
SI	Based on Aswath Damodaran analysis.	eß = aß*[1+(1-t)*(D/E)]
SE	N.A.	

Table 50 – Evaluation of betas in the regulation of electricity TSOs*; dß – debt beta

3.3.6.2.2 Electricity distribution

	Short description of evaluation	Evaluation of asset and equity beta
AT	Based on experts' reports.	eß = aß*[1+(1-t)*(D/E)]
BE	Market value (if operator not listed - value set by law).	only eß
CZ	Based on expert's report. Analysis of similar energy companies from the Europe.	eß = aß*[1+(1-t)*(D/E)]
DE	Based on consultancy reports.	eß = aß*[1+(1-t)*(D/E)]
DK	N.A.	
EE	Based on CEER countries.	eß = aß*[1+D/E]
ES	N.A.	
FI	Based on consultancy reports (market data)	eß = aß*[1+(1-t)*(D/E)]
FR	N.A.	
GB	NRA did not specify point estimate of beta.	NA
GR	Based on relevant values for similar to the operator's foreign companies.	eß = aß*[1+D/E]
HU	Bottom up Beta estimate.	only eß
IE	Based on market data (domestic and European).	
IT	Beta is based on Bloomberg data of network companies operating in AA (or higher) rated countries	eß = aß*[1+(1-t)*(D/E)]
IE	Based on market data (domestic and European).	
LV	N.A.	
LT	Same as in electricity transmission.	
LU	Based on market data.	eß = aß*[1+(1-t)*(D/E)]
NL	Based on international market data on a peer group of comparable network operators.	eß = aß*[1+(1-t)*(D/E)]
NO	Evaluated in 2007. A sample international companies was used for establish asset beta. The average beta from the sample was compared to a local index and the world index and a interval between 0.25 to 0.49 was indicated. We compared the interval with an average of the beta used in the regulation in other countries. Based on this the asset beta was assumed to be 0.35. Based on the asset beta and the equity share (40 %) we were able to find the equity beta (0.875).	eß = aß*[1+D/E]
PL	Based on beta used by other regulators, analysts, analysis of Polish Stock Exchange.	eß = aß*[1+(1-t)+(D/E)]
PT	Benchmark for similar companies + stock market analysis (integrated company) + Adjusted Equity Beta calculated from raw betas (eßAdj = eßraw*2/3 + 1/3) + risk analysis based on bottom - up approach for activities integrated in companies quoted on stock market.	eß = aß*[1+(1-t)*(D/E)
SI	Based on analysis by Damodaran.	eß = aß*[1+(1-t)*(D/E)]
SE	Based on the estimations of European energy companies.	eß = aß*[1+(1-t)*(D/E)]

Table 51 – Evaluation of betas in the regulation of electricity DSOs
* dß – debt beta

3.3.6.2.3 Gas transmission

	short description of evaluation	evaluation of asset and equity beta
AT	Based on experts' reports.	eß = aß*[1+(1-t)*(D/E)]
BE	Computed based on the TSO shres price and the BEL 20 index over a 3 year period with a guaranteed minimum level.	only eß
CZ	Based on expert's report. Analysis of similar energy companies from the Europe.	eß = aß*[1+(1-t)*(D/E)]
DE	Based on consultancy reports.	eß = aß*[1+(1-t)*(D/E)]
DK	N.A.	
EE	Based on CEER countries.	eß = aß*[1+D/E]
ES	N.A.	
FI	Based on consultancy report (market data)	eß = aß*[1+(1-t)*(D/E)]
FR	N.A.	eß = aß*[1+(1-t)*(D/E)]
GB	Based on consultancy reports and market data.	only eß
GR	Based on European data of ß of similar risk TSOs.	eß = aß*[1+(1-t)*(D/E)]
HU	Based on Hungarian market data.	only eß
IE	Based on market data (domestic and European).	
IT	Beta is based on Bloomberg data of network companies operating in AA (or higher) rated countries	eß = aß*[1+(1-t)*(D/E)]
IE	Based on market data (domestic and European).	
LV	N.A.	
LT	Equity beta is set by the weighted average of gas industry risk rate of developed capital country by publicly available data.	
LU	Based on market data.	eß = aß*[1+(1-t)*(D/E)]
NL	Based on international market data on a peer group of comparable network operators.	eß = aß*[1+(1-t)*(D/E)]
PL	Based on beta used by other regulators, analysts, analysis of Polish Stock Exchange.	eß = aß*[1+D/E]
PT	Benchmark for similar companies + stock market analysis (integrated company) + Adjusted Equity Beta calculated from raw betas (eßAdj = eßraw*2/3 + 1/3) + risk analysis based on bottom - up approach for activities integrated in companies quoted on stock market.	eß = aß*[1+(1-t)*(D/E)
SI	Based on analysis by Damodaran.	eß = aß*[1+(1-t)*(D/E)]
SE	Based on the estimations of European energy companies.	eß = aß*[1+(1-t)*(D/E)]

Table 52 – Evaluation of betas in the regulation of gas TSOs

3.3.6.2.4 Gas distribution

	Short description of evaluation	Evaluation of asset and equity beta
AT	Based on experts' reports.	eß = aß*[1+(1-t)*(D/E)]
BE	Market value (if operator not listed – value set by law).	only eß
CZ	Based on expert's report. Analysis of similar energy companies from the Europe.	eß = aß*[1+(1-t)*(D/E)]
DE	Based on consultancy reports.	eß = aß*[1+(1-t)*(D/E)]
DK	Based on betas used by other regulators and on international market data.	eß = aß*[1+(1-t)*(D/E)]+fß*(1-t)(D/E)
EE	Based on CEER countries.	eß = aß*[1+D/E]
ES	N.A.	
FI	Based on consultancy reports (market data)	eß = aß*[1+(1-t)*(D/E)]
FR	N.A.	eß = aß*[1+(1-t)*(D/E)]
GB	Based on consultancy reports and market data.	only eß
HU	Based on Hungarian market data.	only eß
IE	Based on market data (domestic and European).	
IT	Beta is based on Bloomberg data of network companies operating in AA (or higher) rated countries	eß = aß*[1+(1-t)*(D/E)]
IE	Based on market data (European and international energy companies).	
LV	N.A.	
LT	Equity beta is set by the weighted average of gas industry risk rate of developed capital country by publicly available data.	
LU	Based on market data.	eß = aß*[1+(1-t)*(D/E)]
NL	Based on international market data on a peer group of comparable network operators.	eß = aß*[1+(1-t)*(D/E)]
PL	Based on beta used by other regulators, analysts, analysis of Polish Stock Exchange.	eß = aß*[1+D/E]
PT	Benchmark for similar companies + stock market analysis (integrated company) + Adjusted Equity Beta calculated from raw betas (eßAdj = eßraw*2/3 + 1/3) + risk analysis based on bottom - up approach for activities integrated in companies quoted on stock market.	eß = aß*[1+(1-t)*(D/E)
SI	Based on analysis by Damodaran.	eß = aß*[1+(1-t)*(D/E)]
SE	Based on the estimations of European energy companies.	eß = aß*[1+(1-t)*(D/E)]

Table 53 - Evaluation of betas in the regulation of gas DSOs

The majority of NRAs evaluate beta values by using both external and internal market analyses. The most frequently applied approach in the calculation of equity beta is to use the formula which includes tax. Some regulators use a formula which does not include tax or use direct equity beta without a calculation of asset beta.

Due to the different gearing ratios, the comparison of equity betas could be misleading. In order to make the values comparable the asset beta were calculated. The calculation was based on the value of equity betas and gearing ratios used by the regulators. The formulas presented above were used in this calculation.

3.3.6.3 Betas in the regulation

3.3.6.3.1 Electricity transmission

	Equity beta		Asset beta	
	Value	Year	eß = aß*[1+(1-t)*(D/E)]	eß = aß*[1+D/E]
AT	0.69	2012	0.33	0,28
BE	0,53	2016		
CZ	0,901	2015	0,536	0,489
DE	0.79	2008	0.35	0.32
DK	N.A.	N.A.	N.A.	N.A.
EE	0.670	2016	N.A.	0.335
ES				
FI	0.720	2016	0.4	0.36
FR	0.66	2013	0.33	
GB	0.95	2012	0.45-0.50	0.38-0.43
GR	0.56	2016		0.38
HU	0.55	2012	0.33	0.30
IE	0.89	2015		
IT	0.553	2016	0.354	0.31
LT	0.72	2015	0.32	0.288
LU	0.6954	2011	0.41	0.35
LV				
NL	0.61	2013	0.35	0.31
NO	0.88	2016	0.42	0.35
PL	0.724	2016	0.40	0.36
PT	0.58	2014	0.32	0.26
SE	0.62		0.34	0.31
SI	1.14	2015	0.48	

Table 54 - Betas in the regulation of electricity TSOs

3.3.6.3.2 Electricity distribution

	Equity beta	Asset beta		
	value	year	eß = aß*[1+(1-t)*(D/E)]	eß = aß*[1+D/E]
AT	0.69	2012	0.33	0.28
BE				
CZ	0,901	2015	0,536	0,489
DE	0.79	2008	0.35	0.32
DK	N.A.	N.A.	N.A.	N.A.
EE	0.668	2016	N.A.	0.3334
ES				
FI	0.828	2016	0.54	0.50
FR	N.A.	N.A.	0.33	
GB	N.A.		NRA did not specify point estimate for beta	
GR	0,62	2016		0,38
HU	0.55	2012	0.33	0.30
IE	0.89	2015	0.40	
IT	0.616	2016	0.39	0.34
LT	0.72	2015	0.32	0.288
LU	0.6954	2011	0.41	0.35
LV	0.00			
NL	0.61	2013	0.35	0.31
NO	0.88	2016	0.42	0.35
PL	0.724	2016	0.40	0.36
PT	0.67	2014	0.36	0.30
SE	0.62	2009	0.36	0.31
SI	1.14	2015	0.48	

Table 55 - Betas in the regulation of electricity DSOs

3.3.6.3.3 Gas transmission

	Equity beta		Asset beta	
	value	year	eß = aß*[1+(1-t)*(D/E)]	eß = aß*[1+D/E]
AT	0.69	2012	0.33	0,28
BE	0.65	2016		
CZ	0,801	2015	0,532	0,493
DE	0.79	2008	0.35	0.32
DK	N.A.	N.A.	N.A.	N.A.
EE	0.668	2016	N.A.	0.334
ES				
FI	0.690	2016	0.45	0.41
FR	0.96	2013	0.58	
GB	0.91	2012	0.40	0.34
GR	0.65	2012	0.5	
HU	0.74	2009	0.48	0.44
IE	0.78	2012	0.43	0.35
IT	0.575	2016	0.364	0.32
LT	1.93	2012	0.27	0.24
LU	0.6954	2011	0.41	0.35
LV				
NL	0.61	2013	0.35	0.31
PL	0.52	2015	0.42	0.40
PT	0.59	2016	0.35	0.30
SE	0.76	2009	0.36	0.31
SI	1.07	2015	0.45	

Table 56 - Betas in the regulation of gas TSOs

3.3.6.3.4 Gas distribution

	Equity beta		Asset beta	
	value	year	eß = aß*[1+(1-t)*(D/E)]	eß = aß*[1+D/E]
AT	0.69	2012	0.33	0.28
BE				
CZ	0,801	2015	0,532	0,493
DE	0.79	2008	0.35	0.32
DK	0.79	2009	0.35	
EE	0.696	2016	N.A.	0.348
ES				
FI	0,690	2016	0.45	0.41
FR	0.66	2016	0.40	
GB	0.90	2012	0.37	0.32
HU	0,64	2009	0.42	0.38
IE	0.78	2012	0.43	0.35
IT	0.63	2016	0.44	0.39
LT	1.93	2012	0.27	0.24
LU	0.6954	2011	0.41	0.35
LV			0.00	0.00
NL	0.61	2013	0.35	0.31
PL	0.52	2015	0.42	0.40
PT	0.66	2016	0.39	0.33
SE	0,76	2009	0.34	0.31
SI	1.07	2015	0.45	

Table 57 - Betas in the regulation of gas DSOs

The chart below shows asset beta [eß = aß*[1+(1-t)*(D/E)] used in tariff calculation for the electricity TSOs and DSOs in the left half of the chart. On the right half of the chart the asset beta in tariff calculation is given for the gas TSOs and DSOs. The formula for the asset beta considers tax rates.

The values of asset beta are lower in the electricity sector than in gas sector and are typically in the range between 0.26 and 0.50. In the gas sector the values of asset beta are between 0.3 and 0.7.

The second chart below shows asset beta used in tariff calculation for the electricity and gas TSOs and DSOs calculated using the formula without tax [eß = aß*[1+D/E]].

The values of asset betas calculated with this formula are generally lower. The values for electricity sector are between 0.24 and 0.47 and for gas sector between 0.28 and 0.60.

The analysis of the beta values could lead to the conclusion that the gas sector carries slightly more risk than the electricity sector.

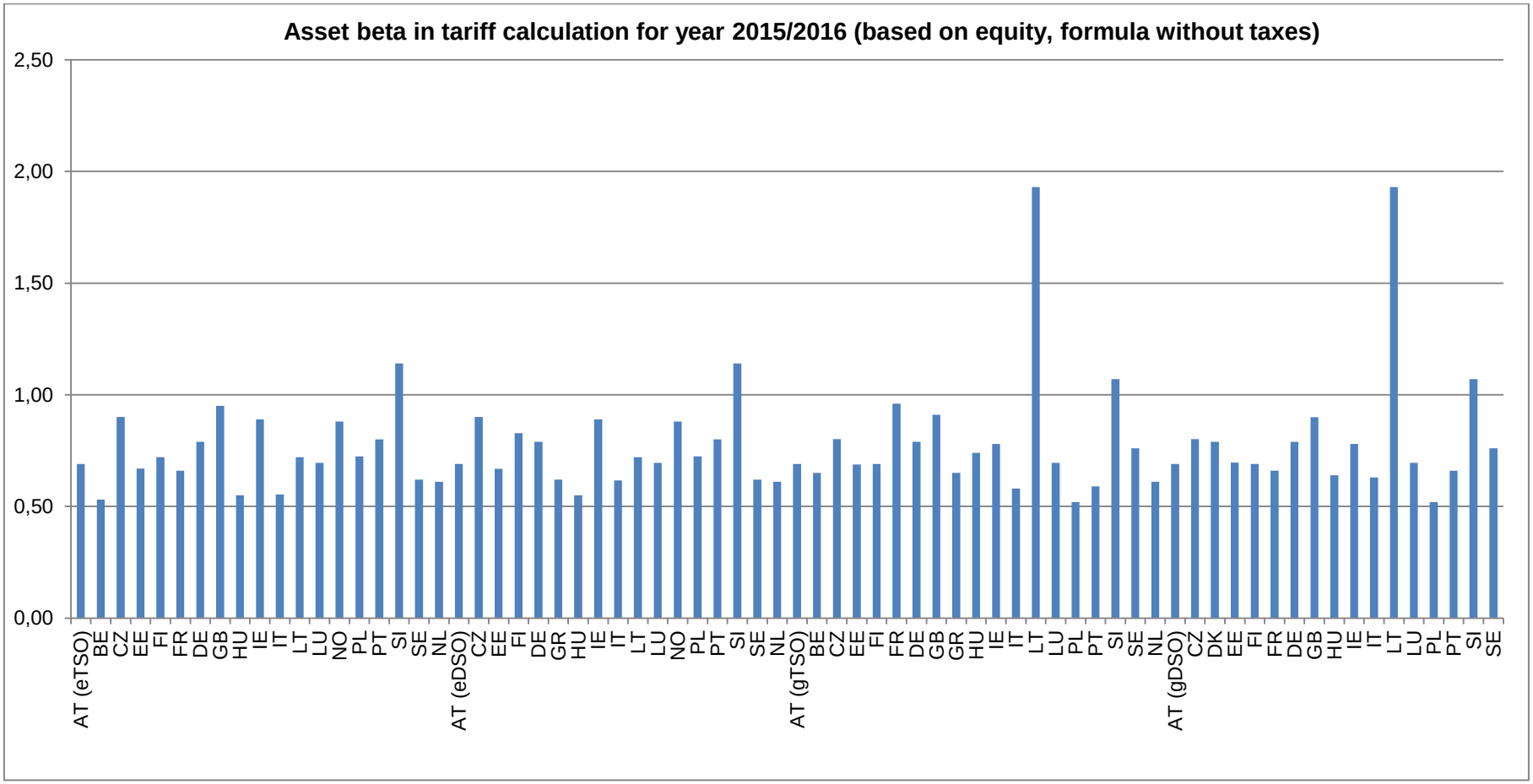

Table 58 – Asset Beta in tariff calculation for 2015/ 2016 (based on equity beta, formula with taxes)

3.3.7 Standardised equity beta

In order to compare the cost of debt there is a need to standardise equity betas.

The standardisation was performed by using the above calculated betas, an average gearing ratio 50% and national tax levels.

The chart below shows standardised equity beta calculated with the formula for the asset beta which considers tax rates.

The standardised equity betas are higher in the gas sector as are the asset beta.

Due to different national tax levels, using the calculation formula without tax influence seems to be the appropriate approach and leads to more comparable results.

The value of equity beta with the “no-tax” formula is between 0.47 and 0.93 for electricity sector and between 0.55 and 1.21 for the gas sector

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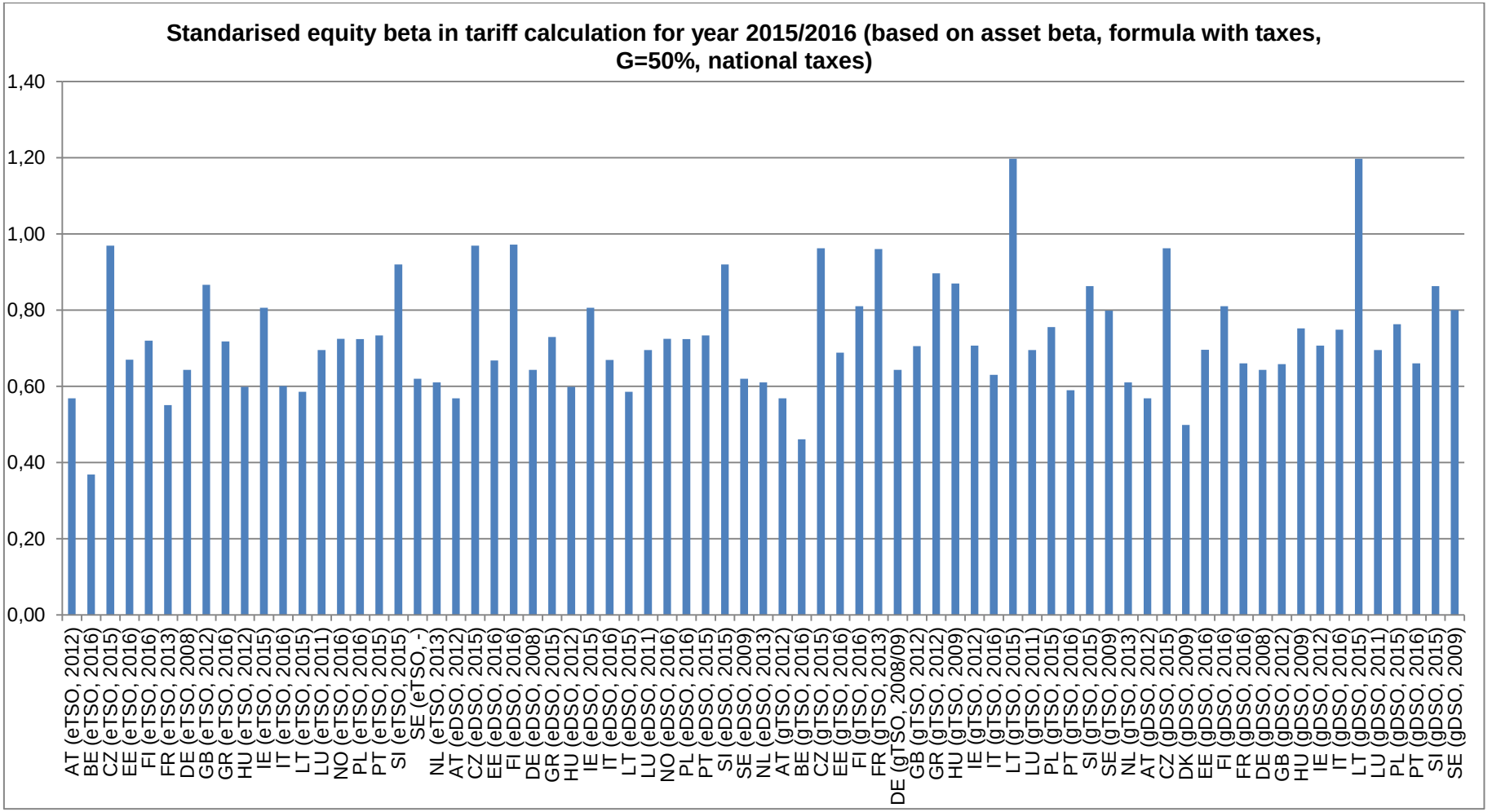

