

# Energy:2030 25

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**ENERGY PERSPECTIVE** 02

Jump start: accelerating net zero commitments – Neil Mearns

**NEW MARKETS** 04

Renewable energy and ecosystem services study begins

**FUTURE NETWORKS** 06

ENW produces scenarios to forecast future network

**LOW-CARBON, HEAT & TRANSPORT** 08

SEA addresses heat decarbonisation regulation  
EV and charging innovation update

**DEMAND-SIDE & SUPPLY** 11

IRENA discusses transformative demand-side flexibility  
Demand-side and supply innovation update

**INTERNATIONAL** 14

Germany approves 65% renewable energy target  
California approves new energy efficiency frameworks  
Energy Storage Grand Challenge launched in US  
FERC order sets capacity market minimum pricing  
AEMC finalises faster switching changes  
New Zealand makes consumer data sharing easier  
Auctions update

## In review

In this month's *Energy:2030*, we look at examples of leadership in delivering the energy market transition.

In our *Perspective*, we focus on the initiative of Nordic countries in accelerating net zero commitments. Recently declared targets have coincided with statements from Nordic oil and gas majors, which are taking a lead in the decarbonisation of their operations.

January saw the launch of the Integrating Renewable Energy and Ecosystem Services (IRENES) project, which is investigating good practice in synergising renewable energy sources and ecosystem services.

The Sustainable Energy Association presented its ideas on regulating the decarbonisation of heat – a key problem in delivering net zero emissions. It suggests an emissions standard for heating that takes a carbon intensity approach to regulation.

The International Renewable Energy Agency presented its thinking on existing demand-side solutions and key innovations.

On electricity networks, Electricity North West recently took an approach to develop five scenarios that might reflect its future network. In Germany, the Federal Network Agency approved a network development plan that includes increasing the proportion of renewable energy to 65% by 2030.

In the US, California recently adopted frameworks for two areas of energy efficiency policy, which could boost emerging technologies as well as provide continued support for existing initiatives. A comprehensive programme to accelerate the development, commercialisation and utilisation of next-generation energy storage technologies was also launched by the US Department of Energy.

Developments in Australia and New Zealand have focused on retail sector transformation. Australian authorities have developed a market design to enable the switching process to occur within two days. New Zealand has implemented a package of initiatives aimed at making it easier for consumers to share their consumption data with organisations they trust.

# Jump start: accelerating net zero commitments

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With the World Economic Forum (WEF) Annual Meeting having just taken place on 21-24 January, there has been increased focus on global sustainability. In this *Perspective*, we take stock of the countries and companies that are accelerating net zero commitments a decade or more ahead of the widely held 2050 target.

## Overtaking

Prior to the annual meeting in Davos, the WEF published *The Net-Zero Challenge: Global Climate Action at a Crossroads (Part 1)* on 11 December 2019. The two-part series assesses the state of global climate action through the lens of corporations, governments and civil society.

It covers countries with net zero ambitions to date, either written into law or as a policy position (see Figure 1).

**Figure 1: European countries with net zero commitments enshrined in law or in policy**

Year	Country and nature of net zero commitment
2030	Norway (in policy document)
2035	Finland (in policy document)
2040	Iceland (in policy document)
2045	Sweden (in law)
2050	Portugal and Switzerland (in policy documents), Denmark, France and UK (in law)

Source: Cornwall Insight

## Pole position

Nordic countries, as the WEF reference in their report, have “been among the few to take truly decisive steps”.

Norway, in its *Climate Strategy for 2030*, published in June 2017, stated its conditional commitment to reduce its emissions by at least 40% by 2030 compared with the 1990 level. The strategy presented a “transformational approach” within a European cooperation framework.

The Finnish government first announced its country’s plan to be carbon neutral by 2035 in June 2019. Five coalition parties agreed on the target, which was championed by incoming Prime Minister Antti Rinne.

The country will tighten its emissions reduction obligation for 2030 to at least 55% below the 1990 emissions level. It will also carry out an assessment of its carbon neutrality target in 2025.

As part of the sustainable development tax reform, the Finnish government will carry out a complete overhaul of energy taxation by the August 2020 government budget session. Emissions guidance in energy production will be increased by abolishing its industrial energy tax rebate system. It will also reduce category II electricity tax (for industrial companies) towards the minimum rate. Heat pumps and data centres generating heat for district heating networks will be transferred to this tax category.

