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## Sustainable Development Work Stream

# Tendering procedures for RES in Europe: State of play and first lessons learnt

## CEER Public Document

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**INFORMATION PAGE**

## Abstract

This CEER report (C17-SD-60-03) presents the state of play on RES tendering schemes in Europe. In particular, it is intended to provide insight to policymakers on the various competitive bidding procedures for determining the level of support for RES, notably by presenting the different design options selected and providing a first assessment of the schemes in selected Member States.

This report should be read in the context of the current revision of the EU's Renewable Energy Directive under the "Clean Energy for All Europeans" legislative package proposals of November 2016. With this revision, transparent, competitive, non-discriminatory and cost-effective principles are almost certainly to become the standard criteria for RES support schemes across Europe.

## Target Audience

RES operators, energy suppliers, electricity customers, electricity industry, consumer representative groups, network operators, Member States, academics and other interested parties.

## Keywords

Renewables; Support schemes; Competitive bidding procedures; National Regulatory Authorities (NRAs).

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## Related Documents

CEER documents

- Status Review of Renewables Energy Support Schemes in Europe in 2014 and 2015, Ref: C16-SDE-56-03, April 2017
  https://www.ceer.eu/documents/104400/-/-/41df1bfe-d740-1835-9630-4e4cccaf8173

- Key support elements of RES in Europe: moving towards market integration
  Ref. C15-SDE-49-03, 26 January 2016
  https://www.ceer.eu/documents/104400/-/-/28b53e80-81cf-f7cd-bf9b-dfb46d471315

External documents

- Proposal for a directive on the promotion of the use of energy from renewable sources (recast), COM(2016) 767 final/2 https://ec.europa.eu/transparency/regdoc/rep/1/2016/EN/COM-2016-767-F2-EN-MAIN-PART-1.PDF

- Design features of support schemes for renewable electricity, Task 2 report, Ecofys, 2014. https://ec.europa.eu/energy/sites/ener/files/documents/2014_design_features_of_support_schemes.pdf

- Directive 2009/28/EC on the promotion of the use of energy from renewable sources, April 2009. http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0028

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# EXECUTIVE SUMMARY

## Background

National support schemes for renewable energy sources (RES) have been subject to important changes since the adoption of the EU's Renewable Energy Directive in 2009. Further changes were implemented in 2014 when the European Commission introduced its "Guidelines on State Aid for Environmental Protection and Energy". These Guidelines set the general conditions for investments and operating aid for any features of new support schemes through to 2020.

As a result, many features, such as RES producers' balancing responsibility and support level tendering procedures, have since informed the renewable energy debate in most Member States. Following the "Clean Energy for All Europeans" legislative package proposed in November 2016, such transparent, competitive, non-discriminatory and cost-effective principles are almost certainly to become the standard criteria for RES support schemes across Europe.

## Objectives and Contents of the Document

This CEER report focuses on RES tendering procedures as it is one of the significant changes introduced for RES support in the EU. Tendering procedures are instruments to determine the financial level of support for electricity sourced by RES. This report aims to present an overview of the key design elements of RES tendering procedures applied in most Member States (i.e. EU-28 except for Slovakia) along with Norway and Iceland. Where empirical evidence is available, valuable insights on the competitiveness of the tenders, their price development as well as the realisation rate (i.e. the extent to which the proposed RES projects are operational) is provided.

The report firstly presents an overview of tendering procedures for RES in Member States, followed by an analysis of national experiences with technology-specific tenders and technology-neutral tenders. Some key lessons learnt and practical recommendations conclude the report.

## Summary of the Conclusions

This CEER report finds that tendering procedures – rather than administratively-set support levels – have been implemented or are about to be implemented for renewable support schemes in many Member States. Specifically, the report shows that by the end of 2017, 18 out of 29 countries had either introduced tendering schemes (13) or were about to do so (5).

This trend is welcomed by CEER as support levels set through such procedures tend to be of lower cost than administratively-set support levels, especially given the adaptability of this instrument to technological innovation and reduced unit costs in solar and wind. Lower-cost schemes are beneficial for Europe's energy consumers, cost competitiveness and the functioning of the electricity markets. This is important, given that renewable generation is now central to the electricity generation mix in Europe, at circa 30% on average and rising, and last year's ACER/CEER Market Monitoring Report showed that the share of RES charges is typically 13% of the cost of electricity to a European residential consumer. In the long-run, CEER advocates that RES is fully incorporated and integrated into the wholesale electricity markets.

The report finds that 8 countries have technology-specific tenders only, while 2 countries have exclusively applied technology-neutral tenders. Thus, in most cases tendering schemes have been set up as technology-specific rather than technology-neutral. An increasing number of Member States are about to have experience with both types of tendering schemes. Across all technology-specific schemes implemented, offshore wind, onshore wind, PV (solar), and biomass have been the most selected renewable technologies. Furthermore, only 2 Member States have opened their support scheme for cross-border projects.

In terms of the price award mechanism when bids are successful, the pay-as-bid method, where bidders are awarded a support entitlement in accordance to the level of their submitted bid, has been applied in 9 out of the 14 countries researched[1]. Recent tenders have predominantly been set up to determine the level of the reference value for calculating a market premium, i.e. the support payment in addition to the market income. The first tender generation has also been used to determine the reference value for the Feed-in-Tariff (FIT). However, the report shows that a majority of the Member States use Feed-in-Premiums (FIP) rather than FIT. This is in line with CEER's preference, as FIP tends to bring RES closer to real market conditions.

A general decrease in RES support prices is identified from tender round to round. For instance in France, the support price for ground-mounted PV decreased by 51% from 2011 to 2017. However, this does not automatically show the effectiveness of tendering procedures, as other external drivers (e.g. cost of capital and raw material, regulatory changes, strategic behaviour) have influence on the outcome of the tender.

Where empirical evidence is available, the realisation rate of successful bids is generally high. In other words, a high percentage of successfully tendered projects are now operational. This is a key criterion to assess the effectiveness of tendering as an instrument to deliver on the decarbonisation agenda.

Informed by the above findings, CEER has the following key practical recommendations:

- In certain cases (i.e. with complex technologies) it can be beneficial to pre-select candidates based on their financial and technical capabilities. These candidates can then be consulted together with the grid operator to discuss the tender procedure and to ensure that a tender scheme is designed with an optimised allocation of the risks.
- Ensure that the body implementing tendering procedures has decision-making independence such that political interference is excluded and thus providing trust for market participants and energy consumers in the system.
- The administrative burden for all those involved in the tender should to be limited, but the fairness, transparency and quality of the tender always must be ensured. Evaluation processes where feedback can be given are advised to improve this process.
- Set financial guarantees and penalties for non-realisation of tendered projects to maximise the realisation rate of winning bids. Additional option is to set specific material prequalifications such as to provide robust business plans.
- Avoid a multiplicity of support schemes applying to a single RES project.
- Bidders should be prevented from switching between tender rounds to realise the project with the tender awarding the highest price. This situation may arise when the penalties for non-realisation are too low and the price outcome of other tenders are higher. Thus, there should be specific rules against such gaming behaviour by tender candidates.

[1] Hungary is included in this data set, legislation for RES tendering procedures has been passed in the country, but the implementation has not yet commenced.

# 1 Introduction

National support schemes for renewable energy sources (RES) have been subject to important changes since the adoption of the EU's Renewable Energy Directive (RED)[2] in 2009. Further changes were implemented from 2014 when the European Commission introduced its "Guidelines on State Aid for Environmental Protection and Energy" (EEAG)[3]. These Guidelines set the general conditions for investments and operating aid for any features of new RES support schemes through 2020.

As a result, many of these features, such as RES producers' balancing responsibility and support level tendering procedures, have since informed the renewable energy debate in most Member States (MS). Following the expected adoption of the revised RED by the end of 2018, as one element of the "Clean Energy for All Europeans" legislative package proposed by the European Commission in November 2016, such transparent, competitive, non-discriminatory and cost-effective principles are almost certainly to become the standard criteria for RES support schemes across Europe.

***Purpose of this report***

This CEER report focuses on RES tendering procedures as it is one of the significant changes introduced for RES support in the EU. The report will give an overview of the RES tendering procedures in Member States[4], i.e. by presenting the key design elements and the technologies selected. Furthermore, the report will provide examples from countries having already gained considerable experience with tendering procedures, which could deliver valuable insights to policymakers on the possibilities and challenges posed. Where empirical evidence is available, insights on the competitiveness of the tenders, their price development as well as the realisation rate (i.e. the extent to which the proposed RES projects are operational) is provided.

***Structure of the report***

The report is structured as follows:

- Overview of tendering procedures in the MS;
- Experiences with technology-specific tenders;
- Experiences with technology-neutral tenders; and
- Key lessons learnt and practical recommendations.

[2] Directive 2009/28/EC: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32009L0028

[3] Guidelines on State aid for environmental protection and energy 2014-2020, European Commission, June 2014, 2014/C 200/01.

[4] EU-28, with the exception of Slovakia, along with EEA members Iceland and Norway (which reflects CEER's membership).

# 2 Tendering procedures for RES in Europe

## 2.1 Main elements of national tenders for RES support

The main objective of a tender as a competitive bidding procedure is to determine cost-efficient support levels for RES technologies. Different types of schemes exist; however, all of them require a thorough and consistent design and a sufficient level of competition to be effective. In principle, there are two main categories of competitive procedures, namely:

- **Price-based tenders,** where the bids with the lowest offered support levels will be awarded; and
- **Multi-criteria tenders**, where the awarding of a bid is subject to an evaluation of various criteria.

The outcome of the tender is a level of support (i.e. per kWh) for RES producers. In general, this can either be the Feed-in Tariff (FIT) or the reference value for the Feed-in Premium (FIP). Alternatively, it can be the basis of a capacity payment per installed kW, paid out once or on a regular basis.

The set-up of a competitive bidding scheme may vary substantially depending on political priorities, the competitive market environment of RES technologies and the legal framework within each country. Tendering designs can encompass a great number of criteria, which can be grouped into the following ten categories:

1. **Eligibility of RES technologies**: technology-neutral vs. technology-specific;
2. **Pricing rule** (e.g. pay-as-bid or uniform pricing);
3. **Price caps** (minimum/ maximum bid level);
4. **Participation criteria** (e.g. size, type of candidates, national vs. cross-border);
5. **Prequalification criteria** (e.g. financial securities, technical requirements such as building permits, land use planning);
6. **Selection criteria** (e.g. price per KW or per kWh, volume, local content, environmental impact, etc.);
7. **Tendered volume**;
8. **Frequency of tendering rounds**;
9. **Penalties** (for non-compliance or different realisation time as foreseen); and
10. **Tradability** of support entitlements.

The design options are not exclusive and can be combined within one bidding scheme.

More detailed information regarding the design options and the outlined criteria is provided in the CEER report “Key support elements of RES in Europe: moving towards market integration”[5].

[5] C15-SDE-49-03: https://www.ceer.eu/documents/104400/-/-/28b53e80-81cf-f7cd-bf9b-dfb46d471315

## 2.2 Current RES Tenders

In order to comply with the in 2014 adopted EU Guidelines on State Aid for Environmental Protection and Energy (EEAG), EU Member States are required to introduce competitive tendering procedures for determining the level of operational support granted to RES installations from 2017 onwards[6].

As indicated in Table 1 below, by the end of 2017, 13 countries had implemented tendering procedures for one or more RES technologies. In addition, by the end of 2017, 5 countries have just passed or were about to adopt the relevant legislation, paving the way for implementing tenders for RES in 2018 and beyond. 11 countries indicated they do not have any concrete plans for introducing tendering procedures in the short term. Not all countries had a legal obligation through the EEAG to apply competitive tendering procedures and did not voluntarily introduce tendering schemes.

| Status | Countries (n=29 responses) |
|---|---|
| **One or more tendering scheme process in place** | **13**: Belgium, Denmark, France, Germany, Greece, Italy, Malta, Netherlands, Lithuania, Portugal, Poland, Spain and United Kingdom |
| **Legislation in place or about to be adopted, first concrete tendering round outstanding** | **5**: Croatia, Finland, Hungary, Luxemburg, Estonia |
| **No concrete plans for introducing tenders in the short term** | **11**: Austria, Bulgaria, Czech Republic, Cyprus, Iceland, Ireland[7], Latvia, Norway, Romania, Slovenia, Sweden |
| **Tendering scheme discontinued** | **2**: Norway, Italy |

*Table 1 – Overview of implementation status of tendering procedures[8]*

The information of Table 1 is further displayed in Figure 1 on the next page.

[6] In a transitional phase covering 2015 and 2016, only 5% of the planned new electricity capacity from renewable energy sources needed to be tendered through a bidding process. Additionally, financial support may also be granted without a competitive bidding process for installations with an installed capacity below < 1 MW (6 MW or 6 generation units for wind onshore). See 2014/C 200/01.

[7] The Irish department responsible for energy matters issued a consultation in November 2017 on the introduction of a new RES auction to replace the existing, non-auction based FiT scheme.

[8] Information displayed is primarily based on information provided by CEER members.

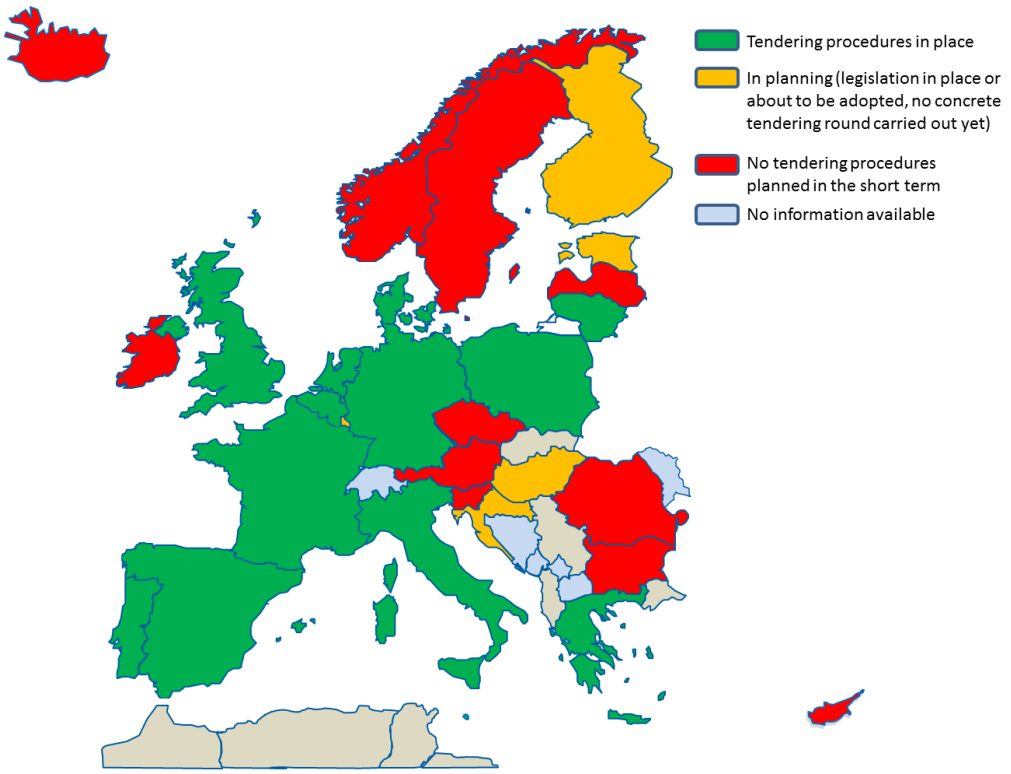


Figure 1 – Overview of implementation status of RES tendering procedures

According to the EEAG, competitive bidding procedures should in principle be open to all RES generators, i.e. technology-neutral. However, if this approach leads to suboptimal results, for example due to network constraints or diversification needs, bidding processes can be designed to be technology-specific.

In total, 8 countries have technology-specific tenders. Figure 2 illustrates that technology-specific tenders are applied more often than technology-neutral tenders. Technology-specific tenders primarily focused on the following RES technologies: offshore wind (6 MS), onshore wind (5 MS), solar (5 MS) and biomass (5 MS).

So far, only 5 Member States (Poland, Portugal, Spain, the Netherlands, and the United Kingdom) have implemented technology-neutral tenders, with 2 Member States (Poland and Spain) having exclusively technology-neutral RES tenders. In France[9], Greece, Hungary and Germany[10], the legislation for technology-neutral tenders has been passed and the implementation of tendering rounds is expected to be carried out in 2018.

[9] In addition to technology-specific tenders, a technology-neutral tender for PV and onshore wind installations has been launched in France in December 2017 with the deadline for submitting the bids in September 2018.
[10] In addition to technology-specific tenders, Germany will organise two rounds of technology-neutral tenders for PV and onshore wind on a pilot basis from 2018 to 2020.

Several Member States selected other RES technologies or applications for their tendering schemes such as hydro (France, Italy, Lithuania, and Portugal), geothermal (Italy), Concentrated Solar Power (Italy) and self-consumption installations (France). Tendering procedures have also been introduced for determining support levels for electricity stemming from combined heat and power (CHP) installations (i.e. Germany and France[11]). However, these installations are not necessarily RES based.[12]

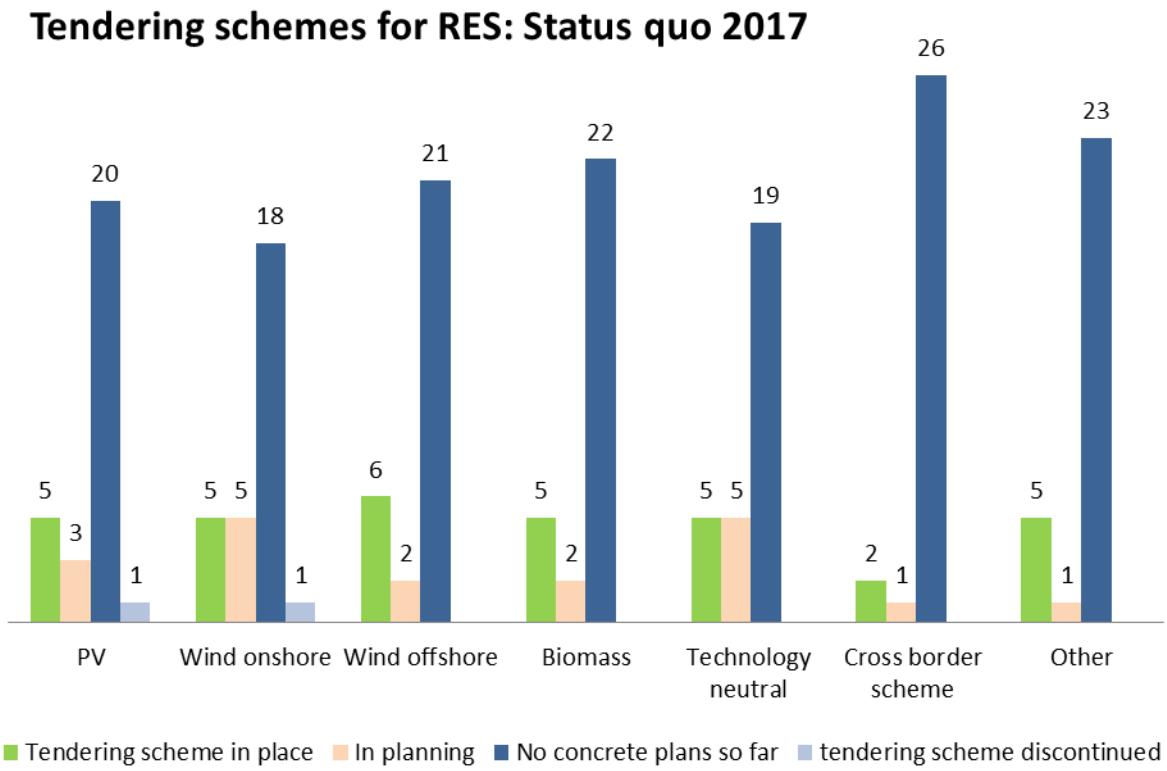


Figure 2 – Tendering schemes for RES: Status quo by RES technologies 2017(n=29)

In 2014 Italy decided to discontinue its tendering scheme for PV, which was introduced two years before.[13] Norway had previously introduced a tender for onshore wind but discontinued the scheme.

