

More in common: Europe's energy storage associations' unified stance

Europe | What do Ireland, Germany, Poland and Spain all have in common? Well, like the other members of the European Union they all have a requirement to decarbonise and a desire for sustainable economic growth. Andy Colthorpe speaks with energy storage associations from those four countries to hear about their unique situations as well as the opportunities and challenges they share.

The European Union brings together 27 different member states with shared goals across everything from promoting peace, security and justice to promoting scientific and technological progress and establishing an economic and monetary union.

Where energy markets and policies sit within this loose unification of nations is a complex issue, one that also spans the distance from social issues (climate change and environmental justice) to economic (job creation and security of supply) and more.

The macro trend is the same as it is worldwide: renewable energy is on the rise and energy storage is a key to unlocking the decarbonisation and economic growth potential of the energy transition. Representatives of energy storage associations from Ireland, Germany, Spain and Poland gathered together to discuss the status and role(s) of energy storage in their respective countries, in Europe and in the wider world.

While Energy Storage Europe, the annual conference and trade fair held in Düsseldorf, Germany, could not take place in person due to coronavirus, German trade association BVES' policy and markets expert Valeska Gottke helped us put together this multi-lateral online gathering from which the responses below were gathered.

Ireland - Paddy Phelan, president, Irish Energy Storage Association

Paddy Phelan was appointed earlier this year as president to the Ireland Energy Storage Association, taking over from Peter Duffy, who founded the group just over two years ago. Phelan says that Duffy and colleagues Eugene Coughlin and Frank Burke, coming from backgrounds working at Irish transmission and distribution groups and the regulator, put a "very strong concept together".

"Energy storage is regarded as relatively new" in Ireland, Phelan says. The first



projects to be handed contracts through the DS3 grid services scheme set up by high voltage grid operator EirGrid to help meet Ireland's 2020 goal of sourcing 40% of its electricity came online earlier in 2021. The transmission system operator (TSO) modelled pathways to achieving net zero by 2050 and as a result a policy target of 70% renewable electricity by 2030 has been set.

Ireland has now surpassed the 40% target. Renewable energy development is gathering pace: the first large-scale solar facilities broke ground in this calendar year, while "significant" offshore wind development is expected over the next decade, Phelan says. Alongside this, the first national community auctions for renewable contracts were completed in 2020, handing contracts to four solar and three wind projects. The three 'Ds' of the energy transition: decentralisation, decarbonisation and digitalisation are now being developed at a system modelling level, but outside of a number of test centres, there is not yet "too much in practise," Phelan says.

The DS3 market gave the energy storage market a strong start, but the fixed tariff regime for 14 different network ancillary services is due to expire in Q2 2023 and the future is uncertain. IESA has been lobbying and it looks as though DS3 will last at least a year longer. The 12 month extension "wasn't as much as we'd hoped for," Paddy

Phelan says, but it still "gives investors a good opportunity, or new companies to come into the market from outside".

To achieve 70% renewable electricity by 2030, non-synchronous generation would have to be at about 90%, leaving only 10% for conventional heavy generators which historically have provided grid stability. At present there is about 65% non-synchronous generation and so the requirement for very fast-acting response that energy storage can provide, is increasing.

There's also a strong scope for distributed and community energy storage; Ireland has many villages of less than 1,000 people, rural towns with populations up to 15,000 and five major cities of 30,000 to 1.1 million people.

"Offering demand level control at a community level is of real interest. There are some sandboxes in place, there are some considerations around peer-to-peer trading. And the European directive is due to be adopted and transposed into Irish legislation by the first of July this year, which is really interesting. These local energy networks will all need storage and smart controls as part of their proposals," Phelan adds.

One of the challenges — created partly by neighbouring Britain's decision to leave the EU — is that under EU market design rules each member state must be interconnected to two others. The grid in Ireland is shared with Northern Ireland, which is now in an "unusual position" straddling Europe and Britain. Going forwards, interconnections are planned with Spain and France via the Celtic Interconnector project, along with an interconnector with Wales on the UK's western coast.