The government will also provide property tax relief for offshore wind farms and remove the double taxation on electricity storage for pumped storage facilities and smaller batteries.

The government will also:

- Implement an energy aid scheme, shifting the focus to grants supporting investments in new energy technologies and demonstrations.
- Support new methods for producing district heating and heat storage without burning fuel.
- Remove barriers to wind project construction.

On 6 December 2019, the Danish Parliament agreed on a legally binding national Climate Act. This set a legally binding target to reduce greenhouse gas emissions by 70% by 2030 compared to the 1990 level.

The Act will overhaul Denmark’s climate policy; every year, the Danish government will present Climate Action Programmes with concrete political initiatives to decarbonise every sector, from transport to energy. The Act establishes an ambition mechanism with a five-year cycle, designed to ensure both early action and to revise the reduction targets. The milestone targets will be implemented in Danish law, with the forthcoming

Climate Action Plan in 2020 to set a target for 2025.

## Handling

Other western European countries are starting to make interim targets long before their respective net zero targets.

One development that appeared to go under the radar was that the Dutch Supreme Court on 20 December 2019 ruled that the Dutch State must reduce Dutch greenhouse gas emissions by 25% by the end of 2020, compared to 1990 levels. This is a remarkably ambitious short-term target considering emissions were down 15% on 1990 levels by the end of 2018. But the Supreme Court justifies this reduction target “on account of the risk of dangerous climate change that could also have a serious impact on the rights to life and well-being of residents of the Netherlands.”

Over a slightly longer timeframe, Germany’s lower house of parliament in November 2019 approved a package to help the country achieve its target of cutting greenhouse gas emissions to 55% of their 1990 level by 2030. Germany will raise the price for CO<sub>2</sub> emissions from transport and heating buildings to €25 (£21.08) per tonne from 2021. This was after a proposed €10 (£8.43) price tag was criticised for being too low. Under the new agreement, the carbon price would rise to €30 (£25.3) in 2022 and rise incrementally to a price corridor of €55-65 (£46.38-54.81) by 2026.

Also using taxation to drive emissions lower Sweden has set the highest carbon tax in the world, at €114 (£96.40) per tonne.

## Traction

Just as Nordic countries are the ones with shorter-term net zero targets, the Nordic oil and gas majors are accelerating their ambitions to decarbonise. An initial marker of this greening intent was the name-change of DONG to Ørsted in November 2017 and Statoil to Equinor in May 2018.

Equinor, on 6 January, announced its aim to reduce all greenhouse gas emissions from its offshore and onshore operations in Norway by 40% by 2030, 70% by 2040 and to near zero by 2050. By 2030, this implies annual cuts of more than 5mn tonnes, corresponding to around 10% of Norway’s total CO<sub>2</sub> emissions. The 2030 ambition will require investments of around NOK50bn (£4.2bn) for Equinor and its partners. Vattenfall

previously stressed in a 11 November 2019 press release that that partnerships will drive its transformation to net zero.

By 2025, Ørsted aims to achieve a 98% carbon reduction in energy generation and operations compared to 2006. The company also aims to have a 100% electric car fleet by this year. By 2030, the company will look to build more than 30GW of green energy projects across technologies. By 2032, Ørsted wants to reduce emissions in the supply chain and from energy trading by 50% compared with 2018. It will aim to become completely carbon neutral by 2040. These targets were explained in its *Sustainability report 2019* on 30 January.

Corporate Knights named Ørsted as the world’s most sustainable company on 21 January. It topped more than 7,300 global companies with billion-dollar revenues to rank number one in the 2020 index of the Global 100 most sustainable corporations. It is the first time an energy company has finished top of the index. Vattenfall announced on the same day that it was awarded an “A” by non-profit Carbon Disclosure Project (CDP) based on data submitted through its 2019 climate change questionnaire. Only the top 2% of 8,000 companies assessed achieved this score.

Vattenfall claims that it has a £10bn+ UK pipeline in wind power, interconnection, power distribution and district heating to drive its net zero ambition. Meanwhile, Equinor is advancing opportunities in offshore wind, carbon capture and storage and emissions-free hydrogen based on natural gas.

## Scrutineering

The Nordic countries, in tandem with the likes of Equinor and Ørsted, are raising their ambitions in the hope that others will follow suit. The likes of Norway and Finland have vastly different fuel mixes and national consumption profiles compared to the UK, but many of the initiatives being employed to reach net zero are certainly transferrable.