The planned tenders in countries where the relevant legislation is recently or about to be adopted are predominantly planned for onshore wind (5MS) and technology-neutral (5 MS).

Most implemented schemes were restricted to national RES projects, only two Member States have opened their support scheme for cross-border projects.

A comprehensive overview of implemented and planned tenders by country and technology is displayed in Table 2.

[11] It consists in a temporary support allocated by a tender to transform existing gas-fired CHP into biomass fueled CHP.
[12] See annex 2 for more information about the schemes.
[13] The Italian tender scheme for PV was in place from 2012 up to 2013. After 2013, no more incentives have been defined for PV.

| | RES Technologies (year in which tendering process has been carried out for the first time or is planned) | | | | | | |
|---|---|---|---|---|---|---|---|
| | PV | Wind onshore | Wind offshore | Biomass | Technology neutral | Cross border scheme | Other |
| AT | | | | | | | |
| BE | | | | 2016 | | | |
| BG | | | | | | | |
| HR | 2018 | 2018 | 2018 | 2018 | | | Small hydro, geothermal, CHP - 2018 |
| CY | | | | | | | |
| CZ | | | | | | | |
| DK | | | | | | 2016 (PV with Germany) | |
| EE | | | | | | | |
| FI | | | | | 2018 | | |
| FR | 2011 | 2018 | 2011 | 2003 | 2018 (wind & PV) | | hydroelectric (2016), CHP (2016), self-consumption (2016) |
| DE | 2015 | 2017 | 2017 | 2017 | 2018 (wind & PV) | 2016 (PV with Denmark) | 2017 (CHP) |
| EL | 2016 | 2017 | | | 2018 (wind & PV) | | |
| HU | | | | | 2018 | | |
| IE | | | | | | | |
| IS | | | | | | | |
| IT | 2012 - 2013. No more incentives are defined for PV | 2013/2016 | 2013/2016 | 2013/2016 | | | 2013 (geothermal and hydro) 2016 (geothermal and CSP) |
| LV | | | | | | | |
| LT | | 2013 | | 2013 | | | 2013 hydro |
| LU | 2018 | | | | | 2018 | |
| MT | 2017 | | | | | | |
| NL | | | 2015 | | 2011 (Solar PV, Solar Thermal, Wind onshore, Biomass, Water & | | |
| NO | | | | | | | |
| PL | | | | | 2016 | | |
| PT | 2010 | 2005 | | | 2011 | | 2010 small hydro |
| RO | | | | | | | |
| SI | | | | | | | |
| ES | | | | | 2016 (latest round 2017 only for PV & onshore wind) | | |
| SE | | | | | | | |
| UK | | | 2009 | | 2015 | | |

Implemented

No plans so far

Discontinued

Legislation in place or about to be adopted. Concrete tendering round outstanding.

*Table 2 – Overview tendering schemes for RES in European countries*

## 2.3 NRA's role in the tendering landscape

The design of a tendering scheme for determining the level of RES support falls in the remit of the national Ministry, while the implementation of the tendering procedures may be the task of different public or private entities.

In some Member States, such as in Germany, Greece, France, Hungary, Lithuania and Poland, the national regulatory authority (NRA) is in charge of carrying out the tenders. Alternatively, the implementation of the process may also be delegated to a public-interest company, as is the case in Italy, the Netherlands and in the United Kingdom. In Malta a division of responsibilities is identified, the Ministry for Energy and Water and the Agency for Energy and Water are in charge of the implementation while the Maltese NRA only provides certain resources. In other words, the NRAs do not always play a role in the implementation of tendering procedures.

In general, the practical implementation of a tender encompasses a range of activities, such as:

- Preparation and publication of tendering documentation (explanation of the procedure, forms to be submitted by the bidders, etc.);
- Information service for potential bidders (e.g. service hotline, email account, etc.);
- Preparation of an electronic platform for submitting the bids;
- Database for administration of the bids and awards; and
- Evaluation of bids and publication/ analysis of results.

# 3 Experiences with technology-specific tenders

## 3.1 Experiences with tenders for PV projects

By the end of 2017, 5 Member States (France, Germany, Greece, Malta and Portugal) have introduced tendering procedures for different categories of PV projects, such as ground mounted PV, rooftop PV, carport PV and/ or Concentrated Solar Power (CSP). In the following sub-chapter, the main elements of the tender, along with the main empirical evidences gathered regarding price development, level of competition and realisation rate (i.e. the extent to which the proposed RES projects are operational) are presented.

### 3.1.1 Main elements of PV tendering schemes

Regarding the selected design criteria, the following evaluation is based on information provided by the MS.[14]

| Elements of PV auctions | Empirical findings |
|---|---|
| **1. Category of auctions** | PV auctions in France and in Germany have been implemented for different categories of installations, either defined by their size (e.g. small, medium or large scale as in France and in Greece) or by type (e.g. rooftop in France or ground mounted in France and in Germany). In Malta only one basket covering all PV installations has been used. |
| **2. Determined value through auction** | The aim of all PV auctions implemented so far has been to determine a **reference price level per kWh**, either as a basis for a **FIT** (auctions before 2016 in France or for installations ≤ 10 MW in 2016 in Greece) of for a **FIP**. |
| **3. Pricing rule** | **Pay-as-bid is being used as the standard price finding mechanism**, although Germany has experimented with a uniform pricing mechanism for two rounds in the context of a pilot scheme for ground mounted PV. |
| **4. Participation size** | A **minimum participation size has been defined in all schemes** ranging between 100 and 1.000 KW, while a **maximum size** ranging between 250 and 17.000 KW has been used. Malta did not define a maximum size for participation nor did Germany in the case of PV installations other than ground mounted PV (10 MW). |
| **5. Key selection criteria** | Germany, Greece and Malta in principal used **single criteria price based tendering schemes**. While in France price is always the main criteria, other criteria such as environmental impacts, contribution to R&D and/ or the stage of the project development can play a role as well. |
| **6. Material prequalifications** | Besides Malta, material prequalifications were requested for all national PV tendering schemes. Depending on the PV auction category, a significant number of documents were requested, for example the ISO-certification in France, a guaranty of the investment sum, a building permit, the proof of land-use right, the carbon footprint assessment, the |

[14] More detailed information see annex 2.

| | |
|---|---|
| | administrative identification of the bidder, a business plan, a technical report on environmental impacts, a proof of the contribution to solar R&D or of the innovative technical aspects of the project. In Germany, administrative documents were requested to demonstrate the stage of development of the PV project, e.g. through an approved communal development plan. Projects in advanced stages benefit from reduced financial guarantees as prequalification compared to the remaining bidders. In Greece, a production license and/ or the final grid connection terms or/and interconnection contract and submission of relevant guarantees to the System Operator are part of the material prequalifications. |
| **7. Financial prequalifications** | Apart from past auctions for medium scale PV in France (2011 and 2013), financial prequalifications are requested for all auction schemes ranging from very low (2 to 5 EUR/KW in Germany) to higher values (30 to 100 EUR/kW in France). In Greece a financial guarantee is requested for the participation in the tender (1% of the total CapEx on the basis of a typical project (€1.000.000/MW) and afterwards for the successful bidders (4% of the total CapEx on the basis of a typical project (€1.000.000/MW). In Germany a financial guarantee is first requested for participating in the auction and in a second stage only for successful bidders (20 to 50 EUR/ KW depending on the project status). |
| **8. Setting of minimum/ maximum bid prices** | France set minimum bid prices for the more recently introduced tendering procedures for rooftop PV (42 EUR/ MWh for the last one, 50 EUR/MWh initially), large scale PV and ground mounted PV installations 66 EUR/ MWh for the last one, 95 EUR/MWh initially).). Germany, Greece and Malta did not define minimum prices. However, bid price ceilings were introduced in all tendering schemes for the different PV categories and adapted throughout the rounds. For ground-mounted PV, maximum allowed bid prices ranged from 150 EUR/ MWh to 125 EUR/ MWh in France, between 112.9 EUR/ MWh and 110.9 EUR/ MWh in Germany, and between 104 EUR/MWh and 94 EUR/MWh in Greece. |
| **9. Administrative participation fees** | Germany and Greece opted for charging a small fee for participating in the tendering procedures. In the pilot tendering scheme for ground-mounted PV installations in Germany, bidders were charged 715 EUR when submitting their bids and 615 EUR for the issuance of their support entitlement once the installation is realised. However, unsuccessful bidders are reimbursed 25% of their participation fee. In the Greek PV tendering scheme, bidders are charged 500 EUR for participating. In the PV schemes in France and Malta no specific fee is being collected. |
| **10. Realisation time** | **Similar realisation times foreseen ranging between 18 and 24 months**. Malta and Germany determined a flexible realisation time between 18 and 24 months, whereby the level of support is reduced by 0.3 ct/kWh (DE) and 0.5 ct/kWh (MT) for realisation after 18 months. Delayed realisation after 24 months lead to the full loss of a support entitlement. France foresees a reduction in support time in case of delayed realisation of the PV installation. In Greece, in the context of the PV pilot tender, the realisation time was set at 18 months for smaller projects (up to 1MW) and 24 months for bigger ones. |

| | |
|---|---|
| **11. Duration of support** | Throughout the auctions schemes, **the guaranteed support time for all PV installations is 20 years**. However, Greece is additionally granting the year in which the installation is starting trial operation while the other MS count the 20 years starting from the date on which the installation is put in operation. |

### 3.1.2 Evaluation criteria: competition level, price development and realisation rate

***High level of competition for PV projects***

Ensuring a certain level of competition, i.e. a market situation where the demand for payment supports is higher than the offer (volume auctioned), is one essential prerequisite for a successful auction outcome. Competition is key for delivering lower support payments and will eventually lead to overall lower RES deployment costs to be borne by final energy consumers and taxpayers while triggering the RES industry to bring down technology costs for RES.

Empirical evidence on the level of competition for PV projects has been gathered for France and Germany. This competitiveness indicator has been defined as the level of oversubscription in a tendering round, i.e. how many times the tendered volume had been oversubscribed (e.g. three times when 300 MW was the tendered volume and bids were offered for 900 MW).

Tendering procedures in France have all been successful in ensuring a sufficient level of competition. As shown in Figure 3, tendering rounds for medium scale rooftop PV have been oversubscribed 1.6 to 3.8 times and for large scale rooftop PV between 1.6 and 4.5 times. The level of competition was the highest for ground mounted PV projects, where the tendered volume in 2013 had been oversubscribed 12.4 times. The level of competition is not constant from one tender to another, as important fluctuations can be observed. These variations can be due to multiple causes as the volume auctioned, how many rounds are organised, the level of competition of the industry itself, the preparedness of the project developers, etc.

Competitiveness among PV projects for support payments have also been ensured in the PV tenders in Germany. In the pilot tendering scheme for ground mounted PV, where the rounds were carried out every three months, oversubscription varied between 2.5 and 4.8. In 2017, competition could also be achieved for tendering procedures covering all PV categories, with oversubscription rate ranging between 2.4 and 3.8, see Figure 4.

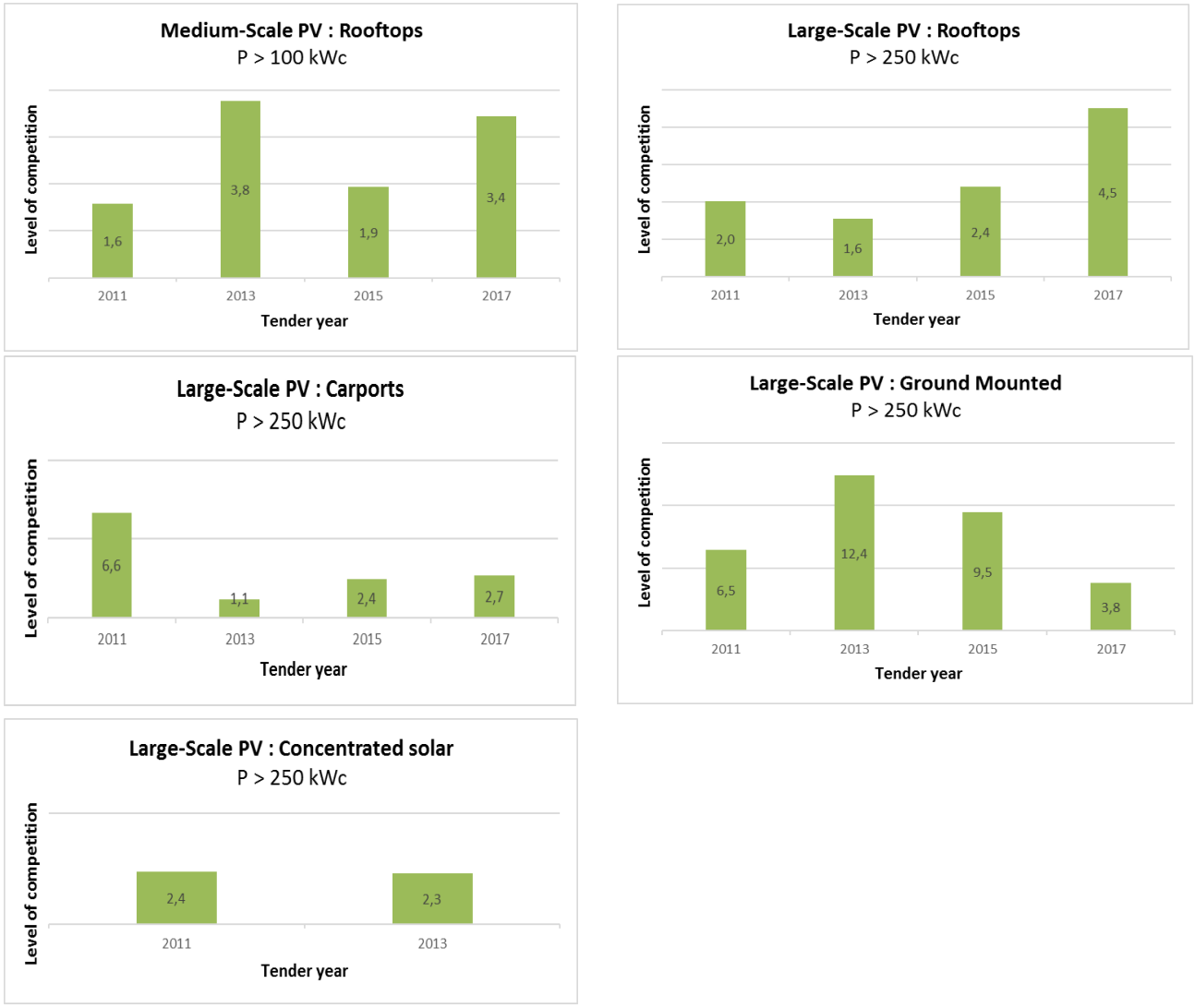


Figure 3 – Level of competition in France in selected PV auctions

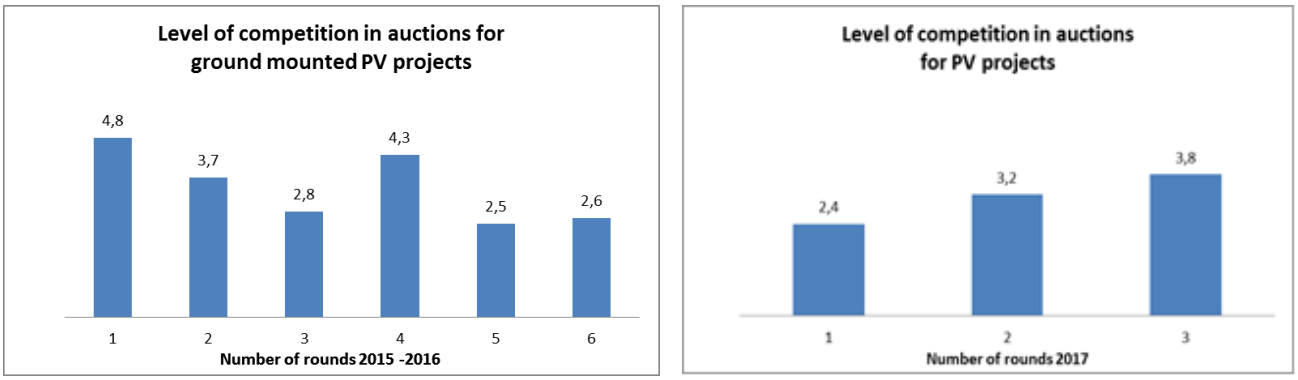


Figure 4 – Level of competition in Germany in selected PV auctions

***Important decrease in support level payments for PV projects***

Besides steering RES deployment, a key aim followed by national governments when introducing tendering schemes as a market-based process for determining the level of support payments for RES projects, is to reduce the overall costs for the deployment of RES in their country. Competition between bidders is a prerequisite for ensuring efficient pricing. As shown in the previous sub-chapter, tendering procedures for PV projects in France and Germany displayed a high level of competition between bidders, an important factor which contributed to downward price developments over the rounds.

In France for example, as shown in Figure 5, the introduction of separate tenders for different categories of PV projects lead to different price developments: For medium and large-scale rooftop PV prices[15] dropped by 51% and for large scale ground mounted PV projects by 61% between 2011 and 2017. For large scale concentrated solar projects, prices were curbed by 21% between 2011 and 2013.

In Germany, experiences gained with the tendering out of support payments for PV projects have been very positive as well in terms of decreasing prices. As shown in Figure 6, the weighted average price for ground mounted PV projects decreased by 25% from 9.17 ct/kwh[16] in the first round (April 2015) down to 6.90 ct/kwh in the last round (December 2016). In 2017, competitive bidding procedures have been introduced for all PV projects, including ground mounted as well as rooftop projects greater 750 KW. After the first three rounds carried out in 2017, the weighted average price had dropped again by 25%, from 6.58 ct/kWh to 4.91 ct/kWh.[17]

For Greece, no trend can be observed yet – except for the pilot PV tender which took place in 2016 – the first round of tenders will be implemented in 2018.

For Malta, the first tender for PV projects has been carried out in November 2017.

[15] Average auction price.

[16] The price cap was set at 11.29 ct/kWh for the first round and 11.09 ct/kWh in the last round.

[17] The price cap for the first round had been set at 8.91 ct/kWh and for the last round in 2017 at 8.84 ct/kWh.

