

The background of the cover is a composite image. The upper portion shows several wind turbines against a dramatic sunset sky with orange and blue clouds. The lower portion shows a close-up, perspective view of solar panels, with the reflection of the wind turbines visible on their surface.

dwf

European renewable energy guide, 2021

Market outlook and support systems
for Ireland, Italy, Poland, Spain and
the United Kingdom

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Introduction



The energy transition is rapidly accelerating throughout the world and in Europe in particular. In December 2019, the European Council endorsed the objective of the European Union achieving complete climate neutrality by 2050, while the United Kingdom set similar goals. As the year 2020 unfolded with historic and life-changing events, many thought that the effort would be undermined. The opposite is in fact happening and the pace of the green revolution increased. It will be one of the pillars of recovery.

In particular, ever more electricity will be generated from wind sources onshore and offshore, and from photovoltaic power plants. Europe is well positioned for that. Strong R&D and manufacturing sectors, skilled labour, the rule of law and, last but not least, favourable weather conditions for RES, make investments attractive.

This guide aims to bring clarity to the onshore RES regulatory framework in major European markets (Ireland, Italy, Poland, Spain and the UK) and provide a long-term perspective for each of these countries.

All of the economies concerned, except for the UK, continue to maintain support systems for industrial-size onshore wind and solar. As fostered by the EU legislation, support is granted through a competitive tendering process which ensures that only the most efficient projects are eligible.

Understanding both similarities and differences of national support systems is vital for ambitious developers operating in an international environment. At DWF, a global legal business with presence in all the described jurisdictions, we analyse and navigate them every day as part of our work. We are pleased to share our experiences with you and contribute to the growth of your businesses.

Kind regards,



Karol Lasocki

Partner & Head of Renewables

T +48 226 534 219

M +48 501 359 370

E Karol.Lasocki@dwf.law



Support system for large scale onshore wind and solar

Investment opportunities until 2030

Bottlenecks

Renewable Energy Support Scheme

(RESS) support from 1 July 2020 until 31st December 2037. Some projects under REFIT will continue to receive REFIT support up to 31 December 2032.

The Irish government target that 15% of Irish electricity demand (potentially up to 6TWh) will be met by renewable energy sources contracted under Power Purchase Agreements by 2030. The appetite of RE100 companies and large US multinational companies in Ireland may lead to further growth of PPAs in Ireland.

Government plans up to 2030 under the Climate Action Plan 2019:

- 70% of electricity generated from renewable sources;
- 950,000 electric vehicles on the road, and;
- Home owners be permitted to generate their own electricity and sell back to the grid under a scheme for micro-generation.
- 15% of Irish electricity demand (potentially up to 6TWh) will be met by renewable energy sources contracted under PPAs.

The frequency of future RESS auctions is dependent on the renewable electricity project supply pipeline. It is envisaged that a minimum of four auctions will occur between 2020 and 2025 to deliver on the 2030 targets.

Planning: While less of an issue for solar PV projects, the planning consent regime in Ireland can cause considerable uncertainty, delays and additional costs for the development of onshore wind projects.

Grid connection: Considerable improvement of the grid system infrastructure is still required, if Ireland is to reach its goal of 70% renewables on the grid by 2030 as set out in the Climate Action Plan 2019.

1. RES market conditions

The electricity market in Ireland is run through an all-Ireland transmission system owned by EirGrid which owns the Northern Ireland transmissions system operator (SONI). The distribution system operator is ESB Networks in Ireland and Northern Ireland Electricity in Northern Ireland. There is a single market operator called SEMO (Single Electricity Market Operator).

In Ireland the Commission for Energy Regulation is Ireland's independent regulator and in Northern Ireland it is the Utility Regulator of Northern Ireland (UREGNI).

Gas is the dominant fuel in Ireland with approximately 50% of the nation's electricity generated from imported natural gas. Ireland has recently taken steps to remove peat and coal generation from its electricity generation capacity. Ireland has one of the highest dependencies on imported fossil fuels for electricity generation in Europe with only Cyprus and Malta being significantly higher.

At present Ireland's power grid has very limited interconnection with the rest of Europe. Whilst the planned Celtic Interconnector to France and the current interconnection with the United Kingdom will give access to other sources of electricity, the relatively limited interconnection gives rise to a policy environment that can accelerate the integration of renewable energy sources.

Current predictions are that by the end of 2020, Ireland will reach its 2020 renewable energy target of 40%. Figures released by the Irish Wind Energy Association show that wind provided 28.5% of Ireland's electricity in April, May and June 2020 and is at 36.8% overall for the first half of the year.

According to Dr David Connolly CEO of the Irish Wind Energy Association, "Ireland is number one in the world for the share of electricity demand met by onshore wind. Last year wind broke records by providing one-third of the country's electricity." Planning permission was granted in the second quarter of 2020 for 136 megawatts of more wind energy. On Friday 14 August 2020, the Irish Supreme Court quashed the Irish Government's plan to cut greenhouse gas emissions. The upshot of this decision is that the Irish Government needs a new plan to enable Ireland to build to a zero-carbon society by 2050. Dr Connolly predicts that wind energy will be Ireland's number one source of electricity within five years.

The increasing connection and wind electricity generation to the Irish Transmission System has meant that the grid must be strengthened to take on this new power from wind farms and solar farms. Whilst it is a topic for another paper, EirGrid has committed to spending €2 billion in the next three years to upgrade the Irish Transmission System.

In 2018 wind provided 85% of Ireland's renewable electricity and 30% of its total electricity demand. It is the second largest source of electricity generation in Ireland after natural gas. Ireland is one of the leading countries in the world in its percentage use of wind energy and was marked third world wide in 2018 after Denmark and Uruguay.

There are 368 windfarms on the Island of Ireland according to the Irish Wind Energy Association and 250 of those are located in the Republic of Ireland. Ireland has 5,030 megawatts of installed wind energy capacity on the island. The Republic of Ireland wind generation record was achieved on 29 February 2020 with 3,347 megawatts produced. In 2017 all electrical generation accounted for by wind energy in Ireland was 25%. It would be significant evidence of movement towards the sustainability of Ireland were it to achieve a full 40% of renewable energy production in total by the end of 2020.

2. Solar energy

Ireland had solar PV capacity of 29 megawatts in 2018. The Government said that the 2019 Climate Action Plan had pledged €3.7m to support the installation of solar panels on homes. The Irish Government has estimated that solar PV technology costs have fallen by 80% from 2008 to 2013.

PV Magazine tells us that there are three key factors to be overcome for the Irish Solar Market to succeed in contributing to the country's movement towards a zero carbon future by 2050 and 70% renewable production by 2030. It estimates that there is a development pipeline of approximately 6.9 Gigawatts but a lack of a clear route to market means build up rates for PV installations continued to be relatively sluggish. The majority of the renewable energy production in Ireland has been achieved through the 4.2 Gigawatts of installed wind capacity. One must caution the enthusiasm for this number when realising that there has been a reduction in electricity demand arising from the Covid-19 pandemic. It was hoped that following the renewable energy support scheme auction that at least 1,000 Gigawatts per annum would be awarded with respect to photovoltaic production. There was an estimated 1.3 Gigawatts of PV capacity eligible to enter the round one of the Renewable Energy Support Scheme auction process. A significant number of sites applying were left empty handed and will have to look at alternative routes to market or apply to qualify at the next RESS auction.

3. Challenging Factors affecting Solar and Onshore Wind Development

3.1 Photovoltaics

Often the size of the solar farm is a factor in reducing overall project costs allowing the owner to tender for construction operation contracts on a wider portfolio basis. As such, there may be some benefit to smaller sized production facilities. In Ireland there is a "use of system" cost for maintenance and upgrade of the electricity grid infrastructure which is passed on by EirGrid to generators. Ireland levies high use of system charges with the latest ranges from EUR 400 a month to EUR 1,200 a month per megawatt of connection capacity depending on the location of the site. The first 5 megawatts of capacity for any site are exempt from paying use of system charges and as such there could be a competitive advantage to sites smaller than the 5 megawatt cap for the exemption.

One of Ireland's biggest challenges with respect to solar PV installation is that it is not particularly blessed with solar resources with the most favourable sites on the Southern coast of Ireland offering an annual global horizontal radiation in excess of 1,000 Kilowatts per square metre.

The size of the single electricity market combined with Northern Ireland gives a relatively small average annual demand of roughly 6 Gigawatts and only a small number of interconnectors to Scotland and Wales available for export of excess electricity means that during periods of high generation and/or low demand that generators are frequently required to curtail output in response to periods of excessive generation relative to demand. It is hoped that the Celtic interconnector to France will help smooth out this aspect of the capacity issue. Obviously battery storage will be another smoothing factor to the efforts by Ireland to match generation with demand.

3.2 Wind

The planning consent regime in Ireland is archaic and can cause considerable uncertainty, delays and additional costs for the development of onshore wind projects. This has always been, and continues to be, a challenge particularly for the wind industry sector.

3.3 Grid connection

It is generally accepted by the energy industry that existing electricity grid system and connection policy in Ireland is not fit for purpose. This is particularly evident in relation to non-synchronous generation which produces a different amount of electricity depending on the energy generated. The majority of renewable forms of energy e.g. wind and solar are types of non-synchronous generation as the amount of power generated by the wind or the sun can differ and is less reliable. Eirgrid (through the DS3 programme) has increased the levels of renewable/non-synchronous generation on the grid but considerable improvement of the grid system infrastructure is still required if Ireland is to reach its goal of 70% renewables on the grid by 2030 as set out in the Climate Action Plan.

According to a recent report¹ published by Energy Storage Ireland and the Irish Wind Energy Association, in 2019 alone more than 710,000 MWh of renewable electricity (enough to power the city of Galway for a year) was lost due to onshore wind farms being required to 'dispatch down' i.e. instructed to reduce the amount of power they generate because the grid system is unable to deal with the substantial volume, and non-synchronous nature, of renewable energy generated.

3.4 Rates

The Valuation Office in Ireland is yet to provide its decision on the revaluation of rates (local authority charges) for windfarms in Ireland. It has been suggested that the revaluation could result in the tripling of rates, which would obviously impact on the financial considerations for such projects. Certainty on the timeframe for

the Valuation Office's would be most welcome to provide clarity on this issue.

4. Draft National Energy & Climate Plan

Ireland issued its draft National Energy & Climate Plan to the European Commission in December 2018 and the Minister for Communications, Climate Action and Environment issued a supplemental Climate Action Plan in June 2019. Ireland's Government set out a number of key goals:

- By 2030 70% of electricity to be generated from renewable sources;
- 950,000 electric vehicles on the road;
- 500,000 existing homes to be upgraded to B2 building energy rating (BER) and;
- Home owners be permitted to generate their own electricity and sell back to the grid under a scheme for micro-generation.

This is all with an aim to achieve net zero greenhouse gas emissions entirely by 2050 in Ireland and the roadmap for this is underpinned by the European green deal which is the legislator framework enshrined in the EU's clean energy package. These two plans supplement the 2017 National Mitigation Plan which lays the foundation for transitioning Ireland to a low carbon, climate resilient and environmentally sustainable economy by 2050. The mitigation plan looks at electricity generation, the built environment, transport and agriculture as the sectors that will drive national change. One of the mitigation plan's most ambitious targets is for all new cars and vans sold in Ireland to be zero emissions vehicles by 2030. Therefore electricity will be the primary fuel option for personal transport.

Ireland's energy efficiency target for 2020 was 20% with the public sector tasked with helping achieve the overall national target with its own energy efficiency target improvement of 33%. Much of those efficiency gains now and into the future will need to be gleaned from technological improvements in indigenous renewable resources including wind; both on-shore and off-shore. To bolster the innovation in the energy sector, Ireland has introduced "Innovation 2020" which is a five year strategy on research and development in science and technology. This plan has six priorities in terms of innovation in energy: empowering energy citizens; markets and regulation; planning and implementing essential energy infrastructure; ensuring a balanced and secure energy mix; putting the energy system on a sustainable path; and driving economic opportunity.

The recently formed Government with its "Programme for Government" commits to development of a solar energy strategy and a policy framework to incentivise the country's electricity storage capacity.

On 31 July 2020 the Supreme Court of Ireland determined that the National Mitigation Plan was unlawful and should be quashed. In adopting the plan the Government had failed to comply with the requirements of the Climate Action and Low Carbon Development

¹ Saving Power – 70 by 30 Implementation Plan, August 2020

Act 2015. The Court concluded that the plan fell well short of the level of detail required under the Act and that the public must be able to know how the Government intends to meet the national transition objective by 2050 of a zero net carbon society. The new programme for Government pledges to deliver draft climate legislation (the Climate Action Bill) within the first 100 days in office. The bill's aim is to set up a five year carbon budget.

Encouragingly, climate action minister and Green party leader Eamon Ryan said "I welcome the judgment of the Court and congratulate Friends of the Irish Environment for taking this important case. We must use this judgment to raise ambition, empower action and ensure that our shared future delivers a better quality of life for all."

The National Mitigation Plan was intended to be renewed every five years. The Supreme Court decision will necessitate more immediate updating of Ireland's plan to meet 2030 and 2050 targets. Security of supply will drive much of the infrastructure investment in the coming years. Wind and Solar along with storage will be key factors.

5. Renewable Energy Support Scheme

5.1 Key rules

On 4 August 2020, the renewable energy support scheme ("RESS") announced the provisional results of its first auction. This was a central element of our own Government's action on climate disruption as set out in the Program for Government, the Climate Action Plan and the National Energy and Climate Plan.

RESS replaced the previous renewable energy feed in tariff (REFIT) scheme. The REFIT schemes were designed to provide certainty to renewable electricity generators by providing them with a minimum price for each unit of electricity exported to the grid over a 15 year period. Whilst applications for the last REFIT schemes (REFIT 2 and REFIT 3) closed on 31 December 2015, those projects will continue to receive REFIT support up to 31 December 2032.

Successful RESS Projects are eligible for RESS support from 1 July 2020 and the RESS support will continue until 31st December 2037.

114 Projects had applied to participate in the RESS 1 qualification process. The final qualification results as approved by the Minister qualified 109 projects (including 8 Community Projects) to participate in the RESS 1 auction. Of the 108 projects who submitted an Offer Price in respect of the RESS 1 Auction, 82 projects (19 windfarms and 63 solar projects) were provisionally successful in the auction. Government approval of the auction results were issued on 11 September 2020.

The average weighted price for community projects was €105.15 per MW. The average weighted price for solar projects was €72.92 per MW and overall all projects averaged a price of €74.08 per MW. The average weighted price was a bit higher than some commentators had expected. In terms of offer quantity, a total of 1,275.536 megawatts were successful and 283.4 megawatts were

not successful. Of the successful projects in terms of deemed energy quantity, wind was 1,469.338 GWh hours and solar was 767.315 GWh hours. In terms of the unsuccessful offers 252.849 GWh were solar and only 64.386 of unsuccessful offers were for onshore wind.

The most northerly successful solar project appears to be just north of Drogheda within the Republic of Ireland whereas the wind capacity was relatively evenly distributed geographically.

The largest award for on-shore wind farm was 73.326 MW whereas the largest solar project was 119MW. Initially, there had been some discussions around technology specific auctions but the first RESS auction was technology neutral – solar and onshore wind benefitted greatly from this. It is proposed to have a RESS auction specifically for offshore wind in 2021. This was scheduled for Q2 of 2021 but it remains to be seen whether this may be delayed.

5.2 RESS Eligibility Criteria

– New or Repowered Renewable Project

The project must either be a new or repowered renewable project (50% energy increase and €300k/MW investment for repowered).

– Planning Consent

Projects are required to have full planning permission (excluding grid connection assets).

– Grid Connection

Projects are required to be grid contracted or listed by EirGrid or ESB Networks as an ECP-1 project that is eligible to be processed to receive a valid connection offer of sufficient capacity to carry the capacity of the project submitted in RESS 1. Projects that have declined to contract an ECP-1 offer within the acceptance period of the offer will not be eligible.

– Site Control

The site of the project must be specified, must demonstrate control of the site for the purposes of developing and operating the project.

– Director Declarations

The Directors are required to give sworn Declarations in relation to various matters including planning consent, grid connection, bankability, and bidding independence.