It is important that the transition is a just one, as the EU has recognised in its Green Investment Plan (see page 21). This will be a difficult balancing act for larger western European economies, with traditionally fossil-fuel heavy energy mixes.

# Renewable energy and ecosystem services study begins

Tom Andrews, [t.andrews@cornwall-insight.com](mailto:t.andrews@cornwall-insight.com)

**The Integrating Renewable Energy and Ecosystem Services (IRENES) project launched in the UK on 10 January. This European Regional Development Fund funded project aims to investigate good practice in synergising renewable energy sources and ecosystem services. The four-year project will cost \$1.7mn (£1.5mn) and examine policy instruments in five countries: Italy, Germany, Romania, Estonia and the UK.**

Two universities in the UK will take part: The University of East Anglia and Anglia Ruskin University. They will examine the *Clean Growth Strategy* – particularly the elements on the decarbonisation of heat.

The University of Venice and Veneto Innovazione will examine the *ROP Veneto ERDF 2014-2020*, considering energy efficiency and self-generation.

Leibniz University Hannover and the Climate Protection Agency Hannover Region will examine Lower Saxony's *Operational Programme ERDF/EDF 2014-2020*, with an emphasis on how policy can support the restoration and enhancement of natural ecosystems and services, supporting biodiversity, cultural and natural heritage.

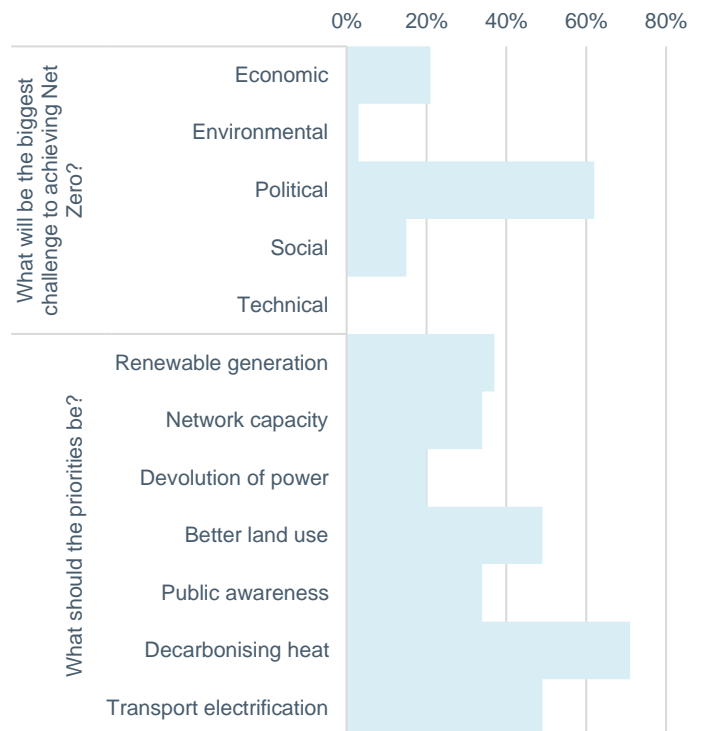
The University of Bucharest and the Ministry of European Funds will examine the *Large Infrastructure Operational Programme* and consider the impacts of “unsuccessful stories”, including negative environmental impacts of using water for hydroelectric dams and impact of wind turbines on bird migration routes.

The Estonian University of Life Sciences and the Estonian Environment Agency will examine the *Operational Programme for Cohesion Policy Funds 2014-2020*, looking at increasing the resource efficiency of the Estonian economy and methods to deliver economic growth without environmental damage.

The project will analyse the selected policy instruments and real-world impacts. By comparing between countries, a guide to best practice will be produced. At the launch event, attendees were surveyed to understand the current challenges facing the decarbonisation of UK (see Figure 1). Over 60% said that political barriers were the

greatest challenge, with the decarbonisation of heat seen as the biggest priority. Cost was seen as the major challenge to introducing low carbon heating.

**Figure 1: Attendee responses at IRENES launch event**



Source: IRENES project

In addition to the academic institutions, a stakeholder group for the project has been assembled. This comprises participants from the wider energy industry, in particular distribution network operators, local government, businesses and major energy users such as the water sector and the NHS, the Local Enterprise Partnerships, and non-governmental organisations.