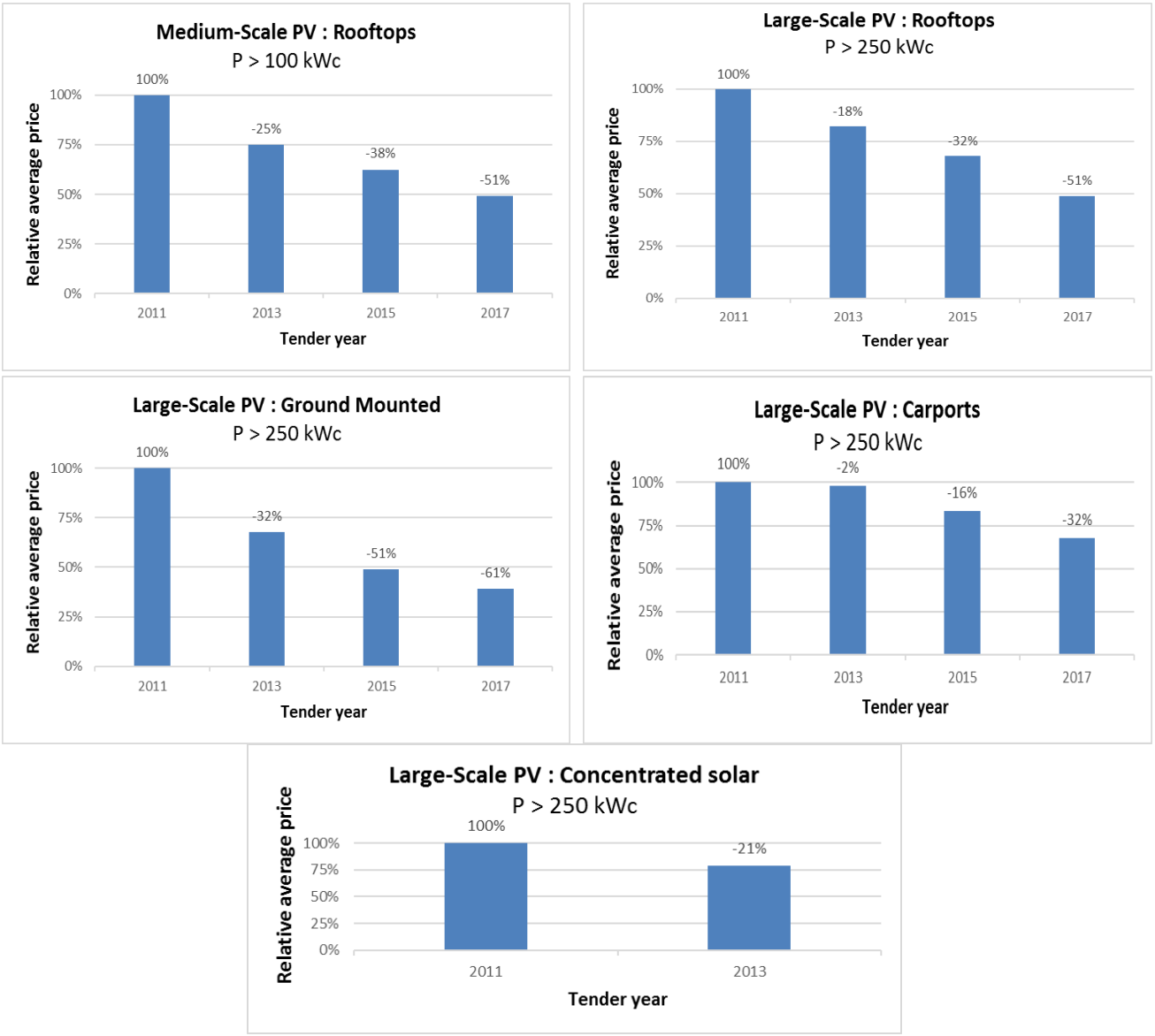


Figure 5 – Relative average price development by PV categories in France

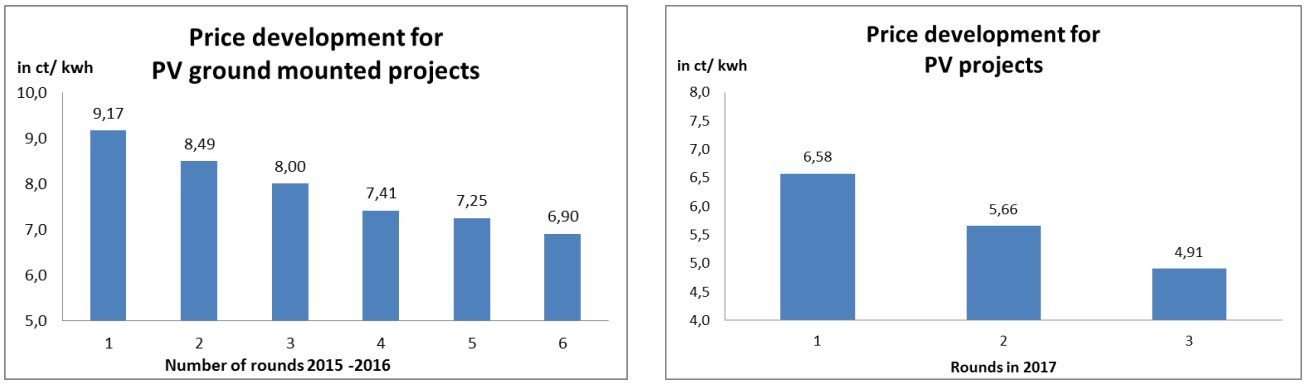


Figure 6 – Weighted average price development in Germany

***High realisation rate for awarded PV projects so far***

In terms of the realisation rate, which is the ultimate criterion to assess the success of a tendering procedure, only little empirical evidence is available at the moment. Figures 7 and 8 show the relevant data for Germany and France that is already available. In France, tenders carried out for different PV categories in 2011 showed realisation rate between 68% and 95% and for the 2013 round between 73% and 93%. Regarding Concentrated Solar Power installations, only just over a third (35%) of the installations from the 2011 round have been realised, while none have been realised so far from the 2013 round.

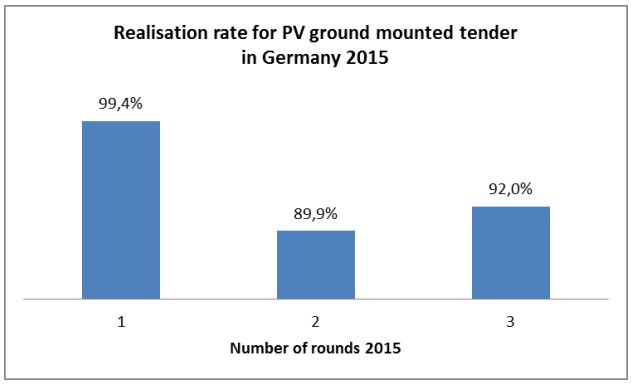


Figure 7 – Realisation rate for PV ground mounted tenders in Germany

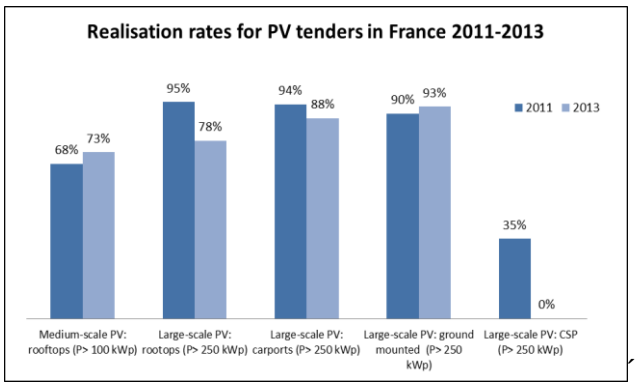


Figure 8 – Realisation rate for PV tenders in France

## 3.2 Experiences with tenders for wind onshore projects

By the end of 2016, 3 MS (Germany, Italy, Lithuania) had introduced tendering procedures for onshore wind projects. In the second half of 2017, France organised the first round of a pluriannual tendering procedure for onshore wind projects. The main elements of these tenders and the main empirical evidences gathered regarding price development, level of competition and realisation rate are presented below.

### 3.2.1 Main elements of tendering schemes for wind onshore projects

Regarding the selected design criteria, the following evaluation based on information provided by the Member States[18] can be provided:

| Elements of onshore wind auctions | Empirical findings |
|---|---|
| **1. Category of auctions** | No differentiation by onshore wind technologies or size can be identified. Germany has differentiated by the nature of the bidder, i.e. defined different prequalifications for professional bidders and local community (citizen) projects. |
| **2. Determined value through auction** | The outcome of the tendering procedure was to determine **a reference price level per kWh**, either as a basis for a **FIT** (Lithuania) or for **FIP** (Germany, Italy, and France). |
| **3. Pricing rule** | There is **no standard pricing rule to be observed** for the tendering of onshore wind projects: Lithuania determines the level of payment by a uniform pricing rule while Italy and France use a pay-as-bid system. Germany follows a hybrid approach, combining pay-as-bid (standard projects with building permit) and uniform pricing (local community projects without building permit) in accordance to the nature of the project submitted. |
| **4. Participation size** | **A minimum participation size has been defined for all tenders so far.** In Germany onshore wind projects must display a capacity of at least 750 KW. In Lithuania all projects over 10 kW must participate in auctions. In France, only projects with at least 7 wind turbines or with at least 1 wind turbine with an installed capacity larger than 3 MW could participate. |
| **5. Key selection criteria** | The majority of tenders were conceived as single criteria price-based schemes. Only in case of bid price equality, offered capacity (largest in LT and smallest in DE) is selected as a second criterion. |
| **6. Material prequalifications** | Besides Lithuania, material prequalifications were requested in all tenders, usually under the form of a building permit (DE), a wind location analysis (DE), an environmental authorisation (FR) or a plant authorisation and connection quote, redacted by the grid operator and accepted by bidder. |
| **7. Financial prequalifications** | These are mostly expressed in relation to the capacity offered or the investment volume and are defined as a fix value in EUR/KW or as a percentage of the investment. In France, the financial guarantee is only due if the bid is selected. |
| **8. Setting of minimum/ maximum bid prices** | Italy has defined a minimum bid price (60% of the base tariff) while the remaining MS with onshore wind auctions rather defined a ceiling price for participation in order to avoid the risk of overcompensation. |
| **9. Administrative participation fees** | Germany (522 EUR) and Italy (2,200 EUR) opted for charging a fee for participating in the tendering procedures. Unsuccessful bidders in the German tenders are reimbursed 25% of their participation fee. |

[18] More detailed information see annex 2.

| | |
|---|---|
| **10. Realisation time** | **The realisation time is between 2.5 and 3 years**. Delays lead to the full loss of a support entitlement. In France, the duration of the FIP will be reduced by the duration of the delay. Local Energy Community wind projects in Germany benefit from an additional 24 months for realisation, which is foremost necessary for the issuance of a building permit. |
| **11. Duration of support** | In Germany, France and Italy support is guaranteed for **20 years** starting from the date on which the installation is put in operation. In Lithuania, support is granted **only for 12 years**. |

### 3.2.2 Evaluation criteria: competition level, price development and realisation rate

***Competition among bidders achieved in all tenders***

In general, for all tenders carried out for onshore wind projects, a high level of competition can be observed. In Italy, tenders have been oversubscribed 2.5 times, similar to tenders in Germany, where all rounds have been oversubscribed at least 2.6 times (see Figure 9). The round organised in 2017 in France was oversubscribed 1.8 times. Onshore wind tenders have also been oversubscribed in Lithuania (see Table 4).

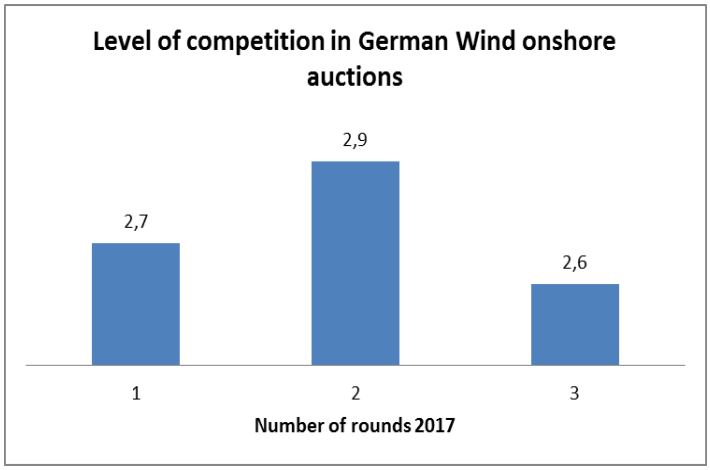


Figure 9 – Level of competition for onshore wind projects in Germany

***All tenders led to reduced price levels***

The price level or the level of the reference value[19] for a support payment, as one central outcome of the tender, has been reduced in all onshore wind tenders implemented so far. In Germany, the reference value for setting the level of the market premium payment for onshore wind projects decreased by 33% within three tendering rounds in 2017 (see Figure 10). In Italy, a decrease of 25% within three rounds and in Lithuania of 12% could be achieved.

[19] The reference value is calculated to cover all costs (investments, inflation, operation, connection to the grid, etc.) over the lifetime of the installation (20 years).

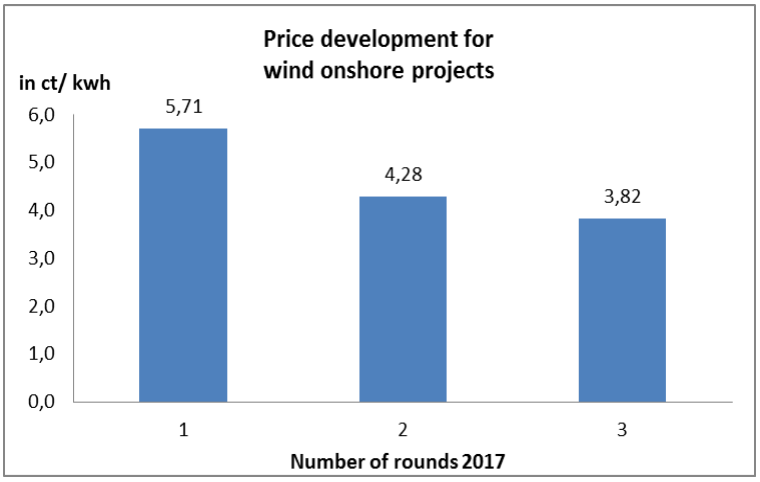


Figure 10 – Price development for wind onshore projects in Germany

The onshore wind tendering scheme in Germany introduced specific rules for citizen's energy companies, which had an impact on the level of competition, i.e. the level of participation, as well as on the price development. Such community energy companies, as defined in the underlying German RES legislation[20], were allowed to participate in the tender without holding a building permit and only had to provide a wind location analysis, showing the wind quality in the location where the project was planned. Furthermore, a pay-as-cleared price awarding mechanism instead of a pay-as-bid applied to them. In addition, when successful in the tender, the citizen's energy companies have an additional 24 months (thus in total 54 months) to realise their projects compared to the other participants. With these specific conditions, the participation rate of citizen's energy companies was very high with far lower price bids than the other bidders.

As a result, over 95% of the successful bidders in the three tendering rounds in 2017 were citizen's energy companies. They were able to bid at lower prices since they could count on a further cost decrease for wind turbines in the coming two years while the other bidders had to stick to the costs of currently available wind turbines on the market for which they were already holding a building permit. This specificity explains the important price fall between the first and the last round. The first tendering procedure for onshore wind in 2018, where all bidders were only allowed to bid with a valid building permit led to an increase in the average awarded price level (4.73 ct/kWh) and a dramatic reduction in the participation of citizen's energy projects (20%).

### *High realisation rate observed*

The realisation time for onshore wind tenders is ranging between 2.5 and 3 years. No empirical data is yet available for recently carried out tenders. However, positive experiences have already been noted, with realisation rates above 85% in Italy and in 2016 100% realisation of all awarded projects of the tenders organised between 2013 and 2015 in Lithuania.

In Germany, realisation rates are yet not observed. However, for the three rounds in 2017 where citizen's onshore wind projects were allowed to participate without a building permit, a high level of uncertainty is already given regarding their realisation. Indeed, realisation could be jeopardised due to the following factors:

[20] §3 Nr.15 Renewable Energy Sources Act (EEG).

- No building permit will be issued;
- The awarded bid is too low to realise the project (winner's curse);
- The support entitlement awarded is dropped in case a participation in another tender leads to a higher awarded price; and
- The legal requirements for qualifying as citizen's project cannot be observed throughout the time period prescribed (from the submission of the bid until 2 years after realisation of the project) leading to a fall back of the awarded price (uniform price) to the offered price in the tender. This price could then be too low to realise the project.

The participation of citizen's projects in a very early stage of development (e.g. no building permit) in combination with low(er) financial prequalifications led to the above-mentioned challenges. Based on this experience, the German government adapted the legislative framework making building permits a compulsory requirement for all bidders in an onshore wind tender.

## 3.3 Experiences with tenders for wind offshore projects

By the end of 2017, 6 Member States (Denmark, France, Germany, Italy, the Netherlands and the UK) had introduced tendering procedures for offshore wind projects. The main elements of these tenders and the main empirical evidence gathered regarding price development, level of competition and realisation rate are presented below.

### 3.3.1 Main elements of tendering schemes for wind offshore projects

While Germany, Italy and the UK implemented constant rules for their auctions, the Netherlands is adapting the rules after each round. France conducted two auctions (in 2011 and 2013) on pre-identified areas (5 in 2011 and 2 in 2013). Regarding the selected design criteria, the following evaluation based on information submitted by the MS[21] can be provided.

| Elements of offshore wind auctions | Empirical findings |
|---|---|
| **1. Category of auctions** | Germany and Italy use schemes with predefined number and volume of rounds whereas the Netherlands change conditions each time. Germany distinguish further by existing projects whose earliest starting time would be 2021 and new developed projects which won`t start before 2026. The UK has implemented a tendering scheme which considers price and project quality. In France, the zones were already identified as favourable but the development of the projects had not been conducted before the tender. |

[21] For more information see annex 2. Information is available only for selected Member States, notably for those, where the NRA is in charge of implementing the tendering procedures. Information about the wind onshore tenders in Denmark can be consulted under https://ens.dk/sites/ens.dk/files/Globalcooperation/offshore_wind_development_0.pdf

| | |
|---|---|
| **2. Determined value through auction** | Determination of a reference price level per kWh, either as a basis for a FIT (NL, FR) or a FIP (DE/ IT). Only the UK award licences to Offshore Transmission Operators (OFTOs) to own and run offshore transmission links for duration of 20 years. |
| **3. Pricing rule** | Pay-as-bid is in general used as pricing rule. The UK implemented a multi-round pay-as- bid auction. |
| **4. Participation size** | To participate in German offshore wind auctions bids have to be at least 750 KW. Italy requests for turbines to be bigger than 5 MW. The UK has no lower limit and the Netherlands change it round by round. In France, the maximum sizes of the projects were imposed by the procedure, either 500 or 750 MW depending on the site. |
| **5. Key selection criteria** | A tendency towards single criteria price-based tendering schemes can be observed. Only the UK tenders consider the project quality as a second criterion of selection. In France, the evaluation of the project was based on price, industrial development and environmental impacts. |
| **6. Material prequalifications** | Germany only request the ownership of an existing project in the early auctions from 2017 to 2020, whereas Italy requests a plant authorisation and connection quote, redacted by the grid operator and accepted by the proposing subject. The UK implemented a special questionnaire for bidders to evaluate their participating status. |
| **7. Financial prequalifications** | Usually linked to the bid or investment volume and to be payed as defined as a fix amount in EUR/KW (e.g. 100€/KW in the early German auctions) or as a percentage of the investment. In some cases (Italy) it is a two-step security in which the second part of the security only has to be payed after winning the award. Furthermore, Italy and the UK request a declaration of economic strength. In France, the details of the investment and of business plan were required, the bidder had to demonstrate his financial capability. |
| **8. Setting of minimum/ maximum bid prices** | Italy defined a minimum bid price (60% of the base tariff) while the other MS defined no minimum prices. Except for the UK ceiling prices for participation in order to avoid the risk of overcompensation were implemented. No maximum bid prices were implemented in France but the government has the right to declare the tender unfruitful, which it did for one project. |
| **9. Administrative participation fees** | Germany (4,727 EUR) and Italy (2,200 EUR) opted for charging a small fee for participating in the tendering procedures. The UK has no participation fees but charges at a later stage of the project. |
| **10. Realisation time** | Only Italy has implemented a strict realisation deadline of 43 months. In Germany it is closely connected to the grid connection while in UK only the estimated realisation time is two years. In the Netherlands, after granting the permit, the realisation deadline is 5 years. |
| **11. Duration of support** | Except in the Netherlands all countries tender a support period of 20 years. |

### 3.3.2 Evaluation criteria: competition level, price development and realisation rate

No offshore wind projects for which the support has been determined by an auction in France, Germany or Italy has been realised so far.