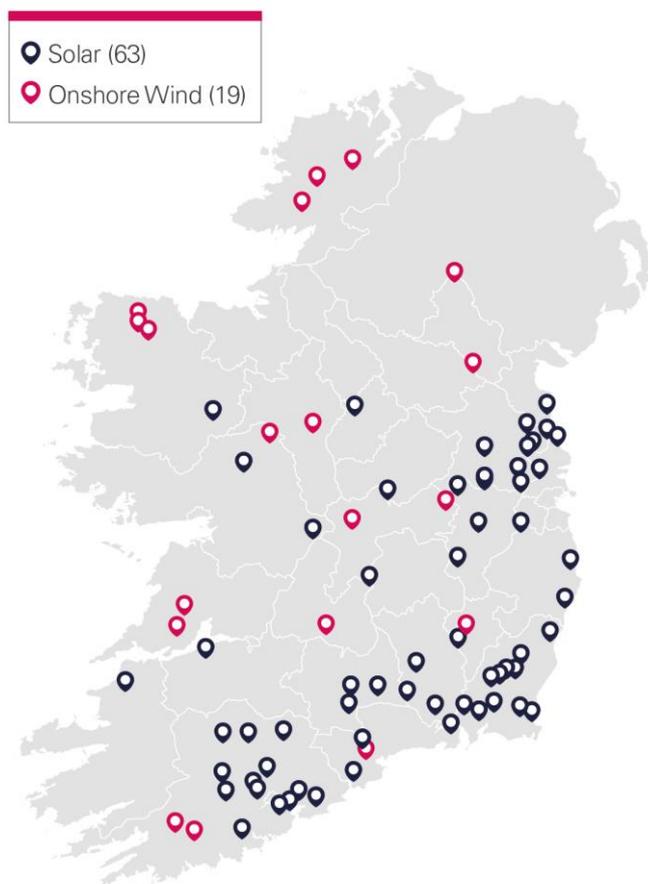
– Bid Bond

In order to participate in the RESS auctions, prospective bidders are required to provide a Bid Bond of €2,000 per MW (where the MW value is the offer quantity for the project). The Bid Bond is to be submitted by way of a cash deposit.

Following the auction, successful bidders will enter into an Implementation Agreement with the minister for DCCA, and a power purchase agreement with an eligible supplier under the Irish Public Service Obligation (PSO) process. Successful bidders will also be required to provide a performance security bond of €25,000/MW. The Implementation Agreement will

commit the project to being developed as offered in return for receiving the RESS letter of offer (providing for support scheme eligibility). The Implementation Agreement will set out the timeframes by which various project milestones must be achieved. The DCCAE will be entitled to rescind the offer if the milestones are not met and/or would also be able to call in the security bond for the project (up to 25% for certain milestones).

Diagram 1 - Location of RESS 1 Successful Projects



6. Community Benefit Requirement

One of the aims of RESS and the Climate Action Plan 2019 is to encourage and facilitate greater community involvement in renewable electricity. RESS-1 will provide a pathway for community projects through the community preference category and a mandatory Community Benefit Fund for all projects successful in the auction².

Community-Led Projects must meet the following requirements as per the timelines of the Implementation Agreement:

- a) at all relevant times be at least 51% owned by a Renewable Energy Community (the “Relevant REC”) either by way of (i) a direct ownership of the RESS 1 Project’s assets, or (ii) a direct ownership of the shares in the Generator; and
- b) at all relevant times, at least 51% of all profits, dividends and surpluses derived from the RESS 1 Project are returned to the Relevant REC³.

There is a mandatory requirement, under the RESS 1 Terms and Conditions, that all successful Projects under RESS 1 establish a Community Benefit Fund prior to Commercial Operation of the relevant RESS 1 Project. The contribution will be €2/MWh of Loss-Adjusted Metered Quantity for all RESS 1 Projects.

The funds from the Community Benefit Fund must be distributed on an annual basis by the generator or its agent.



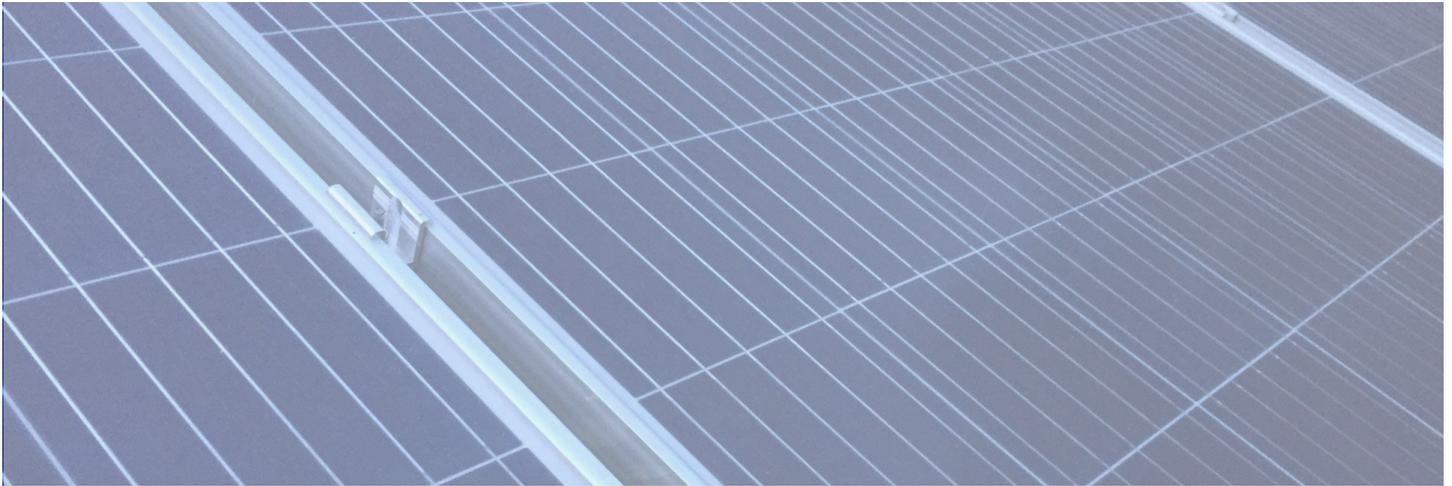
Chris Wheeler
Partner, Ireland
T + 353 1 790 9477
M + 353 8 646 6920 4
E Chris.Wheeler2@dwf.law



Edon Byrnes
Partner, Ireland
T + 353 1 790 9460
M + 353 8 617 0450 6
E Edon.Byrnes@dwf.law

² Terms and Conditions for the First Competition under the Renewable Electricity Support Scheme – Supplementary Note in Relation to Citizen Investment – February 2020 – DCCAE

³ Section 7.1.1 of the RESS 1 Terms & Conditions, February 2020 – DCCAE



Support system for large scale onshore wind and solar

Investment incentive scheme: project support through a Ranking List for project capacity up to 1MW OR Auction Procedure for project capacity over 1 MW (solar PV plants on agricultural land are not eligible for subsidies through GSE auction).

Regulation of PPAs (in progress from August 2020) by Italian Ministry of Economic Development and GSE to support an increase, of at least 0.5 terawatt-hours per year, in renewable energy production.

Investment opportunities until 2030

Integrated National Energy and Climate Change Plan to 2030:

- Reduction of greenhouse gas emissions by 40% (from 1990 levels);
- 30% increase in the share of renewable sources in gross energy consumption (55% of electricity demand to be met by renewable generation);
- Improved energy efficiency by 43%

Market analysis speculates that investments in solar PV can benefit from a return estimated between 6% and 10% in current market conditions.

Bottlenecks

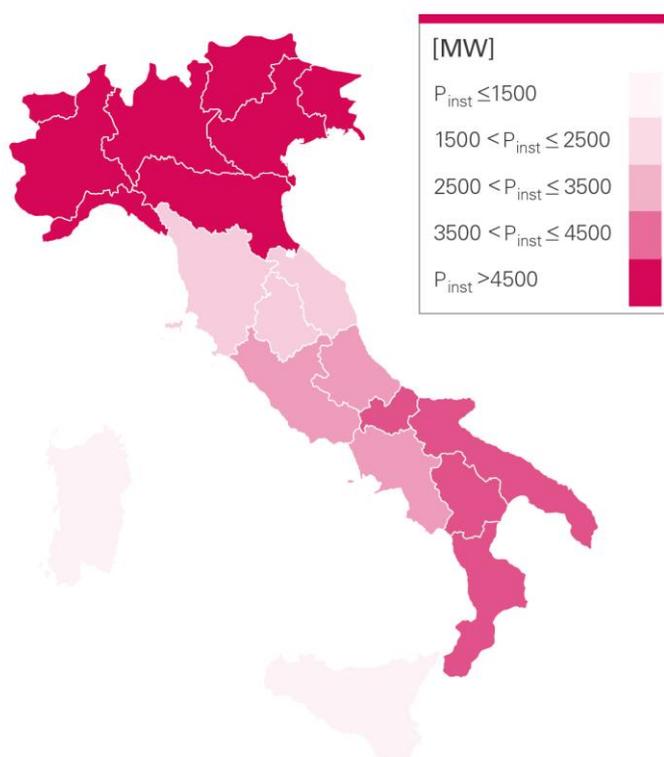
Authorisation procedure concerning environmental matters and the construction of plants. This is mainly caused by the different legislative frameworks in force in the Italian Regions. In order to avoid the difficulties deriving from the heterogeneous legal framework, Italian legislators are going to enact several measures aimed at accelerating and simplifying all the authorisation procedures.

1. Market Conditions

1.1 Photovoltaics

As at July 2020, the energy produced by PV plants in Italy amounted to 3,300 GWh, representing an increase of 368 GWh compared to the previous month.

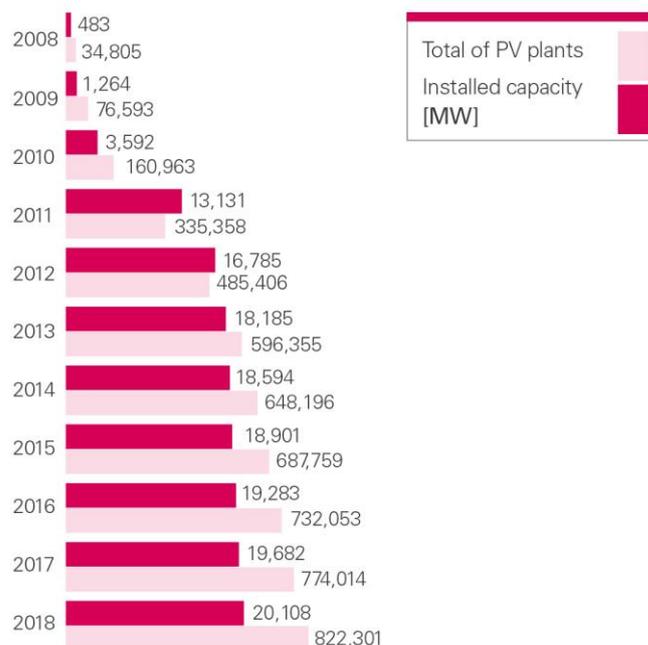
Diagram 1 – Location and power capacity installed in Italian regions – July 2020 issued by Terna



With regard to proliferation of PV plants, it is interesting to note that the most robust development took place after the Guidelines Approval entered into force (*Linee Guida* – Ministerial Decree from 10 September 2010). This national regulation lays down the relevant procedures for obtaining operational and environmental authorisation related to renewable energy plants.

The graphic below shows the growth of PV plants in Italy partly stimulated by the support mechanisms called *Conto Energia* provided by GSE (*Gestore dei Servizi Energetici*). GSE is a joint-stock company, wholly owned by the Ministry of Economy and Finance, in charge of the promotion and development of renewable energy sources in Italy.

Diagram 2 – Evolution of number capacity of PV plants (GWh) – 2018 issues by GSE

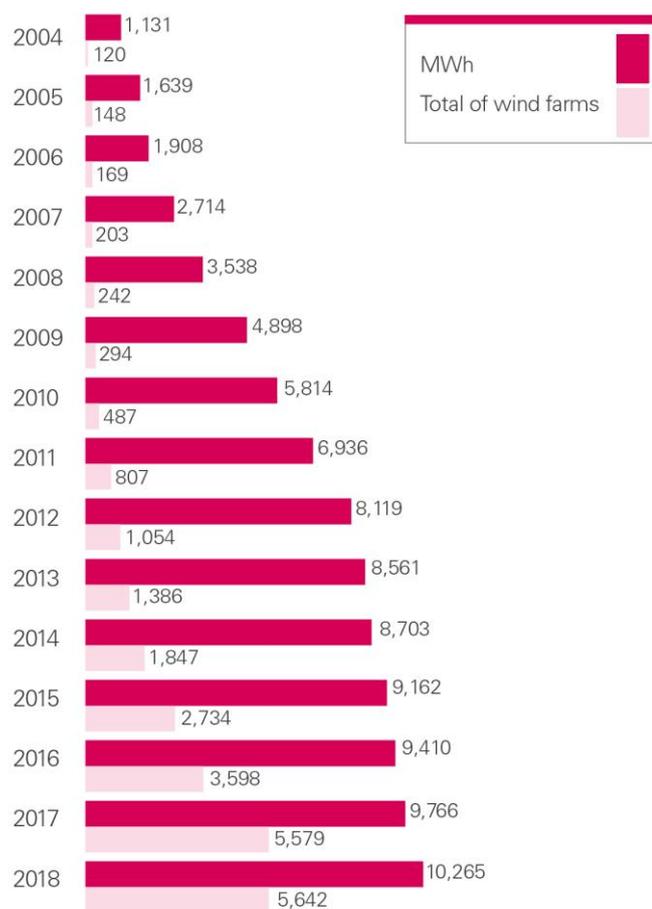


PV plants entered into operation during 2018 - mostly installations serving end customers - have an average power of 8.8 kW. The cumulative average capacity of PV plants is gradually decreasing, reaching 24.5 kW in 2018.

1.2 Wind

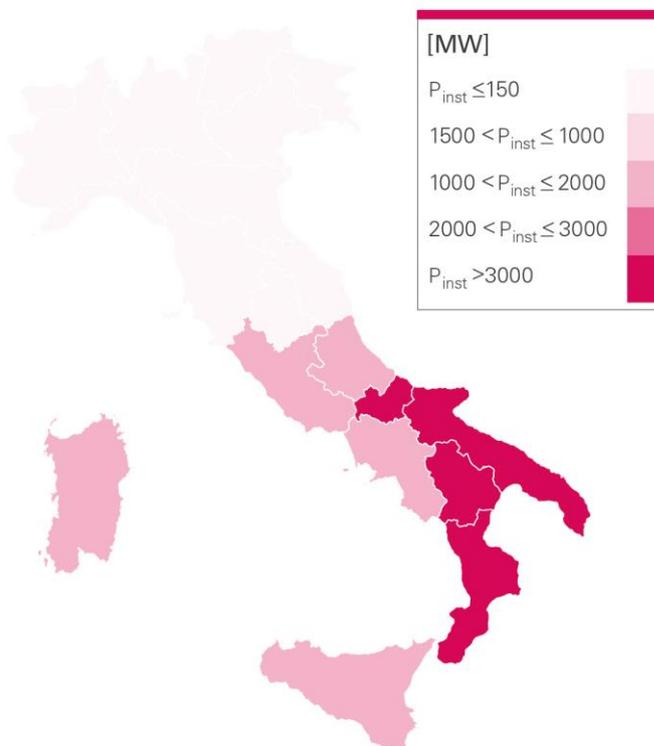
The development of wind farms in Italy is subject to more strict limits and constraints provided for by national and municipal laws. As noted below, concerning the authorisation procedure, the implementation of wind farm projects depends mainly on their environmental impact.

Diagram 3 – Evolution of number and capacity of wind farms (GWh) – 2018 issued by GSE



Nevertheless, the last 15 years were marked by a rapid development of wind farms in Italy. In 2004, there were only 120 wind farms, with a capacity of 1,131 MW, while at the end of 2018 the number of wind farms amounted to 5,642 plants, with total capacity of 10,265 MW. In 2018, the installed wind power capacity represented 18.90% of the total capacity of renewable energy sources.

Diagram 4 – Location and power capacity installed in Italian Regions (July 2020 – issued by Terna)



2. Energy transition – Italian strategy

In terms of actions and commitments in the renewable energy sector, Italy intends to achieve 30% of gross final consumption of energy from renewable energy sources in 2030, aiming at sustainable growth of these sources and ensuring their full integration into the energy system. In particular, a gross final energy consumption of 111 Mtoe (million tonnes of oil equivalent) is forecasted for 2030, of which approximately 33 Mtoe will be derived from renewables.