*Understanding best practice in ecosystem management will be key to developing additional benefits from the large tracts of land being turned over to solar and wind generation and maximising the carbon, which can be absorbed by the land itself. This project will spread best practice across Europe, allowing each to learn from other countries' mistakes.*



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## First UK grid-injected hydrogen pilot commences

The UK's first live pilot scheme to inject zero carbon hydrogen into a gas network to heat homes and buildings is now fully operational, Keele University announced on [2 January](#).

Underpinned by Ofgem's Network Innovation Competition and led by Cadent in partnership with Northern Gas Networks, Keele University, the Health and Safety Executive Science Division, ITM-Power and Progressive Energy, the £7mn project is situated at Keele University and will inject up to 20% (by volume) of hydrogen into its existing natural gas network, feeding 100 homes and 30 faculty buildings.

The 20% hydrogen blend is the highest in Europe, together with a similar project being run by Engie in Northern France.

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## First regional energy transformation plan for East of England

On [20 January](#), the *Energising the East* report was launched in Norwich. Commissioned by Dr Catherine Rowett, Green Party MEP, the report focuses on a low-carbon transition for the East of England. It budgets 200.5mn tonnes of carbon emissions to 2100 for the region, in order to keep global warming to 1.5°C. Remaining within this budget requires cumulative emissions cuts of 13.5% per year to 2030, when the region will become effectively carbon neutral.

The plan sets out an illustrative model to remain within the East of England's carbon budget. This includes a requirement to provide deep retrofits for 2.6mn homes, install heat pumps in 1.5mn further homes and mount solar arrays on 1.5mn homes. In addition, 200,000 industrial and commercial buildings would be fitted with solar arrays averaging 40kW. In transport a replacement of car journeys with travel on foot, by bike and by bus would reduce emissions by 86%. This first-of-a-kind plan, which is not costed, also calls for 180,000 heat pump installations and 156,000 deep retrofits in the current year.

In addition to carbon emission cuts, the report suggests that the transition could deliver significant benefits to the local region, through community investment in renewables and new jobs in the region.

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## New batteries could transform existing energy infrastructures

IBM revealed a new battery discovery on [18 December](#). Three new and different proprietary materials have been combined in a battery which does not use heavy materials or other substances with sourcing concerns. Instead, the materials can be extracted from seawater, laying the groundwork for less invasive sourcing techniques than current methods.

The new battery's performance potential can also be optimised to surpass the capabilities of lithium-ion batteries in terms of lower cost, faster charging, higher power and energy density, greater energy efficiency and low flammability. The battery may help transform the long-term sustainability of our energy system and make the goal of a fast-charging, low-cost electric vehicle a reality.

Meanwhile, on [6 January](#), Kyocera Corporation announced that it has formally launched its residential energy storage system, Enezza. The new battery is the world's first system built using battery technology company 24M's novel SemiSolid electrode manufacturing process. Innovative manufacturing processes have allowed development of the battery with improved safety, longer life, and lower cost.

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## WPD launches largest flexibility market; Kaluza provides paid service

Western Power Distribution (WPD) published its intention to procure 334MW of demand response services through multiple channels across its network on [7 January](#). The volume is the largest amount from any UK network operator. Providers will be able to use multiple routes to market, including Piclo, Cornwall Local Energy Market and WPD's flexibility interface Flexible Power.

OVO Group's intelligent energy platform Kaluza became the first residential technology platform to provide a paid flexibility service to WPD on [21 January](#). Through Flexible Power, Kaluza delivered a flexibility service using a portfolio of domestic sonnen batteries in Lincolnshire in response to WPD's local network needs at peak demand times.

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# ENW produces scenarios to forecast future network

Emily Lewis, [e.lewis@cornwall-insight.com](mailto:e.lewis@cornwall-insight.com)

**Electricity North West (ENW) published its Distribution Future Electricity Scenarios (DFES) in a report on 19 December. The five scenarios are based on implementation of green policies and prosperity and have been used to produce a range of forecasts for indicators from peak electricity demand to electric vehicle (EV) uptake in the ENW region.**

The DFES will be used by ENW to inform its network investment strategy and focus on trends within different areas of its distribution region. The scenarios are:

- Active Economy – high prosperity with weak green policies.
- Green Ambition – high prosperity with strong green policies.
- Central Outlook – average assumptions across scenarios.
- Focus on Efficiency – strong green policies but low prosperity.
- Slow Progression – weak green policies and low prosperity.