## 3.4 Experiences with tenders for biomass projects

By the end of 2017, 5 MS (Belgium, France, Germany, Italy and Lithuania) had introduced tendering procedures for biomass projects. France's experience with tendering procedures for biomass projects is dating back to 2003, while the other Member States introduced this instrument more recently. France and Lithuania have already implemented five and four tenders respectively, while the remaining MS only had one round each. Croatia has indicated to start with tendering procedures for biomass in 2018. This procedure is still under discussion in Estonia. All other MS are not planning to introduce competitive bidding procedures for this specific technology in the near future.

The main elements of these tenders as well as the main empirical evidences gathered regarding price development, level of competition and realisation rate are presented below.

### 3.4.1 Main elements of tendering schemes for biomass projects

Regarding the selected design criteria, the following evaluation based on information provided by the MS[22] can be provided:

| Elements of biomass auctions | Empirical findings |
|---|---|
| **1. Category of auctions** | In France tendering procedures have been applied for wood-energy projects (in 2003, 2006, 2008 and 2010) as well as for wood-energy and methanisation (2015). Lithuania also organised different tenders for biomass and biogas, in accordance to their installed capacity. In Germany, one tender has been carried out covering both new and existing biomass projects. In Belgium and Italy, no specific categories have been defined. The auctioned volume for biomass projects tend to be rather small, ranging between 50 MW (Italy) up to 60 MW (currently in France, while in the past, the majority of tenders covered approximately 200 MW). |
| **2. Determined value through auction** | All recent tenders aimed at determining the reference value for calculating the market premium (monthly or hourly), while the outcome of those carried out up to 2010 were used as a reference value for setting the Feed-in Tariff (France 2003 – 2010). In Belgium tendering has been used to set the reference banding factor for support certificates, which can be converted in a Feed-in Premium equivalent. |
| **3. Pricing rule** | **Pay-as-bid** can be observed as **the general price awarding mechanism** throughout all tendering procedures introduced so far for biomass projects. Only Germany used a hybrid approach, combining pay-as-bid for new biomass projects and existing larger ones |

[22] More detailed information see annex 2.

| | |
|---|---|
| | (installed capacity > 150 KW) and uniform pricing for smaller biomass installations already in operation. |
| **4. Participation size** | The minimum size for participation varies greatly between countries and tendering procedures: Belgium (20 MW), Italy (5 MW) and France (0.3 -12 MW) tendering focus was on rather large biomass projects. In Germany no minimum threshold has been defined for existing plants (bidding for a prolongation of support) and a low one for new projects (150 KW). For wood-energy and methanisation, France also opted for covering small project sizes (300 KW). |
| **5. Key selection criteria** | In terms of used selection criteria for defining the successful projects, no general approach can be observed as both multi-criteria and price-based tendering schemes have been used. Germany, Lithuania and France for its most recent tender, used the price offered as the only relevant criteria for selection and the volume in case of price equality. More precisely, if the last projects necessary to reach the volume auctioned are ranked ex-aequo, all these projects could be selected in France. Interestingly, Germany gives priority to smaller projects while Lithuania to the larger projects. Belgium and France (between 2003 and 2011) opted for multi-criteria selection processes in their biomass tenders, covering different criteria such as price, volume, sustainability aspects, supply plans and the localisation, and attributing them different weight factors. |
| **6. Material prequalifications** | A wide range of material prequalifications have been defined for the participation of biomass project, e.g. building permit, sustainability criteria, or business plans. Only for the participation of biomass projects in Lithuania were no specific documentation requested. Currently, the only notation criteria for France is the price, the other aspects of the project such as the supply plan (in order to deal with conflicting local uses of the resource) have to be exposed by the bidder (otherwise the offer will be eliminated) but do not constitute quantitative criteria. |
| **7. Financial prequalifications** | Financial security has been requested in general, from a simple monetary payment in EUR per KW offered to proof of sales, financial statements and underlying business plans (Belgium). In the first biomass tenders in France (2003-2008) no financial guarantee has been requested while the material prequalifications were rather exhaustive. For the last tender which was launched in 2015, a financial guarantee of 50 k€/MW was requested though. |
| **8. Setting of minimum/ maximum bid prices** | In terms of bid price limitation, most MS did define a price ceiling while a minimum price floor was only introduced in two tender schemes (wood-energy methanisation in France and in Italy). |
| **9. Administrative participation fees** | Fees have been charged in Germany (522 EUR) and in Italy (2,200 EUR). In Belgium, Lithuania and France bidders could participate free of charge. |
| **10. Realisation time** | Project realisation time varies mainly between **24 months (DE) and 36 months (FR, LT)**. Belgium grants a longer time period (48 to 72 months). |

| | |
|---|---|
| **11. Duration of support** | In general, 20 years of support time is allocated to the biomass projects. In Lithuania support is granted for 12 years while in France, in the tendering procedures carried out in 2003, support time was limited to 17 years. In Germany, already installed biomass installation successfully participating in a tender can extend their support period by 10 years. |

### 3.4.2 Evaluation criteria: competition level, price development and realisation rate

Information on the relevant criteria for assessing the success of a tendering procedure has been provided by Belgium, France, Germany, Italy and Lithuania.

***Mixed experience with level of competition for biomass projects***

The experience concerning the level of competition gained with biomass tenders is mixed. Both Lithuania and France experienced high level of competition with all tender rounds being oversubscribed. In France, the level of competition increased between the rounds, see Figure 11. While the first round in 2008 has been oversubscribed 1.3 times, the last round in 2015 was three times oversubscribed.[23]

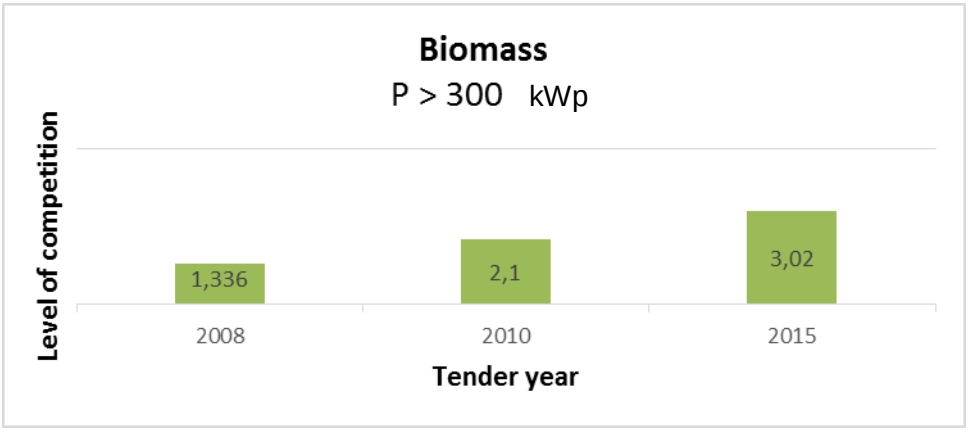


Figure 11 – Level of competition in biomass tenders in France

On the other hand, Italy and Germany experienced low levels of participation in the biomass tenders. In Germany, the level of competition in the first tender carried out in September 2017 was rather low, as only bids for a third (41 MW) of the tendered volume (122 MW) had been submitted. As a result, all biomass projects qualifying for the tender (27,5 MW) did win a support entitlement. In addition to new biomass projects, the tender was also open to already installed biomass installation, which could bid for a prolongation of their support beyond 20 years. The majority of bids submitted and support entitlements awarded were for already installed biomass capacity. The results of the tender show that the conditions defined, i.e. the ceiling price, were not attractive for new biomass projects to participate although all planned projects with an installed capacity greater 150 KW have to sucessfully participate in a tender in order to be entitled to a support payment.

[23] An explanation for this development is not straightforward as the underlying factors evolved between these auctions.

| Criteria | New projects >150 kW | Existing projects ≤ 150 kW | Existing projects >150 kW |
|---|---|---|---|
| Tendered volume (in KW) | | **122.446** | |
| Number of bids submitted | 10 | 3 | 20 |
| Submitted volume (in KW) | 13.542 | 236 | 27.134 |
| Number of issued support entitlements | 4 | 3 | 17 |
| Awarded volume (in KW) | 6.134 | 236 | 21.181 |
| Ceiling price (ct/kWh) | 15 | 17 | 17 |
| (Ø-) awarded price (in ct/kWh) | 14,81 | 16,90 | 14,13 |
| Price mechanism | Pay-as-bid | Uniform pricing | Pay-as-bid |

*Table 3 – Results of unique biomass tender in Germany 2017*

### *Price developments*

In accordance with the high level of competition observed in the french biomass tenders, the relative awarded price decreased by 20% between the first biomass tender in 2008 and the last in 2015 (see Figure 12). In Germany no price development is to be observed yet, however the achieved average awarded price (see Table 3) was very close to the determined ceiling price, reflecting a low level of competition among bidders.

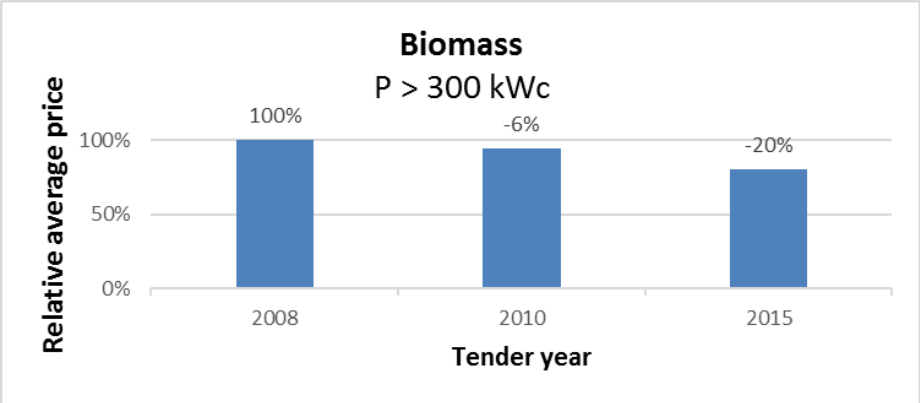


Figure 12 – Price development in biomass tenders in France

### *Mixed achievements in terms of realisation rate*

Italy reported a realisation rate for the three rounds of tenders carried out in 2014, 2015 and 2016 of over 87%. In Lithuania realisation rates of 64% for biogas projects and 0% for biomass projects could be observed. In Belgium, none of the biomass projects have been realised as the new government cancelled the tender.

# 4 Experiences with technology-neutral tenders

Technology-neutral tendering procedures for determining the level of support for RES projects are emerging as the preferred scheme in the State Aid Guidelines as well as in the latest Commission's proposal for the revision of the RED.[24] Technological neutrality in principal means that all renewable technologies compete on an equal footing and the most competitive technologies are awarded a support entitlement.

5 Member States have designed their tendering scheme in a technical neutral manner, notably Poland, Portugal, Spain, the Netherlands, and the United Kingdom. However, only 2 Member States (Poland and Spain) exclusively applied technology-neutral RES tenders. Hungary has passed the relevant legislation for introducing technology-neutral tenders but implementation is still outstanding.

Germany is planning to implement a technology-neutral tender (for PV & onshore wind) in 2018 on a pilot basis and in addition to the technology-specific tenders already in place. France launched both a PV & onshore wind tender in 2017, which will be instructed in 2018.

## 4.1 Main elements of technology-neutral tendering schemes

In the Netherlands, a technological neutral tendering scheme (SDE+) has been introduced in 2011 to determine the market premium for different RES technologies such as solar PV, solar thermal, onshore wind and wind on lakes, biomass, hydro and geothermal. In Poland, the scheme has been introduced in 2016. Both national schemes are conceived as pay-as-bid tenders whereby the winning bidder receives the price of its bid. The key awarding item is the price, whereby the cumulated volume of the bids is the upper limit determining the number of awarded project in each tender round. The differences between RES technologies are reflected in the conditions defined for participation and the realisation time required. In the Dutch scheme the material prequalifications were set in accordance to the technology while in the Polish scheme, prequalifications were identical for all bidders.[25]

As a result of the technology-neutral tenders in the Netherlands, PV projects emerged as the most competitive RES technology (49% of awards in 2017), followed by onshore wind projects (38%).

Spain has already introduced technology-neutral tenders since 2016, however the latest round in 2017 has been restricted to PV and onshore wind.[26]

The UK has implemented a technology neutral scheme that allocates contracts for differences (CfDs) through a competitive auction for large scale projects (≥ 5 MW) of 'established' and 'less established' renewable technologies. The 'established technologies' (pot 1) are onshore wind, solar PV, biomass conversion, landfill gas, and sewage gas, while the 'less established technologies' (pot 2) are advanced conversion technologies, anaerobic digestion, dedicated biomass with CHP, geothermal, hydro, offshore wind, tidal stream, and wave.

So far two allocation rounds have been completed (2015 & 2017). CFDs are allocated through a sealed bid, pay- as-clear auction and the clearing price is set by delivery year. The first allocation

[24] See 2 Article 4 Para. 3, COM (2016) 767 final
[25] For more information see annex 2.
[26] For an analysis of the design elements of renewable energy auction in Spain see Del Rio (2018).

round had a number of available delivery years (from 2015/16 to 2020/21) and the second allocation round had two available delivery years (2021/22 and 2022/23). Realisation time is not set, but projects bid on the basis of commissioning during a given delivery year. Offshore wind projects are able to commission in three phases over several years. Allocation round 2 was held in 2017 with delivery in 2021/22 and 2022/23 – so the realisation time could be interpreted as 4-5 years.

The first allocation round (2015) was available for both pot 1 and pot 2 technologies. Each pot had a separate budget and was auctioned separately.

The second allocation round (2017) was available for pot 2 technologies only. Within this, fuelled technologies (advanced conversion technologies, anaerobic digestion, dedicated biomass) were capped at a maximum of 150MW. Fuelled assets were only able to receive the price of the highest fuelled technology, whereas non-fuelled technologies were eligible to receive the price set by the clearing bid regardless of technology (i.e. fuelled technologies could set the clearing price for both fuelled and non-fuelled technologies, whereas non-fuelled technologies set the clearing price for non-fuelled technologies only).

No statements have been made on further pot 1 rounds. The general expectation is that future allocation rounds will continue to support less market competitive technologies (i.e. pot 2). The industry has renewed calls for a ‘market stabilising’ CFD for established technologies, but no further clarity on this has emerged since the first allocation round.

## 4.2 Evaluation criteria: competition level, price development and realisation rate

No information is available on the level of competition, price development and realisation rate.

# 5 Conclusions

## 5.1 In a nutshell: what can be observed so far

Tendering as an instrument to determine the level of financial support for the operation of RES installations is a rather new phenomenon and not yet implemented in all Member States. However, a first stock taking exercise can be made on which some additional lessons learnt can be derived (see overview in Table 4).

This report has brought forward the following main conclusions concerning the implemented tendering procedures:

- Many national tendering schemes have already been implemented or are about to be implemented. The report shows that by the end of 2017, 18 out of 29 countries had either introduced tendering schemes (13) or were about to do so (5). This trend is welcomed by CEER as support levels set through such procedures tend to be of lower cost than administratively-set support levels, especially given the adaptability of this instrument to technological innovation and reduced unit costs in solar and wind. Lower-cost schemes are beneficial for Europe's energy consumers, cost competitiveness and the functioning of the electricity markets. This is important, given that renewable generation is now central to the electricity generation mix in Europe, at circa 30% on average and rising, and last year's ACER/CEER Market Monitoring Report showed that the share of RES charges is typically 13% of the cost of electricity to a European residential consumer. In the long-run, CEER advocates that RES is fully incorporated and integrated into the wholesale electricity markets.

- The report finds that 8 countries have technology-specific tenders only, while 2 countries have exclusively applied technology-neutral tenders. Thus, in most cases tendering schemes have been set up as technology-specific rather than technology-neutral. An increasing number of Member States are about to have experience with both types of tendering schemes.

- Across all technology-specific schemes implemented, offshore wind, onshore wind, PV (solar), and biomass have been the most selected renewable technologies.

- Only two Member States have opened their support scheme for cross-border projects.

- In terms of the price award mechanism when bids are successful, the pay-as-bid method, where bidders are awarded a support entitlement in accordance to the level of their submitted bid, has been applied in 9 out of the 14 countries researched[27].

- Recent tenders have predominantly been set up to determine the level of the reference value for calculating a market premium, i.e. the support payment in addition to the market income. The first tender generation has also been used to determine the reference value for the Feed-in-Tariff (FIT). However, the report shows that a majority of the Member States use Feed-in-Premiums (FIP) rather than FIT. This is in line with CEER's preference, as FIP tends to bring RES closer to real market conditions.

[27] Hungary is included in this data set, legislation for RES tendering procedures has been passed in the country, but the implementation has not yet commenced.

- Where empirical evidence is available, the level of competition and the price developments have been positive, demonstrating the cost-efficiency of tenders for mature RES technologies. High realisation rates (i.e. the extent to which the proposed RES projects are operational) have already been observed for PV tenders. However, little empirical evidence is yet available for tendering processes applied for other technologies. This is a key criterion to assess the effectiveness of tendering as an instrument to deliver on the decarbonisation agenda. In addition, a general decrease in RES support prices is identified from tender round to round. However, this does not automatically show the effectiveness of tendering procedures, as other external drivers (e.g. cost of capital and raw material, regulatory changes, strategic behaviour) have influence on the outcome of the tender.

## 5.2 Some practical recommendations

***Related to the system change...***

If a MS is planning to switch from an administratively-set the support level towards launching a call for tender, it is advisable for the body in charge of the tenders to consult with the parties involved, e.g. the market players who are interested in the tender, the public authorities and the grid operator. This is necessary in order to learn the specificities of the market, the technology and the bidders. Furthermore, a "competitive concertation procedure" can be organised for tenders concerning a complex technology. Through this principle, the body in charge of the tender is able to pre-select candidates based on their financial and technical capabilities. Afterwards, the body may consult these pre-selected candidates and other relevant parties to discuss the tender procedure and elaborate efficient requirement specifications for the constitution of bids. The overall objective of this approach is to ensure that a tender scheme is designed with an optimised allocation of the risks).[28]

Alternatively, the launch of pilot tenders for a small market segment can be used to test the new system and to learn from different design options.[29]

***Related to the choice of the technological focus...***

The choice of the technological focus of the tendering scheme depends on the prevailing RES market conditions (e.g. level of competition, maturity of the technology, availability of the RES resource) and the RES deployment objectives defined at national level. Both approaches, technology-specific or neutral, have their pros and cons. Some Member States have opted for gaining experience with both approaches.