The energy potential for Ireland from onshore and offshore wind is "phenomenal," Phelan says. In order to make Ireland a "smart island," short-term energy storage will be required. That's where the market and support, financing and funding is

Ireland's first grid-scale battery storage project, supplying grid services under the DS3 regime, was inaugurated at the beginning of this year.

at the moment. However, long-duration energy storage will become “very valuable in the context of interconnection to be able to supply green electricity to our European counterparts from renewable resources,” the IESA president says.

Another clear challenge today is that retrofitting energy storage with existing wind resources is tricky from a standpoint of regulatory treatment. Co-location might be more common among new-build projects, but IESA is still seeking answers to the retrofit question. Phelan says his association seeks cooperation with European stakeholders that could participate in helping to provide some solutions for the regulators.

“A lot of the wind infrastructure that’s been built out over the last 20 years is in quite isolated areas, but there are significant barriers to co-locating with hybrid battery storage,” Phelan says.

“If you modify your connection to incorporate a battery, you trigger some unintended consequences. There’s simple little things, like: because priority dispatch is now no longer on new projects, it was part of the old regime. If you integrate a new battery system and modify your connection, you lose priority dispatch. Secondly, it triggers a requirement to completely modify your controller mechanism to comply with the new grid code, whereas your wind farm could be 10 or 12 years old, and is controlled on the basis of the grid code at that time.”

Germany - Valeska Gottke, senior expert for communications and markets at Bundersvand Energiespeicher (BVES)

In Germany, which was of course a global early adopter of solar PV, it seemed about five years ago that battery storage would similarly also become an integral and fast-growing component of the energy system.

Yet while residential energy storage sales to environment and independence-conscious households has accelerated to more than 300,000 such systems now installed and commercial and industrial (C&I) sales continue despite a slowdown during coronavirus, the utility-scale segment’s opportunities largely became saturated after an initial first wave. Regulatory barriers also prevent the unlocking of the full value of energy storage, inhibiting the delivery of multiple applications and “double charging” operators of assets for using the grid (levying fees when drawing power from the grid and again when injecting into it).

“Germany does not consider energy storage as a key element of the Energiewende (Germany’s ‘energy transition’),” relying largely instead on moves to extend grid infrastructure, Valeska Gottke at German storage association BVES says.

In contrast, the European Union, particularly its Clean Energy Package for All Europeans, recognises the central role

energy storage plays in “new climate-friendly and secure energy systems”. The EU also has a strong geopolitical interest in diversification of its energy supply within and beyond the Union, while the European internal market promotes peaceful ties within Europe, including cross-border energy interconnection. EU law isn’t applicable directly on member states, but instead member states’ national laws are adapted to meet EU requirements.

However, Gottke says that many people are concerned that Germany’s legal mechanisms for implementing energy policy are somewhat divergent with the EU’s Market Design Directive and Renewable Energy Directive frameworks for promoting renewables and regulating energy networks. For instance, rather than adopting a regulatory definition of energy storage set out by the EU Clean Energy Package, the German government has created its own definition of energy storage.

The EU defines energy storage as the deferral of the final use of electricity to a moment later than when it was generated, or the conversion of electrical energy into another form of energy which can be stored. By contrast, the German definition, translated into English, describes energy storage as facilities that consume electrical energy for the purpose of electrical, chemical, mechanical or physical, intermediate storage and generated as an electrical



Battery pack production line for energy storage systems in Germany. Despite the regulatory difficulties, there is high confidence in the German industry’s competencies and tech, Valeska Gottke says.

Credit: Tesvolt.

energy or used again in another form of energy.

"So in a way [according to the German definition], storage is not storage," Gottke says. The German definition of storage as a consumer and generator means that assets will continue to be charged twice for "consuming" power from the grid and charged again for "generating" for grid use.

"For the federal government, it is so important to make energy storage fit into the current system we have, which is still designed according to the old energy system and doesn't give [consideration] for flexibility options like energy storage."

The EU CEP also emphasises the importance of prosumers, generating and using their own renewable energy and making renewable energy available to third parties. Similarly, community energy facilities are an integral part of the CEP, which Germany of course had a hand in designing. Yet the German EEG and EnWG laws which are currently in the process of being passed do not do anything to strengthen the hand of either set of resources.