The scenarios have been used to produce forecasts of peak demand which includes electrification of transport and heating forecasts – also generated from the DFES. Figure 1 illustrates forecast peak demand for each scenario. Green Ambitions is the forecast with the highest percentage increase in peak demand. This is due to green policy influencing an increase in the electrification of heat and transport. The report suggests that EVs and heat pumps could double peak demand in the long term as the transport and heat sectors move away from fossil fuels.

ENW found that the forecast for growth in peak demand was not consistent across the region. This is due to the types of buildings that

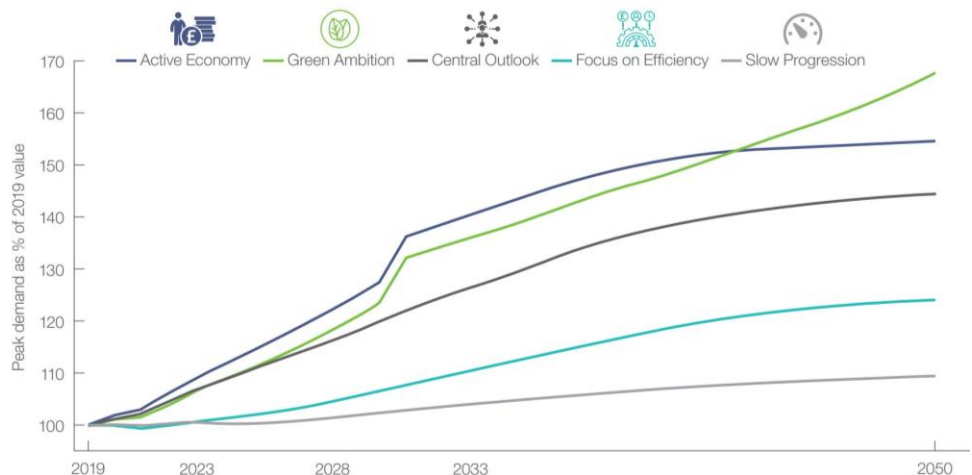
already exist in the area. The forecasts also consider the rise in the use of air conditioning units that will increase peak demand in summer.

Other key findings were that distributed generation capacity is forecast to nearly double in the Central Outlook scenario and there will be a greater reliance on electrical energy of up to 25% by 2030. These changes will require network investment to accommodate the increase in EV chargers and heat pumps, as well as an increased network resilience and network innovations.

ENW identified that, in the north west of England, a ten-fold increase in household solar is needed by 2050 and a push towards 60% of buildings adopting heat pumps is needed by 2050. Battery storage is also expected to increase up to 10 times the current levels, with all scenarios but Slow Progression showing at least 6 times the current amount.

*ENW used two main dependencies in its forecasts: financial conditions and future decarbonisation. National Grid, in their Future Energy Scenarios, factored in these dependencies in the form of policy support (to encourage low carbon solutions) and economic growth. Unlike ENW, National Grid also factored in levels of consumer engagement and the pace of technological innovation.*

**Figure 1: ENW region peak demand forecasts as % of 2019 value**



Source: Electricity North West

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## National Grid launches first green bond to fund sustainability projects

National Grid has launched its first green bonds, with the aim of raising £430mn to finance UK electricity transmission projects with environmental benefits.

Announced on 13 January, the bonds were launched from National Grid's Green Financing Framework and issued by National Grid Electricity Transmission. Examples of ways the funds raised could be used include funding the connection infrastructure of wind farms to the grid.

For energy efficiency or cleaner transportation, the bond's proceeds could go towards investing in projects that would reduce electricity grid losses or financing clean transport infrastructure, such as the electrification of railways.

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## SSEN to deliver improved EV and network coordination

Scottish and Southern Electricity Networks (SSEN) has secured £343,000 in funding from Ofgem's Network Innovation Allowance (NIA) to deliver the Regional Energy System Optimisation Planning (RESOP) project.

Announced on 20 January, the project is part of the £7.5mn Strategic Partnership established between SSEN, the Scottish government, Transport Scotland and SP Energy Networks. It will look to deliver and improve coordination between electric vehicle charging infrastructure and electricity networks in Scotland. SSEN will also work with local authorities and other stakeholders to identify the impact of their plans on the energy networks and the role of low carbon technologies in managing this impact.