Table 59 – Standarised equity beta in tariff calculation for 2015/ 2016 (based on asset beta, formula with taxes G=50% national taxes)

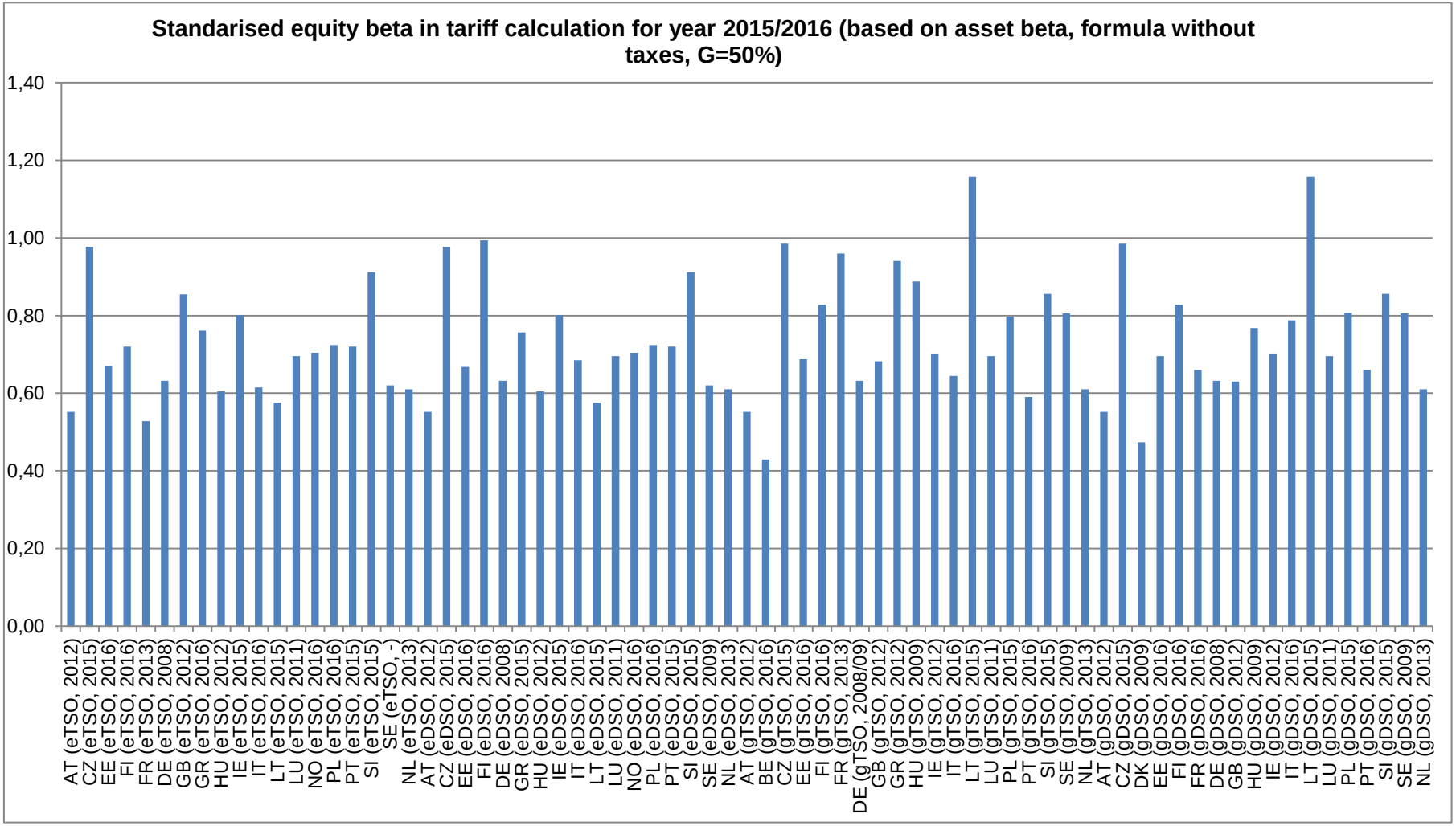

Table 60 – Standarised equity beta in tariff calculation for 2015/ 2016 (based on asset beta, formula without taxes, G= 50%)

3.3.8 Real cost of equity

Finally, using the above calculations, it is possible to calculate the real cost of equity.

The equity beta multiplied by the market risk premium was added to the real risk-free rate.

There are three calculations presented in the charts below, with three approaches applied to the equity beta: The first includes the original equity beta taken into account by the NRAs. The second includes the equity beta calculated with gearing ratio 50% and formula which includes the national tax rate. The third calculation uses the equity beta calculated with the “no-tax” formula.

The real cost of equity calculated on the basis of original beta is between just under 4% to 8% for the electricity sector and between over 3.5% and almost 9% for the gas sector. If the outliers are excluded, the value of the real cost of equity will be 5 to 7% for both electricity and gas companies.

If the standardised equity beta based on the formula which includes the tax influence is used, the real cost of debt after exclusion of outliers is between 4.5 and 7%.

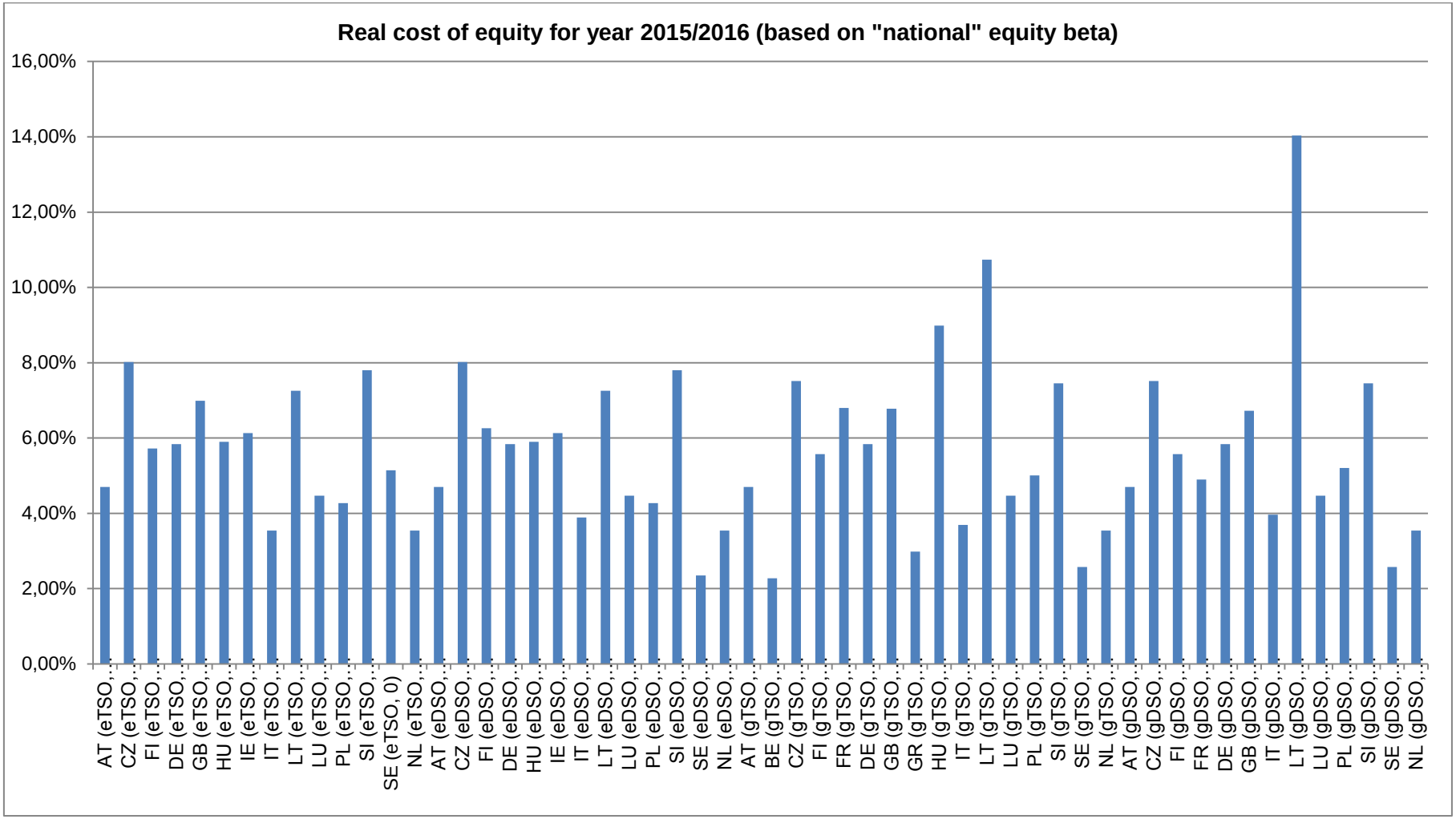

Table 61 – Real cost of equity for year 2015/ 2016 (based on “national” equity beta)

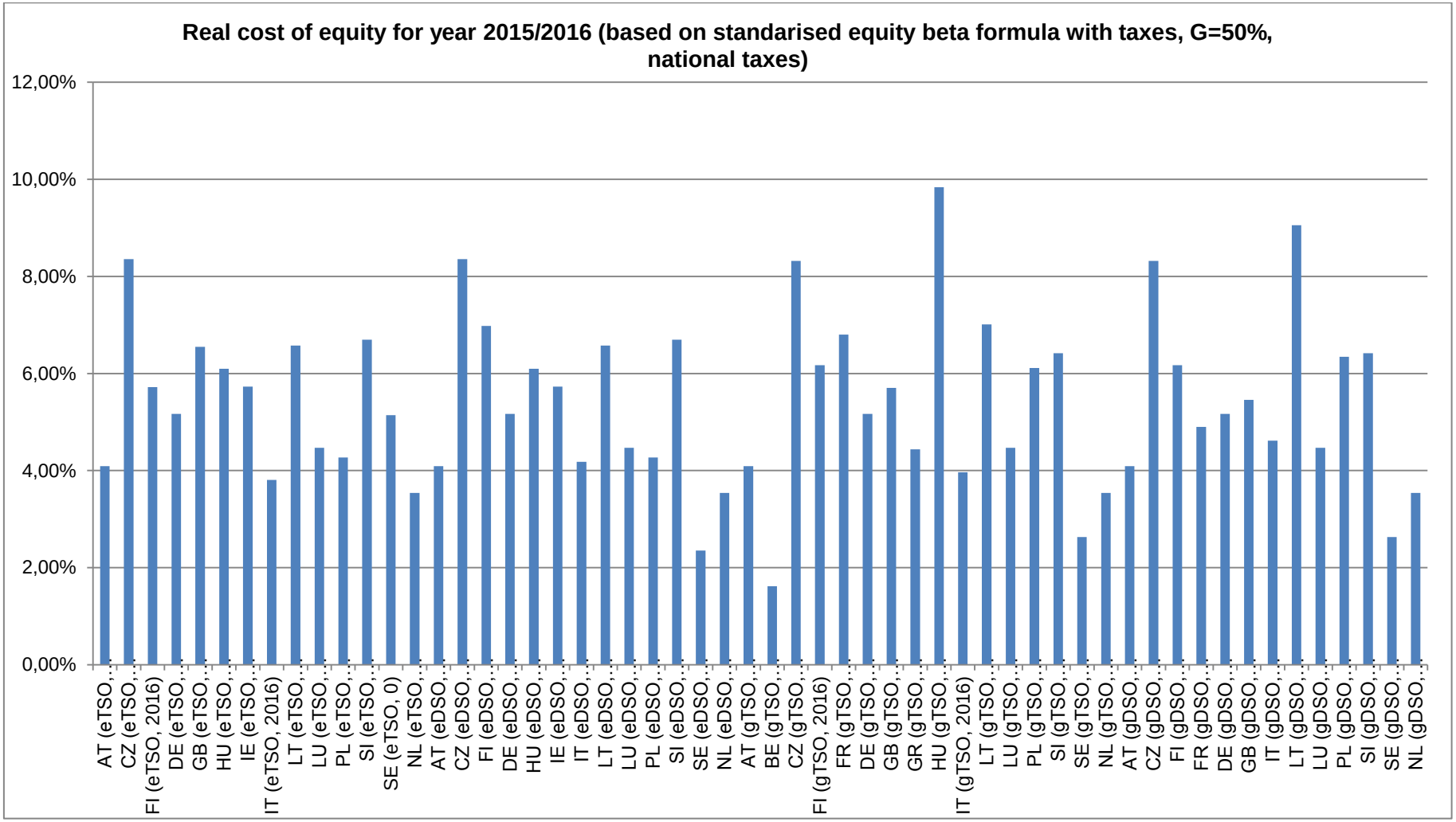

Table 62 – Real cost of equity for year 2015/ 2016 (based on standarised equity beta formula with taxes, G=50%, national taxes)

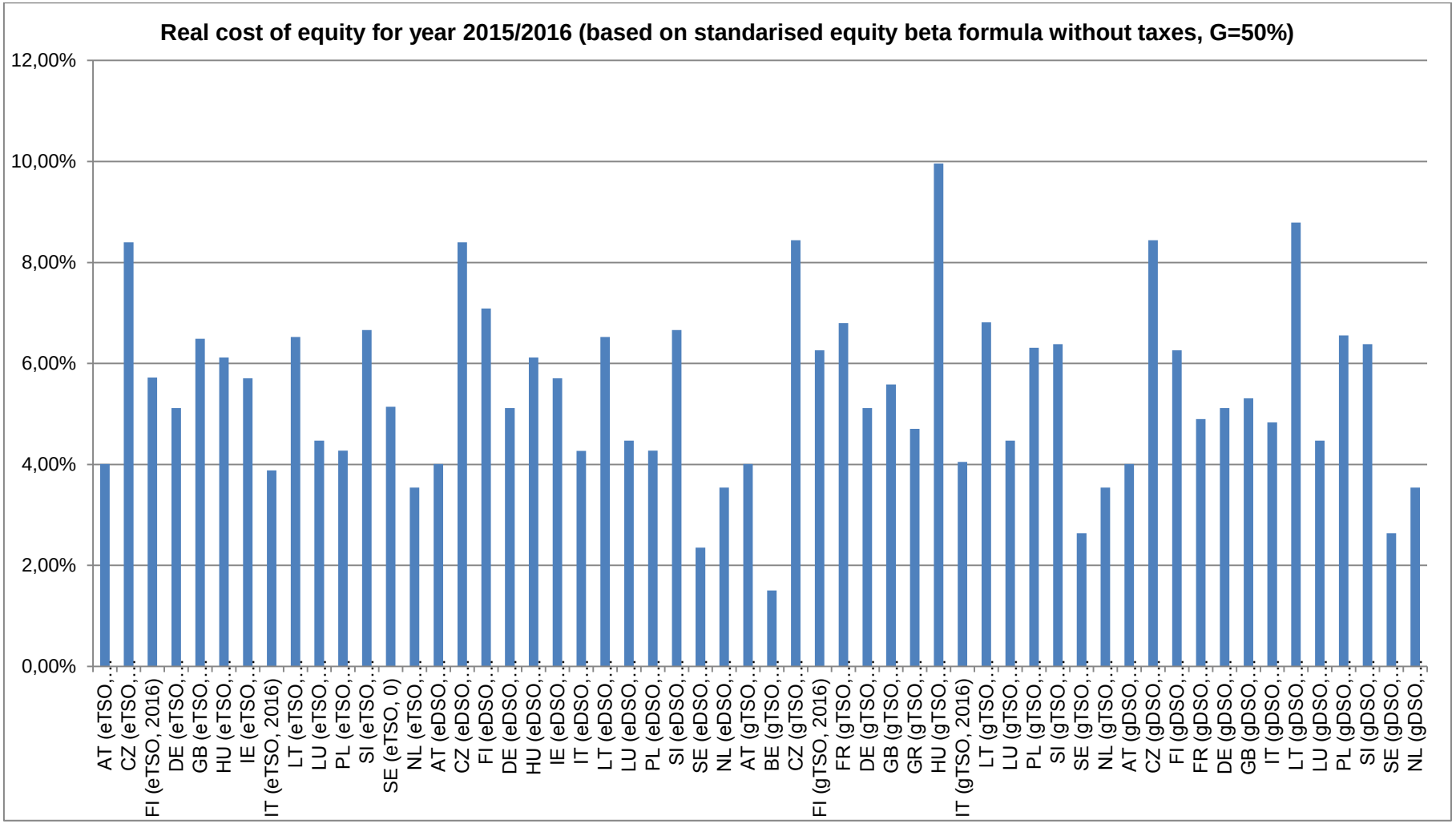

Table 63 – Real cost of equity for year 2015/ 2016 (based on standarised equity beta formula without taxes, G=50%)

3.3.9 Conclusions on rate of return calculation

Where the parameters are analysed separately, the different values of rate of return used by the NRAs are higher. In case the analysis is conducted using the aggregate values which include two or more separate parameters, the differences between countries seem to be smaller.

The differences may be due to national conditions. Both national capital markets and energy markets could have an influence on the value of the rate. The regulatory framework, especially for RAB remuneration, probably also influences the level of the rate of return. Where the values presented above are used in the regulatory practice, all factors should be considered.

The real cost of equity calculated on the basis of original beta is between just under 4% to 8% for the electricity sector and between over 3.5% and almost 9% for gas sector.

The value of asset beta is lower in the electricity sector than in the gas sector. The analysis of beta could lead to the conclusion that the gas sector carries slightly more risk than electricity.

Some countries show different beta values between the TSOs and DSOs, but often the beta is the same.

3.3.9.1 Reaction to the financial crisis

The tables below consider the reaction to the fincanial crisis on the “cost of capital” parameters.