It is "not consistent with EU requirements" from the Market Design Directive that in Germany, prosumers are not able to provide several services at the same time with one energy storage facility, for example. There are additional levies for self-supply of energy too.

Since late 2017, BVES surveys of its member organisations has shown consistently that the industry considers regulatory conditions to be the main burden on the energy storage market preventing it from developing "more positively," Gottke says. There remains a lot of work to be done on this side, urgently so, she says, because deadlines for Market Design Directive implementation passed last December and Renewable Energy Directive deadlines are this June.

Despite the regulatory difficulties, Gottke says the German energy storage industry is still "very strong internationally, especially within Europe, with a strong reputation for system competence and ability to provide customised solutions in very complex conditions". Within the country however, the front-of-the-meter market, initially accelerated by access to frequency control opportunities is largely saturated. Behind-the-meter storage applications in residential and C&I are "growing very strongly", but as BVES has previously argued, energy storage needs to be recognised as an integral part of the



Credit: Edison Energia.

Poland's rooftop solar and community energy sectors can be a strong engine for decarbonisation and development of the energy storage industry.

Energiwende, along with grid infrastructure build-out and other options.

"The overall main trend, the most important one, is that the Energiwende is still important and very popular in Germany. It enjoys a lot of support from society and installing an energy storage-plus-renewable system, at home, or at your office, is a way of doing your own Energiwende. It's still developing well, but there could be more force [at the top level] in my opinion and I think a lot of Germans see that, so they just do their own Energiwende."

Spain - Luis Marquina, president, AEPIBAL

By contrast, at the moment, "Spain is the place to be," says Luis Marquina of Spanish energy storage association AEPIBAL. While only three years old, 20 of its 60 member organisations from across the whole value chain have joined the group within the four months leading up to this interview, he says.

Spain's renewable energy industry has enjoyed a huge renaissance in the past couple of years and now from a policy standpoint targets more than 50GW of renewable energy capacity by 2030 including 30GW of solar PV and 20GW of wind. Nuclear and coal plants will shut down and Marquina describes energy storage as the "unique solution" to mitigate the risks to

security, quality and quantity of electricity supply.

Marquina says the renewable strategy and target is "absolutely achievable," with about 4GW of solar capacity deployed annually in the last two years. The challenge comes with the way that electricity prices and revenues will likely change with the addition of massive solar capacity in the middle of the day. This of course opens the door to energy storage if there's a big discrepancy between peak and off-peak pricing, while the system will also require grid services that batteries and other storage can deliver to provide stability to the grid.

With this in mind, the country has set a 20GW target for energy storage deployment by 2030, 9GW of which should be coming from electrochemical batteries. There was also a recent renewable energy auction which included an energy storage option so that developers could provide "manageable" electricity capacity to the grid. While the incentives proposed by the government were not enough to provoke an "explosion" of energy storage through the auction, the hosting of the auction in itself caught the attention of the wider energy sector and served to raise the profile of energy storage, the AEPIBAL president says.

"These are exciting and historic times," according to Marquina, with great, industrial-scale deployment of new technologies just beginning. He says he sees great potential in Spain for technologies including second life batteries, redox flow battery storage, hybrid renewables-plus-storage and energy management and power control systems.

But while Spain may be enjoying — if you'll pardon the expression — this moment of sunshine on its industry, Marquinos says, the challenges it faces are shared across many countries and the energy transition is an effort that should be undertaken collectively.

"We have to be more coordinated in Europe, because we are living all the same experiences. Ireland is at the same point we are. The difference between Ireland and where we are is very small. We have a lot in common and a lot of information to share, we can serve business opportunities."

The UK might be outside the EU now, but given the UK's rapid development of a thriving energy storage market, Marquinos still believes there's a lot of knowledge sharing that can happen with the former member state too.

EU membership will nonetheless have a bearing on the support the industry in Spain directly benefits from: the Recovery and Resilience Funds will provide more than EU750 billion to be invested by 2026, 70% of that sum before 2023, Marquina says. More than a third of those sums will go to climate transition causes and loans and subsidies into the energy sector for technology innovation, including transmission and distribution grid digitisation.