The project will begin in January 2020 and run for 18 months.

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## WPD to use Integrated Network Model to help reach net zero

Western Power Distribution (WPD) announced on 21 January that it is set to utilise an Integrated Network Model (INM), forming part of its commitment to reaching net zero carbon.

Devised in partnership with CGI, the INM will allow the business to plan for increases in distributed renewable forms of generation, such as heat pumps and solar panels. Connecting directly to the network, the INM will harness network data to deliver a digital picture of a network at any given time and enable the business to manage networks on a more local level and make further use of existing assets.

Graham Halladay, WPD Operations Director, said: "We recognised that the transition to Distribution System Operator will be driven through engagement with external parties. Data is the key to enabling effective communication and having a digital representation of our physical network is a key pillar for addressing the Energy Data Taskforce recommendations."

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## UKPN targets three pillars of innovation in updated strategy

UK Power Networks published an updated innovation strategy in January, explaining its three innovation pillars: *Efficient and Effective*, *Net Zero Ready* and *Future Ready*.

The *Efficient and Effective* pillar aims to deliver value to customers and the business through "innovation by enhancing network performance and reliability at the lowest possible cost. *Net Zero Ready* means enablement of the low carbon transition by connecting electric transport, heat, generation and storage at the lowest cost. *Future Ready* refers setting up the distribution system to facilitate new services for customers' needs.

### Coming up

In next month's issue, we will look at a Hydrogen Council report on hydrogen's cost competitiveness and transition pathways towards an integrated European energy system with coupling of electricity and gas grids.

# SEA addresses heat decarbonisation regulation

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The 2017 *Clean Growth Strategy* commits the government to phasing out fossil fuel heating in off gas grid properties by the end of this decade. The Sustainable Energy Association (SEA) has used this pledge as a starting point to propose regulations to bring down carbon emissions from heat.

The SEA presented its ideas in a policy paper entitled *Achieving Net Zero: Regulating the Decarbonisation of Heat*, published in [January](#).

The SEA has designed an emissions standard for heating that takes a carbon intensity approach to regulation. The off-grid commitment is the core focus, with the option of extending it to gas grid properties after 2030. The regulation is both a function of the carbon intensity of the fuel source, as well as the efficiency of the heating system. This provides an output in kgCO<sub>2</sub>/kWh of heat provided. By adding a timeline, it is thought that levels of public awareness will be improved.

Figure 1 summarises the proposed carbon intensity standards regulation, which initially commits the programme until 2030 to provide confidence the highest emitting heating systems are decarbonised. A decision on the future of the gas grid will likely need to be taken before 2030, as recommended by the Committee on Climate Change (CCC). Essentially, as long as heating systems are within the standard, they can continue to be installed, with high emitting systems being replaced with a more efficient option if they exceed the cap.

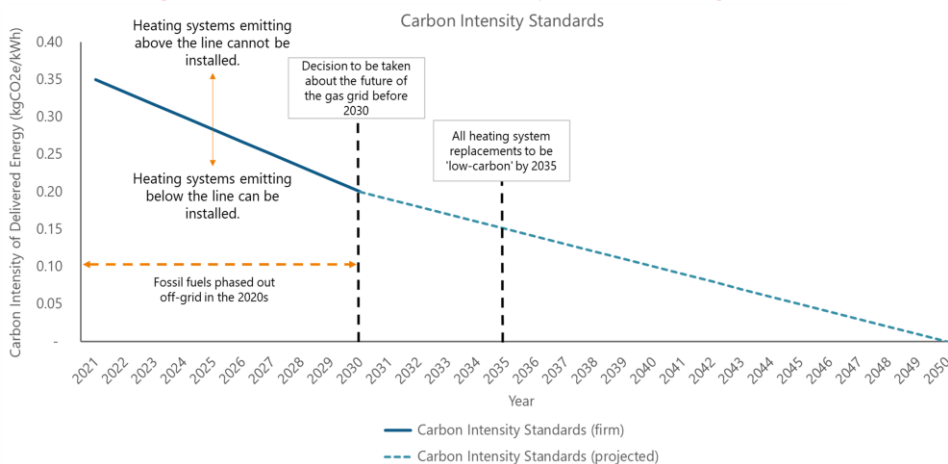
As suggested by the CCC in May 2019's *Net Zero – The UK's Contribution to Stopping Global Warming* report, the standard proposes that, by 2035, all replacement heating systems for existing homes must be low carbon or ready for hydrogen. The CCC also advises that emissions from heating in the average household need to fall to 1.9tCO<sub>2</sub> to reach the fifth carbon budget. With the proposed regulation in place, off gas grid homes could achieve this, but only if heat demand reduces by 30%. This highlights the importance of improving energy efficiency in the existing building stock alongside heat decarbonisation.