Terna S.p.A. ("**Terna**"), as Italy's primary transmission system operator, believes that a full integration of renewable energy sources in the electricity system can only be achieved through the implementation of a set of essential, coordinated and coherent actions. The actions and interventions identified by Terna to achieve the national decarbonisation objectives can be divided into four categories:

- 1) investments in the National Transmission Grid and interconnectors with neighbouring countries, aimed at strengthening the grid, reducing congestions and constraints;
- 2) long-term price signals with the aim of building and converting new generation plants (e.g. flexible and efficient gas plants to replace the most obsolete and polluting thermal capacity) through mechanisms such as the capacity market, promoting the construction of new renewable energy sources plants as well as storage capacities through

instruments such as power purchase agreements (PPA) and forward contracts;

- 3) evolution of the market to favour its integration at European level and to guarantee the right balance between the push for the participation of new flexible resources (DSR, storage) and a centralised and co-optimised management of the various services, necessary to continue to ensure the safety and efficiency of the power system.

3. Italian green recovery

In accordance with the Integrated National Energy and Climate Plan for 2021 to 2030, the Italian recovery plan will be based on (i) modernization, (ii) inclusivity and (iii) robust energy transition.

Italy has already declared the beginning of a significant shift in the country's energy and environmental policy, towards decarbonisation. The main objectives are demanding:

- reduction of greenhouse gas emissions by 40% (from 1990 levels);
- 30% increase in the share of renewable sources in gross end energy consumption, which translates to 55% of the electrical demand met by renewable generation;
- improved energy efficiency by 43%.

According to the latest “Renewable Energy Country Attractiveness Index” report from the consulting company Ernst & Young, published last May, Italy is in 19th place worldwide for attracting investments in the renewables market. This position is slightly lower (-2 places) than the last report pre-Covid, which demonstrated that Italy is still an important environment for investors to accelerate the energy transition.

Renewable energy is now considered a safe choice: the above-mentioned report speculates that investments in photovoltaic can benefit from a return estimated between 6% and 10% in current market conditions.

It is an attractive context for investors, who see the risk associated with returns reduced, and avoid exposure to fluctuations.

This development also implies:

- 1) the creation of new professional opportunities throughout the supply chain of investments in renewables: according to data from the International Renewable Energy Agency (IRENA), investing on a global scale 130,000 billion dollars in renewable energy could allow for a greater increase in global GDP by 2050, with another 98,000 billion dollars (2.4%) and 42 million more jobs, considering the field of energy efficiency and related sectors;
- 2) a possible coexistence between renewables plants and agriculture, drawing up sustainable new horizons. This is the case for agrivoltaic, an innovative method for solar plants that provides positive outcomes for crops and the animal species involved.

4. Overview of the authorisation procedure: PV and wind

The Decree no. 28/2011 provides three different kind of authorisation procedures depending on the type, size, capacity threshold and location of the renewable energy power plant to be constructed and operated and specifically:

- a) The single authorisation procedure, regulated under Article 12 of the Decree no. 387/2003 and implemented by the National Guidelines;
- b) The simplified authorisation procedure (“PAS”) regulated by Article 6 of the Decree no. 28/2011 and implemented by paragraphs 11 and 12 of the National Guidelines;
- c) The simple notification to the competent Municipality regulated under Article 6, paragraph 11 of the Decree no. 28/2011 and Article 6 of the Presidential Decree no. 380 of 6 June 2011 (“DPR 380/2001”) and implemented by paragraphs 11 and 12 of the National Guidelines.

Please consider that the Decrees as well as the other national provisions mentioned above represent a general framework applied on the whole Italian territory. Nonetheless, each region may enact its own local framework within the rules and principles set forth by the national framework. Therefore, the authorisation procedures may partially vary depending on the region.

4.1 The Single Authorisation Procedure

4.1.1 Introduction

As a rule, the construction and operation of RES power plants and auxiliary infrastructure may require several authorisations, opinions and acts of consent depending on the typology, size and location of the project, such as:

- Building permit regulated under the DPR 380/2001;
- Environmental impact assessment (“EIA”) resolution and other environmental approvals regulated under the Legislative Decree no. 152/2006 (the “Environmental Code”) (for more details please see paragraph 4.4 below);
- Authorisation to build in areas subject to landscape protection regulated under the Legislative Decree no. 42/2004 (“Code of Cultural Heritage and Landscape”);
- Authorisation of construction and operation of power lines;
- Other permits and or authorisation, concerning, for example, environmental, cultural and seismic constraints.

However, pursuant to Article 12, paragraph 3 of the Decree no. 387/03, the construction and operation of RES power plants is subject to a single authorisation, which replaces any other authorisation, concession, license, opinion required by the relevant laws including those one recalled above (the “Single Authorisation”). The competent authority is the Region, nonetheless, in some Regions, the competence has been transferred to the Provinces.

The Single Authorisation is issued within a single dedicated procedure led by the Region (or the Province as the case may be)

with the participation of a steering committee (Conferenza di Servizi) convened by the competent Region and composed of all the public bodies involved in the construction and operation of a RES project.

Pursuant to Article 5 of the Decree no. 28/2011, the Single Authorisation applies to all RES projects, except those subject to a simplified authorisation (PAS) or to a simple notification.

4.1.2 Provvedimento Autorizzatorio Unico Regionale (PAUR)

If the RES project is subject to an environmental procedure of regional competence (such as the Regional EIA), pursuant to the Environmental Code the developer has to file a separate motion in order to obtain the so-called Provvedimento Autorizzatorio Unico Regionale ("PAUR"), which encompasses all the necessary authorisation, i.e. the Single Authorisation and the EIA.

The application for PAUR is filed to the competent Region and includes all the technical documentation relating to the project.

At a regional level, the regulation of the Single Authorisation and the PAUR procedure may partially vary depending on the region in which the RES project is located.

4.2 The Environmental Impact Assessment (EIA)

The EIA Screening, aimed at verifying whether the project, considering its characteristics and location, has to undergo the full environmental impact assessment (EIA) and all the EIA procedures are regulated under Section III of the Environmental Code which sets out the main rules and criteria governing the Environmental Impact Assessment at a national level.

The EIA in relation to RES projects is also regulated by regional laws, which may introduce further rules and criteria within the national framework.

Under the current national and regional laws and regulations, renewable energy projects:

- fall within the jurisdiction of the competent Region as to environmental matters;
- are not as such subject to an EIA, unless they are located in protected areas;
- are generally subject to a previous EIA Screening, aimed at verifying whether the project, considering its characteristics and location, must be submitted to an EIA.

With reference to EIA Screening, the Region or the Province should verify if the project should be subjected to previous EIA Screening (for example, PV plants with a capacity exceeding 1 MW are subject to EIA Screening).

If the project is subject to EIA Screening, the applicant has to submit a preliminary environmental study to the Region together with the relevant technical and administrative supporting documents.

At the end of the analysis of the documents provided, the Region will adopt the EIA Screening resolution in which it is decided whether the project will be subject to an EIA or not.

If the EIA Screening resolution identifies that the project is subject to an EIA, the developer will send an application containing an environmental impact report to the Region. Once the completed application is verified, the Region will enact the EIA resolution and the outcome may be either: (a) an approval of the project as to environmental aspects, with or without prescriptions or; (b) a denial of approval.

The EIA resolution replaces all the other environmental authorisations which are necessary for the construction and contains the terms for the realisation, management and decommissioning of the plant.

The EIA resolution is valid for 5 years. At the end of the period, if the construction has not been completed, the EIA procedure must be repeated, unless an extension has been obtained by the developer.

5. Interconnection procedure

5.1 General overview on interconnection procedure

For generating facilities with an installed capacity above 10 MW, Terna is the authority responsible for connection to the grid.

The developer has to (i) file a specific connection application with Terna and (ii) pay a consideration for the management activities and for the technical analysis in relation to the issuance of the general minimum technical solution for the connection ("STMG").

Within 90 business days, Terna issues the estimate for the connection that the developer should accept within the next 120 business days. Upon acceptance of the STMG, the applicant should pay to Terna an amount equal to the 30% of the consideration for the connection. Within 18 months from the acceptance of the STMG, the developer can start the construction works.

The developer has to file the project documents related to the connected plant, in order to obtain its technical approval. Within 120 business days for the connection to high voltage, and within 180 business days for the connection to extra voltage, the applicant files the request for starting the procedure for the single authorisation. Following the obtainment of the authorisation related to the connection plant, the applicant should request the detailed minimum technical solution ("STMD").

After procuring the STMD, the developer will (i) accept the STMD within 60 business days and (ii) pay the remaining part of the consideration for the connection, which is equal to 70%.

6. The incentive system for renewable energy

6.1 Key rules

The current regulatory framework enables GSE to always have sufficient financial resources to meet its payment obligations connected with incentives and the dedicated off-take through funds ultimately received from end-customer' electricity bills.

The Italian Regulatory Authority for Energy, Networks and Environment ("**ARERA**") is required to ensure that the energy system (including tariff components) functions properly and that GSE always has sufficient resources to meet its commitments in terms of support system payments.

Bills paid by end-customers are composed of the following elements: (a) compensation for the electricity consumed; (b) transmission and other system fees; (c) other components destined to specific purposes, the most important of which is the so called "A3" component (which is determined periodically by ARERA) for the promotion of renewables through support systems aimed at ensuring a proper remuneration for the electricity produced.

The Decree of 4 July 2019 provides that renewable energy sources projects may obtain support either through a ranking list for projects with capacity up to 1 MW ("**Ranking List**") or auction procedure designed for projects with capacity exceeding 1 MW ("**Auction Procedure**"). PV plants on agricultural land (the vast majority of the developed projects) are not eligible for the subsidies awarded through the GSE Auction.

The GSE should launch seven notices related to three years (2019, 2020 and 2021) in relation to both Ranking Lists and Auction Procedures. As for the Ranking List as well as for the Auction Procedures, as described below, support is granted until the capacity budgets are not fully utilised.

The notices for the enrolment in the Ranking List are subdivided into the following 4 groups:

- Group A: Wind farms and PV plants, having a total capacity budget allocated equal to 770 MW;
- Group A2: rooftop PV plants with modules replacing asbestos roofs, having a total capacity budget allocated equal to 800 MW;
- Group B: hydroelectric plants and plants fed by by-product gas deriving from purification processes, having a total capacity budget allocated equal to 80 MW;
- Group C: modernizations of existing wind farms and hydroelectric plants, having a total capacity budget allocated equal to 120 MW.

The tender notices related to the Auction Procedures are divided into the following 3 groups:

- Group A: PV plants and wind farms, having a total capacity budget allocated equal to 5500 MW;
- Group B: hydroelectric and plants fed by gas residues from purification processes, having a total capacity budget allocated equal to 110 MW;
- Group C: total or partial modernisation of existing wind farms and hydroelectric plants, having a total capacity budget allocated equal to 620 MW.

6.2 Requirements

Applicants may participate in the Auction Procedure, provided that they have a financial capacity adequate to the project in relation to which they apply for support. This is to be demonstrated through:

- a respective statement from a bank regarding the developer itself or statement from a bank undertaking to finance the plant; or
- capitalisation (corporate capital and/or reserves for future capital increases), the minimum value of which depends on the costs of the planned investment for the construction of the plant, calculated as follows: (a) 10% of the planned investment for investments up to EUR 100 million; (b) 5% of the planned investment for investments exceeding EUR 100 million and up to EUR 200 million; (c) 2% of the planned investment for investments exceeding EUR 200 million.

6.3 Offers and reductions

The Auction Procedure is carried out through the submission of offers for reductions to the incentive tariffs in relation to each specific source. The percentage of reduction of the offer cannot be lower than 2% or higher than 70% of the incentive tariff provided under the relevant Auction Procedure.

6.4 Obligations and selection criteria

The applicant should submit to GSE, among others:

- a bid bond, having a duration not shorter than 120 days from the deadline for the publication of the Auction ranking and an amount equal to 50% of the performance bond described below (the "Bid Bond");
- a formal undertaking to submit a performance bond ensuring the construction of the plant within 90 days from the publication of the Auction ranking, of an amount equal to the 10% of the investment costs (the "Performance Bond").

Support is awarded first to lowest tariff requests.

6.5 Post-award obligations

After the communication of the results of an Auction Procedure, GSE returns Bid Bonds to unsuccessful bidders. Successful bidders are in turn obliged to submit Performance Bonds to GSE within 90 days from the communication of the results of the Auction Procedure. Once Performance Bonds are submitted, GSE returns Bid Bonds. In case the developer fails to submit the Performance Bond, it loses its right to the support and GSE is entitled to enforce the Bid Bond.

The Performance Bond has to be provided in the form of a bank guarantee for an amount of 10% of the overall planned investment cost (e.g. for on-shore wind farms with a capacity higher than 5 MW, it amounts to EUR 1.225 per each kW). The Performance Bond is annual and will be automatically renewed year by year. It is provided in favour of GSE, as a means to cover liquidated damages in case the project would fail to enter into operation within the time limit provided under the Decree 2019.

Projects awarded support under the Auction Procedure have to enter into operation within the following terms starting from the publication by GSE of the results, save for force majeure events recognized by GSE:

- on shore wind: 31 months;
- photovoltaic: 24 months;
- other projects: 51 months.

If the developer does not comply with the applicable deadline, its right to the support is lost and GSE is entitled to enforce the Performance Bond. The Performance Bond will be returned to the developer after the execution with GSE of the respective agreement regulating the support grant.

7. Auction results and trends

7.1 Results

Procedure	Group	Budget (MWh)	Number of applications	Capacity
Auction	A	500.0	22	425.30
Auction	B	10.00	1	2.50
Auction	C	98.50	3	14.70
Auctions total		608.50	26	166.10
Ranking list	A	45.00	494	75.10
Ranking list	A-2	192.10	157	29.80
Ranking list	B	10.00	195	38.50
Ranking list	C	16.90	3	1.60
Ranking lists total		264.00	849	145.10
General total		872.46	875	587.50

The table shows the results of the last Ranking List and Auction procedures published on 28 May 2020 by GSE. In terms of auctions, it is interesting to note that the capacity budget relating to group A (onshore wind and solar) has been mostly used up (425.3 out of 500 MW). The majority of successful projects are wind farms. The winning price range falls between 20% and 2.39%.

7.2 Power Purchase Agreements

In recent years, the Italian renewable energy market participants, particularly with respect to PV projects, have shown an increasing interest in PPAs.

PPAs are particularly appealing for developers of large-scale projects. The growing interest in PPAs is related to the fact that large scale PV plants located on agricultural areas are not eligible to receive GSE support.

Currently, most of the Italian PPAs are quite simply structured and usually short-term - up to 5 years. However, some market players have started to negotiate long-term framework agreements envisaging the conclusion of a series of PPAs lasting more than 12 years. These PPAs are aimed at the purchase of electricity generated by PV projects up to a total capacity of 300 MW.

In August 2020, the Italian Ministry of Economic Development and GSE started the development of the regulation of PPAs, in order to promote the growth of PPAs and to overcome the current lack of a legislative framework for such agreements. This new regulation has been long-awaited by market players and is also considered fundamental for the achievement of the decarbonisation goals set by the national energy and climate plan.

The Italian Government's purpose is to achieve a 55% share of domestic energy consumption from renewable sources by 2030 and PPAs are expected to contribute to an increase, of at least 0.5 terawatt-hours per year, in renewable energy production.



Michele Ciccetti
 Managing Partner, Italy
 T + 39 0230 3179 99
 M + 39 3454 5175 50
 E Michele.Cicchetti@dwf.law



Guglielmo Fabbriatore
 Counsel, Italy
 T + 39 0230 3179 40
 E Guglielmo.Fabbriatore@dwf.law



Support system for large scale onshore wind and solar

Support system

RES Act of 20 February 2015 supporting onshore PV, wind and biomass:

- Support granted through contract for difference (CfD) to winners of annual competitive auctions held at least once a year (support for up to 15 years).
- The electricity produced is sold on a free market, with the right to CfD payments in case the energy exchange market prices are lower than the RES auction price for an individual installation. RES auctions are conducted separately for installations up to 1 MW and above.