Poland - Barbara Adamska, president, PSME

When people think of Poland's energy sector, they usually think of coal. However although around 70% of electricity production still comes from the fossil fuel, renewables now provide around 18% of electricity production and Poland was Europe's fourth largest solar PV market in 2020. Coal plants are also scheduled for phase out by 2049.

With policy in the country adapting to climate risk, partly driven by its European Union commitments, the "dynamic deployment of renewable energy sources" is the main driver for energy storage, Barbara Adamska, president of the Polish energy storage association PSME, confirms. The country is targeting at least 32% of domestic net electricity consumption to come from renewables by 2030.

"The photovoltaics sector in Poland is growing rapidly. The development of the photovoltaics market in Poland is actually a matter of the last few years. At the end of 2015, the installed capacity in PV was only about 70MW. At the end of 2020, it amounted to around 4GW — an increase of some 5000%. In the same period, the number of prosumers went up from 4,000 at the end of 2015 to over 450,000 at the end of 2020. An increase of 11,000% over 5 years," Adamska says.

At the same time, Poland's energy supply security is "jeopardised by the deteriorating technical conditions" of its power infrastructure, with the majority of transformers and transmission lines built in the 1970s and 1980s, making the development of energy storage a necessity, according to Adamska and PSME.

After several years of discussion, the first few "experimental investments" into energy storage have begun in Poland, but as with other territories, the lack of regulatory framework has been a burden for the industry. However, this year looks set to be transformative for the Polish energy storage sector: the Polish parliament adopted an amendment to its Energy Law in April which Adamska believes will "enable the dynamic development of the energy storage market".

These changes include the elimination of the "double charging" of fees for import and export to the grid, the removal of licensing requirements for systems under 10MW rated power, exemption from the obligation for a specific energy storage tariff and allowing distribution and transmission networks to invest in energy storage as eligible costs for recovery through rate structures.

Poland has moved faster than the UK or Germany to adopt a set of regulatory definitions of "grid energy storage" and "grid energy storage facilities". The PSME president says this will solve "interpretation problems stemming from inconsistencies in these definitions across different legal acts".

Allowing network organisations to classify investment in energy storage assets as eligible costs for running their transmission and distribution grids more efficiently and as a substitute for grid expansion has led the transmission operator PGE to announce that it will deploy at least 800MW of energy storage by 2030. This includes a 205MW / 820MWh system in Zarnowiec, northern Poland, which will be the largest of PGE's planned systems — so far.

Microgeneration has benefited from the

implementations of programmes such as the "My Electricity" incentive scheme, to which around EU250 million was committed to support prosumer rooftop PV installations. The programme is expected to restart in July 2021 and Adamska says it is expected to be extended to include subsidies for energy storage systems. She believes support for home energy storage is crucial to continuing the rapid and so far successful development of small-scale renewables.

Meanwhile, community energy generation is a "hot topic" in Poland too, with the government's Ministry of Climate and Environment supporting the concept of local energy clusters. A policy formalised since 2016, different stakeholders can form these community clusters to meet local energy demand with local energy supply, covering up to five municipalities or one district. Adamska believes these clusters could be a game changer for Poland's energy transition, with over 100 already established and 66 receiving approval to proceed as pilots. As many as 300 could be in operation by 2030 and the "local range" concept is of course favourable to energy storage and distributed energy resources of various types as well as renewable energy. Furthermore, the policy is firmly in line with EU directives.

As with all of the other trade association representatives spoken to for this article, Poland's energy storage association president believes international cooperation and communication is vital for the future.

"For the development of the energy storage market in Poland, it is extremely important to exchange experiences with industry representatives from other countries and to stay in contact with foreign universities and research institutes," Adamska says.

"I wholeheartedly appreciate the Energy Storage Europe fair, along with the conferences accompanying the event. Every year since 2015, the Polish delegation, which I chair, has participated. The delegation includes representatives of ministries responsible for energy, Polish universities and research institutes and entrepreneurs from the energy storage industry. Establishing contacts and exchanging experiences with representatives of the regulator, representatives of the world of science and entrepreneurs from other countries are extremely valuable. Hopefully in 2022 we will have the opportunity to meet again face-to-face in Düsseldorf at Energy Storage Europe."