3.3.9.1.1. Electricity transmission

	Reaction to the financial crisis	
		Comment
AT	Yes	New WACC calculation for each new regulatory period.
BE	No	
CZ	Yes	WACC parameters were updated annually during the years 2010-2014.
DE	No	Effects of the financial crisis were analysed by the consultants. As result there was no need of an adjustment of any parameter of the CAPM.
DK	NA	
EE	No	WACC parameters were updated every year.
ES	Yes	Rate of return changed from GB (Goverment Bonds) + 375 bp to GB + 100bp (mid-year 2013) and GB + 200 bp (2014).
FI	No	The effects of financial crisis were considered when updating the WACC parameters for the regulatory periods 2016 – 2019 and 2020 - 2023.
FR	No	
GB	Yes	NRA replaced fixed ex-ante cost of debt with a cost of debt index updated annually.
GR	Yes	The rate of return (WACC) takes into account a Country Risk Premium (CRP).
HU	No	
IE	Yes	Mid term review undertaken in 2013
IT	Yes	In 2016 the WACC methodology was completely revised in order to take into account the effects of the financial crisis. AEEGSI intended to unify the WACC parameters, except β and gearing, for all the regulated activities of electricity and gas sectors. Unified WACC parameters are set by AEEGSI for a period of time, called WACC regulatory period (PWACC), that lasts six years. Under the new approach: - The cost of equity is calculated adding to the traditional CAPM formulation a specific term reflecting the Country risk premium (CRP); - For the calculation of market risk premium a ‘TMR constant’ approach was adopted, according to which the market premium is calculated as the difference between TMR and the risk-free rate; The risk-free rate is calculated on the basis of ten-year benchmark government bond yields in Eurozone countries eith minimum rating “AA”, with a floor level of 0,5 %
LT	Yes	Rate of return was fixed at not more than 5% in the Law on Electricity until 2012.
LU	No	
LV	No	
NL	No	
NO	Yes	NRA made a substansial amendment in the WACC model from 2013. One of the main reason was that the government bond became too low to reflect the capital costs of a network company.
PL	No	
PT	Yes	Between May 2011 and June 2014, Portugal was under the framework of the Economic and Financial Assistance Programme (Portugal is now under post-programme surveillance). The parameters for the 2012-2014 electricty’s regulatory period were set during 2011 and reflect the new framework on the Portuguese economy. The main change on the cost of capital was the establishment of an indexation methodology for the cost of capital since 2012.
SE	No	
SI	No	

Table 64 - Reaction to the financial crisis as regards electricity TSOs

3.3.9.1.2. Electricity distribution

	Reaction to the financial crisis	
		Comment
AT	Yes	New WACC calculation for each new regulatory period.
BE	No	
CZ	Yes	WACC parameters were updated annually during the years 2010-2014.
DE	No	Effects of the financial crisis were analysed by the consultants. As result there was no need of an adjustment of any parameter of the CAPM.
DK	No	
EE	No	WACC parameters were updated every year.
ES	Yes	WACC is eliminated and now it is used rate of return: GB +100bp (mid-year 2013) and GB + 200 bp (2014).
FI	No	The effects of financial crisis were considered when updating the WACC parameters for the regulatory periods 2016 – 2019 and 2020 - 2023.
FR	No	
GB	Yes	NRA replaced fixed ex-ante cost of debt with a cost of debt index updated annually.
GR	Yes	Rate of return is updated annually.
HU	No	
IE	Yes	Mid term review undertaken in 2013
IT	Yes	In 2016 the WACC methodology was completely revised in order to take into accout the effects of the financial crisis. AEEGSI intended to unifiy the WACC parameters, except β and gearing, for all the regulated activities of electricity and gas sectors. Unified WACC parameters are set by AEEGSI for a period time, called WACC regulatory period (PWACC), that lasts six years. Under the new approach: - The cost of equity is calculated adding to the traditional CAPM formulation a specific term reflecting the Country risk premium (CRP); - For the calculation of market risk premium a 'TMR constant' approach was adopted, according to shich the market premium is calculated as the difference between TMR and the risk-free rate; The risk free rate is calculated on the basis of ten-year benchmark government bond yields in Eurozone countries with minimum rating "AA", with a floor level of 0,5 %
LT	Yes	Rate of return was fixed as not more than 5% in the Law on Electricity until 2012.
LU	No	
LV	No	
NL	No	
NO	Yes	NRA made a substansial amendment in the WACC model from 2013. One of the main reason was that the government bond became too low to reflect the capital costs of a network company.
PL	No	
PT	Yes	Between May 2011 and June 2014, Portugal was under the framework of the Economic and Financial Assistance Programme (Portugal is now under post-programme surveillance). The parameters for the 2012-2014 electricty's regulatory period were set during 2011 and reflect the new framework on the Portuguese economy. The main change on the cost of capital was the establishment of an indexation methodology for the cost of capital since 2012.
SE	No	
SI	No	

Table 65 - Reaction to the financial crisis as regards electricity DSOs

3.3.9.1.3. Gas transmission

	Reaction to the financial crisis	
		Comment
AT	NA	New WACC calculation for each new regulatory period.
BE	No	
CZ	Yes	WACC parameters were updated annually during the years 2010-2014.
DE	No	Effects of the financial crisis were analysed by the consultants. As result there was no need of an adjustment of any parameter of the CAPM.
DK	NA	
EE	No	WACC parameters were updated every year.
ES	Yes	Rate of return changed from GB (Government Bonds) + 375 bp to GB 50 + bp (2014).
FI	No	The effects of financial crisis were considered when updating the WACC parameters for the regulatory periods 2016 – 2019 and 2020 - 2023.
FR	No	
GB	Yes	NRA replaced fixed ex-ante cost of debt with a cost of debt index updated annually.
GR	No	WACC parameters will be changed in the next gas tariff regulatory period.
HU	No	
IE	Yes	At the time of setting the WACC, Ireland was experiencing instability in financial markets. The WACC was set using a floor and ceiling approach 5.2 to 8%.
IT	Yes	In 2016 the WACC methodology was completely revised in order to take into account the effects of the financial crisis. AEEGSI intended to unifiy the WACC parameters, except β and gearing for all the regulated activities of electricity and gas sectors. Unified WACC parameters are set by AEEGSI for a period of time, called WACC regulatory period (PWACC), that lasts six years. Under the new approach: - The cost of equity is calculated adding to the traditional CAPM formulation a specific term reflecting the Country Risk Premium (CRP); - For the calculation of market risk premium a 'TMR constant' approach was adopted, according to which the market premium is calculated as the difference between TMR and the risk-free rate; the rsik free rate is calculated on the basis of ten-year benchmark government bond yields in Eurozone countries with minimum rating "AA", with a floor level of 0,5 %
LT	Yes	
LU	No	
LV	No	
NL	No	
PL	No	
PT	Yes	Between May 2011 and June 2014, Portugal was under the framework of the Economic and Financial Assistance Programme (Portugal is now under post-programme surveillance). The parameters for the 2013-2016 natural gas regulatory period were set during 2013 and reflect the new framekork on the portuguese economy. The main change on the cost of capital was the establishment of an indexation methodology for the cost of capital since 2013.
SE	No	
SI	No	

Table 66 - Reaction to the financial crisis as regards gas TSOs

3.3.9.1.4. Gas distribution

	Reaction to the financial crisis	
		Comment
AT	No	New WACC calculation for each new regulatory period.
BE	No	
CZ	Yes	WACC parameters were updated annually during the years 2010-2014.
DE	No	Effects of the financial crisis were analysed by the consultants. As result there was no need of an adjustment of any parameter of the CAPM.
DK	No	
EE	No	WACC parameters were updated every year.
ES	No	
FI	No	The effects of financial crisis were considered when updating the WACC parameters for the regulatory periods 2016 – 2019 and 2020 - 2023.
FR	No	
GB	Yes	NRA replaced fixed ex-ante cost of debt with a cost of debt index updated annually.
HU	No	
IE	No	At the time of setting the WACC, Ireland was experiencing instability in financial markets. The WACC was set using a floor and ceiling approach 5.2 to 8%.
IT	Yes	In 2016 the WACC methodology was completely revised in order to take into account the effects of the financial crisis. AEEGSI intended to unify the WACC parameters, except β and gearing, for all the regulated activitites of electricity and gas sectors. Unified WACC parameters are set by AEEGSI for a period of time, called WACC regulatory period (PWACC), that lasts six years Unter the new approach: - The cost of equitiy is calculated adding to the traditional CAPM formulation a specific term reflecting the Country Risk Premium (CRP); - For the calculation of market risk premium a 'TMR constant'approach was adopted, according to which the market premium is calculated as the difference between TMR and the risk-free rate; The risk free rate ist calculated on the basis of ten-year benchmark government bond yields in Eurozone countries with minimum rating "AA", with a floor level of 0,5%
LT	Yes	
LU	No	
LV	No	
NL	No	
PL	No	
PT	Yes	Between May 2011 and June 2014, Portugal was under the framework of the Economic and Financial Assistance Programme (Portugal is now under post-programme surveil-lance). The parameters for the 2013-2016 natural gas regulatory period were set during 2013 and reflect the new framekork on the portuguese economy. The main change on the cost of capital was the establishment of an indexation methodology for the cost of capital since 2013.
SE	No	
SI	No	

Table 67 - Reaction to the financial crisis as regards gas DSOs

3.4 Premiums on “cost of capital”

3.4.1 Are there any kinds of premiums on "cost of capital" for e.g. new investments, quality of supply, etc.?

3.4.1.1 Electricity transmission

	Premiums on "cost of capital"	
		Comment
AT	No	
BE	Yes	From 2016 considerable incentives/premium’s may be granted to the TSO: (1) A specific premium during the current regulatory period for a number of very important projects (not necessarily corresponding with CPI) (2) Incentives for realising a limited number of projects in time; (3) Incentive for respecting the agreed obligations towards grid users (customer satisfaction) (4) Incentives for an even better control and realisation of efficient investments; (5) Incentives for investment bearing a specific higher risk (cfrRegulation 347/2013 but not necessarily applied for, nor limited to PCI’s); (6) Incentives for provable enhancement of the market integration, eithin Belgium ans within CWE-zone, measured via total welfare and via interconnection capacity; (7) Incentive for the continuity of supply; (8) Incentive for research and technological innovation
CZ	No	
DE	No	
DK	No	
EE	No	
ES	No	
FI	Yes	Premium for lack of liquidity: 0,6%
FR	Yes	Investments in new interconnections are incentivized. At the TSO’s request, a premium may be granted to interconnection investments depending on the social welfare generated by the project and the TSO’s performance on costs, delays and commercial flows. Incentives are in euros.
GB	No	
GR	Yes	Extra premium (1-2.5%) for Projects of Major Importance. Importance, from 2015 onwards.
IE	No	
IT	Yes	AT the end of 2015, the Italian NRA decided, after a critical review, to phase-out the WACC priority premium, which was applied for three regulatory periods (2004-2015) with differentiated adders for various infrastructure categories (e.g. interconnection, removal of internal congestion). As a transient measure, for investments already incentivised in 2015, a lower WACC adder (1%) is possible for the years 2016-2019, up to a limit given by former CAPEX estimates. Other premiums (e.g. for reliability of supply) do not have the form of a cost-of-capital adder, but are simply economic rewards
LT	Yes	For quality of supply, OPEX efficiency.
LU	Yes	For investments in cross-border interconnections which improve security of supply, the WACC is increased by 0.6% at the moment of immobilization of the asset, for a period of ten years, if the final investment decision is notified to the NRA by 30 June 2013. The increase of the WACC is reduced by a quarter for every year of delay of the notification of the final investment decision.
LV	No	
NL	No	
PL	No	

PT	Yes	Between 2009 and 2014 there's 150 Bp premium for the new investments evaluated through standard costs. Since 2015 there's 75 Bp premium for the new investments evaluated through standard costs.
SE	No	
SI	Yes	No extra wacc-remuneration is provided for specific types of investments/projects, however incentives are granted for investments in smart grid projects.

Table 68 - Premiums on "cost of capital" of electricity TSOs

3.4.1.2 Electricity distribution

	Premiums on "cost of capital"	
		Comment
AT	No	
BE	No	
CZ	Yes	There is an incentive mechanism for quality of supply in the Czech republic. According the SAIDI and SAIFI indicators the index of WACC can move between 0,97 and 1,03. That means the best quality of supply causes the raise of allowed profit by 3% and the worst quality of supply causes the decrease of allowed profit by 3%.
DE	No	
DK	No	
EE	No	
ES	No	
FI	Yes	Premium for lack of liquidity: 0,6%
FR	Yes	A premium is granted for investment in smart meters. This premium is reduced if costs and deployment time exceed planned values.
GB	No	
GR	No	
HU	No	
IE	No	
IT	Yes	Specific extra-wacc remuneration is provided for specific types of investments (mostly pilot projects and innovation-related investments)
LT	Yes	For quality of supply, OPEX efficiency.
LU	No	
LV	No	
NL	No	
NO	No	
PL	Yes	Coc depends on development of smart grid projects approved by NRA, quality of supply and regulatory factor (taking into account i.a innovation activities)
PT	Yes	Investments in smart grids can have an incentive (WACC can increase 1%) but it implies that the projects are accepted after the regulator evaluation and the expected benefits are demonstrated.
SE	No	
SI	Yes	No extra wacc-remuneration is provided for specific types of investments/projects, however incentives are granted for investments in smart grid projects.

Table 69 - Premiums on "cost of capital" of electricity DSOs

3.4.1.3 Gas transmission

	Premiums on "cost of capital"	
		Comment
AT	Yes	3.5% on cost of equity for bearing volume risk.
BE	No	
CZ	No	
DE	No	
DK	No	
EE	No	
ES	No	
FI	Yes	Premium for lack of liquidity: 0,6% and extra risk premium because of the riskiness of natural gas transmission business: 1,7%
FR	Yes	Investments designed to relieve congestion: +300bps under certain conditions.
GB	No	
GR	No	
HU	No	
IE	No	
IT	Yes	In order to promote, in particular, adequacy and security of network infrastructures, specific measures, in the form of extra-WACC remuneration, have been adopted, differentiated for type of investment.
LT	Yes	For quality of supply, OPEX efficiency.
LU	Yes	For investments in cross-border interconnections which improve security of supply, the WACC is increased by 0.6% at the moment of immobilisation of the asset, for a period of ten years, if the final investment decision is notified to the NRA by 30 June 2013. The increase of the WACC is reduced by a quarter for every year of delay of the notification of the final investment decision.
LV	No	
NL	No	
PL	No	
PT	No	
SE	No	
SI	No	

Table 70 - Premiums on "cost of capital" of gas TSOs

3.4.1.4 Gas distribution

	Premiums on "cost of capital"	
		Comment
AT	No	
BE	Yes	
CZ	No	
DE	No	
DK	No	
EE	No	
ES	No	
FI	Yes	Premium for lack of liquidity: 0,6% and extra risk premium because of the riskiness of natural gas transmission business: 1,3%
FR	Yes	A premium is granted for investment in smart meters. This premium is reduced if costs and deployment time exceed planned values. It will enter into force on the beginning of the smart metering program roll out, planned on January 1, 2017.
GB	No	
GR	No	
HU	No	
IE	No	
IT	No	
LT	Yes	For quality of supply, OPEX efficiency.
LU	No	
LV	No	
NL	No	
PL	No	
PT	No	
SE	No	
SI	No	

Table 71 - Premiums on "cost of capital" of gas DSOs

4 Regulatory Asset Base

The Regulatory Asset Base (RAB) serves as a fundamental parameter in utility regulation in order to determine the allowed profit. The structure of individual components included into the RAB and their valuation differ significantly among EU Member States and even among the regulated sectors. The RAB value is usually also linked with depreciation, depending on an individual NRA's approach.

In general, the RAB provides for remuneration of both historic and new investment. The RAB should be formed by the assets necessary for the provision of the regulated service in their residual (depreciated) value. The RAB can be comprised of several components such as fixed assets, working capital or construction in progress. Other elements such as capital contributions of customers, government (e.g. subsidies) and third parties, the contrary, are usually excluded.

The RAB may be valued according to different methods (e.g. historical costs, indexed historical costs or actual re-purchasing costs), which will have an influence on the determination of the CAPEX. A RAB based on indexed historical costs would therefore require the use of a 'real' instead of a 'nominal' WACC. As a result, it is important to understand the relation between RAB definition and the WACC structure.

4.1 Components of the RAB

The following chapter analyses the approach taken by NRAs towards fixed assets, working capital, assets under construction, contribution from third parties and leased assets with respect to their inclusion/exclusion to the RAB.

4.1.1 Tariff calculation

4.1.1.1 Electricity transmission

Country	AT	BE	CZ	DE	EE	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	NO	PL	PT	SI	ES	SE
Is 100% of RAB used in tariff calculation?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

4.1.1.2 Electricity distribution

Country	AT	BE	CZ	DE	DK	EE	FI	GB	GR	HU	IE	IT	LV	LT	LU	NL	NO	PL	PT	SI	ES	SE
Is 100% of RAB used in tariff calculation?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes

4.1.1.3 Gas transmission

Country	BE	CZ	DE	EE	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	PL	PT	SI	ES	SE
Is 100% of RAB used in tariff calculation?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

4.1.1.4 Gas distribution

Country	AT	BE	CZ	DE	DK	EE	FI	GB	GR	HU	IE	IT	LV	LT	LU	NL	PL	PT	SI	ES	SE
Is 100% of RAB used in tariff calculation?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes

4.1.2 Fixed assets

Fixed assets, also known as a 'non-current asset' is a term used in accounting for assets and property which cannot easily be converted into cash. Fixed assets normally include items such as land and buildings, motor vehicles, furniture, office equipment, computers, fixtures and fittings, and plant and machinery.

4.1.2.1 Electricity transmission

Country	AT	BE	CZ	DE	EE	ES	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	NO	PL	PT	SI	SE
Are fixed assets taken into RAB?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

According to the survey data submitted by 22 countries, all NRAs count the fixed assets into the RAB. In Finland, transmission network assets are included in the RAB at net present value and other non-current assets at book value. In Great Britain, to avoid TSOs preferring capital solutions, a percentage of capital and operating expenditure is added to RAV.

4.1.2.2 Electricity distribution

Country	AT	BE	CZ	DE	EE	ES	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	NO	PL	PT	SI	SE
Are fixed assets taken into RAB?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

According to the survey data submitted by 22 Member States, all NRAs count the fixed assets into the RAB. In Finland, distribution network assets are included in the RAB at net present value and other non-current assets at book value. In Great Britain, fixed assets are included in the RAB although some categories of CAPEX are excluded.

4.1.2.3 Gas transmission

Country	AT	BE	CZ	DE	EE	ES	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	PL	PT	SI	SE
Are fixed assets taken into RAB?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

According to the survey data submitted by 21 Member States all NRAs count the fixed assets into the RAB. In Finland, gas network assets are included in the RAB at net present value and other non-current assets at book value. In Great Britain, to avoid TSOs preferring capital solutions, a percentage of capital and operating expenditure is added to RAV.

4.1.2.4 Gas distribution

According to the survey data submitted by 21 Member States all NRAs count the fixed assets into the RAB. In Finland, gas network assets are included in the RAB at net present value and other non-current assets at book value. In Great Britain, to avoid TSOs preferring capital solutions, a percentage of capital and operating expenditure is added to RAV.

Country	AT	BE	CZ	DE	EE	ES	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	PL	PT	SI	SE
Are fixed assets taken into RAB?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	na	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

4.1.3 Working capital

Working capital represents operating liquidity available to company. Working capital is considered as a part of operating capital. Net working capital is calculated as current assets minus current liabilities:

$$\text{Working Capital} = \text{Current Assets}$$

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities}$$

In Belgium a slighty different approach is applied, while using the 'need for working capital'
Need for working capital = Current assets (excluding unnecessary cash) – Durrent liabilities (excluding all financial obligations)

4.1.3.1 Electricity transmission

Country	AT	BE	CZ	DE	EE	ES	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	NO	PL	PT	SI	SE
Is working capital taken into RAB?	No	Yes	No	Yes	Yes	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	Yes	No	No	No	No

16 out of 22 NRAs do not calculate working capital into the RAB. In 6 countries working capital is included into the RAB. In Finland, working capital is allowed into the RAB in book values. In Estonia, the level of working capital is determined as 5% of the income and in Norway as 1% of the book value. In Slovenia, the NRA takes into account only the average value of inventories. In Germany, only working capital, which is necessary for the operations is included and in Luxembourg the working capital is approved if duly justified.

4.1.3.2 Electricity distribution

More than half of NRAs do not calculate working capital into the RAB. In 9 countries working capital is included into the RAB. In Finland, working capital is allowed into the RAB at its book values. In Estonia, the level of working capital is determined as 5% of the income and in Norway as 1% of the book value. In Slovenia, the NRA takes into account only the average value of inventories. In Germany, only working capital, which is necessary for the operations is included and in Luxembourg the working capital is approved if duly justified. In Denmark, the working capital is defined as 2% of the (regulatory) book value of fixed assets.

Country	AT	BE	CZ	DE	DK	EE	ES	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	NO	PL	PT	SI
Is working capital taken into RAB?	No	Yes	No	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	Yes	No	No	No

4.1.3.3 Gas transmission

7 NRAs out of 21 responded that the working capital is included into the RAB. In Finland, working capital is allowed into the RAB in book values. In Estonia, the level of working capital is determined as 5% of the income and in Slovenia the NRA takes into account only the average value of inventories. In Germany, only working capital, which is necessary for the operations is included and in Luxembourg, the working capital is approved if duly justified.

Country	AT	BE	CZ	DE	EE	ES	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	PL	PT	SI	SE
Is working capital taken into RAB?	No	Yes	No	Yes	Yes	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	No	No	No

4.1.3.4 Gas distribution

6 NRAs out of 21 responded that the working capital is included into the RAB. In Finland, working capital is allowed into the RAB in book values. In Estonia, the level of working capital is determined as 5% of the income and in Slovenia, the NRA takes into account only the average value of inventories. In Germany, only working capital, which is necessary for the operations is included and in Luxembourg the working capital is approved if duly justified. In Denmark, the working capital is defined as 2% of the regulatory book value of fixed assets.

Country	AT	BE	CZ	DE	EE	ES	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	PL	PT	SI	SE
Is working capital taken into RAB?	No	Yes	No	Yes	Yes	No	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No

4.1.4 Assets under construction

Assets under construction are a special form of tangible assets. They are usually displayed as a separate balance sheet item and therefore require a separate account determination in their asset classes.

Cost includes all expenditures incurred for construction projects, capitalized borrowing costs incurred on a specific borrowing for the construction of fixed assets incurred before it has reached the working condition for its intended use, and other related expenses. A fixed asset under construction is transferred to fixed assets once it has reached the working condition for its intended use.

Ordinary depreciation is not allowed for assets under construction in most countries. Even if from the accounting point of view these assets are not included in the fixed assets, the NRAs, from a regulatory perspective, do sometimes include such cost in the RAB for remuneration, as shown in the survey.

4.1.4.1 Electricity transmission

12 of 22 NRAs responded that electricity transmission assets under construction are included in the RAB. In Luxembourg, financing costs of assets under construction may be considered under working capital.