Corporate power purchase agreements

Corporate PPAs are particularly appealing for investors planning to build large-scale wind or solar projects without public aid due to recent high rises in energy prices.

Investment opportunities until 2030

Both the National Energy and Climate Plan for Poland of 18 December 2019 and the Energy Policy provide for ambitious decarbonisation measures after 2030, with less substantial reductions before 2030.

The draft Energy Policy of Poland until 2040 assumes the share of renewable energy in final energy consumption at ca. 23% in 2030. The increase of wind and solar energy's share in the energy mix will have a key role in achieving the goal with respect to electricity.

Polish Government is currently agreeing with European Commission on the conditions for extending the RES auction system to 2026, which could provide support for up to 15 years after this date.

Bottlenecks

The distance rule for onshore wind requires a distance of 10 times the height of the turbine with blade from residential buildings effectively stopping development due to Poland's scattered rural housing

Draft amendment to the Distance Act in the Government's Covid recovery plan will enable to development of new wind projects.

Inadequate grid interconnection is causing capacity issues. A boom in the PV sector and connected PV capacity applications as well as reservation of substantial capacity for offshore wind in the Baltic Sea means that investment in the grid is required.

1. The Polish electricity market

The National Power System (NPS) consists of three basic elements: the power generation system, the transmission system and distribution systems.

There is a single transmission system operator (TSO) – a State Treasury company Polskie Sieci Elektroenergetyczne (PSE). Distribution systems are in turn operated by various companies, mostly state-owned, the largest being ENEA Operator, ENERGA-Operator, PGE Dystrybucja and TAURON Dystrybucja as well as privately owned Innogy Stoen Operator.

Poland implements the competitive mechanism for nominated electricity market operators (NEMOs). Currently there are 3 NEMOs on the Polish electricity market: Towarowa Giełda Energii (POLPX), EPEX Spot and Nord Pool.

In terms of power generation, at the end of 2019 there was 46,799 MW of installed capacity in the NPS. The system is still based primarily on coal-fired sources. However, the oldest conventional units will be decommissioned soon. In accordance with the cumulated decommissioning scenario presented by the TSO, it will be necessary to shut down more than 20 GW of the oldest coal-based generation sources by 2035. This is caused by their age and wear as well as the implementation of conclusions introducing the new BAT (best available techniques) emissions standards.

There is already ca. 9,475 MW of renewables – of which 6,040 MW of wind and 708 MW of solar - and their share is growing rapidly and will continue to grow in the coming years. Wind and solar energy constitutes an increasingly vital element of the Polish energy mix. Full exploitation of their potential will require considerable domestic and foreign investment.

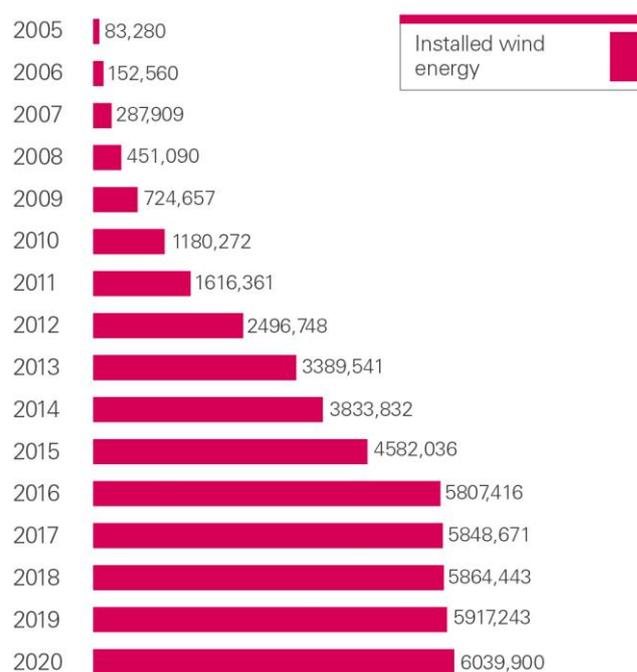
2. The condition of onshore wind and solar energy in Poland

Both the National Energy and Climate Plan for Poland of 18 December 2019 and the energy policy provide for ambitious decarbonisation measures after 2030, with less substantial reductions before 2030. Both rely on renewable energy and gas-fired capacity to close gaps left by the phasing-out of coal, but do not fully utilize the potential of wind and solar, while proposing a nuclear project to be commissioned in 2033 (which seems doubtful to many). Nevertheless, the draft Energy Policy of Poland until 2040 (PEP 2040) assumes the share of renewable energy in final energy consumption at about 23% in 2030. The increase of wind and solar generation in the energy mix will have a key role in achieving this goal.

2.1 Onshore wind

From 2005 to 2016 wind energy experienced the most dynamic growth rates among all RES in Poland, expanding almost 70-fold. The record breaking year was 2016, with 1,225.38 MW of new capacity.

Diagram 1 – Wind energy development in Poland



Source: [The Energy Regulatory Office](#)

2016 was the last year when RES projects built under the green certificates scheme were commissioned. The introduction of the new, auction-based support scheme coincided with adverse changes to the regulatory environment for onshore wind, the so-called distance law, which brought development of new projects to a halt. The introduced changes did not preclude the construction of new farms, however. It continues to be based on transition rules – i.e. on building permits acquired or applied for before the entry into force of new distance regulations.

In mid-2018, the industry partially succeeded in breaking the stalemate. The amendment to the Act on Renewable Energy Sources (RES Act) paved the way for holding substantial RES auctions for new installations. In the meantime, green certificate prices also increased, improving the financial standing of wind farms built under the old support system.

As a result of the auction held at the end of 2020 investors obtained aid for the construction of a further 0.93 GW of wind capacity. The auction reflected a global trend, according to which onshore wind energy is currently the least expensive source of electricity – the

average price of 1 MWh offered by investors reached PLN 227 i.e. 50 EUR.

The Polish Government declared its intention to relax the distance law within the course of 2021. This should pave the way for the development of new wind projects and may prove a game-changer in the context of a growing interest in long-term corporate power purchase agreements among industrial off-takers.

2.2 Photovoltaics

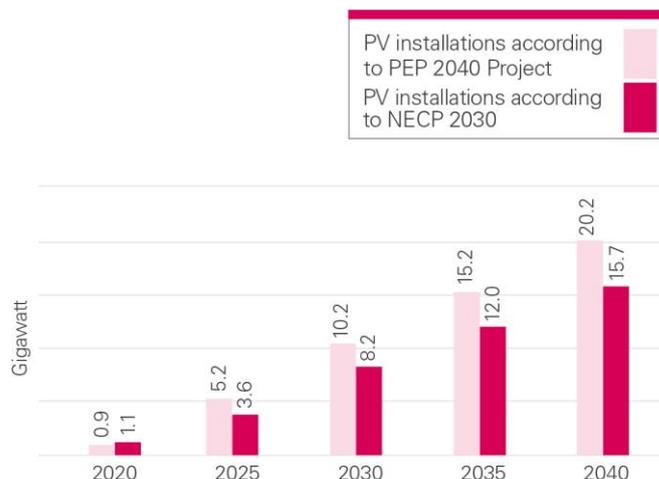
Most of PV projects built or under construction are within the capacity range from 0.5 MW to 1 MW, with many such projects built next to each other in large clusters. This is due to the shape of the auction RES support system, which has a separate auction basket for installations up to 1 MW and provides considerable auction budgets.

This is likely to evolve in the nearest future in the sense that more and more large PV installations will also effectively compete with onshore wind in the auction basket for large installations (i.e., above 1 MW). Decreasing costs of PV as well as absence of newly developed onshore wind projects both play a role. In effect, already in the December 2020 auction, onshore wind and PV shared the auction basket for large installations almost half by half. Around 800 MW of solar farms received the right to state aid in the form of a contract for difference (CfD).

The Polish National Energy and Climate Plan 2021–2030 (NECP) indicates that the capacity installed in the scenario of achieving EU goals in 2030 should amount to 52 GW, of which over 32 GW is RES, of which 8 GW is photovoltaics (increase from 1 GW in 2020). Finally, the fact that solar PV is particularly useful for covering summer energy demand peaks, which the Polish power system has been struggling with in recent years, is driving the Governmental demand for PV.

In effect, solar PV is currently the fastest growing RES sub-market, measured with newly added capacity, both in Europe and in Poland. According to the information provided by PSE, based on data received from distribution system operators, as of 1 January 1 2020, the total capacity of solar farms in Poland amounted to ca. 1300 MW and according to the latest data, the installed capacity of photovoltaic installations in the NPS on 1 November 2020 was around 3420 MW. Meanwhile, at the end of 2018, PSE noted only 471.4 MW installed in the country's PV installations.

Diagram 1 – Development forecast for photovoltaic power, according to PEP 2040 and NECP

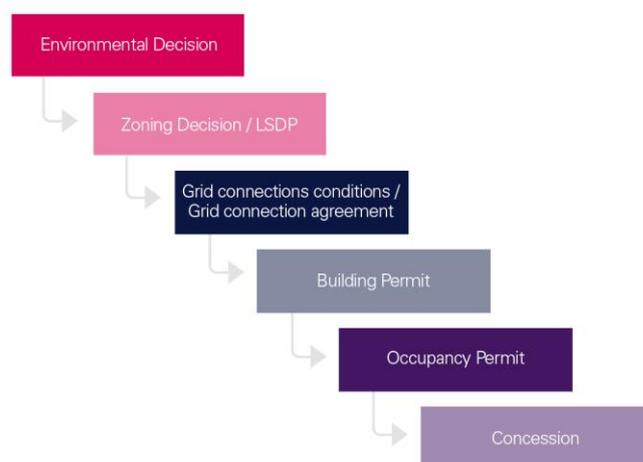


Source: IEO, Market of Photovoltaics in Poland 2019

3. The investment process

The investment process involving the construction and operation of RES projects requires several key decisions and permits: an environmental permit (environmental impact assessment), a zoning decision (or the local spatial development plan), grid connection conditions and a grid connection agreement, a building permit, an occupancy permit and a concession for generation of electricity in RES.

Diagram 2 – Key stages of the RES investment process in Poland



The majority of projects require an environmental decision, issued following an environmental assessment process. This decision is issued prior to obtaining a building permit.

Depending on the type and size of the investment, the next stage of the investment process is a zoning decision, or the need to

assess the compliance of the planned investment with the applicable local development plan (LDP). In the absence of such a plan, in case of onshore wind it will be necessary to adopt it, as currently wind farms in Poland can only be located on the basis of the local spatial development plan. An LDP allowing for localizing wind farms has to be adopted prior to issuance of an environmental decision.

Once in possession of a zoning decision or an LDP, the investor may apply for grid connection conditions. Once issued, they are valid for two years and, during their period of validity, constitute a conditional obligation on the system operator to conclude a grid connection agreement.

The final pre-construction stage of the process is to obtain a building permit, after which construction works may begin. A building permit expires if the construction has not commenced before the lapse of 3 years from the date on which it became final or the construction has been interrupted for more than 3 years. In order for the permit to remain valid, it is sufficient to undertake preparatory works, such as: geodetic delineation of the facility in the field or execution of land levelling.

Before a RES installation can legally start its commercial operation, an occupancy permit needs to be obtained or the relevant authority notified of the completion of construction. For example, a PV farm can be put into operation only after notifying construction supervision authority of the completion of construction works. Instead of notifying about the completion of construction, the investor may also apply for an occupancy permit.

In order to be able to legally sell electricity and to benefit from state support systems, it is necessary to obtain a concession to produce electricity. To that end, the investor is obliged to produce a number of documents confirming both technical and financial capabilities of performing the activity covered by the concession. Installations with a capacity of up to 0.5 MW do not need a concession but an entry in the register of small installations. This threshold is soon expected to be moved to 1 MW.

4. Auctions for 2021

4.1 What are the auction volumes?

On 16 December 2020 the new regulation on the maximum volumes and values of electricity from renewable energy sources that might be auctioned in 2021 has been adopted by the Council of Ministers. The maximum volume of electricity to be contracted from small PV and wind installations was set at 14,700,000.00 MWh of the value of PLN 5,292,000,000.00 (over 1 billion EUR). Regarding industrial-size PV and wind installations, the maximum volume was set at 38,760,000.00 MWh of the value of PLN 10,748,400,000.00 (over 2 billion EUR).

The Polish Government estimates that the figures should translate into at least 800 MW of new industrial-size PV projects and 600 MW in industrial-size onshore wind, i.e., a total of 1,400 MW for large RES installations. Ratios may ultimately be different

between wind and PV, however, as they compete against each other in the same auction basket.

The most recent auctions for onshore wind and PV took place on 26 November and 3 December 2020, respectively for installations above and up to 1 MW capacity.

4.2 How does a project qualify for participation in an auction?

Ready-to-build onshore wind, solar as well as biogas, biomass and waste thermal treatment (including CHP) projects can participate in an auction if they:

- 1) Hold a certificate of admission to an auction, and
- 2) Pay a deposit of PLN 60 (ca. EUR 14) per 1 kW, or provide an equivalent bank guarantee.

Obtaining a certificate of admission to an auction is preceded by a pre-qualification procedure carried out by the President of the Energy Regulatory Office. Investors need to evidence that they possess ready-to-build projects, i.e. that the following criteria are met:

- 1) Interconnection conditions or an agreement is in place:
- 2) The project has a final and non-appealable building permit (valid for at least 6 months):
- 3) An installation scheme is provided, and:
- 4) A schedule of works and expenditures for the completion of construction is presented.

Once the prequalification criteria are fulfilled, a certificate of admission to an auction is issued within 30 days by the President of the Energy Regulatory Office. The certificate remains valid for 12 months from the date of issue.

4.3 How does winning an auction impact grid connection?

Connection conditions or a concluded grid connection agreement is required for participation in an auction. Connection conditions are valid for 2 years from the day of their delivery to the applicant. In this period they constitute a binding obligation on the part of a grid operator to conclude a connection agreement.

The grid connection agreement specifies a period for implementation of the connection and contains a deadline for first delivery of electricity produced in a RES project. This deadline cannot exceed 4 years from the date of execution of the agreement. Non-delivery of electricity within the deadline constitutes statutory grounds for termination by a distribution/transmission system operator (under the applicable provision termination cannot occur up to 30 June 2022).

The Polish RES Law, however, provides for a mechanism to extend the deadline for first delivery of electricity for projects which have won an auction. Grid operators are obliged to adjust the deadline in connection agreements for the winning projects to be in line with the deadlines from the auction (e.g. for onshore wind – 33 months from the auction closure date). Annexes to grid

connection agreements will then be concluded so that the agreements do not expire before the deadline for commissioning of a project.

4.4 How does the auction process work and who wins?

The date of an auction is announced by the President of the Energy Regulatory Office at least 30 days in advance before the auction.

A bidder – (the prospective producer) submits a bid which includes the volume of electricity in MWh and the price in PLN per 1 MWh, at which the bidder agrees to sell electricity on the basis of a quasi-contract for difference. The support is awarded to the lowest bidders. The auction continues until the volume and value of electricity specified in an announcement of an auction is fully exhausted. When several bidders offer the same lowest selling price, and the volume of electricity declared to be produced exceeds the volume referred to in the announcement of the auction, the order of submitted bids is decisive. Winning producers' offers may not jointly exceed 100% of the value of electricity specified in the announcement of the auction and 80% of the volume of electricity covered by all bids.

This second cap is aimed at guaranteeing sufficiently competitive auctions.

Within 21 days from an auction closure date, the President of the Energy Regulatory Office publicly announces, on its website, information about:

- 1) The results of the auction (i.e. the producers who won the auction, the minimum and maximum price at which electricity was sold in the auction, as well as the total volume of electricity sold and its value), or
- 2) Invalidation of an auction, if that happens. An auction may be invalidated only if all offers have been rejected or if it could not be carried out for technical reasons. If the results of an auction have already been published, the auction is settled and final.

4.5 What is the period of support?

The period of support amounts to 15 years from the date of first sale of electricity, however not later than 30 June 2039.

4.6 What is the mechanism of support?

Industrial-size installations (above 0.5 MW) that have won an auction, sell the produced electricity on the electricity market at the market price, to a chosen off-taker, after which they may apply for additional payments to reach their auction price. This is done by way of an application to cover the “negative balance”. The monies are paid out by Zarządca Rozliczeń S.A., a state-owned corporation responsible for carrying out the settlements of the “negative balance”. Under the Polish RES Law, the “negative balance” is the difference between the net value of the sale of electricity in a given month (as calculated on the basis of a commodities exchange index) and the value of that electricity determined on the basis of the price contained in a producer's

offer that won an auction. Please also note that the latter is indexed annually to the inflation rate in Poland.