***Related to the body implementing the tendering procedures...***

For effective competitive tenders, market players (and consumers) should trust the tendering system. In case a Member State decides to primarily have tenders to determine the level of RES support, it is important to ensure the decision-making independence of the body in charge of implementing the tendering procedures. To exclude political interference and to make sure the results of a tender are based on transparent and objective criteria.

[28] In 2017 France organised such a procedure for an offshore wind project.

[29] Germany organised a pilot tender for ground mounted PV installations for a limited time in 2015 and 2016 (6 rounds in total).

***Related to the administrative work linked to the implementation of a tender...***

It is important to impose a minimum time for the candidates of the tender to constitute their offer and a minimum time for the body in charge of the procedure to asses these bids. The set times can vary from one tender to another. For tenders with complex technical projects, bidders should receive enough time to prepare their offer otherwise the tender may result in low competition and high prices. In addition, it is necessary to plan a decent amount of time between tender rounds to make sure unsuccessful bidders are able to improve their offers for the following round.

In general, a tender requires many administrative checks to analyse whether the bids are in compliance with the numerous criteria. It can therefore be an option to not assess all submitted bids. It may be sufficient to analyse for example 110% of the tendered volume (using an automatic pre-ranking based on the quantitative criteria of the tender) in order to nominate the winning bids. In case of tenders where a limited number of documentation has to be submitted, it can be worthwhile to check the conformity of all bids and provide individual feedback to the bidders. This can be beneficial for the quality of the constituted bids and eventually reduce the number of eliminated bids due to unnecessary errors by the bidders. Such feedback is also a way for the body in charge of the tender to improve their processes, rules and requested documentation. Thus, evaluation processes where feedback can be given are advised to improve the process

There is no uniform approach, in any case, the administrative body in charge of the tender has to be pragmatic. The administrative burden for all those involved should to be limited, but the fairness, transparency and quality of the tender always must be ensured.

***Related to achieving high realisation rates...***

In order to maximise the realisation rate of winning bids, it is essential to put in place financial guarantees and penalties for non-realisation of tendered projects. It can also be relevant to require specific material prequalifications, such as to provide robust business plans, also demonstrating the bidders' cost-effectiveness expectations, or building permits, demonstrating the advanced status of the project.

In addition, allowing some flexibility in the realisation requirements has been proved to be effective. For instance to allow for some minor deviations between the commitments provided in the bid, e.g. in terms of capacity to be installed and the location of the installation.

***Related to the existence of different support schemes…***

It is crucial to avoid a multiplicity of support schemes for a single RES project. In a transition phase from one support system to another, it should not be possible to arbitrate between different support schemes. Operators of RES installations should decide between the available schemes without giving them the possibility to switch at a later stage.

***Related to design elements...***

Designing tenders is a complex task, the design elements are usually interrelated and trade-offs are unavoidable. However, beyond the design options of a single scheme, it is important to be aware of possible strategic behaviour of bidders between different schemes. Bidders should be prevented from switching between tender rounds to realise the project with the tender awarding the highest price. This situation may arise when the penalties for non-realisation are too low and the price

outcome of other tenders are higher. Thus, there should be specific rules against such gaming behaviour by tender candidates.

| | Technology focus | Reference value determined through | Duration of support granted | Awarding criteria approach | Price awarding mechanism | Level of competition | Clearing price development over | Realisation rate |
|---|---|---|---|---|---|---|---|---|
| **Belgium** | **Technology specific** | FIP | 20 years from start of operation | multi-criteria based tender | pay as bid | 2x | na | 0% |
| **Denmark** | **Technology specific** | Sliding premium/CfD | 50.000 FLH | Single criterion based (price) | pay as bid | n.a. | n.a. | No information available |
| **France** | **Technology specific & technology neutral (wind & PV)** | FIT & FIP | mostly 20 years | Both single and multi-criteria based tender have been used | pay as bid | high | Decreasing | High for PV (68%-95%) but low so far for CSP (0% in 2013 and 35% for 2011) |
| **Germany** | **Technology specific & technology neutral (wind & PV)** | FIP | 20 years from start of operation | Single criterion based (price) | Mainly pay as bid, but also uniform pricing on a trial basis. Both mechanisms are used in wind and biomass tenders to take into account the specificities of different actors | high, except for biomass | Decreasing | High for PV (90-100%) |
| **Greece** | **Technology specific** | FIT & FIP | Date of start of operation plus 20 years | multi criterion based (price and volume) | pay as bid | Between 3x and 36x. The level of competition in the PV auction of 2016 was 40% | Only one single round so far | No information available |
| **Hungary** | **Technology neutral** | FIP | max. 20 years tbd. | Single criterion based (price) | pay as bid | No information available | No information | No information available |
| **Italy** | **Technology specific** | FIP | 20 or 25 years | Single criterion based (price) | pay as bid | from <1 to 2.5 depending on the technology | No information available | between 0% and 100 % depending on the technology |
| **Lithuania** | **Technology specific** | FIT | from 12 to 20 depending on the technology | multi criterion based (price and volume) | uniform pricing | no exact data available but mostly oversubscribed | Between 0 % and minus 23.5% | between 0% and 100 % depending on the technology |
| **Malta** | **Technology specific** | n.a | 20 years from start of operation | Single criterion based (price) | pay as bid | No information available | No information available | No information available |
| **Netherlands** | **Technology neutral & specific for offshore wind** | FIP | from 8 to 15 depending on the technology | multi criteria based (price and volume) | n.a. | n.a. | No information available | No information available |
| **Poland** | **Technology neutral** | FIT | 15 years from start of operation | multi criterion based (price and volume) | pay as bid | different effects in different sessions | slightly decreasing | No information available |
| **Portugal** | **Technology specific & technology neutral** | FIT (discount related to reference FIT) | 15, 20 or 25 years | Single criterion based (price); multi criterion for wind onshore (+industrial investment) and biomass (+efficiency, innovation, wildfire prevention, etc.) | n.a. | n.a. | No information available | No information available |
| **Spain** | **Technology neutral (but third round in 2017 restricted to (indistinctively) onshore wind and solar PV)** | Incentive proportional to capacity installed | 20 or 25 years | Single criterion based: discount over allowed incentive given as reference | uniform pricing | Exact data confidential; well oversubscribed | All three rounds cleared @ maximum discount (i.e., no incentive awarded) | No information available |
| **UK** | **Technology neutral (and specific for offshore in the past)** | FIP (Contract for Difference) | 20 years | Single criterion based (price) | uniform pricing | No information available | No information available | No information available |

*Table 4 – Selected aspects of implemented tendering schemes in relevant MS*[30]

[30] No tendering procedures have yet been implemented in Hungary.

## Annex 1 – List of Abbreviations

| Term | Definition |
|---|---|
| CEER | Council of European Energy Regulators |
| Commission | European Commission |
| CDFs | Contracts for differences |
| CHP | Combined Hear and Power |
| CSP | Concentrated Solar Power |
| EEAG | Guidelines on State Aid for environmental protection and energy |
| FIP | Feed-in Premium |
| FIT | Feed-in Tariff |
| FP | Financial prequalification |
| kWh | Kilowatt hour |
| kWp | Kilowatt peak |
| kWc | Kilowatt crête (peak) |
| KW | Kilowatt |
| MP | Material prequalification |
| EUR | Euro |
| MS | Member State(s) |
| MWh | Megawatt hour |
| MW | Megawatt |
| NRA | National Regulatory Authority |
| PV | Photovoltaic |
| RED | Renewable Energy Directive |
| RES | Renewable Energy Sources |
| R&D | Research & Development |
| OFTOs | Offshore Transmission Operators |
| TWh | Terawatt hour |

# Annex 2 – Empirical data

## 1. Characteristics of national tendering procedures by RES technology: PV

| | France | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Medium-scale PV (2011) | Medium-scale PV (2013) | Medium-scale PV (2014) | Rooftops PV (2016) | Large scale PV (>250 kWp) 2011 | Large scale PV (>250 kWp) 2013 | Large scale PV (>250 kWp) 2014 | Ground mounted PV (2016) |
| 1. Reference value determined through tender? | Reference value in €/MWh for a feed-in tariff contract | Reference value in €/MWh for a feed-in tariff contract | Reference value in €/MWh for a feed-in tariff contract | Reference value in €/MWh for either a feed-in tariff or a feed-in premium contract (depending on the size) | Reference value in €/MWh for a feed-in tariff contract | Reference value in €/MWh for a feed-in tariff contract | Reference value in €/MWh for a feed-in tariff contract | Reference value in €/MWh for a feed-in premium contract |
| 2. Duration of support granted | 20 years | 20 years | 20 years | 20 years | 20 years | 20 years | 20 years | 20 years |
| 3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects) | Price | Price & carbon footprint | Price & carbon footprint | Price & carbon footprint | Price, carbon footprint, contribution to R&D, assesment of the stage of development | Price, environmental impacts (including carbon footprint), contribution to R&D | Price, environmental impacts (including carbon footprint), contribution to R&D | Price, carbon footprint & environmental relevance. |
| 4. Price awarding mechanism | pay-as-bid | pay-as-bid | pay-as-bid | pay-as-bid | pay-as-bid | pay-as-bid | pay-as-bid | pay-as-bid |
| 5. Number of rounds per year | 7 rounds initially planned, 5 rounds conducted | 3 rounds | 3 rounds | 9 rounds (2017-2019) | 1 round in total | 1 round in total | 1 round in total | 6 rounds (2017 - 2019) |
| 6. Tendered volume per year [MW] | 300 MW initially planned, 240 MW finally conducted | 120 MW | 240 MW | 450 MW each of the 3 years | 450 MW over 2,5 years (180 MW per year) | 400 MW | 400 MW | 1 GW each of the 3 years |
| 7. Realisation time | 18 months (otherwise, the duration of the support is reduced) | 20 months (otherwise, the duration of the support is reduced) | 20 months (otherwise, the duration of the support is reduced) | 20 months (otherwise, the duration of the support is reduced) | 24 months (otherwise, the duration of the support is reduced) | 24 months (otherwise, the duration of the support is reduced) | 24 months (otherwise, the duration of the support is reduced) | 24 months (otherwise, the duration of the support is reduced) |
| 8. Minimum participation size (volume in KW) | 100 | 100 | 100 | 100 | 250 | 250 | 250 | 500 |
| 9. Maximum participation size (volume in KW) | 250 | 250 | 250 | 8,000 | 3 main sub-categories :<br>4 500 (rooftop)<br>12 000 (ground mounted)<br>12 000 (concentrated solar) | 3 main sub-categories :<br>12 000 (rooftop)<br>12 000 (ground mounted)<br>12 000 (concentrated solar) | 3 main sub-categories :<br>5 000 (rooftop)<br>12 000 (ground mounted) | 17,000 |
| 10. Ceiling bid price | na | na | na | Decreasing from 95 €/MWh in the 1st round to 66 €/MWh in the last | na | na | yes (depends on the sub-category) | Decreasing from 50 €/MWh in the 1st round to 42 €/MWh in the last |
| 11. Floor bid price | na | na | na | Decreasing from 143 €/MWh in the 1st round to 114 €/MWh in the last | na | na | yes (depends on the sub-category) | Decreasing from 150 €/MWh in the 1st round to 125 €/MWh in the last |
| 12. Material prequalifications | - commitment that the provider(s) of the PV system will be ISO-certified<br>- formal proof that the investment could be covered (regarding both equity and debt)<br>- building permit | - proof of land-use right<br>- certification for the carbon footprint assesment<br>- certification that the solar panel is part of the roof structure<br>- commitment that the provider(s) of the PV system will be ISO-certified<br>- administrative identification of the bidding company/person | - proof of land-use right<br>- certification for the carbon footprint assesment<br>- certification that the solar panel is part of the roof structure<br>- building permit<br>- commitment that the provider(s) of the PV system will be ISO-certified<br>- business plan<br>- administrative identification of the bidding company/person | - certification for the carbon footprint assesment<br>- building permit<br>- administrative identification of the bidding company/person<br>- business plan | - proof of land-use right<br>- administrative identification of the bidding company<br>- building permit<br>- commitment that the provider(s) of the PV system will be ISO-certified<br>- technical report on environmental impacts of the project (to be assessed by the regional environmental authority)<br>- technical and financial quotation of interconnection work issued by the Grid Operator<br>- formal elements proving the bidder contributes to solar R&D | - proof of land-use right<br>- administrative identification of the bidding company<br>- building permit<br>- technical report on environmental impacts of the project (to be assessed by the regional environmental authority)<br>- technical and financial quotation of interconnection work issued by the Grid Operator (or pre-studies)<br>- formal elements proving the bidder contributes to solar R&D<br>- Business plan along with elements proving the financial solidity (ex: letters of intent from banks) | - proof of land-use right<br>- administrative identification of the bidding company<br>- building permit<br>- technical report on environmental impacts of the project (to be assessed by the regional environmental authority)<br>- technical and financial quotation of interconnection work issued by the Grid Operator (or pre-studies)<br>- note showing the innovative technical aspects of the project<br>- Business plan along with formal elements proving the financial solidity of the company (letters of intent from banks, financial statement reports, equity to be invested in the project) | - certification for the carbon footprint assesment<br>- building permit<br>- administrative identification of the bidding company/person<br>- business plan<br>- certification from the local administrative authority that the area is eligible |
| 13. Financial prequalifications | no | no | yes (10k€/ project ==> between 40 and 100 k€/MWp) | Yes : 30 k€ / MWp | Yes: 50 k€/MWp | Yes: 30 k€/MWp | Yes: 30 k€/MWp | Yes : 30 k€ / MWp |
| 14. Administrative fee for participation | none | none | none | none | none | none | none | none |
| 15.Body in charge of carrying out the tendering procedure/ role played | Case B | Case B | Case B | Case C | Case A<br>+ assesment of the innovative aspects of the projects by a specific government agency<br>+ assesment of the environmental aspects of the projects by the regional environmental authority. | Case A<br>+ assesment of the innovative aspects of the projects by a specific government agency<br>+ assesment of the environmental aspects of the projects by the regional environmental authority. | Case A<br>+ assesment of the innovative aspects of the projects by a specific government agency<br>+ assesment of the environmental aspects of the projects by the regional environmental authority. | Case C |
| 16. Level of competition | see the sheet "analysis" for the details (it appears to be not relevant to isolate the results for only one tender). | | | | | | | |
| 17. Diversity of actors | no analysed data available | no analysed data available | no analysed data available | no analysed data available | no analysed data available | no analysed data available | no analysed data available | no analysed data available |
| 18. Clearing price development | see the core of the report for the details (it is not relevant to isolate the results for only one tender). | | | | | | | |
| 19. Realisation rate | rooftops (P> 100 kWp) : 68% | rooftops (P> 100 kWp) : 73% | no data available yet | no data available yet | rooftops (P> 250 kWp) : 95%<br>carports (P> 250 kWp) : 94%<br>grount-mounted (P> 250 kWp) : 90%<br>CSP (P>250 kWp) : 35% | rooftops (P> 250 kWp) : 78%<br>carports (P> 250 kWp) : 88%<br>grount-mounted (P> 250 kWp) : 93%<br>CSP (P>250 kWp) : 0% | no data available yet | no data available yet |
| 20. Time allocated to the candidates for the constitution of bid | 6 months | 7 months | 6 months | 6 months | 6 months | 6 months | 6 months | 6 months |
| 21. Time allocated to the NRA for the analysis of the bids | 2 months | 2 months | 2 months | 1 month | 4 months | 4 months | 4 months | 1 month |

Ref: C17-SD-60-03

# Tendering procedures for RES in Europe: State of play and first lessons learnt

| | Germany | | Greece | Malta | Portugal |
|---|---|---|---|---|---|
| | Ground mounted PV ≥ 100 kW (2015-16) | All PV≥ 750 kW (2017) | PV > 500 KW (pilot 2016) | PV > 1 MW | |
| **1. Reference value determined through tender?** | Reference value in ct/KWh as basis for calculating monthly sliding market premium (FIP) | | For small systems below 500kW the level of the FiT. For systems above 500kW the reference value as basis for calculating monthly sliding market premium (FIP) | The fixed price per kWh to be paid to the successful bidder which price is deemed to be composed of a sliding premium and the proxy of the market price price determined a yearly basis (the proxy of the market price is used in the absence of a liquid wholesale market) | Finantial compensation to the State |
| **2. Duration of support granted** | Date of start of operation + 20 years | | Year of start of operation + 20 years | 20 years from start of operation | 20 years (or max. 34 GWh per MW of installed capacity) |
| **3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects)** | Price & Volume | | Price & Volume | Price | Amount of offered financial compensation |
| **4. Price awarding mechanism** | Uniform pricing (2 rounds) & pay-as-bid (default procedure since 04/2016) | Pay as bid | Pay as bid | Pay as bid' capped at 1600 x kWp offered/annum | Compensation = Base price + Offered Premium |
| **5. Number of rounds per year** | 3 rounds | | One pilot tender for a limited capacity of 40MW in 2016. | First bid launched on 2 Nov2017 number of rounds will depend on uptake | N/A (tenders since 2010) |
| **6. Tendered volume per year [MW]** | 500 MW in 2015;<br>300 MW in 2016 | 600 MW | For Category I systems (P≤ 1MW: 4-7MW , for systems above 1MW: 33-36MW (Pilot Tender of 2016) | 15 MW | 150 MW |
| **7. Realisation time** | 18 months for full support level (as determined by auction result); 24 months with support reduction of 0,3 ct/kWh; after 24 months: loss of support entitlement | | For Category I systems (P≤ 1MW): 18 months , for systems above 1MW: 24 months (Pilot Tender of 2016) | 18 months to secure the 'pay as bid' (determined through the competitive bidding procedure) 24months with a reduction of 0.5c/kWh;after 24 months loss of support entitlement | Not specified |
| **8. Minimum participation size (volume in KW)** | 100 | 750 | For Category II systems capacity must be above 1MW. (Pilot Tender of 2016) | yes,1MW | n.a. |
| **9. Maximum participation size (volume in KW)** | 10,000 | 10.000<br>No limit for one type of PV installation (on an engineered structure) | 10MW (Pilot Tender of 2016) | No | n.a. |
| **10. Ceiling bid price** | No | | no (Pilot Tender of 2016) | No | n.a. |
| **11. Floor bid price** | Yes (adapted for each round) | | For Category I systems (P≤ 1MW): 104€/MWh , for Category II systems (P>1MW): 94€/MWh (Pilot Tender of 2016) | Yes, adapted per installatiion location category | n.a. |
| **12. Material prequalifications** | Different types of project development stages (advanced= approved local development plan/ less advanced= notification to the public that a PV installation is being planned in a specific place ) | | Production license (for Category II systems (P>1MW)), final grid connection terms and submission of relevant guarantees to the System Operator. (Pilot Tender of 2016) | none | n.a. |
| **13. Financial prequalifications** | First financial security: 2 or 4 EUR/KW, depending on the maturity of the project;<br>Second financial security: 25 or 50 EUR/KW after winning the support entitlement, depending on the maturity of the project. | First security payment when submitting the bid: 5 EUR/KW<br>Second security payment when winning a support entitlement: 20 or 45 EUR/kW depending on the maturity (level of prequalifications)of the project. | 10€/kW (Pilot Tender of 2016) | Successful bidder have to submit a performance bond equivalent to €50/kWtendered by bidder capped at a maximum of €50,000 | n.a. |
| **14. Administrative fee for participation** | 715 EUR for participation & for issuing the support entitlement once the plant is put into operation 615 EUR.<br>In case of unsucessful participation, the fee is reimbursed to 75% to the bidder. | 586 EUR<br>In case of unsucessful participation, the fee is reimbursed to 75% to the bidder. | 500€ (Pilot Tender of 2016) | none | n.a. |
| **15.Body in charge of carrying out the tendering procedure/ role played** | NRA - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. | | NRA/ All actions | Ministry for Energy and water and the Agency for Energy and Water with the provision of certain resources by NRA | DGEG (Energy General Directorate) |
| **16. Level of competition** | 1 round: 4.8X ; 2 round: 3,7X; 3 round: 2,8X; 4 round 4,5X<br>5. round 2,5X ; 6 round 2,6X | 1 round: 2,4X ; 2 round:3,2X; 3 round: 3,8X | 1 round (30 min.), electronic auction [Category I (≤ 1MW): 35 bids between 12 participants], [Category II (> 1 MW), 441 bids between 12 participants] | no data yet because the first competitive bidding process was launched on the 2 November 2017 | |
| **17. Diversity of actors** | Most bidders are professional PV project developers. Support entitlements cannot be traded however it is possible to sell the project company. | | Six different participation profiles per PV category, according to their legal status, varying from full S.A.s to Individuals | | |
| **18. Clearing price development** | Yes<br>Reduction of 25% between first round 04/15 (9,17 ct/KWh) and last round 12/16 (6,90 ct/KWh) | Yes<br>Reduction of 25% between first round 02/17 (6,58 ct/KWh) and last round 10/17 (4,91 ct/KWh) | Category I: weighted average price 98,78 €/MWh; Category II: weighted average price 83,3 €/MWh. Significant competition achieved in both categories | | |
| **19. Realisation rate** | Information only for first 3 rounds of 2015: 99%, 90% & 92% | Results only available 24 months after each round (eg 2/19) | (Pilot tender of 2016). No information on realisation rates yet. | | |
| **20. Time allocated to the candidates for the constitution of bid** | 5-8 weeks | | n.a. | n.a. | n.a. |
| **21. Time allocated to the NRA for the analysis of the bids** | no time limit | | n.a. | n.a. | n.a. |