Country	Are assets under construction taken into RAB?	
AT	Yes	Book values of assets under construction are part of the RAB.
BE	Yes	
CZ	Yes	The assets under construction are included into RAB under certain conditions (e.g. the planned value of constructed asset is more than 0,5 bil. CZK, and the length of construction is more than two years.)
DE	Yes	
EE	No	
ES	No	
FI	No	
FR	Yes	Remunerated at the cost of debt.
GB	Yes	
GR	Yes	
HU	No	
IE	Yes	Costs incurred in any given year are added to the RAB at the mid-point of that year, regardless of whether the assets have been completed.
IT	Yes	
LV	Yes	
LT	No	
LU	No	Financing costs of assets under construction may be considered under working capital.
NL	Yes	Financing costs of assets under construction are considered in the determination of the annual revenues of the TSO.
NO	No	
PL	Yes	
PT	No	
SI	No	
SE	No	

Table 72 - RAB: Treatment of assets under construction in electricity transmission

4.1.4.2 Electricity distribution

In electricity distribution only less than half of the regulators allow inclusion of the assets under construction into the RAB.

Country	Are assets under construction taken into RAB?	
AT	Yes	Book values of assets under construction are part of the RAB.
BE	Yes	
CZ	Yes	The assets under construction are included into RAB under certain conditions (e.g. the planned value of constructed asset is more than 0,5 bil. CZK, and the length of construction is more than two years.)
DE	Yes	
DK	No	
EE	No	
ES	No	
FI	No	
FR	No	
GB	Yes	
GR	Yes	
HU	No	
IE	Yes	Costs incurred in any given year are added to the RAB at the mid-point of that year, regardless of whether the assets have been completed.
IT	Yes	
LV	Yes	
LT	No	
LU	No	Financing costs of assets under construction may be considered under working capital.
NL	No	
NO	No	
PL	Yes	
PT	No	
SI	No	
SE	No	

Table 73 - RAB: Treatment of assets under construction in electricity distribution

4.1.4.3 Gas transmission

In gas transmission 12 out of 21 NRAs responded that assets under construction are included into the RAB.

Country	Are assets under construction taken into RAB?	
AT	Yes	Book values of assets under construction are part of the RAB.
BE	Yes	
CZ	Yes	The assets under construction are included into RAB under certain conditions (e.g. the planned value of constructed asset is more than 0,5 bil. CZK, and the length of construction is more than two years.)
DE	Yes	
EE	No	
ES	No	
FI	No	
FR	Yes	Remunerated at the cost of debt.
GB	Yes	
GR	Yes	For projects with total projected cost of less than 130.000.000 euros. For projects with greater cost, they are included in the RAB upon completion.
HU	Yes	Only if it would rais the tariff too much if it would be accepted after comisioning, costs are accepted during the construction.
IE	Yes	Costs incurred in any given year are added to the RAB at the mid-point of that year, regardless of whether the assets have been completed.
IT	Yes	
NL	Yes	Financing costs of assets under construction are considered in the determination of the annual revenues of the TSO.
LV	Yes	
LT	No	Only for strategic projects for ROI calculation process.
LU	No	Financing costs of assets under construction may be considered under working capital.
PL	No	
PT	No	
SI	No	
SE	No	

Table 74 - RAB: Treatment of assets under construction in gas transmission

4.1.4.4 Gas distribution

In gas distribution only 8 out of 21 NRAs responded that assets under construction are included into the RAB.

Country	Are assets under construction taken into RAB?	
AT	Yes	Book values of assets under construction are part of the RAB.
BE	Yes	
CZ	Yes	The assets under construction are included into RAB under certain conditions (e.g. the planned value of constructed asset is more than 0,5 bil. CZK, and the length of construction is more than two years.)
DE	Yes	
DK	No	
EE	No	
ES	No	
FI	No	
FR	No	
GB	Yes	
GR	N.A.	
HU	No	
IE	Yes	Costs incurred in any given year are added to the RAB at the mid-point of that year, regardless of whether the assets have been completed.
IT	Yes	
LV	Yes	
LT	No	
LU	No	Financing costs of assets under construction may be considered under working capital.
NL	No	
PL	No	
PT	No	
SI	No	
SE	No	

Table 75 - RAB: Treatment of assets under construction in gas distribution

4.1.5 Contributions from third parties

Contributions from third parties such as connection fees, contributions from public institutions, EU funding under cohesion/structural funds, or EU grants under Decision No 1364/2006/EC, which lays down guidelines for trans-European energy networks, are often deducted by the NRAs from the RAB ('*ringfencing*').

This approach is based on the reasoning that to the extent the asset (partly or in total) was not financed by the regulated entity, it must not be included in the RAB and remunerated.

The tables below show that the vast majority of the NRAs are deducting such contributions from the RAB.

4.1.5.1 Electricity transmission

Country	Are contributions from the third parties taken into the RAB?	If yes, which ones and what is the approach?
AT	No	Contributions from third parties are substracted and are therefore not part of the RAB.
BE	No	
CZ	No	
DE	N.A.	The German system is designed to eliminate interest-free loan from the interest basis. Investment aid (e.g. construction grants) is therefore deducted from the investment assets by the passive side of the balance will be increased. Also provisions - which are compounded by the German Accounting Law itself - are to be neutralised accordingly. A distinction applies between existing installations and new installations. New installations are again divided into replacement investment and expansion. Existing installations have to be indexed. Existing installations will be interest by a real rate of interest and subject to the efficiency comparison. New installations, which are replacement investments are valued at historical cost and bear interest at a nominal rate and are also subject to the efficiency comparison. New installations, which represent expansion investments are valued at historical cost and will be interest with a nominal interest rate, but then withdrawn as a so-called "investment measure" for the efficiency comparison.
EE	No	
ES	No	Contributions made by third parties (assets) are excluded for the CAPEX Calculation.
FI	No	
FR	No	They are excluded.
GB	Yes	
GR	No	
IE	No	Contributions by third parties are netted off (not included within) the RAB. Therefore a rate-of-return (or depreciation) is not earned on these contributions.
HU	Yes	
IT	Yes	Contributions received are deducted from the historical cost of the assets.
LV	No	The value of fixed assets financed by the financial aid or financial support of state, municipal, EU, other internal organisation and instititions is not included in RAB. Connection fees are not included in RAB. Financial investments, amounts receivable, securities, participanting interest in capital and monetary instruments are not included in RAB either.
LT	No	Also, considering that contributions come from the European cohesion and structural funds.
LU	No	
NL	No	Any contribution is subtracted from investment sum before inclusion RAB.
NO	No	
PL	No	e.g. connection fees paid by customers and grants from public sources (e.g. EU funds) are deducted from RAB.
PT	Yes	Contributions from third parties are deducted.
SI	No	
SE	Yes	

Table 76 - RAB: Treatment of third party contributions in electricity transmission

4.1.5.2 Electricity distribution

Country	Are contributions from the third parties taken into the RAB?	If yes, which ones and what is the approach?
AT	No	Contributions from third parties are substracted and are therefore not part of the RAB.
BE	No	
CZ	No	
DE	N.A.	The German system is designed to eliminate interest-free loan from the interest basis. Investment aid (e.g. construction grants) is therefore deducted from the investment assets by the passive side of the balance will be increased. Also provisions - which are compounded by the German Accounting Law itself - are to be neutralised accordingly. A distinction applies between existing installations and new installations. New installations are again divided into replacement investment and expansion. Existing installations have to be indexed. Existing installations will be interest by a real rate of interest and subject to the efficiency comparison. New installations, which are replacement investments are valued at historical cost and bear interest at a nominal rate and are also subject to the efficiency comparison. New installations, which represent expansion investments are valued at historical cost and will be interest with a nominal interest rate, but then withdrawn as a so-called "investment measure" for the efficiency comparison.
DK	No	
EE	No	
ES	No	Contributions made by third parties (assets) are excluded for the CAPEX Calculation.
FI	No	
FR	N.a.	They are partially taken into account: a risk premium is applied on third party contribution.
GB	Yes	
GR	No	
HU	Yes	
IE	No	Contributions by third parties are netted off (not included within) the RAB. Therefore a rate-of-return (or depreciation) ist not earned on these contributions.
IT	Yes	Contributions received are deducted from the historical cost of the assets.
LV	No	The value of fixed assets financed by the financial aid or financial support of state, municipal, EU, other internal organisation and instititions is not included in RAB. Connection fees are not included in RAB. Financial investments, amounts receivable, securities, participanting interest in capital and monetary instruments are not included in RAB either.
LT	No	Also, considering that contributions come from the European cohesion and structural funds.
LU	No	
NO	No	
NL	No	Any contribution is subtracted from investment sum before inclusion RAB.
PL	No	e.g. connection fees paid by customers and grants from public sources (e.g. EU funds) are deducted from RAB.
PT	Yes	Contributions from third parties are deducted.
SI	No	
SE	Yes	

Table 77 - RAB: Treatment of third party contributions in electricity distribution

4.1.5.3 Gas transmission

Country	Are contributions from the third parties taken into the RAB?	If yes, which ones and what is the approach?
AT	No	Contributions from third parties are substracted and are therefore not part of the RAB.
BE	No	
CZ	No	
DE	n.a.	The German system is designed to eliminate interest-free loan from the interest basis. Investment aid (e.g. construction grants) is therefore deducted from the investment assets by the passive side of the balance will be increased. Also provisions - which are compounded by the German Accounting Law itself - are to be neutralised accordingly. A distinction applies between existing installations and new installations. New installations are again divided into replacement investment and expansion. Existing installations have to be indexed. Existing installations will be interest by a real rate of interest and subject to the efficiency comparison. New installations, which are replacement investments are valued at historical cost and bear interest at a nominal rate and are also subject to the efficiency comparison. New installations, which represent expansion investments are valued at historical cost and will be interest with a nominal interest rate, but then withdrawn as a so-called "investment measure" for the efficiency comparison.
EE	No	
ES	No	Contributions made by third parties (assets) are excluded for the CAPEX Calculation.
FI	No	
FR	No	They are excluded.
GB	Yes	
GR	No	
HU	No	
IE	No	Contributions by third parties are netted off (not included within) the RAB. Therefore a rate-of-return (or depreciation) ist not earned on these contributions.
IT	Yes	Contributions received are deducted from the historical cost of the assets.
LV	No	The value of fixed assets financed by the financial aid or financial support of state, municipal, EU, other internal organisation and instititions is not included in RAB. Connection fees are not included in RAB. Financial investments, amounts receivable, securities, participanting interest in capital and monetary instruments are not included in RAB either.
LT	No	
LU	No	
NL	No	Any contribution is subtracted from investment sum before inclusion RAB.
PL	No	e.g. connection fees paid by customers are deducted from RAB.
PT	Yes	Contributions from third parties are deducted.
SI	No	
SE	Yes	

Table 78 - RAB: Treatment of third party contributions in gas transmission

4.1.5.4 Gas distribution

Country	Are contributions from the third parties taken into the RAB?	If yes, which ones and what is the approach?
AT	No	Contributions from third parties are substracted and are therefore not part of the RAB.
BE	No	
CZ	No	
DE	N.A.	The German system is designed to eliminate interest-free loan from the interest basis. Investment aid (e.g. construction grants) is therefore deducted from the investment assets by the passive side of the balance will be increased. Also provisions - which are compounded by the German Accounting Law itself - are to be neutralised accordingly. A distinction applies between existing installations and new installations. New installations are again divided into replacement investment and expansion. Existing installations have to be indexed. Existing installations will be interest by a real rate of interest and subject to the efficiency comparison. New installations, which are replacement investments are valued at historical cost and bear interest at a nominal rate and are also subject to the efficiency comparison. New installations, which represent expansion investments are valued at historical cost and will be interest with a nominal interest rate, but then withdrawn as a so-called "investment measure" for the efficiency comparison.
DK	No	
EE	No	
ES	Yes	New investments are paid based on the supply distribution points and gas volume distributed increments.
FI	No	
FR	No	They are excluded.
GB	Yes	
GR	Yes	
HU	No	
IE	No	Contributions by third parties are netted off (not included within) the RAB. Therefore a rate-of-return (or depreciation) ist not earned on these contributions.
IT	Yes	Contributions received are deducted from the historical cost of the assets.
LV	No	The value of fixed assets financed by the financial aid or financial support of state, municipal, EU, other internal organisation and instititions is not included in RAB. Connection fees are not included in RAB. Financial investments, amounts receivable, securities, participanting interest in capital and monetary instruments are not included in RAB either.
LT	No	
LU	No	
NL	No	Any contribution is subtracted from investment sum before inclusion RAB.
PL	No	e.g. connection fees paid by customers are deducted from RAB.
PT	Yes	Contributions from third parties are deducted.
SI	No	
SE	Yes	

Table 79 - RAB: Treatment of third party contributions in gas distribution

4.1.6 Leased assets

According to International Financial Reporting Standards (IFRS) standards[8], finance lease assets must be shown on the balance sheet of the lessee, with the amounts due on the lease also shown on the balance sheet as liabilities. This is intended to prevent the use of lease finance to keep the lease liabilities off-balance sheet.

According to a number of national accounting standards, however, it is possible to consider these assets as the OPEX and keep them off-balance sheet.

4.1.6.1 Electricity Transmission

Country	Are leased assets included into the RAB? (according to the IFRS)	
AT	No	Leased assets are considered as OPEX.
BE	No	Leased assets are considered as OPEX, according to accounting rules.
CZ	Yes	
DE	No	Leased assets are considered as OPEX but the valuation process is nearly the same as it would be a normal part of the RAB.
EE	Yes	
ES	No	
FI	Yes	Leased transmission network assets will be treated in calculations of the reasonableness of pricing in the same way as if the network assets in question were owned by the TSO.
FR	No	Leased assets are considered as OPEX.
GB	No	Finance leases are not capitalised before calculating RAB additions.
GR	No	
HU	No	
IE	No	Leased assets are considered as OPEX.
IT	Yes	Leased assets are considered as OPEX, except for transmission assets that are included in the RAB as if the assets were owned by the TSO
LV	No	Leased assets are considered as OPEX in accordance with lease agreements.
LT	No	Leased assets are considered as OPEX.
LU	No	Leased assets are considered as OPEX.
NL	Yes	Leased assets are included in the RAB when the assets are included in the asset base according to IFRS or national accounting standards, otherwise they are considered OPEX.
NO	No	Leased assets are considered as OPEX.
PL	No	Leased assets are considered as OPEX.
PT	Yes	Leased assets are considered in RAB if they are finance lease assets, if they are operational lease assets they are considered as OPEX.
SI	Yes	
SE	Yes	

Table 80 - RAB: Treatment of leased assets in electricity transmission

[8] Insert IFRS reference and include in Section 7 References

4.1.6.2 Electricity distribution

Country	Are leased assets included into the RAB? (according to the IFRS)	
AT	Yes	Some network operators lease their assets from the mother company, not always based on IFRS.
BE	No	Leased assets are considered as OPEX.
CZ	Yes	
DE	No	Leased assets are considered as OPEX but the valuation process is nearly the same as it would be a normal part of the RAB.
DK	No	
EE	Yes	
ES	No	
FI	Yes	Leased distribution network assets will be treated in calculations of the reasonableness of pricing in the same way as if the network assets in question were owned by the DSO.
FR	No	Leased assets are considered as OPEX.
GB	No	Finance leases are not capitalised before calculating RAB additions.
GR	No	
HU	No	
IE	No	Leased assets are considered as OPEX.
IT	Yes	Leased assets are considered as OPEX, except for distribution assets that are included in the RAB as if the assets were owned by the DSO
LV	No	Leased assets are considered as OPEX in accordance with lease agreements.
LT	No	Leased assets are considered as OPEX.
LU	No	Leased assets are considered as OPEX.
NL	Yes	Leased assets are included in the RAB when the assets are included in the asset base according to IFRS or national accounting standards, otherwise they are considered OPEX.
NO	No	Leased assets are considered as OPEX.
PL	No	Leased assets are considered as OPEX.
PT	Yes	Leased assets are considered in RAB if they are finance lease assets, if they are operational lease assets they are considered as OPEX.
SI	Yes	
SE	Yes	

Table 81 - RAB: Treatment of leased assets in electricity distribution

4.1.6.3 Gas transmission

Country	Are leased assets included into the RAB? (according to the IFRS)	
AT	Yes	Some network operators lease their assets, not always based on IFRS.
BE	No	Leased assets are considered as OPEX, according to accounting rules
CZ	Yes	
DE	No	Leased assets are considered as OPEX but the valuation process is nearly the same as it would be a normal part of the RAB
EE	Yes	
ES	No	
FI	Yes	Leased transmission network assets will be treated in calculations of the reasonable-ness of pricing in the same way as if the network assets in question were owned by the TSO.
FR	No	Leased assets are considered as OPEX
GB	No	Finance leases are not capitalised before calculating RAB additions.
GR	No	
HU	No	
IE	No	Leased assets are considered as OPEX
IT	Yes	Lease assets are considered as OPEX, except for transmission assets that are included in the RAB as if the assets were owned by the TSO
LV	No	Leased assets are considered as OPEX in accordance with lease agreements.
LT	No	Leased are assets considered as OPEX
LU	No	Leased are assets considered as OPEX
NL	Yes	Leased assets are included in the RAB when the assets are included in the asset base according to IFRS or national accounting standards, otherwise they are considered OPEX.
PL	No	Leased are assets considered as OPEX
PT	Yes	Leased assets are considered in RAB if they are finance lease assets, if they are opera-tional lease assets they are considered as OPEX.
SI	Yes	
SE	Yes	

Table 82 - RAB: Treatment of leased assets in gas transmission

4.1.6.4 Gas distribution

Country	Are leased assets included into the RAB? (according to the IFRS)	
AT	Yes	Some network operators lease their assets from the mother company, not always based on IFRS.
BE	No	Leased assets are considered as OPEX.
CZ	Yes	
DE	No	Leased assets are considered as OPEX but the valuation process is nearly the same as it would be a normal part of the RAB.
DK	No	Leased assets are considered as OPEX.
EE	Yes	
ES	No	
FI	Yes	Leased distribution network assets will be treated in calculations of the reasonableness of pricing in the same way as if the network assets in question were owned by the DSO.
FR	No	Leased assets are considered as OPEX.
GB	No	Finance leases are not capitalised before calculating RAB additions.
GR	na	
HU	No	
IE	No	Leased assets are considered as OPEX.
IT	Yes	Leased assets are considered as OPEX, except for distribution assets that are included in the RAB as if the assets were owned by the DSO
LV	No	Leased assets are considered as OPEX in accordance with lease agreements.
LT	No	Leased assets are considered as OPEX.
LU	No	Leased assets are considered as OPEX.
NL	Yes	Leased assets are included in the RAB when the assets are included in the asset base according to IFRS or national accounting standards, otherwise they are considered OPEX.
PL	No	Leased assets are considered as OPEX.
PT	Yes	Leased assets are considered in RAB if they are finance lease assets, if they are operational lease assets they are considered as OPEX.
SI	Yes	
SE	Yes	

Table 83 - RAB: Treatment of leased assets in gas distribution

4.1.7 Other RAB components

The survey did not explicitly specify which elements would be deemed to constitute other RAB components. The majority of the NRAs responded that there were no such components.

The French NRA however stated that stranded costs are allowed into the RAB at net book value. The German RAB includes all the carrying amounts of financial assets required for operations and balance sheet values on operating current assets, minus the tax share in special accounts with reserve element. For all values the average consists of beginning and end of year values.

4.2 Determination of initial regulatory asset value (RAV)

The value of the RAB on which the companies earn a return in accordance with the regulatory cost of capital (i.e. the weighted average cost of capital where applicable) is crucial for the calculation of the regulatory revenue.

The value of the assets included into the RAB could be expressed either in historical costs or re-evaluated values. Whilst the historical cost approach values the RAB with reference to the cost that were actually incurred by the company to build or acquire the network, the re-evaluated values represent the costs that would hypothetically be incurred at the time of re-evaluation of the assets.

4.2.1 Historical costs

The method of valuation of the RAB in historical costs is applied in regulatory regimes where the assets of regulated companies were not re-evaluated or in the regimes where NRAs keep a regulatory database of the historical values of the assets. As the historical costs do not reflect decrease in the real value of the assets caused by the inflation, some NRAs make use of the indexed historical cost method.

4.2.1.1 Electricity transmission

In electricity transmission a historical costs approach is applied in 7 out of 22 countries.

Country	AT	BE	CZ	DE	EE	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	NO	PL	PT	SI	
Is the RAB exclusively based on historical value of assets?	No	No	No	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No	Yes	Yes	No	No	Yes	

4.2.1.2 Electricity distribution

In electricity distribution a historical costs approach is applied in 9 out of 23 countries.