The volume of electricity subject to the settlement is determined on the basis of actual indications of measuring devices in a given month. A producer from an installation informs Zarządca Rozliczeń S.A., within 10 days after the end of the month.

In consequence, the “negative balance” is the difference between the value of produced electricity calculated on the basis of the TGeBase index and the value of such electricity established pursuant to the price from a respective auction bid of an individual producer. Zarządca Rozliczeń S.A. is obliged to verify an application for covering the “negative balance” within 30 days and pay the producer in question the relevant funds, as per the example below.

Diagram 3 – Auction settlement (negative balance)



Please note that in the example below the balance can also be positive, especially in case of a substantial increase of wholesale electricity prices. In such a scenario, the producer could be obliged to pay back the positive balance to Zarządca Rozliczeń S.A. Any positive balance is offset against any future negative balance on an “as-we-go” monthly basis. An outstanding positive balance is returned to Zarządca Rozliczeń S.A. in 6 equal monthly instalments at the end of the 15-year support period.

Diagram 4 – Auction settlement (positive balance)

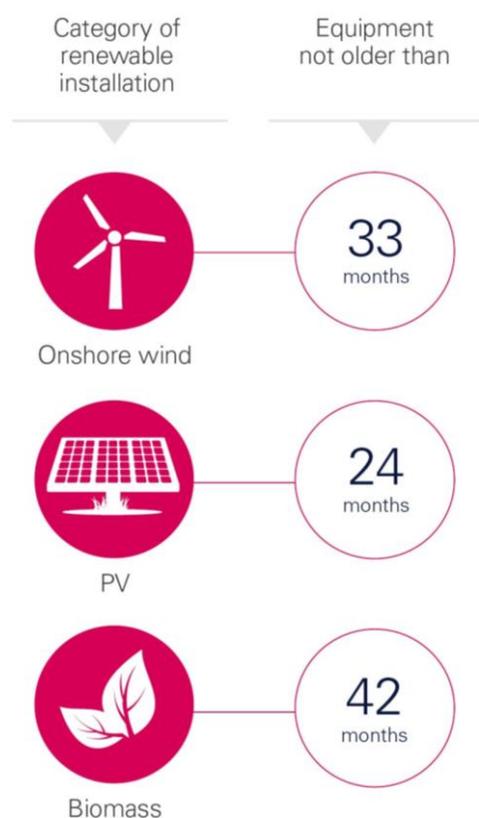


There is no obligation to sell electricity produced by renewables through a commodities exchange.

4.7 What energy producing equipment should be installed?

An investor that won an auction is restricted in terms of generating devices that can be installed. The Polish RES law stipulates that devices used for generating and processing electricity must be new, and produced within certain dates proceeding the day of first production of electricity. This is detailed in following diagram.

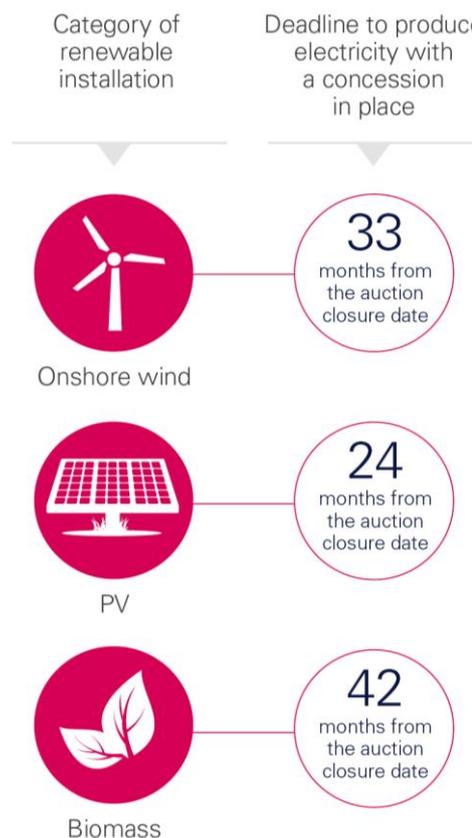
Diagram 5 – Admissible age of the equipment



4.8 What are the responsibilities of an investor that has won an auction?

The first obligation imposed on an investor is to produce electricity for the first time, while already holding a generation concession, within certain deadlines from the auction closure date. Failure to meet this obligation results in an exclusion from the auction system and loss of the deposit. This is detailed in the table below.

Diagram 6 – Deadline for entering the support system



The second obligation is to produce the volume of electricity declared in the offer. However, an option of one update of the offer following the auction, with respect to, in particular, the planned date of commencement of the period of use of the support system and the volume of electricity planned for sale in subsequent calendar years (the total volume will however need to remain constant). The volume is settled after the expiry of each 3 full calendar years in which support was granted, and after the lapse of the entire period of support. If a RES installation fails to produce at least 85% of the volume specified in a winning offer in a relevant settlement period, the producer is subject to a fine. The fine is calculated as 50% of the product of the auction price and the difference between the electricity that was supposed to have been produced, pursuant to the auction offer, and the energy actually produced. However, the financial penalty will not apply if the required volume of electricity was not produced as a result of:

- 1) application of the generally binding law;
- 2) the need to ensure security of the grid;
- 3) a power system failure;
- 4) force majeure, e.g., natural disasters, war, acts of terrorism, riots;
- 5) the technical failure of an installation violent, unpredictable and independent of the producer, damage or destruction of an installation or destruction of buildings or facilities essential for its operation.

4.9 The impact of COVID-19 legislation on the responsibilities of electricity producers

Due to the global outbreak of the COVID-19 pandemic and subsequent introduction of the state of epidemic in Poland, Polish Government adopted legislation aimed at casting off the emerging economic crisis, including the Act of 31 March 2020 on the amendment of the Act on specific measures to prevent, combat and eradicate COVID-19, other transmissible diseases and their associated emergencies. Also known as Anti-Crisis Shield 1.0, the Act introduced amendments to the RES Act.

The amendment enabled the RES energy producers benefiting from the auction support system, in the event of specific circumstances caused by the state of epidemic (or the state of epidemic hazard), to apply to the President of the ERO for an extension (by a maximum of 12 months) of the deadline to sell electricity generated in the RES installation for the first time within the auction system and for an extension of the permissible “age” of equipment included in the RES installations. For PV, the deadline for the first sale of electricity will be thus a maximum of 36 months (instead of the previous 24) and for onshore wind – 45 months (instead of the previous 33).

The President of the ERO, at the request of a producer, shall issue a decision to extend the indicated deadlines in case of delays in the implementation of investments in the new RES installations involving a delay:

- 1) in the delivery of equipment that is part of the RES installation;
- 2) in the supply of elements necessary for the construction of the RES installation;
- 3) in the construction of the RES installation and connections to the power grid;
- 4) in carrying out the technical acceptance or start-up of the RES installation;
- 5) in obtaining a concession or entry in the registers specified in the RES Act, caused by the state of epidemic (or the state of epidemic hazard).

In the request, the producer shall provide, among others, a statement of supplier (or of the producer) confirming that a delay in the delivery of equipment or the start-up of the RES installation is due to the above mentioned circumstances.

All the RES installations that have won the auctions and which have not yet met the deadline for starting the production/sale of electricity in the auction system may exercise the right to extend the said periods.

The application must be submitted by the producer at the latest 30 days before the deadline for fulfilment of the obligation.

In order to fully meet the needs of RES electricity producers, the possibility of extending the above described deadlines was harmonized with respective right concerning the grid connection agreements. The Anti-Crisis Shield 2.0, i.e. the Act of 16 April 2020 on specific support instruments in relation to the spread of the SARS-CoV-2 virus provided the amendment to the RES Act,

on the basis of which power companies are obliged to adjust in the grid connection agreements the date of the first delivery of electricity from the RES installations to the grid, taking into account the extension of the deadline granted by the President of ERO under the Anti-Crisis Shield 1.0, within 30 days of the day on which the producer informed them of winning the auction.

4.10 How is the financing of the auction system secured?

Funds in the auction system are required for the payment of the “negative balance” and the functioning of the entity covering the balance - Zarządca Rozliczeń S.A. They are secured via a renewables fee. The renewables fee is collected by distribution system operators (“DSO”). DSOs collect the renewables fee predominantly from final off-takers interconnected directly to their grid, i.e. mainly households. Therefore, financing of the auction system is not influenced by the Government budget.

The rules for calculating the renewables fee by DSOs are set forth in the respective statute. DSOs calculate it as a product of the renewables fee rate and the sum of electricity consumed. The renewables fee rate is published in the bulletin of the President of the Energy Regulatory Office until 30 November of each calendar year.

4.11 What is the risk of the state evading its responsibilities following and auction?

Although no written agreement is entered into between Zarządca Rozliczeń S.A. and the auction winner, the legal relationship between such a producer and the Polish state takes the form of a binding obligation, by statutory law. The elements of this obligation are construed on the basis of the Polish RES Law and documents published by the President of the Energy Regulatory Office – published auction results. In consequence, if Zarządca Rozliczeń S.A. fails to pay a due amount of money, a producer can enforce its rights in a common court. A producer can also be protected by bilateral investment treaties or the Energy Charter Treaty, providing for investment arbitration outside Poland, provided that the investment is adequately structured in advance. It’s worth mentioning, that this arrangement is deemed sufficient to bank financing on a non-recourse basis (project finance).

4.12 Is it possible to transfer the rights and obligations acquired at an auction?

Under the Polish RES Law, it is admissible to either acquire a project which won an auction or acquire shares in a company holding such a project. In the former case, it is necessary to apply to the President of the Energy Regulatory Office for consent. Granting of such consent is dependent on a statement by a buyer, which should include a declaration by the buyer that electricity will be produced purely from renewables, in the installation related to the auction and that the buyer accepts the rights and obligations of a RES producer.

4.13 Summary of the selected 2020 auctions

The last auctions for wind and solar projects took place in November and December 2020. The volume of electricity from new small PV and wind installations was set at 11.760 TWh of the value of over PLN 4.5 billion (over 1 billion EUR). The reference price for electricity from wind installations up to 1 MW was 320 PLN/MWh, while for electricity from small PV installations – 360 PLN/MWh.

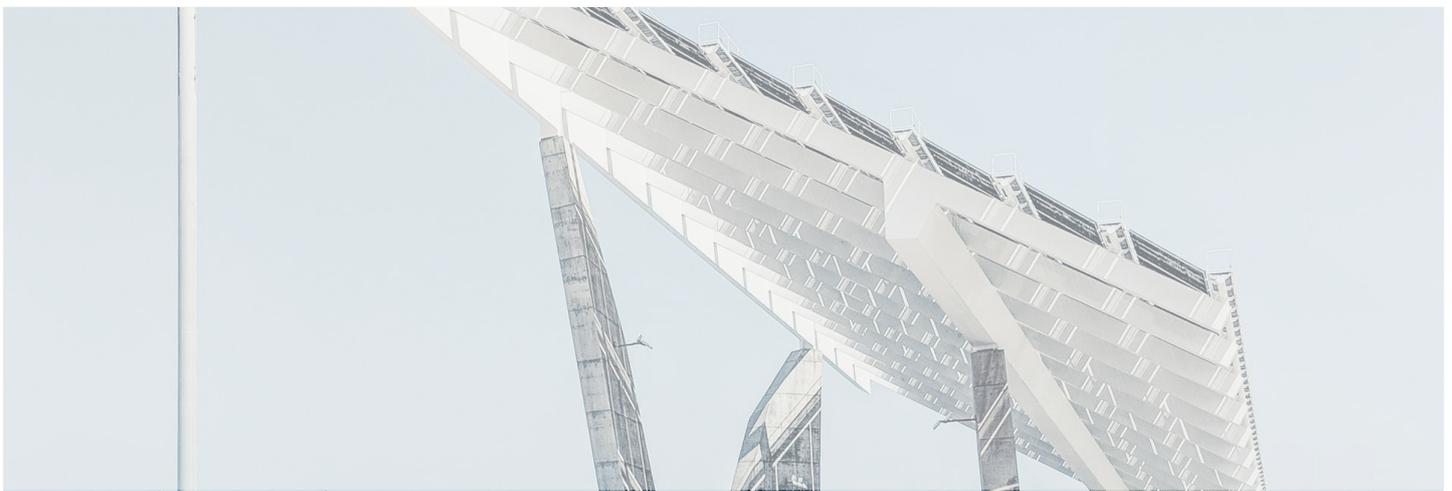
The auction for new small wind and PV installations was the most popular among the producers. Over 590 participants entered the auction, submitting over 1,618 bids for sale of energy, all of which concerned PV installations. Over 11.75 TWh of electricity of the value of over PLN 3 billion was contracted, among the 747 winning offers submitted by 235 producers.

The minimum price at which electricity was sold in this auction was 222.87 PLN/MWh, while the maximum price was 268.88 PLN/MWh. Among the winning producers were ENEA NOWA ENERGIA Sp. z o.o., P-POWER Sp. z o.o., SunForce Sp. z o.o.

For the onshore wind and solar power technological basket (projects above 1 MW of installed capacity), the Government in 2020 envisaged the maximum auction volume of 46.29 TWh for 15 years. The value of support was over PLN 14 billion (over EUR 3 billion). The maximum price (i.e. reference price) that could be submitted in a bid for wind above 1 MW was 250 PLN/MWh (ca. EUR 55), while for solar 340 PLN/MWh (ca. EUR 75). PLN 9.4 billion was contracted in the auction for new large wind and PV installations. That corresponds to the creation of over 1.7 GW of new installed electrical capacity in wind and solar technology. Overall, almost 41 TWh of electricity was sold in this auction. The cheapest electricity in this technology basket was sold for 190.00 PLN/MWh, and the most expensive for 249.90 PLN/MWh. The winners included RWE Energie Odnawialne Sp. z o.o., Energa OZE Sp. z o.o. or companies from the Polenergia group.



Karol Lasocki
Partner & Head of Renewables,
Poland
T +48 226 534 219
M +48 501 359 370
E Karol.Lasocki@dwf.law



Support system for large scale onshore wind and solar

Investment opportunities until 2030

Bottlenecks

Investment incentive scheme:

- Reasonable rate of return: compensation supplement on investment fixed at 7.398% for 2014-20
- Operation Remuneration: for technologies with high operating costs that cannot be recovered through energy sales

Governmental measure to incentivize investment: auctions

Spanish Government remuneration on renewable energy, high-efficiency cogeneration and waste projects that require compliance with European directive energy objectives.

Defining forthcoming auctions: RD 960/2020

In November 2020, RD-L 23/2020, RD 960/2020 was approved to regulate the economic regime for renewable energies for electricity production facilities. Remuneration will be awarded to participants through a competitive tendering process whereby the product to be auctioned will be the electricity, the installed power capacity, or a combination of both.

Spain aims to reach a national level of 42 % of energy from renewable sources in gross final energy consumption in 2030.

The Spanish National and Energy Climate Plan aims to increase renewables share of electricity capacity to a 74 % (from 40%) by 2030. By 2030, the NECP foresees a total installed power in the electricity sector of 161 GW (50 GW wind; 39 GW solar PV).

Competitive auctions will drive installation of 59 GW in the electricity sector (a minimum of 3000 MW of renewables installations per year).

Grid access: As a consequence of strict grid access regulation and lengthy procedures, market agents have reserved feed-in capacity without having realizable projects.

Spanish regulators have approved regulations to remedy this and force speculators to release the feed-in capacity to companies with a proven track record. Clear of this regulations are RDL 23/2020, RD 1183/2020 and Circular 1/2021 of CNMC.

1. The current condition of wind and solar PV in Spain

1.1 Key statistics

The period of 2019 and 2020 marked a turning point in the transition of the peninsular electricity system towards a more sustainable energy model. According to the yearly report issued by Red Eléctrica de España (the transmission system operator of the electricity system in the Iberian Peninsula), during 2019, the installed power capacity in the Iberian Peninsula coming from RES grew by 13.6%, with the entry into operation of 6,528 green MWs.

As a consequence of such growth, at the end of 2019 the total amount of installed power coming from RES surpassed the rest of the energy sources in the Iberian Peninsula for the first time. This means that, “green” energy now exceeds other energy sources in the peninsular generator park, making up 52% of the total peninsular generation park.