| 3 cases | Tendering procedure's launch date | Type of procedure | NRA role |
|---|---|---|---|
| **Case A** | Before February 18, 2016 | "ordinary"<br><br>(Section 2) | - elaboration of tender specifications in response to the government who defines the general conditions (the final document is issued by the government) ;<br>- Q&A with bidders until the end of the submitting period ;<br>- **opening** and elimination of **incomplete** bids received (hand delivered or by post) ;<br>- analysis and elimination of non-compliant bids ;<br>- ranking of the bids notified to the government along with both a detailed analysis of the tender and a specific **analysis** of each bid ;<br>- formal opinion on the final choice of awarded projects made by the government. |
| **Case B** | Before February 18, 2016 | "accelerated"<br><br>(section 3) | - elaboration of tender specifications in response to the government who defines the general conditions (the final document is issued by the government) ;<br>- Q&A with bidders until the end of the submitting period ; |
| **Case C** | After February 18, 2016 | standard | - **formal opinion on tender specifications** submitted by the government ;<br>- **publication** of the Q&A **between the government** and bidders before the end of the submitting period ;<br>- setting up of an electronic plateform to receive and rank the bids ;<br>- analysis and elimination of non-compliant bids until the targeted volume is reached ;<br>- ranking of the bids transmitted to the government along with a detailed analysis and an instruction sheet for each bid ;<br>- formal opinion on the final choice of awarded projects made by the government **only if the choice is different** from the list transmitted ;<br>- **publication** of an analysis report of the tender (without any confidential information). |

# 2. Characteristics of national tendering procedures by RES technology: onshore wind

| | Germany | Italy* | Lithuania |
|---|---|---|---|
| | **Onshore projects > 750 KW** | | |
| **1. Reference value determined through tender?** | Reference value at the 100% reference location in ct/KWh as basis for calculating monthly sliding market premium (FIP) | Reference value in €/MWh as basis for calculating hourly market premium (FIP) | ct/kWh (a feed-in-tariff) |
| **2. Duration of support granted** | Date of start of operation + 20 years | 20 years | 12 years |
| **3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects)** | Price & Volume; special rules for local community projects | Price | The lowest feed – in tariff<br>The biggest installed capacity |
| **4. Price awarding mechanism** | Pay-as-bid; uniform price for local community projects | Pay-as-bid | Uniform pricing |
| **5. Number of rounds per year** | three in 2017; four from 2018 on | 1 | - |
| **6. Tendered volume per year [MW]** | 2,8 GW in 2017; 2,9 GW from 2018 on | 800 MW | 260 MW (from 2013 until now) |
| **7. Realisation time** | 30 months but staggered penalties start by month 24; 54 months for local community projects but gradual penalties start by month 48 | 31 months for full support (determined by auction); after 31 months: loss of the support entitlement and of the financial guarantee | 36 months |
| **8. Minimum participation size (volume in KW)** | 750 kW | yes, > 5 MW | 11 kW |
| **9. Maximum participation size (volume in KW)** | basically no limit; 18 MW and six turbines for local community projects | NO | Three types of auctions: (1) wind power plants 10-350 kW connected to distribution grid ; (2) wind power plants over 350 kW connected to distribution grid and (3) wind power plants over 350 kW connected to transmission grid |
| **10. Ceiling bid price** | no | Yes (60% of the base tariff, i.e. 66 €/MWh) | - |
| **11. Floor bid price** | 7ct/kWh in 2017; from 2018 on based on the 2017 results | Yes (98% of the base tariff, i.e. 107,8 €/MWh) | different for all auctions. |
| **12. Material prequalifications** | - permit registration at least three weeks before tendering closure<br>- no self consumtion during support period<br>- bidders has to be owner of the building permit or at least a declaration of the owner which includes his approval to the use of it.<br>- none for for local community projects and building permit for project developers | Plant authorization and connection quote, redacted by the grid operator and accepted by the proposing subject | - |
| **13. Financial prequalifications** | 30 EUR/kW; two step financial security for local community projects (15€ at the time of bidding and another 15€ after recieving the building permit | 1) Declaration by a financial institution of the financial and economic strenght: that could be a commitment to finance the intiative or a demonstration of an adeguate level of capitalization. 2) Provide a financial guarantee equal to 10 % of the investment cost (defined according to the values of Attached II of the decree), of which, 50% when submitting the bid and the other 50% after winning the award. | 14,48 EUR/kW |
| **14. Administrative fee for** | 522 EUR | 2200 EUR | - |
| **15.Body in charge of carrying out the tendering procedure/ role played** | NRA - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. | GSE - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. | NRA; Auction announcement; Auction documents and feed-in tariff registration; Documents' scrutiny and the list of the auction participants; Feed-in tariff rating and |
| **16. Level of competition** | 1. round: 2.5x; 2.round: 2.5x; 3.round: 2.5x | Two and a half times: the available volume was 800 MW while the requests reached a total volume of 1.972 MW | n/d. But the tendered volume was always oversubscribed. |
| **17. Diversity of actors** | Due to special participation rules for local community projects, most bidders were local communities | 100% private companies | Most bidders are companies |
| **18. Clearing price development** | Yes, -33% between first (5,71 ct/KWh) and third round in 17 (3,82 ct/KWh) | In this round all the winning bidders offered the minimum reduction amount allowed (equal to 40% of the base tariff, i.e. 66 €/MWh). In the previous 3 rounds, referring to decree 6th July 2012, the observed reduction of the average clearing price was: 124 €/MWh in 2012 round, 115 €/MWh in 2013 round and 93 €/MWh in 2014 round. | Yes, -12,5 % in the average between max bid price and winners price. |
| **19. Realisation rate** | No information availiable yet (in | In this round (with the latest available data until July 31st 2017), considering that the realization time is 31 months from December 2016, just one plant (10 MW) is already functioning. In the previous three rounds the realization rate is above 85%. | 100% |
| **20. Challenges encountered, which eventually led to adaptation of process** | Local community rules led to unexpected results, i.e. the rule was intended to ensure a minimum participation of citizen's project and led to over 90% of the support entitlement being won by them. The rules have been adapted for 2018, making the prequalifications for all bidders identical. | Given the increased competitivity reached during the previous three rounds, the incentivation amount was reduced (the base tariff amount and the maximum allowed reduction price bid). Also the financial and guarantees requirements became more stringent. Moreover the realization period was extended | n..a |
| **21. Time allocated to the candidates for the constitution of bid** | 5-8 weeks | n.a. | n..a. |
| **22. Time allocated to the NRA for the analysis of the bids** | no limitation | n.a. | n.a. |

| | Portugal | France |
|---|---|---|
| | | |
| 1. Reference value determined through tender? | Discount on FIT | Reference value in €/MWh for a feed-in premium contract |
| 2. Duration of support granted | 15 years (or max. 33 GWh per MW of installed capacity) | 20 years |
| 3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects) | Amount of discount, Industrial investment | Price |
| 4. Price awarding mechanism | Percentage over FIT | Pay-as-bid |
| 5. Number of rounds per year | N/A (tenders since 2005) | 1 round every 6 months |
| 6. Tendered volume per year [MW] | 1.000 MVA + 500 MW + 200 MW | 500 MW for each round (1 round every 6 months) |
| 7. Realisation time | Not specified | 36 months |
| 8. Minimum participation size (volume in KW) | n.a. | at least 7 wind turbines or 1 wind turbine > 3 MW |
| 9. Maximum participation size (volume in KW) | n.a. | no |
| 10. Ceiling bid price | n.a. | 74,8 €/MWh |
| 11. Floor bid price | n.a. | |
| 12. Material prequalifications | n.a. | - administrative identification of the bidding company<br>- environmental autorisation<br>- optionnal: commitment to be partly financed by individuals or territorial authorities |
| 13. Financial prequalifications | n.a. | 30 EUR/kW |
| 14. Administrative fee for participation | | no |
| 15.Body in charge of carrying out the tendering procedure/ role played | DGEG (Energy General Directorate) | NRA (Case C) |
| 16. Level of competition | n.a. | 1 round: 1.8x |
| 17. Diversity of actors | | |
| 18. Clearing price development | | Only one round conducted (average price: 65 €/MWh) |
| 19. Realisation rate | | No information availiable yet |
| 20. Challenges encountered, which eventually led to adaptation of process | | no |
| 21. Time allocated to the candidates for the constitution of bid | n.a. | 6 months |
| 22. Time allocated to the NRA for the analysis of the bids | n.a. | 6 weeks |

# 3. Characteristics of national tendering procedures by RES technology: offshore wind

| | Denmark | Germany | | Italy* |
|---|---|---|---|---|
| | | **2017/2018 for existing projects /earliest start 01/21** | **from 2021 on new developed projects /earliest start 01/26** | ***Data collected in the following tables are referred to the most recent decree (23 June 2016).** |
| **1. Reference value determined through tender?** | Sliding premium/CfD | Reference value in ct/KWh as basis for calculating monthly sliding market premium (FIP) | Reference value in ct/KWh as basis for calculating monthly sliding market premium (FIP) | Reference value in €/MWh as basis for calculating hourly market premium (FIP) |
| **2. Duration of support granted** | 50.000 FLH | Date of start of operation + 20 years | Date of start of operation + 20 years | 25 years |
| **3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects)** | Price | Price | Price | Price |
| **4. Price awarding mechanism** | Pay-as-bid | Pay-as-bid | Pay-as-bid | Pay-as-bid |
| **5. Number of rounds per year** | Not a constant figure | 1 | 1 | 1 |
| **6. Tendered volume per year [MW]** | Not a constant figure | 1550 MW | 700 MW - 900MW | 30 |
| **7. Realisation time** | | depending on the grid connection; | depending on the grid connection; | 43 months for full support (determined by auction); after 43 months: loss of the support entitlement and of the financial guarantee |
| **8. Minimum participation size (volume in KW)** | | 750 | 750 | yes, > 5 MW |
| **9. Maximum participation** | | no | no | NO |
| **10. Ceiling bid price** | | no | no | Yes (60% of the base tariff, i.e. 99 €/MWh) |
| **11. Floor bid price** | | In 2017: 12 ct/kWh<br>in 2018: 10 ct/kWh; negative bids inadmissible | lowest winning bid of 2018 auctions sets maximum price from 2019 on | Yes (98% of the base tariff, i.e.161,7 €/MWh) |
| **12. Material prequalifications** | Technical experience | Bidder must be owner of an existing project defined in § 26 WindSeeG | | Plant authorization and connection quote, redacted by the grid operator and accepted by the proposing subject |
| **13. Financial prequalifications** | Financial eligibility: Turnover of 4-15 billion DKK and equity ratio of 20 % or certain financial rating | 100 EUR/kW installed | 200 EUR/kW installed | 1) Declaration by a financial institution of the financial and economic strenght: that could be a commitment to finance the intiative or a demonstration of an adeguate level of capitalization. 2) Provide a financial guarantee equal to 10 % of the investment cost (defined according to the values of Attached II of the decree), of which, 50% when submitting the bid and the other 50% after winning the award. |
| **14. Administrative fee for participation** | No administrative fee for bidders to participate. | 4727,29 EUR | | 2,200 € |
| **15.Body in charge of carrying out the tendering procedure/ role played** | Danish Energy Agency | NRA - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. | NRA - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. | GSE - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. |
| **16. Level of competition** | n.a. | n.a. | n.a. | The admitted volume (30 MW) is exactly equal to the winning volume (30 MW) |
| **17. Diversity of actors** | n.a. | n.a. | n.a. | 100% private company |
| **18. Clearing price development** | n.a. | n.a. | n.a. | In this round the sole winning bidder offered the minimum allowed reduction of 2% respect to the base tariff, i.e. 161,7 €/MWh |
| **19. Realisation rate** | n.a. | n.a. | n.a. | No plants have yet been realized |
| **20. Challenges encountered, which eventually led to adaptation of process** | n.a. | n.a. | n.a. | Given the increased competitivity reached during the previous three rounds, the incentivation amount was reduced (the base tariff amount and the maximum allowed reduction price bid). Also the financial and guarantees requirements became more stringent. Moreover the realization period was extended |

| | Netherlands | UK |
|---|---|---|
| | **Seperate tender procedures apply to the category "Wind offshore" compared to the other renewable sources. These offshore wind tender procedures are not the same each tender round and may vary from one tender round to another, therefore some cells are not applicable.** | |
| **1. Reference value determined through tender?** | Reference value in €/MWh as basis for calculating hourly market premium (FIP) | Award of licences to Offshore Transmission Operators (OFTOs) to own and run offshore transmission links for a 20 year duration. This is achieved through the delivery of a fair and transparent tender process, using an effective level of competition, ultimately to deliver savings to GB consumers. |
| **2. Duration of support granted** | 15 years. However, there also have been a tender procedure without any support granted. | N/A |
| **3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects)** | Price | Price (60%), quality (40%) |
| **4. Price awarding mechanism** | Pay-as-bid | Bidders are provided with access to a 'data room' of information upon which to undertake due diligence and then submit a tender revenue stream (TRS) to own and run a transmission link for a 20 year duration. In very general terms, the bidder submitting the lowest TRS is likely to receive the highest score for this pricing elevement of their bid. |
| **5. Number of rounds per year** | Not a constant figure | Generally no more than one round, but this is dependant on what projects windfarm developers come forwards with |
| **6. Tendered volume per year [MW]** | Not a constant figure due to the size of the projects which may vary per tender round. | This varies from one tender round to another, both due to the size of projects and the timings when those tenders take place therefore this is not a constant figure |
| **7. Realisation time** | 5 years, after 5 years: loss or change in the support entitlement. | From the time a project comes forward for tender qualification to the awarding of a licence, this takes approximately 2 years |
| **8. Minimum participation size (volume in KW)** | N.A.P. | No |
| **9. Maximum participation size** | N.A.P. | No |
| **10. Ceiling bid price** | No | No |
| **11. Floor bid price** | No | No |
| **12. Material prequalifications** | | Bidders are invited to repond to a pre-qualification questionnaire which requests evidence of certain technical requirements. These responses are evaluated and then form part of the over all score to determine who will form part of the |
| **13. Financial prequalifications** | | The same as the 'material' cell, but this time bidders are requested to provide details of their financial experience, presenting evidence of raising large sums of finance within appropriate timescales |
| **14. Administrative fee for participation** | N.A.P. | There is no admin fee for bidders to participate at the ITT stage or earlier, however fees apply after this (at the preferred bidder and successful bidder stages). |
| **15.Body in charge of carrying out the tendering procedure/ role played** | RvO (english: NEA) - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. | OfGEM on behalf of GEMA |
| **16. Level of competition** | n.a. | n.a. |
| **17. Diversity of actors** | Mainly private companies or companies who are partially owned by governments (for example Orsted) | Financial institutions; construction firms; technical, financial, insurance etc consultancies |
| **18. Clearing price development** | n.a. | n.a. |
| **19. Realisation rate** | Since 2007 until now in total 4 plants have been realized with a total of 957MW. | Thus far we have seen the ratio of TRS% to asset transfer value reduce, demonstrating the success of the tender process. |
| **20. Challenges encountered, which eventually led to adaptation of process** | n.a. | No challenges encountered, however the tender process is reviewed from one tender exercise to the next. |