Country	AT	BE	CZ	DE	DK	EE	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	NO	PL	PT	
Is the RAB exclusively based on historical value of assets?	Yes	No	No	No	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No	Yes	Yes	No	Yes	

4.2.1.3 Gas transmission

In gas transmission a historical costs approach is applied by only 7 NRAs.

Country	AT	BE	CZ	DE	EE	ES	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	PL	PT	SI
Is the RAB exclusively based on historical value of assets?	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	Yes	Yes	No	Yes	No	No	Yes

4.2.1.4 Gas distribution

In gas distribution 9 NRAs answered that the method of historical costs was applied.

Country	AT	BE	CZ	DE	DK	EE	ES	FI	FR	GB	GR	HU	IE	IT	LV	LT	LU	NL	PL	PT	SI
Is the RAB exclusive-ly based on historical value of assets?	Yes	No	No	No	Yes	Yes	Yes	No	No	No	No	No	Yes	No	Yes	Yes	No	Yes	No	No	Yes

4.2.2 Re-evaluation of assets

The re-evaluation of fixed assets is a technique that may be required to accurately describe the true value of the capital goods a business owns. The purpose of a re-evaluation is to bring into the books the fair market value of fixed assets. This may be helpful in order to decide on selling one of its assets or inserting part of the company into a new company. Re-evaluation of assets was conducted in many countries following the unbundling of vertically integrated companies where separate network companies were established.

Other reasons for re-evaluation mentioned in the survey were; very high inflation rates and the consolidation processes of regulated companies. In some regulatory regimes, a re-evaluation of distribution assets is conducted annually according to the IFRS accounting standards. Even though the most frequently applied method was depreciated replacement costs, for the sake of comparison it is crucial to know, when the last re-evaluation was performed. This is the major difference among countries surveyed. In principle, the re-evalution can be done in two ways: only once or on a frequent basis.

One of the main advantages of the annual re-evaluation is that a NRA works with the real asset values and does not need to deal with the significant increase of RAB of market circumstances.

The tables below show how the re-evaluation of the assets was performed in those countries which base RAB exclusively on re-evaluated assets.

4.2.2.1 Electricity transmission

In electricity transmission, the RAB is exclusively based on the re-evaluated assets in 5 countries: the Czech Republic, Great Britain, Italy, Poland and Sweden.

Country	Is the RAB exclusively based on re-evaluated assets?	If previous answer was 'yes' please describe in detail how the re-evaluation of assets influenced the level of RAB. (how is the RAB linked to the re-evaluated assets and the reasons for this decision)
AT	No	
BE	No	
CZ	Yes	100% of re-evaluated assets is not included into RAB. RAB is not reduced by full size of depreciation, so it is constantly approaching to a value of re-evaluated assets.
DE	No	
EE	No	
ES	No	
FI	No	
FR	No	
GB	Yes	RAB indexed annually for inflation using retail prices index (RPI).
GR	No	Mixed approach: From 2009, no revaluation is taken into account. Before 2009, two revaluations of assets have taken place.
HU	No	
IE	No	
IT	Yes	The assets are evaluated on the basis of a 'historical revaluated cost' approach. Every year the value of assets is updated using the inflation index of the price of "investment goods" published by the National Statistics Institute (ISTAT).
LT	No	
LU	No	
LV	No	
NL	No	
PL	Yes	The reasons for re-evaluation: 1) huge inflation rate in 1994-2000; 2) unbunling of TSO and new evaluation of BV in 2007.
PT	No	
SE	Yes	Aquisition re-evaluted with index based on the development of the construction industry index.
SI	No	

Table 84 - Re-evaluation of fixed assets in electricity transmission

4.2.2.2 Electricity distribution

In electricity distribution the RAB is also exclusively based on the re-evaluated assets in 4 countries: The Czech Republic, Great Britain, Italy and Poland.

Country	Is the RAB exclusively based on re-evaluated assets?	If previous answer was 'yes' please describe in detail how the re-evaluation of assets influenced the level of RAB. (how is the RAB linked to the re-evaluated assets and the reasons for this decision)
AT	No	
BE	No	
CZ	Yes	100% of re-evaluated assets is not included into RAB. RAB is not reduced by full size of depreciation, so it is constantly approaching to a value of re-evaluated assets
DE	No	
DK	No	
EE	No	
ES	No	
FI	No	
FR	No	
GB	Yes	RAB indexed annually for inflation using retail prices index (RPI).
GR	No	Mixed approach: From 2009, no revaluation is taken into account. Before 2009, two revaluations of assets have taken place.
HU	No	
IE	No	
IT	Yes	The assets are evaluated on the basis of a 'historical revaluated cost' approach. Every year the value of assets is updated using the inflation index of the price of "investment goods" published by the National Statistics Institute (ISTAT).
LT	No	
LU	No	
LV	No	
NL	No	
PL	Yes	The reasons for re-evaluation: 1) huge inflation rate in 1994-2000; 2) unbunling of DSO and new evaluation of BV in 2007; 3) consolidation process in distribution sector and new valuation of BV in years 2002-2005.
PT	No	
SE	No	
SI	No	

Table 85 - Re-evaluation of fixed assets in electricity distribution

4.2.2.3 Gas transmission

In gas transmission, the RAB is exclusively based on the re-evaluated assets in 5 countries: The Czech Republic, France, Hungary, Italy and Sweden.

Country	Is the RAB exclusively based on re-evaluated assets?	If previous answer was 'yes' please describe in detail how the re-evaluation of assets influenced the level of RAB. (how is the RAB linked to the re-evaluated assets and the reasons for this decision)
AT	No	Share of equity financed assets are re-evaluated as indexed historic costs.
BE	No	
CZ	Yes	100% of re-evaluated assets is not included into RAB. RAB is not reduced by full size of depreciation, so it is constantly approaching to a value of re-evaluated assets.
DE	No	
EE	No	
ES	No	
FI	No	
FR	Yes	Inflated annually (only a small percentage is not re-evaluated: IT, vehicles).
GB	Yes	RAB indexed annually for inflation using retail prices index (RPI).
GR	No	
HU	Yes	
IE	No	
IT	Yes	The assets are evaluated on the basis of a 'historical revaluated cost' approach. Every year the value of assets is updated using the inflation index of the price of "investment goods" published by the National Statistics Institute (ISTAT).
LT	No	
LU	No	
LV	No	
NL	No	
PL	No	
PT	No	
SE	Yes	Acquisition re-evaluted with index based on the development of the construction industry index.
SI	No	

Table 86 - Re-evaluation of fixed assets in gas transmission

4.2.2.4 Gas distribution

In gas distribution, the RAB is also exclusively based on the re-evaluated assets in 5 countries: The Czech Republic, France, Hungary, Italy and Sweden.

Country	Is the RAB exclusively based on re-evaluated assets?	If previous answer was 'yes' please describe in detail how the re-evaluation of assets influenced the level of RAB. (How is the RAB linked to the re-evaluated assets and the reasons for this decision)
AT	No	
BE	No	
CZ	Yes	100% of re-evaluated assets is not included into RAB. RAB is not reduced by full size of depreciation, so it is constantly approaching to a value of re-evaluated assets.
DE	No	
DK	No	
EE	No	
ES	No	
FI	No	
FR	Yes	Inflated annually
GB	Yes	RAB indexed annually for inflation using retail prices index (RPI).
GR	No	
HU	Yes	
IE	No	
IT	Yes	The assets are evaluated on the basis of a 'historical revaluated cost' approach. Every year the the value of the DSOs' assets is updated using the inflation index of the price of "investment goods" published by the National Statistics Institute (ISTAT).
LT	No	
LU	No	
LV	No	
NL	No	
PL	No	
PT	No	
SE	Yes	Acquisition re-evaluted with index based on the development of the construction industry index.
SI	No	

Table 87 - Re-evaluation of fixed assets in gas distribution

4.2.3 Mix of historical and re-evaluated assets

7 NRAs apply a mix of historical values and re-evaluated assets:

In Germany, the self-financed share of fixed assets is indexed for existing installations. The result is a future replacement value of these investments. The debt-financed share is valued at historical cost residual values. The new plants are always valued at historical cost and then multiplied by a nominal rate.

In Luxembourg, assets are valued at historical costs. Old assets (capitalised before 1 January 2010) may, as an option, be evaluated as follows: A fraction of old assets is valued at historical costs (up to the debt ratio, 50% of all old assets) and at indexed historical costs (up to the equity ratio, 50%).

In Portugal, at the electricity TSO the investments integrated in the RAB before 2009 are valued historically. After 2009, the subsequent investments in transmission lines and substations are valuated through a mix of standard cost and acquisition costs. In the gas sector the RAB was re-evaluated by the government in the first regulatory period.

The tables below only show the part of the re-evaluated assets.

4.2.3.1 Electricity transmission

Country	Which methodology was applied? (e.g. annuities, indexed purchasing cost, etc.)	If Regulated Asset Base (RAB) is evaluated according to market value or replacement cost, which sources are used? (e.g.cost catalogue)	When was the re-evaluation done (year)?	Was the re-evaluation done for all companies in the same manner and at the same time?
BE	Depreciated replacement costs	Cost catalogue	2000	N.A.
DE	Depreciated replacement costs.	Data of the government agency "Statistisches Bundesamt Deutschland".	Different, promptly to 1990.	No, only for companies in Eastern Germany.
FI	Standard network component values set before regulatory period. During the regulatory period component prices are not updated.	TSO reports standard component values before the regulatory period.	2016	Yes
GR	Mix of historical values and re-evaluated assets. Specifically the surplus of the re-evaluation of assets of 2000 and 2004 has been included in the RAB.	The Re-evaluation of 2000 and 2004 were made by independent evaluators, according to replacement cost methodology.	The last two re-evaluations took place in 2009 and 2014, but they were not accepted by RAE.	

Table 88 - Electricity transmission asset re-evaluation in Belgium, Germany, Greece and Finland

4.2.3.2 Electricity distribution

Country	Which methodology was applied? (e.g. annuities, indexed purchasing cost, etc.)	If Regulated Asset Base (RAB) is evaluated according to market value or replacement cost, which sources are used? (e.g.cost catalogue)	When was the re-evaluation done (year)?	Was the re-evaluation done for all companies in the same manner and at the same time?
BE	Was indexed purchasing cost.	N.A.	2003	N.A.
DE	Depreciated replacement costs.	Data of the government agency "Statistisches Bundesamt Deutschland".	Different, promptly to 1990.	No, only for companies in Eastern Germany.
FI	Standard network component values based on survey conducted before the regulatory period. During the regulatory period component prices are not updated.	Standard component values are based on survey conducted by the Energy Authority.	2016	Yes
GR	Mix of historical values and re-evaluated assets. Specifically the surplus of the re-evaluation of assets of 2000 and 2004 has been included in the RAB.	The Re-evaluation of 2000 and 2004 were made by independent evaluators, according to replacement cost methodology.	The last two re-evaluations took place in 2009 and 2014, but they were not accepted by RAE.	
LT	LRAIC model applied	Net present value in the market, if no in the market, the modern equivalent asset criterion is used	2015	Yes, for TSO and DSO

Table 89 - Electricity distribution asset re-evaluation in Belgium, Germany, Finland, Greece and Lithuania.

4.2.3.3 Gas transmission

Country	Which methodology was applied? (e.g. annuities, indexed purchasing cost, etc.)	If Regulated Asset Base (RAB) is evaluated according to market value or replacement cost, which sources are used? (e.g.cost catalogue)	When was the re-evaluation done (year)?	Was the re-evaluation done for all companies in the same manner and at the same time?
AT	Depreciated replacement costs	Replacement cost	2012	Yes
BE	Depreciated Economic Replacement Costs.	Cost catalogue, Internet Prices.	2002	N.A.
DE	Depreciated replacement costs.	Data of the government agency "Statistisches Bundesamt Deutschland".	Different, promptly to 1990.	No, only for companies in Eastern Germany
FI	Standard network component values set before regulatory period. During the regulatory period component prices are not updated.	TSO reports standard component values before the regulatory period.	2016	Yes
PT			For the first regulatory period (2007) the RAB was re-evaluated by the government.	

Table 90 - Gas transmission asset re-evaluation in Belgium, Finland, Germany, Hungary and Portugal

4.2.3.4 Gas distribution

Country	Which methodology was applied? (e.g. annuities, indexed purchasing cost, etc.)	If Regulated Asset Base (RAB) is evaluated according to market value or replacement cost, which sources are used? (e.g.cost catalogue)	When was the re-evaluation done (year)?	Was the re-evaluation done for all companies in the same manner and at the same time?
BE	Was indexed purchasing cost.		2003	N.A.
DE	Depreciated replacement costs.	Data of the government agency "Statistisches Bundesamt Deutschland".	Different, promptly to 1990	No, only for companies in Eastern Germany.
FI	Standard network component values based on survey conducted before the regulatory period. During the regulatory period component prices are not updated.	Standard component values are based on survey conducted by the Energy Authority.	2016	Yes
PT			For the first regulatory period (2008) the RAB was re-evaluated by the government.	

Table 91 - Gas distribution transmission asset re-evaluation in Belgium, Finland, Germany, Hungary and Portugal

4.3 Difference between the RAB defined on net book values and the RAB based on re-evaluated asset base

4.3.1 Electricity transmission

Country	What's the difference (in %) between the RAB defined on net book values according to national GAAP (or IFRS) and the RAB based on re-evaluated asset base? (Please use net book values as the basis for your calculation). (The purpose of this question was to find out if there is any diference between net book value and the RAB. There could be an example of the calculation included (net book value = 100 €, RAB 50 €, answer is 50%). The reason for this, is that the regulated companies may have re-evaluated the assets but the NRA, for regulatory purposes, could approve only part of those assets.)
AT	N.A.
BE	43% - NBV GAAP : 2209 (mio â,¬), RAB : 3916, Delta : 1 707 Million €
CZ	95,9%
DE	The index evaluates the assets residual values from all companies round about 40% higher than their book values in accordance with national accounting standards (HGB). The values for companies in eastern Germany (the former GDR) were obtained through a reevaluation of fixed assets acquired before 1990. Assets from this re-evaluation are of a higher valuation by approximately 1.5 times (DM-opening balance for the German currency union of July 1990).
DK	N.A.
EE	N.A..
ES	Not possible
FI	N.A.
FR	N.A.
GB	N.A.
GR	N.A.
HU	80% - net book values = 100%
IE	N.A
IT	N.A.
LT	127% (79% of NBV)
LU	N.A.
LV	See answers 1.1. and 2.1.
NL	N.A.
NO	N.A.
PL	-40% (RAB = 60% of NBV))
PT	N.A.
SE	0%
SI	N.A.

Table 92 - Difference (in %) between the RAB defined on net book values according to national GAAP (or IFRS) and the RAB based on re-evaluated asset base, (electricity TSOs)

4.3.2 Electricity distribution

Country	What's the difference (in %) between the RAB defined on net book values according to national GAAP (or IFRS) and the RAB based on re-evaluated asset base? (Please use net book values as the basis for your calculation). (The purpose of this question was to find out if there is the diference between net book value and the RAB. There could be an example of the calculation included (net book value = 100 €, RAB 50 €, answer is 50%). The reason for this, is that the regulated companies may have re-evaluated the assets but the NRA, for regulatory purposes, could approve only part of those assets.)
AT	N.A.
BE	50%
CZ	74,5%
DE	The index evaluates the assets residual values from all companies round about 40% higher than their book values in accordance with national accounting standards (HGB). The values for companies in eastern Germany (the former GDR) were obtained through a re-valuation of fixed assets acquired before 1990. Assets from this re-evaluation are of a higher valuation by approximately 1.5 times (DM-opening balance for the German currency union of July 1990).
DK	N.A.
EE	N.A.
ES	Not possible
FI	Net book value of electricity network (sum of all DSOs) / NPV of electricity network (sum of all DSOs) = about 54%
FR	N.A.
GB	N.A.
GR	N.A.
HU	95-160% - net book values = 100%
IT	N.A.
LT	96% (104% of NBV)
LU	N.A.
LV	See answers 1.1. and 2.1.
NL	N.A.
NO	N.A.
PL	+1.4 (RAB = 101,4 % of NBV)
PT	N.A.
SE	0%
SI	N.A.

Table 93 - Difference (in %) between the RAB defined on net book values according to national GAAP (or IFRS) and the RAB based on re-evaluated asset base, (electricity DSOs)

4.3.3 Gas transmission

Country	What's the difference (in %) between the RAB defined on net book values according to national GAAP (or IFRS) and the RAB based on re-evaluated asset base? (Please use net book values as the basis for your calculation). (The purpose of this question was to find out if there is the diference between net book value and the RAB. There could be an example of the calculation included (net book value = 100 €, RAB 50 €, answer is 50%). The reason for this, is that the regulated companies may have re-evaluated the assets but the NRA, for regulatory purposes, could approve only part of those assets.)
AT	N.A.
BE	75% - NBV gaap : 400 (mio â,¬), RAB : 1 600, Delta : 1 200
CZ	58,4%
DE	The index evaluates the assets residual values from all companies round about 40% higher than their book values in accordance with national accounting standards (HGB). The values for companies in eastern Germany (the former GDR) was obtained through a reval-uation of fixed assets acquired before 1990. Assets from this re-evaluation are of a higher valuation by approximately 1.5 times (DM-opening balance for the German currency union of July 1990).
DK	N.A.
EE	N.A.
ES	Not possible
FI	N.A.
FR	N.A.
GB	N.A.
GR	N.A.
HU	N.A.
IT	N.A.
LT	232%
LU	N.A.
LV	See answers 1.1. and 2.1.
NL	N.A.
NO	N.A.
PL	0% (RAB = NBV)
PT	31.6% - This value is refered at the date of the reavaliation (2006). It is not possible to establish a value for the difference in 2016.
SE	0%
SI	N.A.

Table 94 - Difference (in %) between the RAB defined on net book values according to national GAAP (or IFRS) and the RAB based on re-evaluated asset base, (gas TSOs)

4.3.4 Gas distribution

Country	What's the difference (in %) between the RAB defined on net book values according to national GAAP (or IFRS) and the RAB based on re-evaluated asset base? (Please use net book values as the basis for your calculation). (The purpose of this question was to find out if there is the diference between net book value and the RAB. There could be an example of the calculation included (net book value = 100 €, RAB 50 €, answer is 50%). The reason for this, is that the regulated companies may have re-evaluated the assets but the NRA, for regulatory purposes, could approve only part of those assets.)
AT	N.A.
BE	50%
CZ	70,8%
DE	The index evaluates the assets residual values from all companies round about 40% higher than their book values in accordance with national accounting standards (HGB). The values for companies in eastern Germany (the former GDR) was obtained through a revaluation of fixed assets acquired before 1990. Assets from this re-evaluation are of a higher valuation by approximately 1.5 times (DM-opening balance for the German currency union of July 1990).
DK	N.A.
EE	N.A.
ES	Not possible
FI	Net book value of electricity network (sum of all DSOs) / NPV of electricity network (sum of all DSOs) = about 33%
FR	N.A.
GB	N.A.
GR	N.A.
HU	N.A.
IT	N.A.
LT	80%
LU	N.A.
LV	See answers 1.1. and 2.1.
NL	N.A.
NO	N.A.
PL	0% (RAB = NBV)
PT	N.A.
SE	0%
SI	N.A.

Table 95 - Difference (in %) between the RAB defined on net book values according to national GAAP (or IFRS) and the RAB based on re-evaluated asset base, (gas DSOs)

4.4 Monetary value of regulated assets on historical cost basis and monetary value of re-evaluated regulated assets

4.4.1 Electricity transmission

Country	If possible, please provide the monetary value of regulated assets (aggregated for all companies) on historical cost basis. - million EUR	If possible, please provide the monetary value of re-evaluated regulated assets (aggregated for all companies). - million EUR
AT	approximately 1 bn EUR	No re-evaluation.
BE	300 Million €	About 1.900 Million €
CZ	N.A.	23 731 mil. CZK
DE	N.A.	N.A.
DK	N.A.	N.A.
EE	N.A.	N.A.
ES	N.A.	N.A.
FI	N.A.	N.A.
FR	11,654 million € – estimated value for 2013 (excluding assets under construction)	N.A.
GB	N.A.	13 bn GBP
GR	1.516 million euros (mixed approach): The monetary value of RAB is calculated according to the mixed approach.	N.A.
HU	951 using exchange rate of 308.7 HUF/EUR	951 using exchange rate of 308.7 HUF/EUR
IE	Opening asset value for 2016 in 2014 monies is €2.31 billion.	N.A.
IT	N.A.	Confidential
LT	323,64 m EUR	409,63 m EUR
LU	N.A.	N.A.
LV	Confidential	Confidential
NL	2,257 mln € in 2012	N.A.
NO	Book value 2015: 3 230 (EUR:9.30 pt)	N.A.
PL	N.A.	1.7 bn - Not public data
PT	2094 Net asset values in million euros for 2016. Budget values	N.A.
SE	N.A.	N.A.
SI	N.A.	N.A.