With the integration of these new 6,528 “green” MW, the peninsula power capacity coming from renewable energy sources currently amounts to 54,457 MW, of which 46% is wind, 16% photovoltaic and the rest (38%) corresponds to other renewable technologies. In addition, this increase has managed to position wind power as the leader in installed power in the Iberian Peninsula - even ahead of the combined cycle power - with a total generation capacity of 25,255 MW.

Generally speaking, in 2019, the electricity generation park on the Iberian Peninsula experienced an increase of 6.2% compared to 2018, mainly thanks to the 13.6% growth in installed renewable capacity. This remarkable fact has resulted in the commissioning of a total of 6,528 MW of renewable generation. Solar photovoltaic, which closed the year with 8,623 MW of installed power, has been the technology that has increased its presence the most in 2019, with an increase of 93.2% (4,159 MW) compared to the previous year.

1.2 The aid scheme for renewable energies in Spain: from the Feed-In Tariff scheme to the investment incentive scheme and the auction system

In recent years, the Spanish aid scheme to promote green energy has undergone significant variations. Below we describe the two main aid schemes that have governed the remuneration system of the renewable energy sector in Spain: (i) the feed-in tariff (FIT) scheme and (ii) the investment incentive scheme.

1.2.1 Premium for production: the feed-in tariff (FIT)

Under the FIT, producers of electricity from RES have the right to sell all their production at a price either legally fixed in its entirety (what is known as “total regulated tariff”) or partly fixed (premium or regulated incentive added to the price of the kWh in the electricity market).

Up until 2013, the Spanish regulatory system allowed renewable energy producers to choose, every twelve months, if they wanted the totally regulated tariff or the regulated incentive added to the price of the kWh in the Spanish electricity spot market or “pool”. With the regulatory changes introduced in Spain in early 2013, the

second option (market option plus regulated incentive) was removed by the Spanish Royal Decree-Law 2/2013.

Shortly after, with the approval of Royal Decree-Law 9/2013, the economic regime of renewable energy, cogeneration and waste facilities was widely modified, removing FIT entirely and establishing a new support scheme: remunerating renewable energy producers according to a reasonable rate of return defined by the Spanish Government. Additionally, Royal Decree Law 9/2013 introduced the specific principles on which the retribution regime applicable to these facilities would be articulated, which were subsequently integrated into Law 24/2013, of December 26, of the Electricity Sector.

The modification of the economic regime of the renewable energy sector in Spain and the removal of FIT brought with it a substantial reduction of investments in RES projects, since much of the development of renewable energy in Spain was due to its attractive FIT scheme available until 2013. As a result, the proportion of (non-hydro) renewables in Spain’s electrical capacity mix increased from 29% in 2013 to just 29.9% in 2016.

1.2.2 The investment incentive scheme and the auction system in Spain. General considerations of the investment incentive scheme.

As of today, under the legislation that followed Royal Decree-Law 9/2013, the remuneration for renewable installations is defined by the Spanish Government and is based on the concept of “Reasonable Rate of Return”, which is applied on a theoretical “Initial Investment” and which is calculated from the moment that a RES installation enters into operation. Each type of technology is assigned a Regulatory Useful Life, during which the producers may receive a compensation supplement on the investment, in addition to the income obtained from the sale of energy on the wholesale market for the market price. Such complement allows to achieve the so-called “Reasonable Rate of Return”.

For technologies with higher operating costs (mainly PV, thermosolar and cogeneration), the regulation also includes an Operation Remuneration for that part of the operating costs that cannot be recovered through the sale of energy on the market. This remuneration scheme will be further analysed under section 3 below.

1.2.3 The complementary measure of the investment incentive scheme: renewable energy auctions

Additionally, article 14.7 of Law 24/2013, of December 26, on the Electricity Sector, authorises the Government to establish a specific remuneration scheme to promote production from RES high-efficiency cogeneration and waste when there is an obligation to comply with certain energy objectives coming from the EU directives or other rules of or when its introduction carries a reduction in energy cost and external energy dependence.

For the past few years, Spain has been seeking to relaunch its renewable energy sector and to attract new investors through auctions, which, according to the aforementioned article 14.7. of Law 24/2013, of December 26, of the Electricity Sector, allow the Government to grant specific remuneration to certain facilities for the production of electricity from RES.

In January 2016, after several years of paralysis, the Spanish Government auctioned 750 MW, and in May 2017, auctioned 3 GW of renewable energy capacity, and almost all of it was allocated to wind developers. The next round of auctions for another 5 GW of renewable energy took place in July 2017, which was mostly allocated to PV developers.

The auctions were not project specific and the mechanism for assigning the capacity was based on the investment, besides the criteria for awarding the MW changed in each auction.

The first auction held in 2016 was technology specific and assigned 500MW to wind energy and 250MW to biomass technologies. The second auction was not technology specific and assigned 3 GW. However, given the selection criteria basically all the auctioned MW were assigned to wind energy, as explained below.

One of the most striking aspects of this auction was its aim, to give financial support to the installed power and not to the energy generated. In other words, the participating companies charge a specific amount for each MW they obtained at the auction and finally end up building, regardless of the energy the installation generates in the future. The auction rules set the remuneration parameters (regulatory lifespan, equivalent hours of average annual production, standard value of initial investment, return on investment, etc) for new wind, PV and remaining technologies reference installations. The bidders had to offer a percentage of discount to the standard value of the initial investment of the applicable reference installation. Based on this discount, the offers were sorted by the resulting marginal extra cost to the system, calculated as the ratio between the return on investment obtained with the discounted standard value of the initial investment and the equivalent hours of average annual production. In case of a tie, the technology with more equivalent hours would be assigned and since wind energy had the most equivalent hours, most of the MW were assigned to it.

Finally, the last auction of 2017 had wind energy and solar PV energy as the only protagonists and was the largest auction, around 5,000 MW were assigned.

The auction criteria were the same for the second auction. In this case the maximum discount that can be offered by project developers for both wind and solar projects was raised giving the solar PV projects a chance to challenge wind energy projects since solar PV discounts have not reached the maximum allowable value (69.88% for solar PV in relation to 87.08% for wind energy).

As a result, the Spanish Government assigned around 4,000 MW to solar PV energy and 1,000 to wind energy.

1.3 From the “sun tax” to the promotion of collective self-consumption

On 5 April 2019, the Spanish Royal Decree 244/2019, came into force, which regulates the administrative, technical and economic conditions of the self-consumption of electricity. This Royal Decree regulates the conditions set for self-consumption of

electricity, which encourages collective self-consumption and establishes a simplified mechanism for compensation of self-produced and unconsumed energy.

This new energy regulation puts an end to the so-called 'sun tax' introduced in 2015 to tax the development of photovoltaic solar energy and self-consumption in Spain. Such 'sun tax' meant that most energy consumers, with only a few exceptions, had to pay the corresponding taxes for the energy produced in their self-consumption installations, thus greatly discouraging potential stakeholders from investing in self-consumption installations. It is no surprise that in 2019, the repeal of the Spanish 'sun tax', together with other legislative reforms, increased requests for the installation of self-consumption facilities by 44% compared to the previous year 2018.

Furthermore, the entry into force of the Royal Decree 244/2019 was a significant turning point for energy self-consumption in Spain. Among the most important measures introduced by the Royal Decree, was the authorisation of the collective self-consumption, which aims to benefit both households and small businesses. From now on, several consumers can be associated to the same installation of solar panels and it will be allowed to install photovoltaic panels in adjacent buildings that have better orientation, as long as there is an agreement between the members of both buildings.

Also, the new regulation simplifies administrative procedures, and, in addition, lays down a simplified mechanism for compensation of self-produced and unconsumed energy.

2. The future of wind and solar PV energy in Spain: Spanish Integrated National Energy and Climate Plan (PNIEC) 2021-2030

In February 2019, the Spanish Government notified a draft **National Energy and Climate Plan 2021-2030** (the “NECP”)⁴ to the European Commission. After a public consultation on the initial draft plan, as well as an assessment by the European Commission, the Government approved a new draft in March 2020. Due to the COVID-19 pandemic, the final Plan has not been approved yet; this is expected to be done in the short-mid term.

The draft NECP lays the foundation for a carbon neutral economy by 2050. The initial objective in this regard is to reduce the current level of greenhouse gas emissions by 26% by 2030.

While covering all dimensions, the draft NECP is particularly comprehensive on targets and contributions as well as policies and measures on decarbonisation (including renewable energy) and the energy efficiency dimensions.

⁴ In Spanish, the Plan Nacional Integrado de Energía y Clima 2021-2030, or PNIEC 2021-2030. This document is available online at: https://www.miteco.gob.es/images/es/pnieccompleto_tcm30-508410.pdf

2.1 Key projected figures (total capacity, share of clean energy)

According to the draft NECP, the carbon neutral economy needs to be promoted by equally ambitious policies on the security of supply, internal market dimensions and research, innovation and competitiveness dimensions. This includes a **national ambition level of 42 % of energy from renewable sources in gross final energy consumption in 2030**, which means doubling the current share of energy generated from renewable sources (around 20% in 2020).

To achieve decarbonisation, the NECP plans to **increase the deployment of new renewable electricity capacity substantially (up to a 74 % share by 2030, while the current share is 40%)**, in particular solar and wind, and accelerate the electrification of the energy system including the transport and heating and cooling sectors. The final objective of the Spanish Government is reaching a 100% share of renewable energy capacity by 2050.

By 2030, the NECP foresees a **total installed power in the electricity sector of 161 GW⁵ of which 50 GW (31%) will be wind power and 39 GW (24%) solar photovoltaic**. This represents a very ambitious target in relation to some technologies, notably **solar photovoltaic (increase around 400% of installed power by 2030)**, **solar thermoelectric (increase of around 300% of installed power by 2030)** or **wind energy (increase of around 78% of installed power by 2030)**.

The total installed power of renewables for the different years is compromised in the NECP. However, the specific distribution by renewable technologies carried out year-by-year between 2021 and 2030 will depend on the evolution of the relative costs and on the feasibility and flexibility of their implementation.

2.2 Implications for the remuneration schemes applicable to wind and solar PV energy

The draft NECP also describes measures to promote renewables in different sectors. In electricity, the main instrument envisaged to install around 59 GW from 2021 to 2030 is the **organisation of competitive auctions**, for which the Spanish Government will publish a multi-year calendar, together with measures to facilitate the increased penetration of renewables in the grid such as increasing storage capacity and facilitating demand side response (DSR) through demand aggregators. This is in line with the EU Directive 2018/2001 on the promotion of use of energy from renewable sources (the so-called RED II). Therefore, no dramatic change in relation with the current investment promotion mechanisms in Spain is expected.

In relation to auctions, the NECP refers to a preliminary draft Climate Change and Energy Transition Act, which states that **competitive auctions will be convened annually to promote the construction of at least 3,000 MW of renewable**

installations each year. This installed capacity objective may be reviewed by regulation depending on the evolution of the decarbonisation of the Spanish energy system. In line with NECP, on 4 November 2020, Spanish Government published Royal Decree 960/2020 regulating the economic regime of renewable energy for electricity production facilities (hereinafter, "**RD 960/2020**"), which sets the remuneration framework for the generation of electrical energy from renewable energy sources, based on the long-term recognition of a price for energy (for further detail, please see 4.d below).

Regarding investments needs, the draft NECP estimates a total of EUR 236 billion, in the period 2021-2030, annually around 2 % of GDP. The figure covers key sectors and dimensions, notably renewables, energy efficiency, grids and non-energy sectors. The estimation should be distributed as follows: energy efficiency EUR 86.5 billion; **renewable energy EUR 101.6 billion**; grids 41.8 billion EUR; and non-energetic sectors (other measures) EUR 6.2 billion.

Most of them (80%) are expected to be private investments. 20% will be public investment in energy saving and efficiency measures, in the electrification of the economy and in actions associated with the promotion of sustainable mobility and modal shift. Around 5 % of total investment is planned to come from European funds. Some investment needs could partly be covered by EU funds, in particular cohesion policy funding.

3. Investment in solar PV plants and onshore wind farms

3.1 Available remuneration schemes to solar PV plants and onshore wind farms (I): the auction system.

Notwithstanding the booming interest in greenfield projects in Spain, the secondary market for operating projects has been and still is very active. In fact, several national and/or international key players have focused their attention on this type of transaction.

The low interest rates as well as the level of profitability of similar assets or investment targets made the current regulatory framework quite attractive for the investors.

In this sense, the current regulatory framework for the operating PV and/or wind farms comes from the Royal Decree 413/2014 of 6 June, regulating the production of electricity from renewable energy sources, cogeneration and waste together with Royal Decree (Order in Council) 9/2013 of 12 July, adopting urgent measures to ensure the financial stability of the electricity system, and Law 24/2013, of 26 December, of the Electricity Sector.

As stated above, the current regulation rests on the principle of cost coverage together with a "Reasonable Rate of Return" on investment, which creates a fairly secure investment climate for the years to come.

⁵ This represents an increase of around 50 GW in relation with the current situation, with an installed power around 112 GW in Spain.

Nevertheless, the system to fix the remuneration is complex and takes into account several parameters, among others:

- (i) remuneration on investment,
 - (ii) remuneration on operation,
 - (iii) regulatory lifespan,
 - (iv) minimum number of operating hours, etc.
- Additionally, certain parameters may be subject to a review during the regulatory period, others only at the end of each six year regulatory period and some of them are not subject to a further review once they are fixed.

With all these elements the "Reasonable Rate of Return" was fixed for the first regulatory period 2014-2020 at the rate of 7,398%.

At the end of 2019 and due to the imminent end of the first regulatory period, the Spanish Government approved the Royal Decree-law 17/2019 setting out the "Reasonable Rate of Return" for the purposes of the specific remuneration regime for the production of renewable energy applicable to the second regulatory period (2020-2025). The current pre-tax rate of 7.389% for facilities prior to RDL 9/2013 will remain in effect until the end of 2031, provided that the developer thereof does not have existing litigation or commits to end any such litigation⁶. Otherwise, or for facilities after RDL 9/2013, a value of 7.09% is set until 2025. The approval of the other remuneration parameters is expected during 2020.

The new regulation follows the proposal made by the Spanish National Commission of Markets and Competition (CNMC) and, in this sense, changes the criteria to calculate the "Reasonable Rate of Return". For the new regulatory period the "Reasonable Rate of Return" is no longer calculated by reference to the Spanish 10-year bond plus a spread (3% during the first regulatory period) but by reference to the weighted average cost of capital (WACC).

As we mentioned above, the regulatory changes of 2013 generated multiple filings for arbitration from several investors before the International Centre for Settlement of Investment Disputes (ICSID) against Spain, claiming multi-million-euro damages. In this regard, the purpose of the Spanish Government to maintain the "Reasonable Rate of Return" of the first regulatory period was to try to restore investors' confidence in the Spanish renewable energy market.

Nevertheless, the new "Reasonable Rate of Return" was positively received by the main photovoltaic and wind energy associations and the market is still expected to be active in the following years.

⁶ In particular, such remuneration may be kept for the next 12 years subject to the fulfilment of the following requirements: (i) the facilities have not started an arbitration or legal procedure challenging the amendment of the remuneration regimes; (ii) the facilities withdraw any of such on-going proceedings it has initiated or (iii) waives its right to receive any compensation recognized in its favour under any such proceedings.

3.2 Available remuneration schemes to solar PV plants and onshore wind farms (II): merchant projects and the energy pool

Developers and investors that failed to secure capacity in the auction system described above, are now looking at other options to fund greenfield solar PV plants and onshore wind farms. Some of them have found debt and equity available in fully merchant projects, which, in order to be built and operated, go to the Spanish electricity spot market, also known as "pool", and sell the electricity they produce at market prices.

The pool takes place in OMIE's⁷ virtual platform, as market operator, where all ask and bid offers are submitted to the pool usually by representative agents of producers and suppliers.

Hourly and for every session, OMIE sorts the producer bids received from lower to higher prices and the supplier purchase orders from higher to lower prices listing a price range from 0 € /MWh to 180.30 / MWh (known as instrumental price). The daily market matching is marginal and the price for one hour in a day occurs at the intersection of the two curves. That price will be allocated to all producer bids which were under the crossing spot as well as to all the purchasing offers that were above.