Implementation of the standard would be through natural replacement cycles, not through retrospective action. For example, when an oil heating system requires replacement at the end of its life, it will be changed for a new low-carbon system that meets the carbon standard.

The regulation proposed phases out high emitting technologies in the 2020s, including coal heating, oil boilers and liquid petroleum gas boilers. The significance of a decision over the future of the gas-grid becomes critical ahead of 2030, where it is currently in need of phase-out. The ability of biomethane and hydrogen blending are both options, but their viability of meeting significant demand remains questionable. Favourable technologies include electric heating and hybrid heat pumps.

*The government needs to establish the pathway for low-carbon heat if the country is to achieve net zero by 2050. In tandem, there is a need to understand the suitability of certain technologies to replace gas heating, the ability of systems to cope with new, higher demand, the geographical spread of decarbonised heating options and improve energy efficiency in property.*

**Figure 1: Proposed Carbon Intensity Standards Regulation**





## EV and charging innovation update

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### **This month, there were new partnership announcements and developments in wireless electric vehicle (EV) charging.**

Power management company Eaton announced on 8 January that it has joined with EV charging company Green Motion to enable a “smooth integration” of EV chargers in commercial and residential buildings and shopping malls. The collaboration provides customers with a combined intelligent charging and energy storage solution, which enables intelligent EV charging as well as peak shaving to avoid expensive energy tariff periods.

Octopus Electric Vehicles has partnered with EO Charging to launch a new EV home charging solution. Announced on 14 January, the package includes the EO Mini Smart Home charger and the Octopus GO EV driver tariff. Octopus claimed that the charger will be fully interoperable with its Octopus Go tariff to enable “effortless” off-peak overnight charging.

Moixa and Honda partnered with Islington Council to deliver a smart EV charging project to optimise its vehicle fleet on 16 January. Both parties will support the council to achieve its ultra-low emissions zone emissions standard across its fleet of 500+ vehicles and help Islington to achieve its 2030 net zero carbon emissions target. Five bi-directional vehicle-to-grid chargers, manufactured by EVTEC and Honda, will be installed with Moixa’s GridShare software outside Islington Town Hall.

Connected Kerb announced in January that it is to roll out wireless EV charging technology in the first half of 2020 in London, the Midlands and Scotland. The technology sees induction chargers in inductive pads sunk beneath the ground with EVs then able to park over them and charge wirelessly. The chargers are set to be fitted in residential streets, car parks and taxi ranks, initially alongside existing chargers, upgrading them.

On 17 January, Transport Secretary Grant Shapps confirmed that the government will invest £3.4mn in wireless charging for electric taxis in Nottingham. The project will look to speed up

charging and help reduce congestion in city centres. 10 Nissan and London Electric Vehicle Company electric taxis will be fitted with wireless charging hardware for six months to trial taxi rank-based charging. Nottingham City Council will own the vehicles and provide them to drivers rent free. If successful, the technology could be rolled out for public use.

National Infrastructure Commission (NIC) Chair Sir John Armitt wrote a letter to *The Times* on 16 January, calling for the government to subsidise charging solutions in rural and hard-to-reach areas that are unlikely to be served by the market in the short term. He said this move would “send a strong signal of ministers’ intent”. He said the national infrastructure strategy to be published with the Budget in March is a chance for the government to do this as part of a comprehensive action plan to put electric vehicles at the heart of the UK’s net zero emissions strategy.

The Electric Vehicle Energy Taskforce published its *Energising Our Electric Vehicle Transition* report on 15 January, making recommendations to the government on EV and energy policy. The report identified priorities including the urgency of developing standards and codes of practice to enable interoperability and the sharing of data within the EV sector and with the electricity system. Other priorities identified were: the need for effective local and national planning and coordination to enable efficient investment; mediating the balance between future-proofing and asset stranding; and the criticality of smart charging, underpinned by a resilient network and clear market signals, to reduce the cost of supplying millions of EVs with power.