Table 96 - Monetary value of regulated assets on historical cost basis and monetary value of re-evaluated regulated assets, (electricity TSOs)

4.4.2 Electricity distribution

Country	If possible, please provide the monetary value of regulated assets (aggregated for all companies) on historical cost basis. - Mill EUR	If possible, please provide the monetary value of re-evaluated regulated assets (aggregated for all companies). - Mill EUR
AT	approximately 4 bn EUR	No re-evaluation.
BE	N.A.	no competences
CZ	N.A.	189 455 mil. CZK
DE	N.A.	N.A.
EE	N.A.	N.A.
ES	N.A.	N.A.
FI	Sum of book values approximately 4,8 bn EUR	Sum of NPV:s approximately 9,1 bn EUR
FR	45 508 Mill € - estimated value for ERDF, on 01/01/2014 (operating 95% of the distribution grid)	N.A.
GB	N.A.	21.3 bn GBP
GR	3.185 million euros (mixed approach): The monetary value of RAB is calculated according to the mixed approach, according to the decision of RAE in 2012.	N.A.
HU	2578 - using exchange rate of 308.7 HUF/EUR	2578 - using exchange rate of 308,7 HUF/EUR
IE	Opening asset value for 2016 in 2014 monies is €5.34 billion.	N/A
IT	N.A.	Confidential
LT	797.99 m EUR	764,33 m EUR
LU	N.A.	N.A.
LV	Confidential	Confidential
NL	10,474 mln € in 2012	N.A.
NO	Book value 2015: 5 900 (EUR:9.30 pt)	N.A.
PL	N.A.	11 bn
PT	3009 - Net asset values in million euros for 2016 Budget values	N.A.
SE	N.A.	N.A.
SI	N.A.	N.A.

Table 97 - Monetary value of regulated assets on historical cost basis and monetary value of re-evaluated regulated assets, (electricity DSOs).

4.4.3 Gas transmission

Country	If possible, please provide the monetary value of regulated assets (aggregated for all companies) on historical cost basis. - Mill EUR	If possible, please provide the monetary value of re-evaluated regulated assets (aggregated for all companies). - Mill EUR
AT	N.A.	N.A.
BE	400	1.600
CZ	N.A.	38 151 mil CZK
DE	N.A.	N.A.
DK	N.A.	N.A.
EE	N.A.	N.A.
ES	N.A.	N.A.
FI	N.A.	N.A.
FR	N.A.	8197 Mill € – estimated value of regulated assets for GRTgaz and TIGF - as of 01/01/2013
GB	N.A.	5 bn in GBP
GR	N.A.	N.A.
HU	N.A.	N.A.
IT	N.A.	Confidential
LT	136	
LU	N.A.	N.A.
LV	Confidential	Confidential
NL	6,681 mln € in 2012	N.A.
PL	Confidential	Confidential
PT	N.A.	654 Net asset values in million euros for 2016. Budget values
SE	2895 - exchange rate 1€ = 8,70 SEK	N.A.
SI	N.A.	N.A.

Table 98 - Monetary value of regulated assets on historical cost basis and monetary value of re-evaluated regulated assets, (gas TSOs).

4.4.4 Gas distribution

Country	If possible, please provide the monetary value of regulated assets (aggregated for all companies) on historical cost basis. - Mill EUR	If possible, please provide the monetary value of re-evaluated regulated assets (aggregated for all companies). - Mill EUR
AT	approximately 2 bn EUR	No re-evaluation.
BE	N.A.	No competences
CZ	N.A.	79 844 mil CZK
DE	N.A.	N.A.
DK	N.A.	N.A.
EE	N.A.	N.A.
ES	N.A.	N.A.
FI	Sum of book values approximately 60 m EUR	Sum of NPV:s approximately 190 m EUR
FR	N.A.	14 789 Mill € - estimated value for GrDF and main local distribution companies, as of 01/01/2012
GB	N.A.	16.8 bn in GBP
GR	N.A.	N.A.
HU	N.A.	1199,704 - using exchange rate of 308,66 HUF/EUR
IT	N.A.	Confidential
LT	128	
LU	N.A.	N.A.
LV	Confidential	Confidential
NL	6,770 mln € in 2012	N.A.
PL	Confidential	Confidential
PT	N.A.	1648 Net asset values in million euros for 2015. Budget values
SE	269.7 - exchange rate 1â,¬ = 8,70 SEK	N.A.
SI	N.A.	N.A.

Table 99 - Monetary value of regulated assets on historical cost basis and monetary value of re-evaluated regulated assets, (gas DSOs).

4.5 RAB adjustment

The RAB is ordinarily adjusted annually within the regulatory period when the value of the new investments is taken into consideration and the value of the depreciation is deducted.

According to survey responses, the annual recalculation of the net book value (new investment depreciation) is the most common approach. The survey also enquired whether NRAs adjusted the RAB within the regulatory period to correspond the real values of the RAB by some kind of progression index.

In line with the replies given in chapter 4.2, 7 NRAs stated that the RAB is annually rising. In Great Britain, the RAB indexed for inflation using RPI (Government retail price index of inflation including interest costs) is applied. In Ireland, the Irish Harmonised Index of Consumer Prices is used. This applies to the current 5-year period, which started 1 January 2011. Previously, the Irish Consumer Price Index was used as the index. In Italy, the gross fixed investment deflator measured by the National Institute of Statistics is used.

4.5.1 Electricity transmission

Country	Is the RAB adjusted during the regulatory period?	If the RAB is adjusted during the regulatory period please indicate how often (e.g. Annually).	Does the adjustment affect net book values by accounting for new investements and/or depreciation? Please explain your approach.	Is the RAB adjusted within regulatory period by any kind of escalation index? If yes, please indicate by which index and since when is this method applied.
AT	Yes Yearly adjustments due to annual cost audits.	Annually - regulatory period of one year.	Yes Net book values will change due to new investments and depreciation.	No
BE	Yes Ordinary adjustement for new investments, depreciation and decommissioning	Annually within the regulatory period of 4 years	Yes Ordinary adjustment for new investments, depreciation and decommisioning	No
CZ	Yes	Annually	Yes The adjustment is similar to the net book value calcultion (investment - depreciation), the formula for RAB adjustment is “investment – depreciation x k”; k is revaluation coefficient which is set annually and which is calculated as the result of dividing the planned value of the regulatory asset base in year “i-1” by the planned residual value of assets in year i-1; k = <0;1>.	No
DE	No	No	All energy companies may require an adjustment in standard methods by applying an investment measure.	No
EE	No	No	No	No
ES	Yes	Annually	Yes	No
FI	Yes	Annually	Book values taken to RAB annually from balance sheet	No
FR	Yes	Annually	Yes capital costs are recalculated annually with actual commissioning and depreciation figures.	No
GB	Yes	Annually updated for RPI and allowed additions less regulatory depreciation and cash proceeds from disposals.	N.A.	Yes RPI
GR	No	N.A.	N.A.	N.A.

HU	Yes	Annually	Yes	No
IE	N.A.	Forecast expenditure during the regulatory period is added to the RAB before the period commences. There are then no further adjustments during the regulatory period.	N.A.	The RAB is set in real terms for each year of the regulatory period (real 2014 terms in the case of the current period). Then the depreciation and return is calculated in real terms for each year of the control. These are then added to the OPEX in real terms, giving the revenue requirement in real terms (2014 terms) for each year of the control. This revenue requirement is then indexed upwards to provide a nominal value. The index used is the Irish Harmonised Index of Consumer Prices. This applies to the current 5-year period, which started 1 January 2016. Previously, the Irish Con-sumer Price Index was used to as the index.
IT	Yes	Annually	Yes . Net book values will change due to new investments and depreciation.	Yes inflation index of the price of “investment goods” published by the National Statistics Institute (ISTAT).
LV	No	N.A.	N.A.	No
LT	Yes	Annually	Yes, adjusted by classic RAB formula (mainly new investments and depreciation) by 7.2 art. of Methodology.	No
LU	Yes	Annually	N.A.	No
NL	Yes	Annually	Only adjustment for special investments	Yes, CPI
NO	Yes	Annually	Yes. the net book value is calculated each year by adding investment and subtracting depreciation at the end of the year (31.12).	No
PL	Yes	Annually, the adjustment is similar to the net book value calculation (investment - depreciation).	Yes	No
PT	Yes	Annually for the allowed revenues for year t. After 2 years the real values are considered in the adjustment of the	Yes. Each year the RAB allowed for year t is adjusted in order to consider new investments, write-offs and depreciation.	No

		allowed revenues for year t.		
SI	Yes	Annually	Yes	No
SE	No	N.A.	No	No

Table 100 - RAB adjustment in electricity transmission

4.5.2 Electricity distribution

Country	Is the RAB adjusted during the regulatory period?	If the RAB is adjusted during the regulatory period please indicate how often (e.g. Annually).	Does the adjustment affect net book values by accounting for new investements and/or depreciation? Please explain your approach.	Is the RAB adjusted within regulatory period by any kind of escalation index? If yes, please indicate by which index and since when is this method applied.
AT	Yes	The investment factor updates CAPEX (also RAB) Annually on book value basis, t-2 time lag.However, a recalculation method takes care of the time-lag.	Yes. Net book values will change due to new investments and depreciation. Investment factor uses recent book values.	No. Investment factor uses recent book values, thus no escalation with inflation rate.
BE	No	N.A.	No	No
CZ	Yes	Annually	Yes The adjustment is similar to the net book value calcultion (investment - depreciation), the formula for RAB adjustment is “investment – depreciation x k”; k is revaluation coefficient which is set annually and which is calculated as the result of dividing the planned value of the regulatory asset base in year “i-1” by the planned residual value of assets in year i-1; k = <0;1>.	No
DE	No	No	All energy companies may require an adjustment in standard methods by applying an investment measure.	No
DK	Yes	Annually	Yes	No
EE	No	No	No	No
ES	Yes	Annually	Yes	No
FI	Yes	Annually	Book values taken to RAB annually from balance sheet	No
FR	Yes	Annually	Yes. Capital costs are recalculated annually with actual commissioning, depreciation and third party contributions figures.	

GB	Yes	Annually updated for RPI and allowed additions less regulatory depreciation and cash proceeds from disposals	N.A.	Yes RPI
GR	No	N.A.	N.A.	N.A.
HU	Yes	Annually	Yes	No
IE	N.A.	No. Forecast expenditure during the regulatory period is added to the RAB before the period com-mences. There are then no further adjustments during the regulatory period.	N.A.	The RAB is set in real terms for each year of the regulatory period (real 2014 terms in the case of the current period). Then the depreciation and return is calculated in real terms for each year of the control. These are then added to the OPEX in real terms, giving the revenue requirement in real terms (2014 terms) for each year of the control. This revenue requirement is then indexed upwards to provide a nominal value. The index used is the Irish Harmonised Index of Consumer Prices. This applies to the current 5-year period, which started 1 January 2016. Previously, the Irish Con-sumer Price Index was used to as the index.
IT	Yes	Annually	Yes. Net book values will change due to new investments and depreciation.	Yes, inflation index of the price of “investment goods” published by the National Statistics Institute (ISTAT).
LT	Yes	Annually	Yes, adjusted by classic RAB formula (mainly new investments and depreciation) by 7.2 art. of Methodology	No
LU	Yes	Annually	N.A.	No
LV	No	N.A.	N.A.	No
NL	Yes	Annually	Only adjustment for special investments	Yes, CPI
NO	Yes	Annually	Yes. the net book value is calculated each year by adding investment and subtracting depreciation at the end of the year (31.12).	No
PL	Yes	Annually, the adjust-ment is similar to the net book value calcula-tion (investment - de-preciation).	Yes	No

PT	Yes	Annually for the al-lowed revenues for year t, after 2 years the real values are consid-ered in the adjustment of the allowed revenues for year t	Yes. Each year the RAB allowed for year t is adjusted in order to consider new investments, write-offs and depreciation.	No
SE	No	N.A.	No	No
SI	Yes	Annually	Yes	No

Table 101 - RAB adjustment in electricity distribution

4.5.3 Gas transmission

Country	Is the RAB adjusted during the regulatory period?	If the RAB is adjusted during the regulatory period please indicate how often (e.g. Annually).	Does the adjustment affect net book values by accounting for new investements and/or depreciation? Please explain your approach.	Is the RAB adjusted within regulatory period by any kind of escalation index? If yes, please indicate by which index and since when is this method applied.
AT	No (there is an ex post re-evaluation of CAPEX)	N.A.	No	Yes
BE	Yes Ordinary adjustment for new investment, depreciation and decomissioning	Ammually within the regulatory period of 4 years	Yes Ordinary adjustment for new investments, depreciation ans decommissioning	No
CZ	Yes	Annually	Yes The adjustment is similar to the net book value calcultion (investment - depreciation), the formula for RAB adjustment is “investment – depreciation x k”; k is revaluation coefficient which is set annually and which is calculated as the result of dividing the planned value of the regulatory asset base in year “i-1” by the planned residual value of assets in year i-1; k = <0;1>.	No
DE	No	No	All energy companies may require an adjustment in standard methods by applying an investment measure.	No
EE	No	No	No	No
ES	Yes	Annually	Yes	No
FI	Yes	Annually	Book values taken to RAB annually from balance sheet	No
FR	Yes	Annually	Yes. capital costs are recalculated annually with actual commissioning, depreciation and CPI figures.	No
GB	Yes	Annually updated for RPI and allowed additions less regulatory depreciation and cash proceeds from disposals.	N.A.	Yes RPI

GR	Yes	RAB is annually updated by taking into account new investments, removals and regulatory depreciation.	Net book value of assets is adjusted annually by taking into account depreciation and new investments	N.A.
HU	Yes	Annually. Only with the new investments which are activated.	Yes	Yes
IE	N.A.	No	No	Yes, HICP
IT	Yes	Annually	Yes. Net book values will change due to new investments and depreciation.	Yes, inflation index of the price of “investment goods” published by the National Statistics Institute (ISTAT).
LT	Yes	Annually	Yes	No
LU	Yes	Annually	N.A.	No
LV	No	N.A.	N.A.	No
NL	Yes	Annually	Only adjustment for expansionary investments.	Yes, CPI
PL	No	N.A.	N.A.	N.A.
PT	Yes	Annually for the allowed revenues for year t, After 2 years the real values are considered in the adjustment of the al-lowed revenues for year	Yes. Each year the RAB allowed for year t is adjusted in order to consider new investments, write-offs and depreciation.	No
SE	Yes	N.A.	No	No
SI	Yes	Annually	Yes	No

Table 102 - RAB adjustment in gas transmission

4.5.4 Gas distribution

Country	Is the RAB adjusted during the regulatory period?	If the RAB is adjusted during the regulatory period please indicate how often (e.g. Annually).	Does the adjustment affect net book values by accounting for new investements and/or depreciation? Please explain your approach.	Is the RAB adjusted within regulatory period by any kind of escalation index? If yes, please indicate by which index and since when is this method applied.
AT	Yes.	The investment factor updates CAPEX (also RAB) annually on book value basis, t-2 time lag.However, a recalculation method takes care of the time-lag.	Yes. Net book values will change due to new investments and depreciation. Investment factor uses recent book values.	No
BE	No	N.A.	No	No
CZ	Yes	Annually	Yes The adjustment is similar to the net book value calcultion (investment - depreciation), the formula for RAB adjustment is “investment – depreciation x k”; k is revaluation coefficient which is set annually and which is calculated as the result of dividing the planned value of the regulatory asset base in year “i-1” by the planned residual value of assets in year i-1; k = <0;1>.	No
DE	No	No	All energy companies may require an adjustment in standard methods by applying an investment measure.	No
DK	No	No	No	No
EE	Yes	Annually	Yes	No
ES	No	n.a.	No	No
FI	Yes	Annually	Book values taken to RAB annually from balance sheet	No
FR	Yes	Annually	Yes. capital costs are recalculated annually with actual commissioning, depreciation and CPI figures	No
GB	Yes	Annually updated for RPI and allowed additions less regulatory depreciation and cash proceeds	N.A.	Yes RPI

		from disposals.		
HU	Yes	Annually. Only with the new investments which are activated.	No	Yes
IE	N.A.	No	No	Yes, HICP
IT	Yes	Annually	Yes. Net book values will change due to new investments and depreciation.	Yes, inflation index of the price of "investment goods" published by the National Statistics Institute (ISTAT).
LT	Yes	Annually	Yes	No
LU	Yes	Annually	N.A.	No
LV	No	N.A.	N.A.	No
NL	Yes	Annually	Only adjustment for special investments.	Yes, CPI
PL	No	N.A.	N.A.	N.A.
PT	Yes	Annually for the al-lowed revenues for year t, after 2 years the real values are consid-ered in the adjustment of the allowed reve-nues for year t	Yes. Each year the RAB allowed for year t is adjusted in order to consider new investments, write-offs and depreciation.	No
SE	Yes	N.A.	No	No
SI	Yes	Annually	Yes	No

Table 103 - RAB adjustment in gas distribution

4.6 Conclusions

From a balance sheet perspective, fixed assets are the most significant items in the energy industry. Also, according to the responses of the energy regulators, fixed assets were unanimously indicated as a component of the RAB. Roughly half of the regulators additionally include working capital in the RAB, albeit with specific rules for its determination and inclusion.

Less than half of the regulators in the gas and electricity distribution sector and in gas transmission include the investment in progress in the RAB. For electricity transmission, on the other hand, the ratio is inversed and investment in progress is included in the RAB. The contribution by third parties is deducted from the RAB by all NRAs with only one exception.

From the responses one can conclude that the most common way of calculating the RAB components is the historical costs method, followed by the re-evaluated assets method, with the mixture of these two methods applied only rarely.

In all countries surveyed, other adjustments were not mentioned.

5 Depreciation

Depreciation decreases the asset value through use and the shortening of theoretical asset life and should also allow a firm to cover replacement investment costs during the economic life of an asset. Concerning the duration of depreciation, the economic lifetime of the asset should be taken into account in a forward looking, long-run approach.

The two most common approaches towards depreciation are the 'straight line' and 'accelerated' depreciation: The straight-line depreciation method spreads the cost evenly over the life of an asset. On the other hand, a method of accelerated depreciation such as the double declining balance (DDB) allows the company to deduct a much higher share in the first years after purchase.

5.1 Overview

5.1.1 Electricity transmission

Country	How is the depreciation calculated?	What is the depreciation ratio for typical network assets?	Which valu allowe
AT	Straight line (book value * depreciation ratio) - depreciation of tangible and intangible assets excluding goodwill based on book values.	2.5%-4%	Depreciat tangible a will bas
BE	Straight line.	2% and 3%	Hi
CZ	Electricity transmission system operator calculate the depreciation in accordance with national accounting standards.		Re-evalu preciatio regulation sis con these ana cal value not suffi needs o
DE	Linear per anno.	Useful life periods: - cable 110-380kV: 40-50 years - station: 25-35 years	Mixture than 2 evaluated; historical v 2006: bas
DK	N.A.	N.A.	
EE	For depreciation of fixed assets we use a regulatory capital expenditure method, which differs from accounting depreciation. In the regulatory capital expenditure accounting a principle is used in which, from a certain moment in time, fixed assets are divided into two parts, the old ones and the new investments. All assets acquired before the limit year are considered old ones and for them an accelerated rate of depreciation is applied.	2.5 %	Hi
ES	Straight line.	2.5% yearly	
FI	Straight-line depreciation on replacement value of network. Depreciation is inflation corrected annually with CPI.	N.A.	Depreci regulation placem
FR	Book value depreciation, which is linear-type depreciation based on assets economic lifetime.	N.A.	