# 4. Characteristics of national tendering procedures: technology-neutral

| | Netherlands | | | | |
|---|---|---|---|---|---|
| | **Solar PV, Solar Thermal** | **Wind onshore (& wind on lakes)** | **Biomass** | **Hydro** | **Geothermal** |
| **1. Reference value determined through tender?** | Premium = basic price – correction factor (reference market price).<br><br>The subsidy (SDE+) compensates for the difference between the cost price and the market value of the energy supplied. The maximum SDE+ contribution is therefore equal to the maximum base amount minus the correction amount. It follows that the SDE+ contribution what a producer can receive, depends upon energy price trends. If the energy price goes up, the producer receives a lower SDE+ contribution (because the correction amount increases), but the entity its energy purchaser will pay more. | | | | |
| **2. Duration of support granted** | 15 years; | | In general, this is 12 years for all the biomass types, with an exception of "Wood pellet boiler > 5 MWth". This type of biomass has a maximum subsidy period of 8 years. | | |
| **3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects)** | Volume and Price | | | | |
| **4. Price awarding mechanism** | Technology neutral scheme with gradually increasing remuneration (EURct/kWh) per phase but with flexible budgets per round. | | | | |
| **5. Number of rounds per year** | 2 rounds, and each round consists out of 3 phases. | | | | |
| **6. Tendered volume per year [MW]** | One subsidy budget has been set for all the categories together per round. For the autumn 2017 round of applications, 6 billion euro has been made available to support all projects. | | | | |
| **7. Realisation time** | There are two categories for renewable electricity in which a producer can apply for a subsidy: 1) Operations with a capacity >15 kWp and <1 MWp; 2) Operations with a capacity >1MWp. For operations with a capacity larger than 15 kWp and smaller than 1 MWp, the operation must start at the latest within 1.5 years (18 months). For operations with a capacity larger than 1MWp, the operation must start at the latest within 3 years (36 months).<br><br>For renewable heat (Solar Thermal) with a minimum of 140kW the operation must start at the latest within 3 years (36 months). | The operation must start at the latest within 4 years (48 months). | Depends on the type of Biomass. See tables below | The operation must start at the latest within 4 years (48 months). | The operation must start at the latest within 4 years (48 months). |
| **8. Minimum participation size (volume in KW)** | yes, 15 kWp for renewable electricity. For renewable heat the minimum participation size is equal to or more than 140 kW. | no | | | |
| **9. Maximum participation size (volume in KW)** | yes, 950 full load hours for renewable energy. For renewable heat there is a maximum of 700 full load hours.<br><br>Full load hours =<br>The maximum number of production hours at full load (nominal capacity) per year for which the subsidy is paid. | The maximum full load hours per annum depends on the 'Net P50-value' of full load hours taken from the applicant's wind report. This value is determined on an individual basis for each project.<br><br>Full load hours =<br>The maximum number of production hours at full load (nominal capacity) per year for which the subsidy is paid. | See tables below for specification of maximum full load hours per biomass type in the autumn round. For example, Mono-fermentation has a maximum of 400 kW.<br><br>Full load hours =<br>The maximum number of production hours at full load (nominal capacity) per year for which the subsidy is paid. | See tables below for specification of maximum full load hours per type under the column: "Maximum full load hours per annum" in the autumn round. | See tables below for a specification of the maximum full load hours in the autumn round per type of Geothermal heat under the column "Maximum full load hours per annum". |
| **10. Ceiling bid price** | no | no | no | no | no |
| **11. Floor bid price** | Yes. This amount can adapt each round and/or year, but that is not necessary. | Yes. This amount can adapt each round and/or year, but that is not necessary. | Yes. This amount (the maximum basis amount per phase) can adapt each round, but that is not necessary. | Yes. This amount (the maximum basis amount per phase) can adapt each round, but that is not necessary. | Yes. This amount (the maximum basis amount per phase) can adapt each round, but that is not necessary. |
| **12. Material prequalifications** | A large-scale energy connection to the grid (i.e. a connection to the electricity grid with a rating of more than 3 * 80 A) is a necessity. If an entity does not have one, it will not get the opportuny to receive a subsidy for renewable energy.<br><br>For renewable heat it is necessary that all the collectors used are covered with a translucent layer. | Subsidies for the replacement of wind turbines are only available under the following conditions:<br>• The nominal and actual power ratings of each new wind turbine are at least 1 MW more than those of the old one; or<br>• The wind turbine to be replaced has been in use for 15 years at the relevant location at the time of replacement, and has been in use for at least 13 years when the subsidy is applied for.<br><br>Subsidy can also be requested for a wind turbine with the foundation entirely located in the water of a lake with an area of at least 1 km². The midpoint of the foundation must be at least 25 m from the shore of the lake. This ruling applies, for example, to the IJsselmeer and the lakes in the Dutch province of Zeeland. | The condition set for the categories in which solid biomass is used is that they satisfy sustainability criteria. This relates to the category "Boiler for the production of industrial steam from wood pellets ≥ 5 MWth". The sustainability criteria are applicable to all types of woody biomass. However, the producer must make a reasonable case to support claims that the biomass used satisfies the sustainability criteria for solid biomass. More information on the sustainability criteria can be found on the RVO website.<br><br>The following requirements also apply:<br>• If liquid biomass is used, it must be demonstrated that the sustainability criteria of RED (Renewable Energy Directive) have been met;<br>• No B-grade wood may be used as fuel (this requirement does not apply to the extended lifespan category);<br>• At least 95% of the energy produced by | Hydro<br>The following are eligible for subsidy:<br>• new hydroelectric power stations with a drop of ≥ 50 cm; and<br>• renovation of existing hydroelectric power stations with new turbines and a drop of ≥ 50 cm.<br><br>Free flowing energy<br>Subsidy is available for turbines that use tidal power with a drop of < 50 cm, for example. In all cases, this must involve energy derived from water that is not specially pumped upwards for the purpose of generating energy. | |
| **13. Financial prequalifications** | If a producer applies for a subsidy for an installation with a rating of more than 500 kWp, then the producer must perform a feasibility study and include the results of this study in its application. Such a feasibility study is also required if you are applying for a subsidy for several installations with a combined total power rating of more than 500 kWp (0.5 MWp) in the same round of applications.<br><br>A thorough feasibility study (only if the part described above is applicable) consists out of the following:<br>- a description of the project;<br>- a calculation of the exploitation, and;<br>- a financing plan<br><br>The "calculation of the exploitation" consits out of: 1) a specification of the investment costs of the installation. 2) An overview of all the costs and benefits. 3) A calculation of the project return in the time in which the support is granted. | | | | Additionally to the requirements for all technologies (see above), in order to obtain a better assessment of the energy production, a geological survey will be requested in support of the budget claim.<br><br>When applying for a subsidy in the Geothermal category, an exploration permit must be issued as required by the Dutch Mining Act. This permit must be obtained before you apply for a SDE+ subsidy and should be included with your subsidy application. |
| **14. Administrative fee for participation** | No | | | | |
| **15.Body in charge of carrying out the tendering procedure/ role played** | RVO (Rijksdienst voor Ondernemend Nederland), in English: NEA (Netherlands Enterprice Agency) - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. More information about RVO (NEA) can be found via www.rvo.nl/english. | | | | |
| **16. Level of competition** | 1st round 2017: During the first round, a total amount of €7,1 billion was requested. There was a budget of €6 billion. So, level of competition: 7.1/6 = 1.183 | | | | |
| **17. Diversity of actors** | PV projects have received the biggest share of the total budget in the first round this year: 49%. The second biggest share of the total budget went to onshore wind: 38%. Unfortunately, there is no information available about the distribution by type of bidders. | | | | |
| **18. Clearing price development** | Each round is divided into three phases, each of which is subject to a maximum base amount. Unfortunatelty, there is no information about the subsidy paid per kWh this year (and the change of this amount over the years). This is because the amount of subsidy granted depends on the amount requested, and the moment when the amount of subsidy is requested (because of the three phases during the rounds: for example, the "less expensive" forms of technology may apply for a subsidy in the first phase because the first round has a lower maximum base amount and thus a lower cost price), and the subsidy is different for each source of renawble energy. Therefore the prices determined through the tendering procedure evolved over the years, are not available. | | | | |
| **19. Realisation rate** | No information available | | | | |
| **20. Challenges encountered, which eventually led to adaptation of process** | N.a. | N.a. | N.a. | N.a. | N.a. |

| | Hungary | Poland | Portugal | Spain | France |
|---|---|---|---|---|---|
| | **All technologies (not implemented yes)** | **Technology neutral** | **small renewables: mainly wind, solar PV and hydro** | **Technology neutral, but third round in 2017 restricted to onshore wind and solar PV.** | **Solar or wind onshore** |
| **1. Reference value determined through tender?** | Supported price in HUF/kWh as basis for calculating monthly sliding market premium (FIP) (FIP = Supported (tender) price - reference market price) | Reference value in PLN/MWh as a ceiling, winning bid guarantees selling price; 7 essential types of auctions divided into two groups: no higher and higher than 1 MW | Discount in relation to base FIT. Base FIT is 250 €/MWh. | Incentive in €/MW installed and year, monthly settled (incentive added to non-regulated income obtained via sales in wholesale market) | Reference value in €/MWh for a feed-in premium contract |
| **2. Duration of support granted** | max 20 years, to be specified in the call for tender. Uniform for all technologies. | 15 years from start of producing energy | 15 years | 25 years from start of operation | 20 years |
| **3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects)** | Price only | Price & Volume | Amount of discount offered | Discount in % as applied to maximum reference allowed incentive in €/MW installed; volume as tie-breaker | Price only |
| **4. Price awarding mechanism** | Pay as bid | pay-as-bid | Offers ordered according to discount | Uniform pricing | pay-as-bid |
| **5. Number of rounds per year** | Not defined | specified on yearly basis by the Council of Ministers | N/A | Not pre-defined; 1 in 2016, 2 in 2017. No additional tenders foreseen by 2020. | 1 round (2018) |
| **6. Tendered volume per year [MW]** | To be defined in the call (Yearly budget for support via tenders set at 1 Mrd HUF) | specified on yearly basis by the Council of Ministers | 50 MW | No yearly volumes established; 8.717 MW awarded in 3 rounds: 4.608 MW to onshore wind; 3.909 MW to solar PV; 200 MW to biomass; 19 MW to other technologies | 200 MW |
| **7. Realisation time** | To be defined in the call for tender | 24 months for PV, 72 months for offshore wind, 48 month for other technologies (being counted from the close of the auction) | Not specified | Deadline for commissioning date: end 2019. | 2 years<br><br>if delay = Y months, the price is reduced by Y*0,25 €/MWh for the 6 first months, then by Y*0,50 €/MWh.<br><br>And :<br><br>if delay =X days, the financial warranty is debited by X/365 percent. |
| **8. Minimum participation size (volume in KW)** | No | in auctions dedicated to capacity installed no higher than 1MW there is no minimum; in auctions for capacity installed above 1MW - 1001 kW is a minimum | 20 | 1 kW | 5 000 kW |
| **9. Maximum participation size (volume in KW)** | No | in auctions dedicated to electric capacity no higher than 1MW - 1000kW is a maximum; in auctions for electric capacity above 1MW there is no maximum (some exceptions exist for biomass power plants) | 250 | Only applicable to indivisible bids: 50.000 kW in 2016; 200.000 kW in 2017 | 18 000 kW |
| **10. Ceiling bid price** | No | no | | Yes (0% discount on inventive, i.e. | Yes : 90 €/MWh |
| **11. Floor bid price** | Yes (currently 31,776 HUF/kWh, subject to yearly indexation) | yes - reference price (ceiling price) is specified for each type of technology - annaunced in ordinance of Ministry of Energy every year. | | Yes (maximum allowed discount on incentive; equal or close to 100% discount, i.e. *zero* incentive) | Yes : 40 €/MWh |
| **12. Material prequalifications** | The DSO's offer regarding the connection to the electricity network. | extract of local spatial development plan or a decision on conditions of land use in case of lack of local spatial plan; conditions for connecting the installation to transmission or distribution grid / agreement for connecting source to transmission or distribution grid; building permit; operational and financial schedule | Maximum of 50% consumption capacity | Confidentiality and non-collusion agreement.<br>Some project development stages are demanded 12 and 18 months *after* tender is held, so as to check commitment; poor development would be taken as a sign of advanced low realisation rate and could trigger an additional round, if deemed needed to meet 20/20/20 national objectives. | - administrative identification of the bidding company<br>- certification from the local administrative authority that the area is eligible (only if PV)<br>- building permit (only if PV)<br>- certification for the carbon footprint assesment (only if PV)<br>- environmental authorisation (only if Wind onshore) |
| **13. Financial prequalifications** | Bid bond and "Completion bond", to be specified in the call for tender. Cannot discriminate between technologies. | bank guarantee or a deposit in amount of 30 PLN per 1 kW of capacity installed of the installation - deposit is being paid after prequalifiacation but before the auction and is being returned after loss in the auction or after the winning installation starts generating contracted electricity. | Must have a consumption contract | 20 €/kW in 2016; 60 €/kW in 2017 | Yes: 50 k€/MW |
| **14. Administrative fee for participation** | If applicable to be defined in the call for tender | non | | 0,17 €/kW in 2016; 0,08 €/kW in 2017 Reimbursed to unsuccessful bidders | None |
| **15.Body in charge of carrying out the tendering procedure/ role played** | NRA: Preparation and publication of tendering documentation and the call for tender, opening and evaluation of bids, issuing of support entitlement, etc. (Main tender features are set by the responsible ministry previously.) | President of the Energy Regulatory Office - announcing auctions; conducting prequalification process; running the auctions; publication of results; controlling winners obligations | DGEG (Energy General Directorate) | NRA (CNMC) in supervision role and Market Operator (OMIE) in organization and operation role | NRA (Case C) |
| **16. Level of competition** | N.a. | different effects in different sessions | | Exact data confidential; well oversubscribed | N.a (september 2018) |
| **17. Diversity of actors** | N.a. | Most bidders are professional entities prepared to win and run high numer of projects. Small/local companies with single projects are in minority. | | Professional, large scale developers; very large scale ones (100 MW+ projects) mostly appeared to spurn tenders in favour of private, financial PPA-like contracts, though | N.a (september 2018) |
| **18. Clearing price development** | N.a. | average price for winning installations has slighty come down | | All three rounds cleared @ maximum discount (i.e., no incentive awarded) | N.a (september 2018) |
| **19. Realisation rate** | N.a. | no data yet, projects that won are still in the realisation phase | | No information available | N.a (september 2018) |
| **20. Challenges encountered, which eventually led to adaptation of process** | N.a. | in 2016 auctions were conducted simultaneously during one day what burden the IT system and seem to be confusing for participants; this led to conclude auctions in 2017 separately and with time gaps between each session. | | Awarded volume in MW extended as long as it implied no additional cost (i.e. added bids also offered maximum discount) | N.a (september 2018) |

# 5. Characteristics of national tendering procedures by RES technology: biomass

| | France | | | | |
|---|---|---|---|---|---|
| | Biomass and biogas 2003 | 2006 | 2008 | 2010 | Wood-energy & methanation 2015 |
| 1. Reference value determined through tender? | Reference value in €/MWh for a feed-in tariff contract | Reference value in €/MWh for a feed-in tariff contract | Reference value in €/MWh for a feed-in tariff contract | Reference value in €/MWh for a feed-in tariff contract | Reference value in €/MWh for a feed-in premium contract |
| 2. Duration of support granted | Approximately 17 years | 20 years | 20 years | 20 years | 20 years |
| 3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects) | Price, supply plan (qualitative evaluation), energy efficiency and technical & financial warranty (qualitative evaluation) | Price, supply plan (qualitative evaluation), energy efficiency and technical & financial warranty (qualitative evaluation) | Price, supply plan (qualitative evaluation), energy efficiency and localisation (specific zones) | Price, supply plan (qualitative evaluation) and localisation (specific zones) | Price |
| 4. Price awarding mechanism | pay-as-bid | pay-as-bid | pay-as-bid | pay-as-bid increased by an energy efficiency premium | pay-as-bid |
| 5. Number of rounds per year | 1 round (2004) | 1 round (2007) | 1 round (2009) | 1 round (2011) | 3 rounds (2017 - 2019) |
| 6. Tendered volume per year [MW] | 200 MW | 300 MW | 250 MW | 200 MW | 60 MW each of the 3 years |
| 7. Realisation time | less than 1 year (before 01/12/2004) (otherwise, the duration of the support is reduced) | approximately 2,5 years (before 01/01/2010) | 2,5 years (otherwise, the duration of the support is reduced) | 2,5 years (otherwise, the duration of the support is reduced) | 3 years (if delay =X days, the financial warranty is debited by X/365 percent) |
| 8. Minimum participation size (volume in KW) | 12,000 | 5,000 | 3,000 | 12,000 | 300 |
| 9. Maximum participation size (volume in KW) | None | None | None | None | 25,000 |
| 10. Ceiling bid price | None | None | None | None | 50 €/MWh |
| 11. Floor bid price | None | None | None | 175 €/MWh | 200 €/MWh |
| 12. Material prequalifications | - descriptive note of the bidding company (financial and legal structure)<br>- descriptive report of the installation (with schemes)<br>- supply plan<br>- letters of intent from the buyers of the generated heat<br>- environmental report with an analysis of the energy efficiency<br>- feasibility study of the interconnection work by the grid operator | - descriptive note of the bidding company (financial and legal structure)<br>- descriptive report of the installation (with schemes)<br>- supply plan evaluated by the regional environmental authority<br>- letters of intent from the buyers of the generated heat<br>- feasibility study of the interconnection work by the grid operator | - descriptive note of the bidding company (financial and legal structure)<br>- descriptive report of the installation (with schemes)<br>- supply plan evaluated by the regional environmental authority<br>- environmental report with an analysis of the energy efficiency<br>- letters of intent from the buyers of the generated heat | - descriptive note of the bidding company (financial and legal structure)<br>- descriptive report of the installation (with schemes)<br>- supply plan evaluated by the regional environmental authority<br>- environmental report with an analysis of the energy efficiency<br>- letters of intent from the buyers of the generated heat | - administrative identification of the bidding company/person<br>- business plan<br>- supply plan evaluated by the regional environmental authority<br>- letters of intent from the buyers of the generated heat<br>- descriptive report of the installation (with schemes) |
| 13. Financial prequalifications | None | None | None | None | Yes : 50 k€ / MW |
| 14. Administrative fee for participation | None | None | None | None | None |
| 15.Body in charge of carrying out the tendering procedure/ role played | Case A | Case A | Case A | Case A | Case C |
| 16. Level of competition | 1 round: 2,0X | 1 round: 2,2X | **see the sheet "analysis" for the details (it appears to be not relevant to isolate the results for only one tender).** | | |
| 17. Diversity of actors | no analysed data available | no analysed data available | no analysed data available | | no analysed data available |
| 18. Clearing price development | - | The average price increased by 49% between the 2 first tendering procedures (2003 & 2006). | **see the sheet "analysis" for the details (it appears to be not relevant to isolate the results for only one tender).** | | |
| 19. Realisation rate | no data available yet | no data available yet | no data available yet | no data available yet | no data available yet |
| 20. Challenges encountered, which eventually led to adaptation of process | | | | | |
| 21. Time allocated to the candidates for the constitution of bid | 5 months | 8 months | 6 months | 7 months | 6 months |
| 22. Time allocated to the NRA for the analysis of the bids | 6 months | 6 months | 6 months | 6 months | 4 months |

