

UNEF Annual report 2019

The PV sector at the heart of the energy transition

Executive summary

Renewable energies are developing at a much higher rate than the most optimistic experts had estimated. In 2018, the new installed power of solar photovoltaic (PV) was once again around 100 GW, specifically 94.2 GW, according to the International Renewable Energy Agency (IRENA).

This positive trend is due among other things to the cost reductions of PV technology, which have also exceeded the best forecasts. Photovoltaics is now a technology that, in addition to contributing to the fight against climate change, is very economically competitive: PV is already cheaper than fossil fuel plants in terms of LCOE (Levelized Cost of Energy). For IRENA, photovoltaics will be even cheaper in 2020 than the marginal cost of existing coal-fired power plants. In addition, the prospect is that the current cost reduction trends will continue in the coming years. Until 2030, according to Bloomberg New Energy Finance (BNEF), photovoltaics will continue to reduce its costs by 34%.

Aside from cost reduction, the growth of PV is explained by two main drivers: long-term Power Purchase Agreements (PPAs) -which continued rising and added a total of 14 GW in 2018- and auctions –that set historical minimum clearing prices and will account for up to 2022 half of the world's new installed power. During 2018, PV auctions have cleared as low as \$ 20 / MWh in places of good solar resource. In the near future, auction design will tend to be refined introducing additional selection criteria i.e. the need to count with local companies or to improve the environmental footprint.

Analyzing the PV market in Europe, the annual growth of installed solar capacity in the continent has been + 23%, with Germany on the lead adding 2.95 GW. More than half of the growth in Germany (67%) resulted of regulated tariffs for self-consumption in commercial facilities. Turkey (+1.64 GW) and the Netherlands (+1.5 GW) hold the second and third place in Europe in annual new installed capacity. While Turkey suffered a reduction in 2018 due to the financial crisis in the country, the Netherlands showed strong growth under the umbrella of technologically neutral auctions in which photovoltaics was awarded most of the capacity.

Descending one step to the Spanish market, according to our estimates, that consider both the power connected to the network, centralized generation and self-consumption, and stand-alone facilities, the installed capacity in 2018 amounted to 262 MW. This represents a significant increase compared to the 135 MW of new capacity installed in 2017.

The outlook is that these figures will continue to grow in the future. The expected cost reductions imply that countries such as China and India, in full development of thermal plants, will find a market in which renewable energy competes in costs, much sooner

than expected. With this scenario, the big loser will be coal, whose generation potential will fall in all countries, reducing CO2 emissions from electricity generation worldwide.

In Europe already in 2019, a strong growth is expected with 20.4 GW (+ 81%) of new PV capacity, motivated by the countries lagging behind in the fulfillment of the EU's 2020 targets, the renewable auctions as those of Portugal and the growth of self-consumption, as PV rooftop prices continue to adjust and regulation is adapted to the current scenario.

From 2020 onwards, the new installed PV capacity will be in the range of 20 GW per year, surely exceeding the previous record of 22.5 GW added in 2011 and with double-digit growth rates until 2030. Conservative estimates expect in Europe an accumulated figure of 200 GW installed capacity in 2023 (126 GW in 2018), whereas in more optimistic scenarios the 300 GW barrier could be exceeded.

In Spain it is expected in the first place the installation during 2019 of 3.9 GW of photovoltaic projects awarded in the 2017 auctions. On the other hand, the status of access and connection permits shows us a sector prepared to continue its development: as of April 30, 2019, and only for photovoltaics, there were more than 28 GW that had obtained the permit and 70 GW that had requested them¹. In the next decade, considering the target scenario of the National Energy and Climate Plan (NCEP, in Spanish PNIEC), around 2.8 GW per year of photovoltaics must be installed to reach the 37 GW planned for 2030. Self-consumption will also continue the upward trend observed in recent years. In a liberalized regulatory framework without the barriers of RD 900/2015 and with an electricity tariff that sends the appropriate signals, the installation of 300-400 MW per year can be expected.

Regarding legislation, 2018 was the most relevant year in terms of European energy policy since the third energy package was approved in 2009. The agreements reached on the legislative proposals of the Clean energy package, now materialized in revised directives and regulations, will establish the legal framework on which the European Union will base its energy transition and the achievement of the 2030 targets.

Of the eight legislative proposals of the Clean Energy Package, the Renewable Directive 2018/2001 has to be highlighted due to its importance for the photovoltaic sector. This Directive includes the basic right to self-consumption, individual or collective, to storage, and the sale of surpluses. In addition, the Governance Regulation, which introduced the figure of the NCEP, obliges member states to draw a long-term energy planning, a historic claim of the sector.