GB	20 years straight line for assets built prior to 1 April 2013. Incrementally moving to 45 years straight line depreciation for assets built from 1 April 2013.	1/45	Re-e
GR	Straight line.	35 years (2.86%).	Estimatic cludingac tor
HU	Straight line.	2.6% (expected life time: 38,6 years), Technical expected lifetime:iron pipelines 20 years; steel pipelines 40 years; plastic pipelines 50 years; other assets 10 years; intangible assets - accord-ing to the Hungarian corporate tax act.	Tangible: ble:
IE	Straight-line depreciation based on economic technical life criteria.	1/50	
IT	Straight-line depreciation based on economic technical life criteria.	Lines: 45 years Buildings: 40 years Stations: 33 years Other: between 5 and 20 years Land: no depreciation	
LT	Straight line.	Transformers - 35 years, HV lines - 55 years	
LU	Linear.	2.5%-2.8%	Mi
LV	Depreciation = the deprecation of fixed assets + the write-off the costs of creation of intangible investmenets. If fixed assets are not completely utilized, depreciation shall be corrected in con-formity with actual utilization of fixed assets. Depreciation of fixed assets is calculated in accordance with international aaccounting standarts and the accounting policy accepted by the system operator. E.g. if a system opera-tor uses astraight line depreciation method, we accept it.	Calculated as linear depreciation with the ex-pected useful asset lifetime 15 - 40 years.	Depreca values in a ciation ca fina
NL	Straight line, corrected for inflation each year.	Mostly 35 – 55 years.	Historical c
NO	Straight line.	Set by companies according to expected lifetime.	All fixed a regulatic
PL	Straight line.	Transformers, substations: 30 - 40 years.	Average v (e.g. trans IT s
PT	Straight line depreciation.	15 to 30 years.	Depreciat intangible sets at evaluate ues .The the fiscal
SE	Straight line.	40 years on the grid.	10
SI	Straight line	N.A..	For exis takes into of depreci investmen ture the N in calcula preciation fo

Table 104 - Depreciation policy in electricity transmission

5.1.2 Electricity distribution

Country	How ist the depreciation calculated?	What is the depreciation ratio for typical network assets?	Which va ciation ar re
AT	Straight line (book value * depreciation ratio) - depreciation of tangible and intangible assets excluding goodwill based on book values,	2.5%-4%	Depreciati intangible goodwil
BE	Straight line	100000	
CZ	straight line	Buildings 2%, overhead lines, cables 2.5%, transformers VHV 4%, transformers MV, LV 3,3%, metering devices 6,6%	Re-evalua depreciati the regula of analysi result of th that histor preciation to cover fu replacem
DE	Linear per anno.	Useful life periods: - cable 1 kv: 40-45 years - line 1 kv: 30-40 years - control devices: 45 years - metering devices: 45 years.	Mixture older than re-evaluat based on assets based on
DK	Straight line.	It depends on the type of asset. For cables and network stations it is between 1/50 and 1/30.	Depreci assets ba and his
EE	For depreciation of fixed assets we use a regulatory capital expenditure method, which differs from accounting depreciation.In the regulatory capital expenditure accounting a principle is used in which, from a certain moment in time, fixed assets are divided into two parts, the old ones and the new investments.All assets acquired before the limit year are considered old ones and for them an accelerated rate of depreciation is applied.	For new assets (after year 2003) 3.33% and for old assets (before year 2003) 7.14%.	Histo
ES	Straight line.	2,5% yearly	
FI	Straight-line depreciation on replacement value of network. Depreciation is inflation corrected annually with CPI.	Sum of DSOs: Depreciation/Replacement value of network = approximately 2,6%	Deprecia the regula from repl
FR	Book value depreciation, which is linear-type depreciation based on assets economic life-time.	N.A.	
GB	20 year depreciation straight line. Incrementally moving, transitioning to 45 yearsyear straight line depreciation for assets built from 1 April 2015.	44927	Re-eva
GR	On a straight line basis.	35 years (2.86%).	Estimatio according Ass

HU	Straight line	2.8%, Technical expected lifetime:iron pipelines 20 years; steel pipelines 40 years; plastic pipelines 50 years; other assets 10 years; intangible assets - according to the Hungarian corporate tax act	Tangible: tangible:
IE	Straight-line depreciation based on economic technical life criteria.	1/45	
IT	Straight-line depreciation based on economic techni-cal life criteria.	35 years for cables, 30 years for network stations; 30 years for transformers; 15-20 years for metering devices; 5 years for in-tangible assets Control devices.	Depreciat and intang on re-ev
LT	Straight line.	Transformers - 35 years, MV/LV lines – 45 years, HV lines - 55 years	H
LU	Linear.	2.5%-2.8%	Mixtu
LV	Depreciation= the deprecation of fixed assets +the write-off the costs of creation of intangible investmenets. It fixed assets are not completely utilized, depreciation shall be corrected in conformity with actual utilization of fixed assets. Depreciation of fixed assets is calculated in ac-cordance with international aaccounting standarts and the accounting policy accepted by the system operator.E.g. If a system operator uses astraight line depreciation meth-od, we accept it.	Calculated as linear depreciation with the expected useful asset lifetime 15 - 40 years.	Deprecatio values in depreciati operator'
NL	Straight line, corrected for inflation each year.	Mostly 40 - 50 years.	Historical
NO	Straight line.	Set by companies according to ex-pected lifetime.	Based on
PL	Straight line.	Transformers: 30 - 40 years.	Average v ments (e. substati
PT	Straight line depreciation.	5 to 40 years.	Depreciat and inta based on a values, r mixture of is accord depreciat
SE	Annuity method.	40 years on the grid.	10 a
SI	Straight line.	N.A.	For existin takes into rate of d planned n energy i NRA take calculatio depreciatio ciation f

Table 105 - Depreciation policy in electricity distribution

5.1.3 Gas transmission

Country	How ist the depreciation calculated?	What is the depreciation ratio for typical network assets?	Which va ciation ar re
AT	Straight line.	3.3%-8,3%	Depreciati intangible goodwil values. (di between nan
BE	Straight line.	2% and 3 %.	Hist
CZ	Straight line.	Depreciation ratio is different for particular groups of network assets. Buildings 2%, pipes 2,5%, pumps, compresors 5% etc.	Re-evalua depreciati the regula of analysi result of th that histo preciation to cover fu replacem
DE	Linear per anno.	Useful life periods: - steel pipes with cathodic protection: 55-65 years - polyethylene coated steel pipes: 45-55 years - bitumen coated steel pipes: 45-55 years - compressors: 25 years.	Mixture older than re-evaluat based on assets based on
DK	N.A.	N.A.	
EE	For depreciation of fixed assets we use a regulatory capital expenditure method, which differs from accounting depre- ciation.In the regulatory capital expenditure accounting a principle is used in which, from a certain moment in time, fixed assets are divided into two parts, the old ones and the new investments.All assets ac- quired before the limit year are considered old ones and for them an accelerated rate of depreciation is applied.	3.78%	Histo
ES	Straight line.	2.5% yearly.	
FI	Straight-line depreciation on replacement value of network. Depreciation is inflation corrected annually with CPI.	N.A.	Depreciа the regula from repl
FR	Mostly Linear-type depreciation based on assets econom- ic life-time.	1/50 (pipes) and 1/30 (compressors).	
GB	45 year depreciation straight line.	1/45	Re-eva
GR	Straight line.	2.7% (1/37)	Depreciat and intang on his

HU	Straight line.	2%, Technical expected lifetime:iron pipelines 20 years; steel pipelines 40 years; plastic pipelines 50 years; other assets 10 years; intangible assets - according to the Hungarian corporate tax act.	See pr
IE	Straight-line depreciation	2.00% Pipelines: 1/50 Compressors: 1/25	
IT	Straight-line depreciation based on economic techni-cal life criteria.	Pipes: 50 years Buildings: 40 years Compressors, metering: 20 years Other: between 5 and 10 years Land: no depreciation.	Depreciat and intang on re-ev
vLT	Straight line.	-	H
LU	Linear.	2.5%-2.8%	Mixtu
LV	Depreciation= the deprecation of fixed assets +the write-off the costs of creation of intangible investmenets. It fixed assets are not completely utilized, depreciation shall be corrected in conformity with actual utilization of fixed as-sets. Depreciation of fixed assets is calculated in accord-ance with international aaccounting standarts and the ac-counting policy accepted by the system operator.E.g. If a system operator uses astraight line depreciation method, we accept it.	Calculated as linear depreciation with the expected useful asset life-time 15 - 40 years.	Deprecatio values in depreciati operator'
NL	Straight line, corrected for inflation each year.	Mostly 30 - 55 years.	Historical
NO	N.A.	N.A.	
PL	Straight line.	Pipe lines: ca. 40 years.	4.5 % - av investmer IT-syst
PT	Straight line depreciation.	5 to 45 years.	Depreciat and inta based on a values, r mixture of is accord depreciat
SE	Annuity method.	65 years for transmission lines	25, 4
SI	Straight line.	N.A.	For existin investmer into accou de

Table 106 - Depreciation policy in gas transmission

5.1.4 Gas distribution

Country	How ist the depreciation calculated?	What is the depreciation ratio for typical network assets?	Which va ciation ar re
AT	Straight line (book value * depreciation ratio) - depreciation of tangible and intangible assets excluding goodwill based on book values.	2%-3.3%	Depreciati intangible goodwil
BE	Straight line.	10000	
CZ	Straight line.	Depreciation ratio is different for particular groups of network assets. Buildings 2%, pipes 2,5%, pumps, compresors 5% etc.	Re-evalua depreciati the regula of analysi result of th that histor preciation to cover fu replacem
DE	Linear per anno.	Useful life periods: - polyethylene pipes: 45-55 years - polyvinyl chloride pipes: 45-55 years - control devices: 45 years - metering devices: 45 years.	Mixture older than re-evaluat based on assets based on
DK	Straight line.	Between 1/30 and 1/15.	Depreci assets ba
EE	For depreciationof fixed assets we use a regulatory capital expenditure method, which differs from accounting depreci-ation.	3.33%	Histo
ES	N.A.	N.A.	
FI	Straight-line depreciation on replacement value of network. Depreciation is inflation corrected annually with CPI.	N.A.	Depreciа the regula from repl
FR	Linear-type depreciation based on assets economic life-time.	1/45 (pipes – over 90% of the assets value).	
GB	53 year front-loaded sum of digits for assets built prior to 1 April 2003. 45 years front-loaded sum of digits for assets built from 1. April 2013.	1/45	Re-eva
GR	N.A.	N.A.	
HU	Straight line.	2%, Technical expected lifetime:iron pipelines 20 years; steel pipelines 40 years; plastic pipelines 50 years; other assets 10 years; intangible assets - according to the Hungarian corporate tax act.	See pr

IE	Straight-line depreciation	2.00% Pipelines: 1/50	
IT	Straight-line depreciation based on economic technical life criteria. The regulator fixes the economic technical life of assets.	50 years for pipelines (2%), 40 years for buildings and customers connections, 20 years for citygates, 7 years for other tangible assets and intangible assets.	Deprecia evalu
LT	Straight line.	-	H
LU	Linear.	2.5%-2.8%	Mixtu
LV	Depreciation= the deprecation of fixed assets +the write-off the costs of creation of intangible investmenets. It fixed assets are not completely utilized, depreciation shall be corrected in conformity with actual utilization of fixed assets. Depreciation of fixed assets is calculated in accordance with international aaccounting standarts and the accounting policy accepted by the system operator.E.g. If a system operator uses astraight line depreciation method, we accept it.	Calculated as linear depreciation with the expected useful asset lifetime 15 - 40 years.	Deprecatio values in depreciati operator'
NL	Straight line, corrected for inflation each year.	Mostly 30 - 55 years.	Historical
NO	N.A.	N.A.	
PL	Straight line.	Pipe lines: ca. 40 years.	4.5 % - av investmer IT-syst
PT	Straight line depreciation.	5 to 45 years.	Depreciat and inta based on a values, r mixture of is accord depreciat
SE	Annuity method.	50 years for distribution lines.	12,
SI	Straight line.	N.A.	For existin investmer into accou de

Table 107 - Depreciation policy in gas distribution

5.2 Conclusion

Once the NRA has decided on a depreciation method (straight line or accelerated depreciation), then this method is applied for both gas and electricity system operators in this country. Straight line depreciation is applied by most NRAs in gas and electricity regulation.

For both electricity and gas regulation, most NRAs have the same depreciation rate for typical TSO and DSO network assets. One question in the questionnaire was: *"Which values of depreciation are allowed into the regulation?"*

The NRAs predominantly use the same value of depreciation for the TSOs and DSOs. There are no differences between the two. The NRAs use different depreciation values, with the majority using historical values in different variations.

The linear method is predominantly applied for the depreciation of the regulated assets. The lifetime of a typical network asset ranges from 30 to 50 years and the majority of the NRAs use the individual depreciation ratio for each type of asset. However, in some regulatory frameworks the average ratio for all companies and all assets is applied.

As with RAB valuation, the depreciation of assets could be based on historic values, re-evaluated values or on a mixture of these two methods. The vast majority of regulators allowed depreciation of the tangible and intangible assets valued on the same basis as the RAB in their regulation, hence clear correlation between these values can be seen.

6 Consideration of sectoral-wide changes of productivity

6.1 Adjustment of the cost base

As already indicated in Chapter 3.2 [Year of rate of return estimation and length of regulatory period] most countries apply multiannual regulation periods, which have a typical duration of between three and five years.

In such a case the cost base can annually be adjusted by an inflation rate, which shall serve to take into account the input-sided increase of factor prices within the regulatory period. An adjustment of the cost base is actually applied by:

- a sectoral specific inflation rate of input prices, which represents the change of input prices within the network sector, or
- a non-sectoral specific inflation rate, like the Consumer Price Index (CPI), that indicates the overall development of output prices.

The table below shows that three Member States (Austria, Portugal, Sweden) use a sectoral specific input price index. Five NRAs (Croatia, Finland, Germany, Luxembourg, Poland[9]) apply the CPI for the adjustment of inflating input prices and in two countries (Hungary,The Czech Republic) both indexes are in use.

	In case of no annual cost checks: do you consider the inflation of input prices?	Sectoral specific input price Index	Consumer Price Index	Other	If other, please explain
AT	Yes	Yes			
BE	No	No	Yes	No	
HR	Yes		Yes		
CZ	Yes	Yes	Yes	No	
EE	No				
FI	No	No	Yes	No	RAB is not indexed. Depreciation and the reference levels in efficiency- and quality incentives are indexed annually using CPI.
FR	Yes	No	Yes		
DE	Yes	No	Yes	No	
HU	Yes	Yes	Yes		
IE	Yes	No	Yes up to 2010	Yes	HICP from 2011
IT	Yes	No	Yes		

[9] All data for Poland presented in section 6 relates to the electricity sector only.

LV	No	No	No	No	
LU	Yes	No	Yes	No	
NO					Annual updates.
PL	Yes		Yes		All answers presented in this part of the questionnaire refer to electricity.
PT	Yes	Yes (For the CAPEX standardised costs)	No	GDP deflator	
ES	No				
SW	Yes	Yes			
NL	Yes	No	Yes	Yes	ACM assumes an annual productivity change.

Table 108 - Adjustment of input prices by inflation

6.2 Sectoral-wide changes of productivity

Beside the application of a regulatory component for company-specific efficiency scores ("individual X-factor", see Chapter 2.2 [Efficiency requirements]), the additional implementation of a component that takes sectoral-wide changes of productivity into account ("general X-factor") aims at considering technological progress across all operators in the sector. Sectoral-wide changes of productivity shift the efficiency frontier, which represents the benchmark for less efficient operators ("catch-up"), to another level of input-output performance ("frontier-shift").

The specific structure of the general X-factor depends, however, on the type of inflation rate that is used in multiannual regulation periods as described in Chapter I.

In case of a sectoral specific inflation rate, the general X-factor is directly related to a sectoral-wide change of productivity, which can either be evaluated with:

- Tornquist Index, which uses aggregated datasets for the calculation of the total-factor productivity ("TFP"); or
- Malmquist Index, which considers the operators' change of input-output performance over time.

In case of an adjustment by the CPI the general X-factor has – in addition to the determination of the sectoral-wide change of productivity as mentioned before – to comprise of sectoral specific input price changes. Moreover, since the CPI represents an output price index, the overall economic productivity change and the overall economic input price development have to be considered as well. Hence, the general X-factor acts as a corrective for the CPI, which adjusts sectoral input prices as an overall economic output price index.

As indicated in Table 109, seven Member States already apply a general X-factor. In four countries (Austria, Finland, Germany, Netherlands) the general X-factor is addressed to TOTEX, in the remaining four countries (Poland, Portugal, Slovenia, Sweden) the general X-factor adjusts OPEX.

	Does your X factor incorporate a component for the sectoral/industry-wide change of productivity ("General X factor or Frontier")	If yes, is the general X-factor addresssed to TOTEX	Just OPEX	Just CAPEX	Other cost component (part of OPEX or CAPEX) – please explain
AT	Yes	X (gas distribution)	X (electricity and gas transmission, electricity distribution)		
BE	No				
CZ	No				
DK	No				
FI	Yes	X (electricity TSO and DSOs, natural gas TSO)			General efficiency target is 0% in 2016 – 2019 and 2020 - 2023
FR	No				

DE	Yes	X			During first and second regulatory period the X-factor is determined by law. X-factor 1. Regulatory period: 1.25% X-factor 2. Regulatory period: 1.5%.
HU	No				
IE	Yes	No	Yes up to 2010	Yes	HICP from 2011
IT	No				
LV	No				
NO	No				
PL	Yes		X		
PT	Yes (Electricity)		X		No
SI	Yes		X		
SE	Yes		X		
NL	Yes	X			

Table 109 - Adjustment of input prices by inflation

Table 110 demonstrates the methods that are used for the determination of sectoral-wide changes of productivity. The Malmquist Index has been adopted in two Member States (Finland, Portugal), the Tornquist Index is applied in Austria. In Poland and Sweden, results derive from different methods. Slovenia uses the labour productivity as an indicator for the sectoral-wide change of productivity, in Germany, the general X-factor is given by law.

Which method do you apply for determining 'Total Factor Productivity'?				
	Malmquist Index	Tornquist Index	Other: Please explain	In case of Malmquist Index: Does your general X-factor only account for the estimated frontier shift?
AT		Yes		
BE	No	No		No
FI	Yes	Yes	General productivity target was set to 0% in order to compensate the impacts of extra costs resulting from new tasks and methods of operation to the network operators	
DE	No	No	The general X-factor is given by law.	
HU	No	No		
NO	No	No	No	
PL	No	No	Bayesian Stochastic Frontier Analysis of Cost Efficiency.	
PT	Yes			No
SI			The Labour productivity (GDP per employee) is applied for determining TFP on basis of Slovenian Forecasts of Economic Trends (published by Institute of Macroeconomic Analysis and Development).	
SW	No	No	The X-factor has been determined based on numerous empirical grounds. The Malmquist Index, the Tornquist Index, and other methods were used together with historical progress in other industries and X-factors in other countries to arrive at 1% for the regulatory period 2012-2015.	
NL	Yes			

Table 110 - Methods for the determining sectoral-wide productivity changes

As shown in Table 111, the calculation of sectoral-wide productivity changes is based on sectoral specific data sets in Finland and Poland. Austria applies aggregated time series, in Portugal, both sectoral specific and aggregated data are used.

	Do you use for the calculation	
	specific time series for network operators?	aggregated time series for the total energy sector
AT	No	Yes
BE	No	No
BG		
HR		
CY		
CZ		
DK		
EE		
FI	Yes	Yes
FR		
DE		
GB		
GR		
HU	No	No
IS		
IE		
IT		
LV	No	No
LT		
LU		
MK		
MT		
ME		
NO	Yes	
PL	Yes	No
PT	Yes	Yes
RO		
SI	No	No
ES		
SW		
CH		
NL		

Table 111 - Time series for calculating sectoral-wide productivity changes

7 PCI Treatment

7.1 Background

To facilitate the implementation of projects, which are necessary for the timely development and interoperability of priority corridors and areas of trans-European energy infrastructure, Regulation (EU) No. 347/2013 ("the Regulation") was adopted. The Regulation contains criteria and a process for the selection of Projects of Common Interest ("PCIs") as well as the development of Cost-Benefit-Analysis ("CBA") methodologies supporting this.

Against the background of the risk that necessary investments will not be undertaken (on time) because of obstacles referring to permit granting, regulatory treatment and financing, the Regulation foresees different benefits a PCI might receive:

- Accelerated permit granting procedures;
- Cross-border cost allocation (if applied for);
- Additional incentives (improved regulatory treatment, if necessary); and
- Under certain conditions, financing by the Connecting Europe Facility ("CEF").

Against the background of current discussions in connection with high investment needs in European energy infrastructure, potential financing gaps, and additional incentives possibly needed to raise adequate levels of financing, some questions were added to the questionnaire for the CEER Investment Conditions Report 2015.

The answers to these questions should help to identify the "real" issues behind the delayed or non-implementation of PCIs, based on NRAs' knowledge of actual issues (e.g. due to discussions on implementation of national network development plans with their TSOs).