| | Germany | Italy* | Lithuania | Portugal |
|---|---|---|---|---|
| | **Biomass (existing installations and new projects) 2017** | | | |
| **1. Reference value determined through tender?** | Reference value in ct/KWh as basis for calculating monthly sliding market premium (FIP) | Reference value in €/MWh as basis for calculating hourly market premium (FIP) | ct/kWh (a feed-in-tariff) | Plant operators for preselected geographical locations considering fuel availability, wildfire risk and non-presence of other biomass users. |
| **2. Duration of support granted** | Date of start of operation + 20 years for new plants; Date of start of operation + 10 years for existing plants | 20 years | 12 years | 15 years |
| **3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects)** | Price & Volume | Price | The lowest feed – in tariff<br>The biggest installed capacity | Type of fuel (biomass only or biomass+support fuel), reliability, energy production efficiency, heat use and innovation contribution |
| **4. Price awarding mechanism** | pay-as-bid for new plants; pay-as-bid for existig plants >150kW but in maximum FIT as recieved before; uniform-price for existing plants <150 kW | Pay-as-bid | Uniform pricing | |
| **5. Number of rounds per year** | 1 round per year | 1 | - | N/A |
| **6. Tendered volume per year [MW]** | 2017-2019: 150 MW; 2020-2022 200 MW | 50 | 105 MW (from 2013 until now) | 100 MW (15 plants) |
| **7. Realisation time** | 24 month for new plants; existing plants have to determine their "new" start of operation within 36 month | 51 months for full support (determined by auction); after 43 months: loss of the support entitlement and of the financial guarantee | 3 years | Not specified |
| **8. Minimum participation size (volume in KW)** | mone for existing plants; 150 kW for new plants | yes, > 5 MW | 11 | 2,000 |
| **9. Maximum participation size (volume in KW)** | 20 MW for all bids | NO | it was different auctions for biomass and biogas. For biomas is two types of auction: (1) up to 5 MW and (2) over 5 MW. For biogas is also two types of auctions: up to 1 MW and over 1 MW | 11,000 |
| **10. Ceiling bid price** | 0 ct/kWh | Yes (60% of the base tariff, i.e. 71.4 €/MWh) | - | |
| **11. Floor bid price** | 16,9 ct/kWh for existing plants and 14,88 ct/kWh for new plant; yearly degression of 1% | Yes (98% of the base tariff, i.e.116,6 €/MWh) | different for all auctions. | |
| **12. Material prequalifications** | - permit registration at least three weeks before tendering closure<br>- no self consumtion during support period<br>- bidders has to be owner of the building permit or at least a declaration of the owner which includes his approval to the use of it | Plant authorization and connection quote, redacted by the grid operator and accepted by the proposing subject | - | |
| **13. Financial prequalifications** | 60 €/kWh | 1) Declaration by a financial institution of the financial and economic strenght: that could be a commitment to finance the intiative or a demonstration of an adeguate level of capitalization. 2) Provide a financial guarantee equal to 10 % of the investment cost (defined according to the values of Attached II of the decree), of which, 50% when submitting the bid and the other 50% after winning the award. | financial guarantee 14,48 EUR/kW | |
| **14. Administrative fee for** | 522,-€ | 2,200 € | - | |
| **15.Body in charge of carrying out the tendering procedure/ role played** | NRA - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. | GSE - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. | NRA; Auction announcement; Auction documents and feed-in tariff registration; Documents' scrutiny and the list of the auction participants; Feed-in tariff rating and winner announcement; | DGEG (Energy General Directorate) |
| **16. Level of competition** | 1. round: approximate 0,35x; | Underbid (20 MW on 50 MW of available capacity) | n/d. But the tendered volume was always oversubscribed. | |
| **17. Diversity of actors** | | 100% private company | most bidders are companies | |
| **18. Clearing price development** | only one auction completed so far | In this round the sole winning bidder offered a reduction of nearly 5% respect to the base tariff, i.e. 112,9 €/MWh | Biomass: Yes, -23,08% in the average between max bid price and winners price. Biogas: Yes, -18,97%, in the average between max bid price and winners price. | |
| **19. Realisation rate** | no data available yet (realisation starting in 2019) | In this round (with the latest available data until July 31st 2017), considering that the realization time is 43 months from December 2016, none of the plants is already functioning. In the previous three rounds the realization rate is above 87%. | Biogas 64 %; Biomass 0 %, (litigation is taking place regarding the change of the law) | |
| **20. Challenges encountered, which eventually led to adaptation of process** | Very low level of competition so far (undersubscription of the tender) | Given the increased competitivity reached during the previous three rounds, the incentivation amount was reduced (the base tariff amount and the maximum allowed reduction price bid). Also the financial and guarantees requirements became more stringent. Moreover the realization period was extended | n.a. | n.a. |
| **21. Time allocated to the candidates for the constitution of bid** | 5 to 8 weeks | n.a. | n.a. | n.a. |
| **22. Time allocated to the NRA for the analysis of the bids** | no time limit | n.a. | n.a. | n.a. |

| | Belgium |
|---|---|
| | **Medium-scale PV (2011)** |
| **1. Reference value determined through tender?** | Reference banding factor in Support Certificates/ MWh, which can be converted in its FIP-equivalent in cts/KWh, as basis for yearly assessment of profitability target (expressed in percent of Internal Rate of Return) in order to control that the allowed profitability target is not exceeded (if it were, the banding factor would be reduced). |
| **2. Duration of support granted** | 20 years |
| **3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects)** | Price (25%)<br>Volume (25%)<br>Sustainability of biomass supply (30%)<br>Territorial integration (20%)<br>*Sustainability of biomass supply* was detailed in sustainability 10%, traceability 10%, conflicts of uses 5% and reliability 5%.<br>*Territorial integration* was detailed in choice of location 5%, fuel flexibility 3% and 2% for using local fuel in case of mild winters, environmental (air, water soil) performance 5%, network connection 5%. |
| **4. Price awarding mechanism** | Pay-as-bid, but capped at maximum bid price and controlled yearly in order to adapt banding factor if actual profitability exceeds 9% profitability target. |
| **5. Number of rounds per year** | A single tender (i.e. only once) |
| **6. Tendered volume per year [MW]** | 200 MW, once (i.e. not once per year) |
| **7. Realisation time** | Realisation between 48 months and 72 months.<br>Deadline submitted by tenderer is considered as a commitment. Any delay means less support as end date for support remains unchanged. |
| **8. Minimum participation size (volume in KW)** | 20 000 KW, provided the total for all plants in the tender exceeds 100 000 KW |
| **9. Maximum participation size (volume in KW)** | 200 000 KW, in one or several plants |
| **10. Ceiling bid price** | None |
| **11. Floor bid price** | 16,25 cts/KWh |
| **12. Material prequalifications** | Candidate with 5 *years of experience* incl. running 5+ MW biomass project.<br>*New plant* (s) of minimum 20 MW each, each providing at least 75% CO2 emission reduction and each with IRR < 9% post-tax.<br>Plants must use at least 90% of *sustainable solid biomass* , where the following is not eligible: 1) any healthy manufacturable wood with a small-end diameter larger than 10 cm under bark 2) animal fats 3) biodegradable fraction of municipal waste 4) any biomass issued from land with high biodiversity & high carbon stock. Each fuel demonstrates 75% CO2 emission reduction, and, for forestry resources, both proof of sustainable forest management and risk analysis of direct and indirect land-use changes.<br>*Binding supply plan* (with biomass type, planned tonnage (low, average, high), LCV and CO2 emission factor, geographical origin and transport modes, expected prices and contracts)<br>*Risk analysis of conflict of uses* and demonstration of *cascading use* and, if applicable, the waste hierarchy (Lansink scale). |
| **13. Financial prequalifications** | Financial statements of last 3 years<br>Yearly sales of 50 M €, with at least 10 M € in biomass plants<br>Business plan of project |
| **14. Administrative fee for participation** | None |
| **15.Body in charge of carrying out the tendering procedure/ role played** | Ministry of Energy (SPW DGO4) with support for specific items from energy regulator (CWAPE), which had to determine elements of the banding factor, and Transversal Committee for Biomass (grouping representatives from several ministries and in charge of addressing sustainability). |
| **16. Level of competition** | 2 |
| **17. Diversity of actors** | 1 incumbent power company, 1 new entrant |
| **18. Clearing price development** | NA |
| **19. Realisation rate** | 0% |
| **20. Challenges encountered, which eventually led to adaptation of process** | Change of government and the new one decided not to award the tender. |
| **21. Time allocated to the candidates for the constitution of bid** | n.a. |
| **22. Time allocated to the NRA for the analysis of the bids** | n.a. |

## 6. Characteristics of national tendering procedures: other technologies

| | France | | Italy* | Lithuania | Portugal |
|---|---|---|---|---|---|
| | AO Self-consumption 2016 | hydroelectric 2016 | Geothermal & CSP | Hydro | Small Hydro |
| 1. Reference value determined through tender? | Reference value in €/MWh for a feed-in premium contract | Reference value in €/MWh for either a feed-in tariff or a feed-in premium contract (depending on the size) | Reference value in €/MWh as basis for calculating hourly market premium (FIP) | ct/kWh (a feed-in-tariff) | Finantial compensation to the State |
| 2. Duration of support granted | 10 years | 20 years | 25 years | 12 years | 45 years concession, 25 years |
| 3. Key awarding criteria (e.g. price, volume, Local content rules, special rules for local community projects) | Price | Price, energy efficiency and environmental criteria | Price | The lowest feed – in tariff<br>The biggest installed capacity | Amount of offered finantial compensation. |
| 4. Price awarding mechanism | pay-as-bid | pay-as-bid | Pay-as-bid | Uniform pricing | Compensation = Base price + |
| 5. Number of rounds per year | 2 rounds (2016 - 2017) | 1 round in total | 1 | - | N/A |
| 6. Tendered volume per year [MW] | 20 MW each of the 2 years | 55 MW + 50 projects for the category of the smallest installations (<150 kW) | 100 (CSP)<br>20 (Geothermal) | 14 MW (from 2013 until now) | 250 MW total, 150 W in 2010 |
| 7. Realisation time | 30 months | less than 4,5 years | 39 months (CSP), 51 months (geothermal) for full support (determined by auction); loss of the support entitlement and of the financial guarantee | 3 years | Not specified |
| 8. Minimum participation size (volume in KW) | 100 | 36 | yes > 5 MW | 11 | |
| 9. Maximum participation size (volume in KW) | 500 | 4500 | NO | it's two types of auctions: (1) 11-1000 kW and (2) over 1000 kW | 20,000 |
| 10. Ceiling bid price | None | None | Yes (60% of the base tariff, i.e.: CSP: 174.6 €/MWh<br>Geothermal: 50.4 €/MWh) | - | n.a. |
| 11. Floor bid price | 130 | From 150 to 180 depending of types of installations | Yes (98% of the base tariff, i.e.: CSP: 285,2 €/MWh<br>Geothermal: 82,3 €/MWh) | different for all auctions. (it was organised three auctions for hydro power plants up to 1000 kW) | n.a. |
| 12. Material prequalifications | - administrative identification of the bidding company/person<br>- descriptive report of the installation (with schemes)<br>- if PV : certification for the carbon footprint assesment | - proof of land-use right<br>- administrative identification of the bidding company<br>- descriptive report of the project and demonstration of the readiness of the project<br>- note of analysis of the energetical performance<br>- technical report on environmental impacts of the project (to be assessed by the regional environmental authority) | Plant authorization and connection quote, redacted by the grid operator and accepted by the proposing subject | - | n.a. |
| 13. Financial prequalifications | None | None | 1) Declaration by a financial institution of the financial and economic strenght: that could be a commitment to finance the intiative or a demonstration of an adeguate level of capitalization. 2) Provide a financial guarantee equal to 10 % of the investment cost (defined according to the values of Attached II of the decree), of which, 50% when submitting the bid and the other 50% after winning the award. | financial guarantee 14,48 EUR/kW | n.a. |
| 14. Administrative fee for participation | None | None | 2,200 € | - | |
| 15.Body in charge of carrying out the tendering procedure/ role played | Case C | Case C<br>+ assesment of the environmental aspects of the projects by the regional environmental authority. | GSE - Publication of tendering documentation, opening of bids, publication of results, communication with bidders, issuing of payment entitlement, etc. | NRA; Auction announcement; Auction documents and feed-in tariff registration; Documents' scrutiny and the list of the auction participants; Feed-in tariff rating and winner announcement; | DGEG (Energy General Directorate) |
| 16. Level of competition | 1 round: 3,9 X<br>2 round: 4,3 X | 0,5 X | CSP underbid: out of the 100 MW of available capacity, just 41 MW were offered but they were excluded. For the geothermal technology the admitted volume (20 MW) has been almost totally reached by the sole winning bidder (19,8 MW). | n/d. The tendered volume wasn't oversubscribed. | n.a. |
| 17. Diversity of actors | no analysed data available | no analysed data available | 100% private company | 100 % companies | n.a. |
| 18. Clearing price development | The average price decreased by 54% between the 2 periods. | - | Geothermal: in this round the sole winning bidder offered the minimum allowed reduction of nearly 2% respect to the base tariff, i.e. 82,3 €/MWh | All auctions had one participant and they won max. feed-in tariff | n.a. |
| 19. Realisation rate | n.a. | n.a. | Geothermal: in this round (with the latest available data until July 31st 2017), considering that the realization time is 51 months from December 2016, none of the plants is already functioning. In the previous three rounds the realization rate is 100% (single plant). | it's 10 % of auctions of 2013 and n/d of 2015. | n.a. |
| 20. Challenges encountered, which eventually led to adaptation of process | n.a. | n.a. | Given the increased competitivity reached during the previous three rounds (in the case of geothermal), the incentivation amount was reduced (the base tariff amount and the maximum allowed reduction price bid). Also the financial and guarantees requirements became more stringent. Moreover the realization period was extended | n.a. | n.a. |
| 21. Time allocated to the candidates for the constitution of bid | 2 months | 8 months | n.a. | n.a. | n.a. |
| 22. Time allocated to the NRA for the analysis of the bids | 1 month | 4 months | n.a. | n.a. | n.a. |

## 7. Overview and summary

| | Technology focus | Reference value determined through tender? | Duration of support granted | Awarding criteria approach | Price awarding mechanism | Level of competition | Clearing price development over the rounds | Realisation rate |
|---|---|---|---|---|---|---|---|---|
| Belgium | **Technology specific** | FIP | 20 years from start of operation | multi-criteria based tender | pay as bid | 2x | na | 0% |
| Denmark | **Technology specific** | Sliding premium/CfD | 50.000 FLH | Single criterion based (price) | pay as bid | n.a. | n.a. | No information available |
| France | **Technology specific & technology neutral (wind & PV)** | FIT & FIP | mostly 20 years | Both single and multi-criteria based tender have been used | pay as bid | high | Decreasing | High for PV (68%-95%) but low so far for CSP (0% in 2013 and 35% for 2011) |
| Germany | **Technology specific & technology neutral (wind & PV)** | FIP | 20 years from start of operation | Single criterion based (price) | Mainly pay as bid, but also uniform pricing on a trial basis. Both mechanisms are used in wind and biomass tenders to take into account the specificities of different actors | high, except for biomass | Decreasing | High for PV (90-100%) |
| Greece | **Technology specific** | FIT & FIP | Date of start of operation plus 20 years | multi criterion based (price and volume) | pay as bid | Between 3x and 36x. The level of competition in the PV auction of 2016 was 40% | Only one single round so far | No information available |
| Hungary | **Technology neutral** | FIP | max. 20 years tbd. | Single criterion based (price) | pay as bid | No information available | No information available | No information available |
| Italy | **Technology specific** | FIP | 20 or 25 years | Single criterion based (price) | pay as bid | from <1 to 2.5 depending on the technology | No information available | between 0% and 100 % depending on the technology |
| Lithuania | **Technology specific** | FIT | from 12 to 20 depending on the technology | multi criterion based (price and volume) | uniform pricing | no exact data available but mostly oversubscribed | Between 0 % and minus 23.5% | between 0% and 100 % depending on the technology |
| Malta | **Technology specific** | n.a | 20 years from start of operation | Single criterion based (price) | pay as bid | No information available | No information available | No information available |
| Netherlands | **Technology neutral & specific for offshore wind** | FIP | from 8 to 15 depending on the technology | multi criteria based (price and volume) | n.a. | n.a. | No information available | No information available |
| Poland | **Technology neutral** | FIT | 15 years from start of operation | multi criterion based (price and volume) | pay as bid | different effects in different sessions | slightly decreasing | No information available |
| Portugal | **Technology specific & technology neutral** | FIT (discount related to reference FIT) | 15, 20 or 25 years | Single criterion based (price); multi criterion for wind onshore (+industrial investment) and biomass (+efficiency, innovation, wildfire prevention, etc.) | n.a. | n.a. | No information available | No information available |
| Spain | **Technology neutral (but third round in 2017 restricted to (indistinctively) onshore wind and solar PV)** | Incentive proportional to capacity installed | 20 or 25 years | Single criterion based: discount over allowed incentive given as reference | uniform pricing | Exact data confidential; well oversubscribed | All three rounds cleared @ maximum discount (i.e., no incentive awarded) | No information available |
| UK | **Technology neutral (and specific for offshore in the past)** | FIP (Contract for Difference) | 20 years | Single criterion based (price) | uniform pricing | No information available | No information available | No information available |

# 8. Explanations for data requested

| EXPLANATIONS FOR DATA REQUESTED |
|---|
| **1. What is being determined?** |
| With this question, we would like to enquire, what the tendering procedure is supposed to determine. In many cases it is a certain monetary reference value, which is then used as a basis for calculating a premium (in FIP scheme, part of support paid on top of market price). It could also be the monetary reference value for a feed-in-tariff. The financial value can be expressed per KWh produced or per KW installed. Please specify your answer. |
| **2. Duration of support granted** |
| Please indicate the duration in years for which the support is granted. Usually the support is granted for 15 to 20 years (from the start of operation or in addition to the year of starting operation). |
| **3. Key awarding criteria** |
| In each tendering scheme, the selection of the bids submitted is based on a number of predefined criteria. The most common ones are the price (reference value) and the volume (capacity size of planned RES installation for which the bid is submitted). However, other criteria are possible such as:<br>*- Local content rules (e.g. % of the value chain for the construction/ installation process for a RES plant (panels, turbines, work force, etc.) to be locally anchored)*<br>*- Special rules for local community energy projects (e.g. reduced financial security, different price awarding mechanism, different maturity of the project at the time of participation in the tendering process)*<br>*- Grid connection/ network capacity (e.g. special rules regarding the location of the grid connection in order to steer the regional distribution of the RES installations)*<br>Please describe the awarding criteria used and how they are weighted. |
| **4. Price awarding mechanism** |
| Please indicate how the price (reference value) is being determined. Uniform pricing, pay-as-bid or a mixture of both mechanims are often being used as a method to set the price although other approaches exist. Please specify. |
| **5. Number of rounds per year** |
| Please indicate the number of annual rounds (1, 2, 3 or more) foreseen per tendering scheme. |
| **6. Tendered volume per year [MW]** |
| Please indicate the overall yearly volume in MW of RES capacity foreseen to be auctioned. |
| **7. Realisation time** |
| Please indicate how much time RES investors have for starting operation once they have sucessfully participated in a tendering procedure and whether there is a different timing foreseen. E.g. realisation within 18 months for the full support level or within 24 months with a small deduction from the price determined through the auction. |
| **8. Participation size (volume in KW)** |
| Please indicate whether there is a minimum or maximum capacity size for participating in the tendering procedure. E.g. for ground-mounted PV min. 100 KW and maximum 10 MW. |
| **9. Bid Price** |
| Please indicate whether there is a minimum (floor) or maximum (ceiling) bid price defined for participating in the tendering procedure. E.g. min. 5,00 ct/ KWh and maximum 9,00 ct/KWh. |
| **10. Prequalifications** |
| Please indicate what are the requirements for participation in the tendering procedure: these can be financial requirements, such as financial guarantee payments, or material ones, such as a construction plan or a building permit, etc. The type of prequalification determine whether is an early (early project developement stage) or a late (advanced project development stage) auction. |
| **11. Administrative fee for participation** |
| Please indicate whether participants have to pay a fee to participate in the tendering procedure and if yes, its amount. |
| **12. Body in charge of carrying out the tendering procedure** |
| Please indicate whether the NRA or another public or private body is responsible for carrying out the tendering procedure. In cases where the NRA is responsible, please describe the tasks carried out in the process. |
| **13. Empirical evidences** |
| Empirical evidences are crucial in order to judge the success of tendering. Some evidences such as the level of participation (as an indicator for the level of competition), the type of participants (as an indicator for the diversity of actors) or the price development can be gathered immediately after each tendering round. However, information about realisation rates will only be available much later (e.g. 24 months). This requested information on empirical evidences is very important for the preparation of this CEER report on tendering procedures.<br>*1. Level of competition* : Please indicate the intensity in participation in each tendering round by indicating how many times the tendered volume had been oversubscribed (e.g. thrice when 300 MW was the tendered volume and bids were offered for 900 MW).<br>2. *Diversity of actors* : If the information is available, please indicate the distribution by type of bidders (e.g. 10% companies, 50% local community projects, 2% private, etc.).<br>*3. Clearing price development:* Please indicate how the prices determined through the tendering procedure have evolved from round to round.<br>*4. Realisation rate:* If available, please indicate in % (55%) and or in MW (200 of 500 MW), the realisation rate for each tendering round.<br>5. Challenges encountered: If possible, describe what were the unexpected challenges encountered in the process and whether they led to adapting the rules. |

## Annex 3 – 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 36 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, national regulatory authorities 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 Work Streams, composed of staff members of the national energy regulatory authorities, and supported by the CEER Secretariat. This report was prepared by the Sustainable Development Work Stream of CEER's Electricity Working Group.

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More information at www.ceer.eu.