This instrumental price cap was set by the 6th Rule of the Resolution of 23 December 2015 of the Secretary of State for Energy as protective measure for customers in Spain.

Falling technology costs and attractive day time pool prices have enticed investors' appetite for fully merchant projects and a few financial entities have shown in recent deals their availability to finance such projects, even though conditions seem to be more strict than PPA-backed projects (e.g. higher debt service cover ratio), given the risks associated with lack of predictability of future prices of electricity when structuring their financial models.

3.3 Available remuneration schemes to solar PV plants and onshore wind farms (III): the rise of PPA as an alternative private remuneration scheme

In order to hedge the Spanish electricity spot market's volatility and boost the projects' bankability, developers and investors in greenfield solar PV and onshore wind projects are increasingly keen on executing long term PPA contracts with subsidy-free projects.

Spain's lack of regulation on PPAs gives market participants a wide margin of autonomy for preparing a tailored PPA (either physical or financial), specifying only certain requirements that physical PPAs must fulfil in order to be legally valid, although most regulation falls upon a contract tightly linked to physical

⁷ OMI-Polo Español, S.A. is the company responsible for managing the day-ahead and intraday Iberian (Spain and Portugal) spot electricity market. The firm also manages the billing and settlements for the energy purchased and sold in the aforementioned electricity markets.

PPAs: connection agreements with distribution system operators (DSOs).

Apart from the creditworthiness of the off-taker, the parties' autonomy to negotiate PPAs and their lack of standardisation due to their complexity, only underpins the importance of having the contract's structure (e.g. take-or-pay, financial guarantees and guarantees of origin, intermittent or continued delivery of power, etc.) properly studied and advised from a commercial, legal and technical point of view, in order to increase its use as an alternative greenfield projects' funding mechanism.

4. New regulation modifying the project development cycle and definitive support to auctions towards targets set by NECP

4.1 Royal Decree-law 23/2020, of June 23, Royal Decree 1183/2020, of December 29 and Circular 1/2021, of January 20

On 24 June 2020, Royal Decree-law, of 23 June, which approves measures in relation to energy and other areas to stimulate economic recovery (RD-L 23/2020). RD-L 23/2020 entered into force on 25 June 2020.

RD-L 23/2020 had been highly anticipated by stakeholders in the Spanish renewable energy sector, introducing, among others, new important measures on grid access and connection permits awarded since 27 December 2013 and laying the foundation for the future auction system. RD-L 23/2020 includes further measures (e.g. hybridisation, simplification of authorisation procedures, review of remuneration on operation during the state of emergency for facilities whose operating costs are connected with fuel prices, etc.) which fall outside the scope of this document and will not be analysed in the following sections.

Even though measures contained in RD-L 23/2020 are directly applicable, more importantly it has paved the way for future regulations to be passed to implement those measures. This will play a decisive role in determining Spain's success in meeting the energy transition ambition embedded in NECP.

On 31 December 2020, the long awaited Royal Decree 1183/2020, of December 29 (RD 1183/2020), which approves grid access and connection was published. An overarching regulation that sets out the specific criteria for access and connection to transport grid and power distribution for greenfield renewable energy projects, establishing the framework in the light of which provisions of RD-L 23/2020 must be interpreted.

The primary expected effect of RD 1183/2020 is to curtail speculation and hinder potential bubbles in the sector.

Finally, on 22 December 2021, the Spanish National Commission for Markets and Competition (CNMC) published Circular 1/2021, which provides RD 1183/2020 and the renewable energy projects sector as a whole with the appropriate technical back up for grid access and connection conditions.

4.2 Expiry of grid access permits

RD-L 23/2020 has factored a new item into the development cycle of greenfield solar PV and wind projects, which is the expiry of grid access permit awarded since 27 December 2013 onwards.

The expiry of grid access permits is subject to the fulfilment of administrative milestones before successive deadlines that circumscribe a project development cycle. The expiry of a grid access permit will necessarily trigger the expiry of the associated connection permit, bringing the project to an end.

In the following table, we will try to summarise grid access permits' milestones and deadlines, notwithstanding further in-depth analysis:

	Awarded between 28/12/2013 and 31/12/2017 ⁸	Awarded between 01/01/2018 and 24/06/2020 ⁹	Awarded from 25/06/2020 onwards ¹⁰
Application for prior administrative authorisation submitted and processed	3 months (expires 24/09/2020)	6 months (expires 24/12/2020)	6 months
Obtaining a favourable environmental impact statement	18 months (expires 24/12/2021)	22 months (expires 24/04/2022)	22 months
Obtaining the prior administrative authorisation	21 months (expires 24/03/ 2022)	25 months (expires 24/07/2022)	25 months
Obtaining the construction permit	24 months (expires 24/06/2022)	28 months (expires 24/10/2022)	28 months
Obtaining the commissioning authorisation	5 years (expires 24/06/2025)	5 years (expires 24/06/2025)	5 years

This measure is aimed at curtailing speculation with grid access permits ramping in Spain and distorting the actual energy system capacity. In order to further discourage grid access applicants

⁸ All of the deadlines in this column are calculated from the date on which RD-L 23/2020 entered into effect (25 June 2020).

⁹ All of the deadlines in this column are calculated from the date on which RD-L 23/2020 entered into effect (25 June 2020).

¹⁰ All of the deadlines in this column are calculated from the date on which the grid access permit was granted by REE.

from speculation, RD-L 23/2020 provides a 3-month exit window from the entry into force of RD-L 23/2020 (i.e. 25 September 2020) to withdraw their grid access permits application without execution of their financial guarantees (40 €/kW).

Investors willing to fund greenfield projects will have to be cautious and pay special attention to the project's and the developer's capability to meet RD-L 23/2020 deadlines by means of contractual provisions and payment structures that hedge this risk (e.g. milestone-linked instalments subject to reimbursement upon expiry, escrow account) and minimise the investor's exposure to grid access permit expiry.

4.3 Moratorium on new grid access permits applications

RD-L 23/2020 imposed a moratorium to new applications from generation facilities, but a lift of such moratorium was expected as soon as RD 1183/2020 and Circular 1/2021 were approved. However, renewable energy sector players now anticipate the prolongation of this moratorium until such time as grid operators enable access to their grid capacity platforms with updated information to applicants.

4.4 Defining forthcoming auctions: RD 960/2020

In November 2020, as anticipated at the approval of RD-L 23/2020, RD 960/2020 was passed which regulates the economic regime for renewable energy for electricity production facilities and partially transposing the EU RED II Directive, with regard to support schemes for electricity from renewable sources into Spanish law.

RD 960/2020 established the following criteria for facilities to be eligible for the support scheme: (i) facilities must use a non-fossil renewable energy as their primary energy; (ii) facilities must be new in their entirety or an extension or modification of an existing one.

In summary, the following items included in RD 960/2020 should be highlighted:

- 1) remuneration is awarded to participants through a competitive tendering process whereby the product to be auctioned is electricity, installed capacity, or a combination of both;
- 2) small facilities (<5MW) and pilot projects can be exempted from the competitive tendering process;
- 3) financial guarantees have to be provided in order to participate in the auction;
- 4) bidding price is awarded on the basis of a pay-as-bid mechanism, hence successful bidders are awarded the price they bid, which is not subject to updates;
- 5) the economic regime for renewable energy allows for the collection of revenues through the sale of energy to the market where for a given volume of energy (i.e. "auctioned energy") and within a defined period of time (i.e. "maximum delivery time"), the sale price of energy

will be calculated on the basis of the result of each auction;

- 6) for the auctioned energy guarantees of origin are not issued;
- 7) facilities commit to sell a minimum auctioned energy within the maximum delivery time. Should a facility breach this obligation, a penalty will be imposed. The penalty will be based on a bidding price reduction;
- 8) operators of facilities under the scheme will participate in the daily and intraday market. Physical bilateral contracts for these facilities are however prohibited.



Javier Olmos
Partner, Spain
T + 34 9350 3486 8
M + 34 6355 1540 9
E Javier.Olmos@dwf-rcd.law



Federico Belausteguigoitia
Partner, Spain
T +34 91758 3906
M +34 65048 0002
E Federico.Belausteguigoitia@dwf.law



Gerard Pérez
Partner, Spain
T +34 91758 3906
M +34 91758 3906
E Gerard.Perez@dwf.law



Support system for industrial-size onshore wind and solar

- Contracts for Difference – 15 year contracts, where a price is set for the duration of the contract. Ensures certainty and a stable income
- Feed-in Tariff (FIT Scheme) – encouraged investments in small scale renewables projects. Offered cash payments over course of 20 years
- Smart Export Guarantee (SEG) – replaced FIT scheme. Licensed electricity suppliers required to offer small scale low carbon generators a price for electricity exported to the grid.

Investment opportunities until 2030

- UK to be "world leader" in clean air energy
- Introduced 10 point plan to achieve pledge to be carbon neutral by 2050
- Government raised target for offshore wind power by 2030 from 30GW to 40 GW.

Bottlenecks

- Finance is a major barrier
- Developers usually secure finance for the planning process, not full development
- Subsidy free schemes depend on wholesale market price, which is volatile
- Cannibalisation can lead to projects becoming uneconomic.

1. The UK's electricity market

The UK's electricity transmission network comprises of high voltage electricity wires. The system is operated by a single Electricity System Operator (ESO); the National Grid Electricity System Operator (NGESO), whilst the system is owned and maintained by regional transmission companies.

The three Transmission Operators (TOs) are National Grid Electricity Transmission plc (NGET) for England and Wales, Scottish Power Transmission Limited for southern Scotland and Scottish Hydro Electric Transmission plc for northern Scotland and the Scottish islands groups.

They are regulated by the Office of Gas and Electricity Markets (Ofgem), a non-ministerial Government department and independent National Regulatory Authority, which has the role of protecting consumers by "delivering a greener and fairer energy system." Ofgem is governed by the Gas and Electricity Markets Authority (GEMA) which determines strategy and makes decisions on regulatory matters.

In 2019, the UK's renewables' share of electricity generation increased to 35.8% compared to 30.5% from the same period of the year before. By the end of June this year, the total renewables capacity was 48.5 GW, up by 2.4 GW from June 2019. Around 80% of that growth was attributable to offshore wind.

2. The Condition of Onshore Wind and Solar PV in the UK

The UK has been building onshore wind farms since 1991, when 10 turbines were switched on and powered 2,700 homes. By 2016, there were over 1,000 commercial wind energy projects in the country, which powered over 9,500,000 homes. At that time, half of the country's renewable energy came from wind alone.

This was despite the Government stating only in 2014 that the public were "fed up" with onshore wind farms and removing the technology from the CfD scheme. In England in 2019, only two onshore wind projects were approved which totalled 1.9 MW. The Scottish and Northern Irish Governments however have taken a different stance and have continued to support onshore wind projects over the years, which has played a key role in its rise in capacity.

Regardless of the English Government's opposition to onshore wind, it has paved the way for the increase in renewable sources as it represented 71% of the total increase in renewables generation from 2018 to 2019. This can be attributed in part to the 0.6 GW of newly installed capacity, including the new site in Dorenell, which has a capacity of 177 MW. Today, the UK is the sixth largest wind power producer in the world. At 29.8% of all renewable capacity, onshore wind is currently the UK's largest source of renewable energy.

The country is also a major global player when it comes to solar PV, which has experienced exponential growth as it has risen from 12 MW of capacity in 2006 to more than 13,000 MW in 2019.

The country's large solar capacity is due in part to the Government launching the Feed-in Tariff in April 2010. This was introduced under the Energy Act 2008, in order to meet both EU 2020 renewable energy targets and UK 2050 decarbonisation targets. Set out under the Climate Change Act, the target states that carbon emissions will be reduced by 80% by 2050 compared to the levels that were seen in 2050.

Between Year 1 and Year 5 of the scheme, there were 682,511 installations which had a cumulative capacity of 3,567 MW. At the end of Year 5, this represented around 13.5% of the total installed renewable electricity capacity of 26.4 GW in the UK. By this time, 99% of Solar PV installations were FIT installations.

In 2016, it was estimated that 31% of the UK's electricity would be renewable by 2025 whereas Government now expects that this figure will be 47%. This adjustment is not said to be due to changes in Government policy, but rather a reflection of the falling cost of renewables. Despite the increase in the country's renewables capacity, the Government projects that the UK will miss its legally binding carbon budgets of 2023-2032; so the picture is not clear.

Looking to the future, the UK's Prime Minister has recently said that the UK will be "the world leader in clean air energy", after announcing £160m to upgrade ports and factories and raising the target for offshore wind power capacity by 2030 from 30GW to 40GW. This announcement is part of a 10-point plan that the Government have announced to bring about a green industrial revolution and looks towards achieving the UK's 2050 carbon neutral pledge.

The 10-point plan also includes a move to boost hydrogen production, with the Government promising a town that will be heated entirely by hydrogen by the end of the decade. Many say that the proposals do not go far enough, as they amount to around £4bn over several years, whereas countries such as France and Germany are investing tens of billions of euros.

3. Contracts for Difference (CfDs) as the key scheme of RES support

It is the UK Government's main renewables mechanism, which supports the generation of and investment into new renewable energy projects.

These CfDs are 15-year contracts between a renewable electricity generator and the Low Carbon Contracts Company (LCCC), Government owned entity. At the start of the contract, a "strike price" is set for the duration of the contract. Where the market price for the electricity generated by a CfD generator (the "reference price") is lower than the strike price, the LCCC pay the generators an amount to make up the difference between the strike price and the reference price. Conversely, where the reference price is higher than the strike price, the generators are required to pay the LCCC the difference.

The obligation to make payments to CfD generators under the scheme is funded by a statutory levy on all UK-based licensed

electricity suppliers. This is set out in The Contracts for Difference (Electricity Supplier Obligations) Regulations 2014. The regulation also provides for the laws in which payments are made from the CfD generators back to electricity suppliers; when the reference price is higher than the strike price.

3.1 CfDs application process

Renewable generators that are based in the UK can apply for CfD. These generators must also meet a series of eligibility requirements:

- The project must use a qualifying form of low carbon generation;
- The project must have secured either planning permission or development consent;
- A grid connection offer must have been accepted;
- The generator is validly incorporated under the laws of the jurisdiction in which it has been incorporated; and
- Supporting evidence that enables the CfD to be drafted including the target commissioning date of the project, its estimated installed capacity and its location

Eligible generators can apply for CfD by submitting a sealed bid; those who are successful are then offered a CfD.

3.2 Benefits of utilising the scheme

Renewables projects see high upfront costs, and this, coupled with volatility of wholesale electricity prices pose a huge barrier to the investment and generation of such projects. The CfD scheme removes one of these barriers by ensuring certainty on price and a stable income for generators, as the strike price is set at the start of the contract and does not change over its 15-year duration.

The CfD thus encourages investment into these projects, as the risk is substantially reduced for both investors and generators.

3.3 Forms of renewable energy included in the scheme

The way in which generators compete against each other within this scheme is within groups, called 'pots'. The renewable technologies are split into Pots 1, 2 and 3.

Pot 1 are established technologies; those that are the lowest cost renewables. Pot 1 renewables include onshore wind and solar PV. Pot 2 conversely are the less established technologies including offshore wind and biomass CHP.

The Government has proposed introducing Pot 3, which would be specifically for offshore wind, in the hope that this will allow other Pot 2 technologies to better compete. Offshore wind projects are much bigger in size than other projects and are generally lower in cost, meaning that just a few projects can use up the available subsidy. Creating a third pot will help to diversify the country's electricity generation mix and help the Government achieve its offshore wind deployment target of 40 GW by 2030.

3.4 Changes for the next allocation round

The Government recently announced that the fourth allocation round, which is due to take place in 2021, will now include Pot 1 technologies. This is the first time since 2015 that Pot 1 renewables have been part of the CfD scheme and this change has been welcomed by the industry.

It likely that this fourth round will be highly competitive as it has been estimated that projects amounting to over 10 GW in capacity will be competing against each other.

3.5 Rationale for the changes

On 27 June 2019 a new target to reach net zero greenhouse gas emissions was brought into law in the UK in the form of The Climate Change Act 2008 (2050 Target Amendment) Order 2019, making the UK the first major economy to pass a net zero emissions law.

In order to achieve this target, low carbon electricity generation needs to quadruple by 2050. The Government therefore made the decision to include Pot 1 technologies in this fourth round of CfD to help encourage the growth of solar PV and onshore wind, which in turn will contribute to the UK meeting its 2050 target.