The results of the request of the NRAs refer to the first PCI list. Meanwhile on 27 January 2016 a new (second) PCI list, that could not be included to the survey yet, was established and which was subject to the approval of NRAs/ACER during 2017. Concerning the evaluation of PCIs Two ACER's Consolidated reports on PCI monitoring have been published in the last two years pursuant to the legal requirement set out by Article 5 of Regulation (EU) No 347/2013, with the contributions of all NRAs. The ACER Consolidated report of June 2015 monitored the first PCI list, the ACER report of June 2016 monitored the second PCI list.
The CEER conditions report refers to the first PCI list only and potential differences of the results of the reports might be ascribed to the different evaluation methodologies adopted.

7.2 Findings

The analysis of the feedback received shows that out of 33 CEER members and observers 5 countries (Czech Republic, Estonia, Latvia, Poland and Portugal) host 13 PCIs at risk, which makes 5% of the total number of electricity and gas PCIs (241).

For the electricity tansmission and gas transport in Belgium the methodology for dedecting these risks is also applied for ll projects gearing such risks.

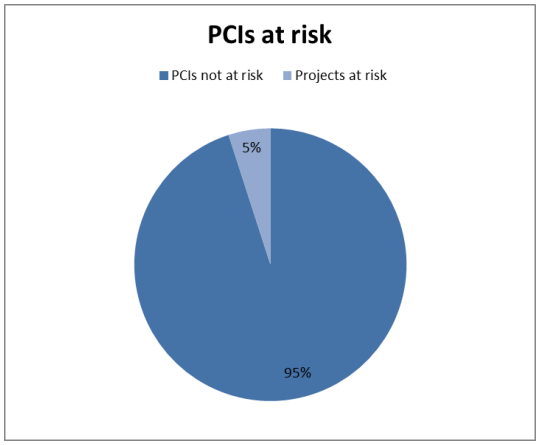

Table 112 – Overall PCIs at risk

The gas sector hosts 7 PCIs at risk out of 107 (5 %), the electricity sector 6 out of 134 (4 %).

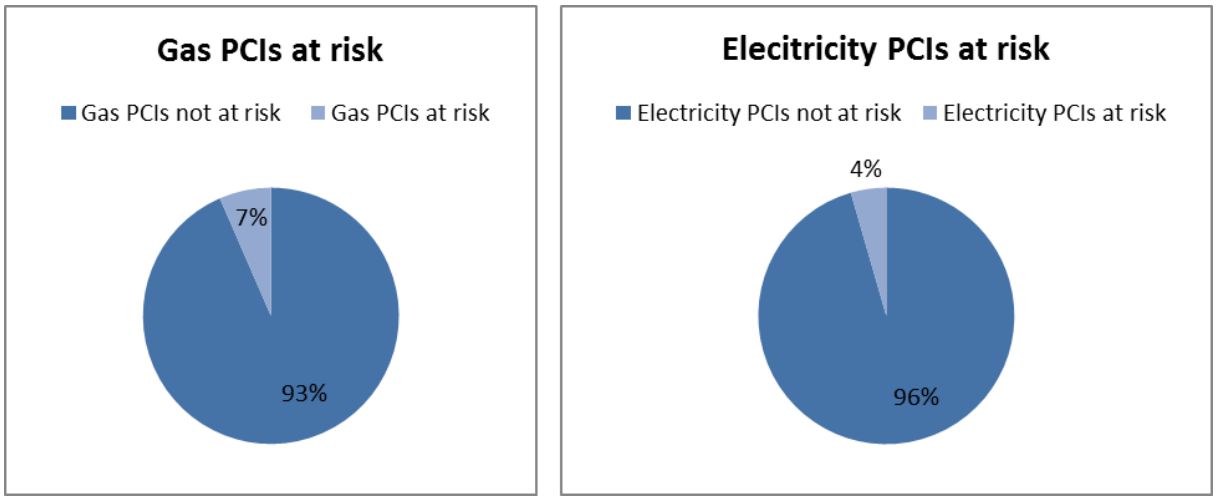

Table 113 – PCIs at risk – gas and electricity

The table below illustrates the issues which hindered / delayed the implementation of PCIs mentioned in the answers to the questionnaire.

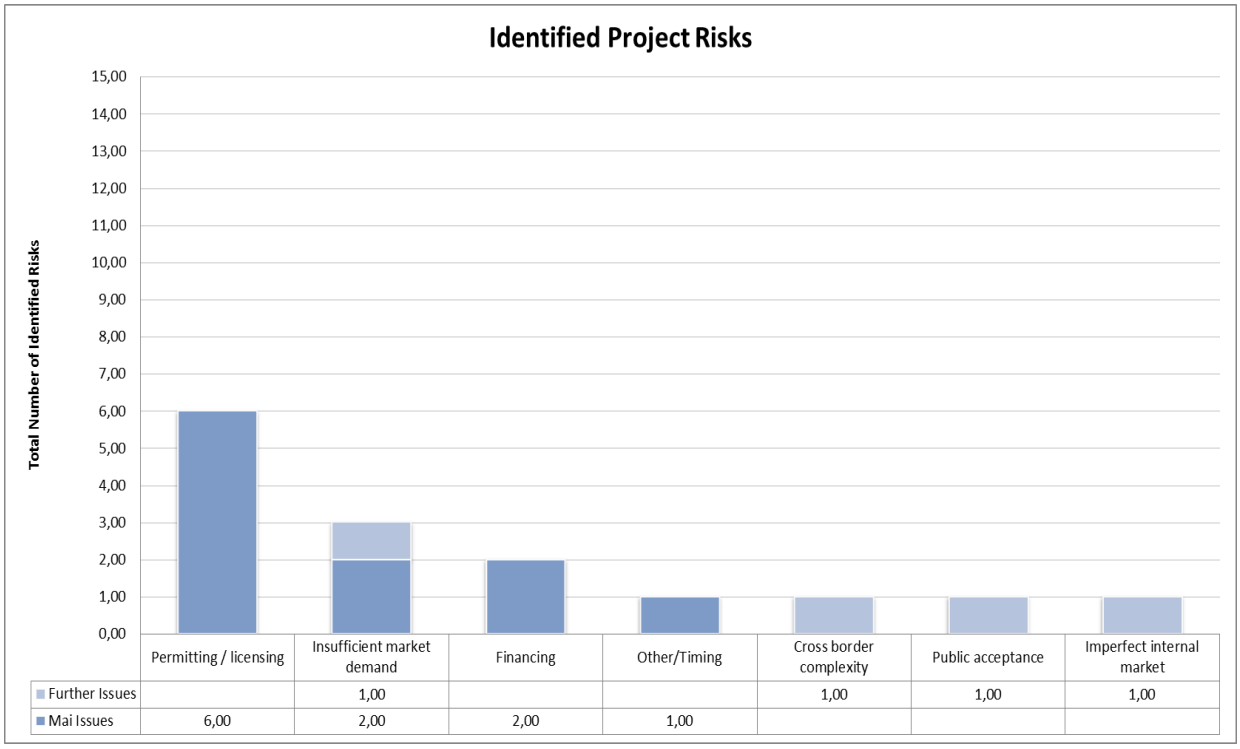

Table 114 – Identified Project Risks

More than a third of the risks identified are related to permitting issues (6). Other issues mentioned are insufficient market demand (3) and financing (2), followed by public acceptance (1), imperfect internal market (1), cross border complexity (1) and timing (1). In total, 15 issues were indicated, two of which were already solved, one by adopting the legal framework (Poland) and by the implementation of new regulatory measures (Czech Republic).

The answers according to financing risks showed that two countries are affected by financing issues. In one country three competing LNG PCIs are in discussion, but only one should be implemented and potentially receive funding from the EU, the other two LNG PCIs will then not be implemented (Estonia). In the other country the project has not yet received EU funding (Latvia).

In general, all projects at risk mentioned above were delayed.

According to Art 13 of the Regulation, project promotors are allowed to request additional incentives for specific projects incurring higher risks. A project promotor applied for additional incentives for one PCI in only one country (Czech Republic) out of 33 CEER member countries. As a consequence, the rate of return on the PCI concerned was adopted.

8 Overall conclusions

This CEER report has analysed the conditions for investment in electricity and gas networks in individual countries. It provides a general overview of the regulatory practices in place, the desired productivity developments and especially the determination of capital costs and the RAB in the different systems. Whilst this reports examines certain quantifiable (monetary) conditions in the EU Member States and Norway, it is not the intention of this report to paint a complete picture of the existing regulatory framework. For example, the costs of OPEX and their treatment within the regulatory system are not considered in this report. Furthermore, other important factors which are difficult to measure (such as the stability of the regulatory framework or regulatory processes) are not addressed in this report, although they play a key role in the decisions of investors.

When interpreting the figures presented in this report, the regulatory framework must be considered as a whole, as singling out selected parameters would distort the picture. Nevertheless, this report provides detailed information into the regulatory framework and investment conditions in each country, offering helpful insights about the overall attractiveness of the investment conditions in European energy markets.

The report shows that different countries have different characteristics in their respective regulatory systems, which have to be considered. Despite differences in the regulatory system and the specific situation in each country, the variation in the risk-free base rate is not very high. When taking the free premium risk (β varies roughly between 0.5 to 0.8%) into account, it is necessary to bear in mind that it reflects the default risk of the revenue caps.

For the method of asset valuation, the WACC is the preferred method. Whereas the real WACC was used for the profitability calculation of the re-evalued assets, the nominal WACC is used for the assets in historical values.

A separate chapter is devoted to the Regulatory Asset Base (RAB). The RAB can be comprised of several components including fixed assets, working capital or construction in progress. There are thus different variations among the NRAs. According to the survey data, almost all NRAs include the fixed assets in the RAB. In contrast, with respect to the working capital,more than half of the NRAs do not include working capital in the RAB, or use a derived notion of that working, depending on whether the electricity or gas system operator is considered. The “construction in progress” component gives the same result as working capital. Less than half of the NRAs surveyed allow assets under construction in the RAB.

The RAB value is usually linked with depreciation, depending on the NRAs. In gas and electricity regulation, straight line depreciation is applied by most NRAs. The NRAs use different depreciation values, with the majority using the historical values in different variations. The lifetime of the typical network asset ranges from 30 to 50 years and the majority of the NRAs use the individual depreciation ratio for each type of asset.

Not only for CPI’s, beside the remuneration of the capital invested in the RAB, new and considerable incentives appear both to enhance efficient investment and to raising the quality of the services, directly or indirectly related to investment: in those countries the remuneration may not longer be considered on a marginal basis (only related to ‘variable’ investment), but should be appreciatied in a global way.

For a deeper analysis of investment conditions, it would be useful to take a closer look at other fundamental parameters such as costs per unit, share of CAPEX, total expenditures (TOTEX) or the consideration of total costs [€].This could possibly be the focus of a future report in 2017.

Annex 1 – List of abbreviations

Term	Definition
CEER	Council of European Energy Regulators
CAPEX	Capital expenditure
DSO	Distribution System Operator
IFRS	International Financial Reporting Standards
NRA	National Regulatory Authority
OPEX	Operational expenditure
RAB	Regulated asset base
RAV	Regulatory asset value
TOTEX	Total expenditures
TSO	Transmission System Operator
WACC	Weighted average cost of capital

Annex 2 – List of country abbreviations

Abbreviation	Country
AT	Austria
BE	Belgium
CZ	Czech Republic
DK	Denmark
EE	Estonia
FI	Finland
FR	France
DE	Germany
GB	Great Britain
GR	Greece
HU	Hungary
IE	Ireland
IT	Italy
LV	Latvia
LT	Lithuania
LU	Luxembourg
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
SI	Slovenia
ES	Spain
SE	Sweden

Annex 3 – List of tables

Annex 4 – List of questions

Additional questionnaire

	country			
	electricity		natural gas	
	transmission	distribution	transmission	distribution
WACC (Weighted Average Cost of Capital)				
Is allowed profit calculated by the formula RAB * WACC? (if not please describe your approach)				
Is the WACC differentiated by type of RAB (for the same activity), ie, taking into account how the RAB is valued or taking into account the nature of the RAB (ex.: new investments)?				
Is the municipal tax taken into account in the WACC? (If yes, please describe briefly in what way)				
How is the municipal tax evaluated?				
Is the tax shield taken into account in the WACC? (If yes, please describe briefly in what way)				
Components of the RAB (Regulatory Asset Base)				
Are fixed assets taken into RAB?				
Are contributions from the third parties taken into account for the calculation of the RAB? (non-interest bearing liabilities taken, tangible and intangible assets in the amount, which is subsidized by the European cohesion and structural funds)				
If the answer to the previous question is 'yes' please describe the approach (how the inclusion in RAB affects depreciation costs and costs of capital, etc.)				
Is working capital taken into RAB? (if yes please indicate how is this capital calculated or which percentage of fixed asset is included)				
Are assets under construction taken into RAB? (if yes please describe briefly how does this mechanism work)				
Are leased assets included into the RAB? (according to the IFRS)				
If the answer to the previous question is 'no' - are leased assets considered as OPEX?				
Are there any other components that are included into the RAB (e.g. special positions of the balance sheet)?				
Determination of the initial value of RAB for regulatory period.				
Is the RAB exclusively based on historical value of assets?				
Is the RAB exclusively based on re-evaluated assets?				
If previous answer was 'yes' please describe in detail how the re-evaluation of assets influenced the level of RAB. (how is the RAB linked to the re-evaluated assets and the reasons for this decision)				
Is the RAB based on a mixture of historical and re-evaluated assets?				

If previous answer was 'yes' please describe in detail how the level of RAB was set up. (how is the RAB linked to the re-evaluated and historical assets and the reasons for this decision)				
What's the difference (in %) between the RAB defined on net book values according to national GAAP (or IFRS) and the RAB based on re-evaluated asset base? (Please use net book values as the basis for your calculation). (The purpose of this question was to find out if there is the diference between net book value and the RAB. There could be included example of the calculation (net book value = 100 €, RAB 50 €, answer is 50%). The reason is that the regulated companies has done re-evaluation of the assets but the NRA for the regulatory purposes could aproved only part of the assets.)				
If RAB was set up on the basis of re-evaluated assets please indicate:				
Which methodology was applied? (e.g. replacement costs, depreciated optimal replacement costs, economic value, deprival value, optimal deprival value, impairment test - the description of the methods is in the table "methods")				
If Regulated Asset Base (RAB) is evaluated according to market value or replacement cost, which sources are used? (e.g.cost catalogue)				
When was the re-evaluation done (year)?				
Was the re-evaluation done for all companies in the same manner and at the same time?				
Adjustment of the RAB within the regulatory period.				
Is the RAB adjusted during the regulatory period?				
Does the adjustment affect net book values by accounting for new investements and/or depreciation? Please explain your approach.				
Is the RAB adjusted within regulatory period by any kind of escalation index? (if yes please indicate by which index and since when is this method applied)				
Is there any kind of other adjustment addressed which is not mentioned here?(If 'yes' please describe the approach).				
Investment conditions				
What regulatory system is in place? (Cost-plus/ Rate-of-Return Regulation, Incentive-based Regulation [Price-Cap/ Revenue-Cap, Mixture …])				
Does the NRA evaluate investment plans of the companies?				
If the previous answer was 'yes' please describe in detail this approach.				
Is there any incentive scheme for efficient investments decision?				
Is an X-factor/ efficiency requirement applied on the CAPEX?				
Is there any incentive scheme for the efficient use of the CAPEX (ex: to extend the economic/technological asset life or to reduce the energy losses?)				
Is there any incentive scheme for the efficient CAPEX aquisition (for ex., considering standard costs)?				
Does the RAB include budget costs/ additional costs for planned new investments? (If 'no' how long is the time-lag and is there an adjustment for new investments during the regulatory period?)				
Are there any kind of premiums on OPEX for anything (e.g. quality of supply, bonus systems etc.). Does this have any consequeces for the interest rate? (if yes please explain in more detail)				

*The non-interest bearing liabilities comprise provisions, customer advance payments and down payments received, non-interest-bearing trade payables, contributions to construction costs received, including compensation payments of network recipients for grid connection costs entered on the liabilities side, and other liabilities to the extent the funds have been made available to the operator of the supply grids without interest.

Country:
National Regulatory Authority:
Name of the respondent:
E-mail:

If information can not be provided, please fill the cell "na"

Please do not add any addtional rows and columns! If you want to add something, please fill row "Other comments"

QUESTIONS / REMARKS

Parameters	electricity		natural gas			electricity		natural gas	
	transmis-sion	distribution	transmis-sion	distribution		trans-mission	distribu-tion	trans-mission	distribu-tion
Nominal risk-free rate					WACC parameters				
Real risk-free rate									
Debt premium									
Cost of Debt									
Risk premium									
Asset beta									
Equity beta									
Cost of Equity									
Gearing - D/(D+E)									
Tax rate									
Nominal pre-tax WACC									
Nominal post-tax WACC									
Nominal "vanilla" WACC									
Real pre-tax WACC									
Real post-tax WACC									
Real "vanilla" WACC									
If it is possible, provide the formulaes (e.g. in active cells or as a description)									
In case of different methodology than WACC, provide the most important information									

Additional information and comments	electricity		natural gas						
	transmis-sion	distribution	transmis-sion	distribution					
Year of evaluation of "cost of capital" parameters									
Regulatory period (if parameters are set for peri-od)									
Tariff year (if parameters are set for one year)									
Inflation (which can be comparable to the risk-free rate in order to calculate both nominal and real rate)									
How risk-free rate is evaluated?					Evaluation of pa-rameters				
How debt premium is evaluated?									
How equity risk premium is evaluated?									
How beta is evaluated?									
How gearing ratio is evaluated?									
How tax ratio is evaluated?									
Which "cost of capital" is used in tariff calculation?									
How "cost of capital" parameters are actualised?									
Were "cost of capital" parameters actualised as a reaction on the financial crisis?									
Are some kind of premiums on "cost of capital" for anything (e.g. new investments, quality of supply)?									
How Regulatory Asset Base (RAB) is evaluated? (e.g. net book value, replacement cost, re-evaluated value, etc.)					Evaluation of RAB				
Are fixed assets taken into RAB?									
Are assets under construction taken into RAB?									

Is working capital taken into RAB?									
Was RAB re-evaluated?									
If yes, when and which methodology									
Is 100% of RAB used in tariff calculation?									
If no, please quote the renumerated share of RAB and inform, when 100% of RAB will be renumerated.									
Are some kind of premiums on RAB for anything (e.g. new investments, quality of supply)?									
How is the depreciation calculated?									
What is the depreciation ratio for typical network assets?									
Can be above information published by other regulators?									
If not, please indicate which information can not be published.									
Other comments									
Which values of the depreciation are allowed into the regulation? (depreciation of the tangible and intangible assets based on historical values, re-evaluated or mixture of values - please describe briefly your approachand the decision taken by NRA)									
Is an X-factor/ efficiency requirement applied on the OPEX (if yes please describe your approach)?									
Does the NRA have competences to approve investment plans of companies?									
Does the NRA differentiate between replacement investments and new investments?									
If the previous answer was 'yes' please describe your approach.									
Does the regulation contain additional investment incentives / remuneration?									

How are investments included in the regulation (regulatory formula). (please describe your approach)								
Do you account for a time-lag (t-x problem - tariff calculation might for example be based on book values, which causes a certain time-lag (e.g. two years)?								
If the answer to the previous question is 'yes', which mechanism do you apply and how does it work? (e.g. planned values with recalculation after a certain period)								
If possible, please provide the monetary value of regulated assets (aggregated for all companies) on historical cost basis.								
If possible, please provide the monetary value of re-evaluated regulated assets (aggregated for all companies).								
If the RAB is adjusted during the regulatory period please indicate how often.								

About CEER

The Council of European Energy Regulators (CEER) is the voice of Europe's national regulators of electricity and gas at EU and international level. CEER's members and observers (from 33 European countries) are the statutory bodies responsible for energy regulation at national level.

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. CEER actively promotes an investment-friendly and harmonised regulatory environment, and consistent application of existing EU legislation. Moreover, CEER champions consumer issues in our belief that a competitive and secure EU single energy market is not a goal in itself, but should deliver benefits for energy consumers.

CEER, based in Brussels, deals with a broad range of energy issues including retail markets and consumers; distribution networks; smart grids; flexibility; sustainability; and international cooperation. European energy regulators are committed to a holistic approach to energy regulation in Europe. Through CEER, NRAs cooperate and develop common position papers, advice and forward-thinking recommendations to improve the electricity and gas markets for the benefit of consumers and businesses.

The work of CEER is structured according to a number of working groups and task forces, composed of staff members of the national energy regulatory authorities, and supported by the CEER Secretariat. This report was prepared by the Incentives Regulation and Efficiency Benchmarking Task Force of CEER's Implementation, Benchmarking and Monitoring Working Group.

CEER wishes to thank in particular the following regulatory experts for their work in preparing this report: Alexander Lüdtke-Handjery and Roland Görlich.

More information at www.ceer.eu.