In the process of approving the winter package, the EU, consistent with both a new reality of cost reduction and technological disruption, as well as with its aimed leadership position, has increased the 2030 targets to 32% renewable energies and 32.5% energy efficiency, introducing a clause for a possible upward revision of both in 2023.

¹ As of 31st July 2019, there were around 46 GW that had obtained the permit, 58 GW were in process and 24.5 had been rejected.

In Spain, the change of Government of 2018 implied a turn in the institutional vision on climate change, putting the energy transition in the political agenda. In October 2018 the kick-off was the Royal Decree-Law 15/2018, and in November, the now Ministry for Ecological Transition published a draft Law on Climate Change and Energy Transition (LCCTE).

During 2018, progress was also made in the development of the strategic energy and climate framework that would culminate already in 2019, with a new draft of the LCCTE and with the publication of the Fair Transition Strategy and the aforementioned NCEP. According to the target scenario of the NCEP sent to the European Commission, in 2030 the participation of renewables will reach 74% in the electricity sector and 42% in final energy consumption.

Regarding self-consumption, the package of measures included in the RD-L 15/2018 (and in the Royal Decree of Self-consumption already in 2019) also implied a radical change with respect to previous regulations. The regulatory framework established now in Spain is based on the principles defined by the Renewable Energy Directive which have been claimed from UNEF: legal security, non-retroactivity, right to self-consumption without charges and administrative simplification.

Another regulatory element of 2018 was the review of the reasonable rate of return of the specific remuneration regime for renewables, in order to fix this rate for the period 2020-25. In November 2018, the CNMC published a methodology report in which it proposed to use the average cost of capital or WACC to set the rate. With the data available at the time, this methodology resulted in the proposal for the 2020-25 regulatory period of 7.09% as rate of return.

Likewise, the Council of Ministers approved a draft law assuming the 2020-25 value proposed by the CNMC (7.09%), although for the facilities installed previously to Royal Decree-Law 9/2013, it proposed to keep its current profitability (7.398%) to 2030. The definitive approval of this draft as Royal Decree-Law, expected for 2019, would allow existing facilities to maintain their profitability.

The Autonomous Communities are also making progress in energy transition and climate change. Andalusia, Balearic Islands and Navarra established during 2018 decarbonization roadmaps, in some cases with ambitious targets. In addition, regions such as Madrid, the Valencian Community, or Murcia among others, have given explicit support to renewable energy with various programs and grants, including photovoltaic self-consumption.

Regarding the contribution of the photovoltaic sector to the economy, according to our estimates, the direct contribution of PV to Spanish GDP was 2,711 million euros in 2018, 0.22% of national GDP, continuing the upward trend observed last year. The total economic footprint of the sector, estimated as the aggregation of the generation of direct, indirect and induced GDP both inside and outside of Spain, reached in 2018 6.265 million euros (+ 19.6% compared to 2017). From the point of view of employment, the total footprint of PV in Spain amounted to 29,306 workers linked to the sector in 2018, of which 7,549 were direct, 13,393 indirect and 8,365 induced, respectively.

In fact, the expansion of photovoltaic energy in the coming years, both nationally and internationally, offers an opportunity for the reindustrialization of Europe and, in particular, Spain. For this to happen, it is essential that the energy transition is accompanied by an industrial development, planned and carried out in an orderly manner that allows continuous and stable growth. This industrial planning is key so the take-off of photovoltaic energy translates into a business activity that ensures employment and local development, following fair transition criteria.

Likewise, a commitment to industrial capacities through R&D is necessary, to allow taking advantage of this growth. Nowadays, new types of photovoltaic cells other than silicon are being developed, such as perovskite or organic, for the construction of flexible cells to extend PV to new applications such as mobile phones and vehicles. In addition, efforts are being devoted to the development of storage, which may serve to prevent spills from renewable plants, to soften demand peaks and to provide services to the network, as well as to the digitalization that will give way to an active consumer or prosumer, and to smarter electricity networks. Spanish companies in the PV sector participate in this innovation by carrying out research projects that allow them to explore new industrial developments, enriching with the transfer of know-how.

In short, the photovoltaic sector is experiencing a sweet moment based on its economic competitiveness and its ability to contribute to the fight against climate change. In addition, in 2018 both Spain and the European Union established a favorable regulatory framework that provides security for the coming years. At UNEF we want to be a relevant actor in this process by accompanying our associates and establishing a meeting forum for the PV sector. For this, we continue with our institutional activity with events such as the V Solar Forum of 2018, which under the motto "Photovoltaics towards the leadership of the energy transition", repeated a great success of assistance with more than 600 attendees and 50 speakers.

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