4. Feed-in Tariff scheme

The Feed-in Tariff (FIT) scheme was a policy mechanism to encourage investment in small-scale renewable generation projects, including but not limited to solar PV and onshore wind. It was introduced on 1 April 2010 and stopped accepting new applicants on 1 April 2019.

The scheme was in place to provide support to projects with a capacity of up to 5MW and, whilst it has closed to new applicants, it will continue to provide support to those successful applicants for a period of 20 years.

The scheme offered cash payments to renewable projects over the course of 20 years. Participating licensed electricity supplies, called FIT Licensees, were required to make payments for both the generation and export of renewable energy from these projects.

Projects accepted onto the scheme were assigned tariffs, which were based on several factors, including the technology and the total installed capacity. The tariff rates were set by the Department of Business, Energy and Industrial Strategy (BEIS) and were all determined in accordance with the Feed-in Tariffs Order 2012. The scheme was very popular and enabled around 800,000 households and 28,000 business to generate their own clean energy.

4.1 Rationale behind stopping the Feed-in Tariff

The Government decided that the scheme did not align with wider Government objectives to move towards market-based solutions and cost-reflective pricing, as set out in the Control for Low Carbon Levies. The Government also advised that the scheme didn't support the vision set out in the Industrial Strategy and

Clean Growth Strategy. It stated that growth in the small-scale renewables generation must be sustainable and driven by competition as opposed to direct Governmental subsidies.

5. Smart Export Guarantee

The Smart Export Guarantee (SEG) was introduced by the Government on 1 January 2020, after the Feed-in Tariff drew to a close. Licensed electricity suppliers that have at least 150,000 domestic customers are now required to offer small-scale low carbon generators (for solar PV and wind, those which generate up to 5MW) a price per kWh for all electricity that the generator exports to the grid.

To qualify for the SEG, generators installations must be MCS certified and also have a meter that provides half-hourly readings.

The suppliers are free to determine both the price and length of the contract, but they are required by the Smart Export Guarantee Order 2019 to provide generators with at least one SEG compliant tariff. They are also required to ensure that remuneration for the generators is greater than zero at all times. Already, there are a number of market offerings, so generators have a range of tariffs to choose from.

The offerings are either on a fixed or flexible rate basis. Most SEG tariffs offer a fixed rate so that generators receive the same amount no matter when the electricity is exported. The flexible rates pay different amounts for electricity; this depends on when the electricity is exported to the grid, and therefore whether there is a high or low demand for it at that time. The rates must however be always greater than zero and so when there is negative pricing, generators will not have to pay the suppliers for electricity supplied to the grid.

6. Differences between the Feed-in Tariff and the Smart Export Guarantee

The FIT consisted of two different payments whereas under the SEG, there is only one type of payment. The FIT consisted of a generation tariff and an export tariff. So, under the FIT scheme, generators were paid for both harvesting and exporting energy. The generation tariff was a payment for the total amount of electricity generated and this was calculated per unit. The export tariff was calculated as 50% of the total electricity generated.

Conversely, under the SEG, generators are only paid for exporting energy to the grid. The export price is not fixed and there are no long term contracts. Furthermore, FIT payment rates were set by Ofgem. The rates were the same regardless of the supplier, whereas SEG rates are set by the supplier. FIT rates were set at the beginning of the contract which lasted for 15-20 years, whereas under SEG, the generators are not entering into a fixed rate contract and so the suppliers are able to offer different tariffs and change such tariffs as and when they see fit.

7. Subsidy free renewables

7.1 Drivers of subsidy free renewables

The lack of Government support for solar PV and onshore wind has meant that developers and investors have had to turn to subsidy free renewables. This has been possible due to the reduction in costs of both wind and solar PV, with onshore wind now being the cheapest form of renewable generation.

The reduction of the cost of battery technology has led to an increase in hybrid solar power and battery storage systems, as they are becoming seriously investable opportunities. The co-location of solar and battery helps to mitigate the risks associated with subsidy free projects including price cannibalisation, which is where wholesale electricity prices fall to a low rate when the output is high.

Barriers imposed by regulations and the network itself limited the occurrences of co-location. However, Ofgem removed the Final Consumption Levies, which reduces the cost of batteries. National Grid are also working on wider access to the balancing mechanism, which will hopefully encourage the rise of small projects.

7.2 Extent and examples of subsidy free projects

Subsidy free solar projects are on the rise, as the capacity of projects that have been accepted, but are not yet connected is over 7 GW. Comparatively there are 6.6 GW of existing connected solar farms. These farms are also becoming larger in scale and capacity; some proposed sites will have over 100 MW in capacity.

In 2019, NESF launched a subsidy free solar farm in Cambridgeshire, which at 50-MWp is said to be the UK's largest subsidy-free solar farm; it produces enough power to provide electricity to 15,000 households.

Enso Energy has recently announced plans to develop a number of subsidy free solar farms across the UK which will have a total capacity of 1 GW. These projects will be a hybrid co-location system of battery and solar. The project will be financed by a power purchase agreement (PPA) with the Green Investment Group.

This year, SSE Renewables began constructing a 47 MW subsidy free extension of an existing wind park in Scotland. Another subsidy free project has been given the go-ahead this May and is set to be the UK's largest solar plant, at 350 MW.

The UK is on course for a serious increase in subsidy free renewables projects, with analysts Aurora stating that 9 GW of solar and 6 GW of onshore wind could be built by the end of the decade.

7.3 The risks and challenges associated with subsidy free projects

Despite the reduction in cost of solar PV and onshore wind, finance is a major barrier to the development of subsidy free schemes. Many developers will have secured finance so that the project can pass through the planning process, as opposed to its full development. Compared with Government schemes, where the financial risks are minimised due to certainty on price, the success of subsidy free schemes depend on the volatile wholesale electricity market, known as "merchant risk". This uncertainty around merchant risk undoubtedly concerns lenders and is likely to make them demand higher returns in order to match the level of risk they are faced with.

Cannibalisation is one of the risks of subsidy free projects; it is estimated that average baseload prices between 2020-2045 will see around a 14% reduction. Cannibalisation can impact a project to such a degree that it could outweigh any technological cost reductions and subsequently make the project uneconomic.

Co-location of solar and battery systems can help to minimise this risk, as battery storage prevents energy spilling in cases where solar capacity is higher than the grid connection. This in turn will also lead to higher revenues.

Entering into long term PPAs is another way of minimising the risks associated with subsidy free projects. PPAs are long-term agreements with renewable energy generators, where a company purchases all the output from a renewable installation.

Entering into a PPA has a number of benefits, including ensuring a secure revenue stream, achieving budget certainty and increasing stakeholder confidence. They are a popular method of reducing risks, as around 40% of subsidy free projects in Europe have also signed a PPA.



Darren Walsh

Partner

T +44 1519 0732 06

M +44 7841 3175 45

E Darren.Walsh@dwf.law

About us



DWF's team of energy specialists helps its clients to adapt to regulatory reforms, rethink their strategies, optimise efficiencies across the value chain and find new agile ways to tackle emerging challenges. We offer a complete range of services in areas such as regulatory, environmental, finance, corporate, construction, insurance, technology and transport law and dispute resolution.

Our renewables expertise spans solar power, wind power, wave and tidal, biomass, energy from waste, waste disposal and recycling, combined heat and power plants and is composed of more than 50 specialists from across the business.

Our team has worked on global energy projects and their financing for many years, giving us real experience in all aspects of the evolving renewables sector. We act for clients across the globe, ranging from start-ups to multi-nationals, developers, funders, investors, electricity suppliers and customers, all the way down the supply chain. We act for several leading domestic and international investors for the development and construction of large scale photovoltaic and wind plants, for the acquisition or sale of such assets as well as for their financing.

Key contacts



Karol Lasocki
Partner & Head of Renewables,
Poland
T + 48 226 534 219
M + 48 501 359 370
E Karol.Lasocki@dwf.law



Javier Olmos
Partner, Spain
T + 34 9350 3486 8
M + 34 6355 1540 9
E Javier.Olmos@dwf-rcd.law



Chris Wheeler
Partner, Ireland
T + 353 1 790 9477
M + 353 8 646 6920 4
E Chris.Wheeler2@dwf.law



Federico Belausteguigoitia
Partner, Spain
T +34 91758 3906
M +34 65048 0002
E Federico.Belausteguigoitia@dwf.law



Edon Byrnes
Partner, Ireland
T + 353 1 790 9460
M + 353 8 617 0450 6
E Edon.Byrnes@dwf.law



Gerard Pérez
Partner, Spain
T +34 91758 3906
M +34 91758 3906
E Gerard.Perez@dwf.law



Michele Ciccetti
Managing Partner, Italy
T + 39 0230 3179 99
M + 39 3454 5175 50
E Michele.Cicchetti@dwf.law



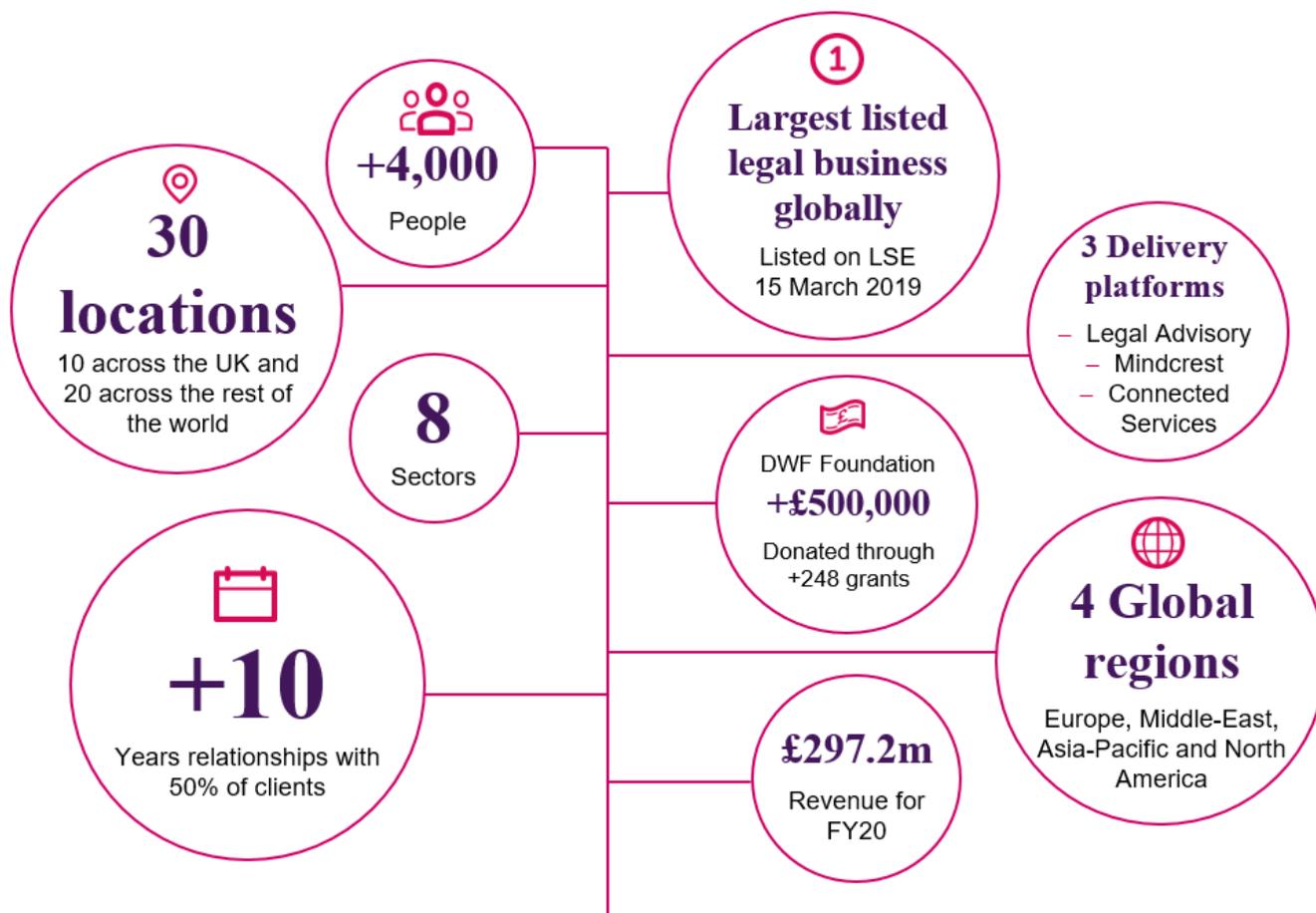
Darren Walsh
Partner
T +44 1519 0732 06
M +44 7841 3175 45
E Darren.Walsh@dwf.law



Guglielmo Fabbicatore
Counsel, Italy
T + 39 0230 3179 40
M + 39 0230 3179 40
E Guglielmo.Fabbicatore@dwf.law

Who we are

Our global team offers the strength and depth you can expect from a leading legal business.



Our three platforms:

Our three platforms, **Legal Advisory**, **Mindcrest** and **Connected Services**, are at the heart of our integrated legal offering, adding value for our clients.

Together they ensure we can create seamless integrated legal solutions that meet today's business challenges. Working with our clients' interests at heart, we deploy our market-leading people, products and processes, integrating seamlessly with in-house departments where required. Our client solutions include experts from our global legal services teams, working in harmony with our innovative range of Connected Services and world-class alternative legal services; delivered by our Mindcrest division.

Legal Advisory

Premium legal advice and excellent client service. Our teams bring commercial intelligence and industry sector relevant experience.

Mindcrest

Outsourced and process led legal services which standardise, systematise, scale and optimise legal workflows.

Connected Services

Products and business services that enhance our legal offerings.

Environment

Our guiding principles

We ensure our people are informed of and understand their environmental responsibilities so that they will not only fulfil them, they will lead, inspire and role model behaviours consistent with the aims of our environmental policy and encourage our clients and suppliers to do the same.

- We actively manage our carbon emissions.
- We act to ensure efficient use of resources.
- We invest in technology to help drive our sustainability agenda.
- We externally audit our sustainability performance.
- We collaborate to develop, apply and promote environmental best practice.

Waste reduction

In November 2018, we signed up to Business in the Community's Waste to Wealth Commitment, which aims to double the UK's resource productivity and eliminate avoidable waste by 2030. In addition to these core commitments, we will:

- Set targets to improve the productivity of resources key to our business.
- Redesign the way resources are used in our products, services and operations.
- Collaborate across our organisations, value chains and sectors to reduce waste.
- Report on progress annually to share learning and demonstrate results.

Our key environmental targets

Maintain a target of under 3 tonnes per person per year ('TPPPY') CO₂.

- 2015 – 2.6 tonnes per person per year
- 2016 – 2.3 TPPPY
- 2017 – 2.25 TPPPY
- 2018 – 1.3 TPPPY

Maintain a target of recycling at 85% per site

Target was beaten this year, with recycling figures at around 90%.

Energy Savings Opportunity Scheme ('ESOS') Compliance

Stage 1 was completed ahead of target and we are on track to do the same with Stage 2.

Responsible business

Our ambition is to make DWF a world leader at responsible business, mobilising our collective strength as a force for good in society to:

- Create a skilled and inclusive workforce today and for the future.
- Help build and sustain thriving communities in which we live and work.
- Play our part to repair and sustain our planet.

Ultimately, we are taking a sustainable view of our business performance, the "how we do things at DWF", to maintain and enhance our long term value.

Inclusive culture

We have a collaborative and inclusive culture that drives our decisions. Our Diversity & Inclusion Leadership Group defines and executes our global inclusion strategy. Executive Sponsors and more than 40 senior leaders, supported by our Affinity Networks and a growing number of Diversity Champions, deliver action plans supporting gender, race, LGBT+, age, disability, agile and flexible working and mental health. We are building inclusivity by:

- Being a force for good in society, acting globally and engaging locally.
- Demonstrating visible commitment at the highest level.
- Embedding sustainable and socially responsible business principles.
- Making DWF a great place to work and do business.



Beyond borders, sectors and expectations

DWF is a global legal business, connecting expert services with innovative thinkers across diverse sectors. Like us, our clients recognise that the world is changing fast and the old rules no longer apply.

That's why we're always finding agile ways to tackle new challenges together. But we don't simply claim to be different. We prove it through every detail of our work, across every level. We go beyond conventions and expectations.

Join us on the journey.