EDF Energy has signed a deal to support Royal Mail Group with its commitments under the Optimise Prime Project, “the world’s largest commercial electric vehicle project”. Announced on 29 January, the three-year framework will see EDF Energy provide charge points, associated maintenance and ancillary items such as signs, bollards and wheel stops. The initial agreement is for sites in the south east of England, with potential for this to increase as required.

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## York Council awards £1.6mn to make buses greener

Ahead of launching its Clean Air Zone, City of York Council awarded over £1.6mn to five bus companies to make their vehicles environmentally friendly on [17 January](#).

Bus operators were invited to bid for Clean Air Zone funding to help them meet the cost of 'retrofitting' their vehicles with cleaner exhausts to meet the Euro VI emission standard. A total of £1,654,000 has been allocated to Arriva Yorkshire, First York, Harrogate Coach Travel; Reliance Motor Services and Transdev, where a total of 93 buses will either be 'retrofitted' or replaced.

From 31 January, the only buses that will be exempt from the requirements are those that enter the Clean Air Zone fewer than five times each day and those due to be retrofitted or replaced before 31 January 2021.

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## Innovative energy schemes planned for north east of England

Newcastle City Council announced the opening of a District Energy Centre in the city on [15 January](#). The £20mn facility – a joint venture between the council and ENGIE – uses a 5km network of underground pipes to supply heating and cooling to 10 buildings and up to 450 homes planned on the Newcastle Helix site. The centre contains a natural gas-fired combined heat and power unit and a private electricity network.

Meanwhile, South Tyneside Council provided details of a proposed renewable energy scheme on [20 January](#). Subject to planning permission, the "Viking Energy Network" scheme would combine a river source heat pump, a combined heat and power back-up system, a 1MW solar farm and a private wire electrical network with battery storage.

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## Scotland and Wales address low carbon heating from mid-2020s

On [5 January](#), the Scottish government confirmed that new regulations will be developed to ensure all new homes will utilise renewable or low carbon heating from 2024. The move to increase energy efficiency and reduce carbon emissions will run alongside a £30mn investment in renewable heat projects. Renewable and low carbon heating systems will be phased in for non-domestic buildings given consent to build from 2024.

On [20 January](#), Housing Minister Julie James launched new proposals that would see all new homes in Wales heated and powered only from clean energy sources from 2025, leading homes to produce 75-80% less CO<sub>2</sub> emissions. Forming part of wider Welsh government plans, the proposals would see the new standards implemented in stages over the next five years. All new homes will need to be future-proofed to enable the retrofitting of low carbon heating systems and encompass the phasing out high-carbon fossil fuels in favour of renewable energy sources, such as heat pumps.

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## £1.25mn grant awarded to Waste2Tricity for hydrogen production plant

PowerHouse Energy Group announced on [6 January](#) that it has awarded UK-based waste-to-hydrogen technology company Waste2Tricity Protos a grant of £1.25mn for the development of a hydrogen production plant in Cheshire. The company secured the grant following a successful application to the £4.1mn Energy Fund competition.

The grant will be used to fund the thermal conversion chamber – a core element of the plant. It is also subject to the development achieving planning approval and funding by the end of March.

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## AFC Energy to explore green hydrogen for fuelling fuel cell systems

Hydrogen generation provider AFC Energy announced on [28 January](#) that it has entered an agreement with green hydrogen generation technology developer HiiROC. The two companies will work together to explore the supply of green hydrogen for fuelling fuel cell systems.

The agreement will also see the integration of the HiiROC and AFC Energy technology platforms which, if successful, "has the potential to unlock natural gas as a zero-emission, low cost hydrogen fuel carrier."

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# IRENA discusses transformative demand-side flexibility

Laura Woolsey, [l.woolsey@cornwall-insight.com](mailto:l.woolsey@cornwall-insight.com)

The International Renewable Energy Agency (IRENA) published an analytical brief in December, entitled *Demand-side Flexibility for Power Sector Transformation*. The brief presents existing demand-side solutions, key innovations and recommendations for policy makers on how best to utilise these solutions.

IRENA proposes a toolbox of 30 key innovations to transform the power sector across the four outlined dimensions and facilitate demand-side flexibility implementation.

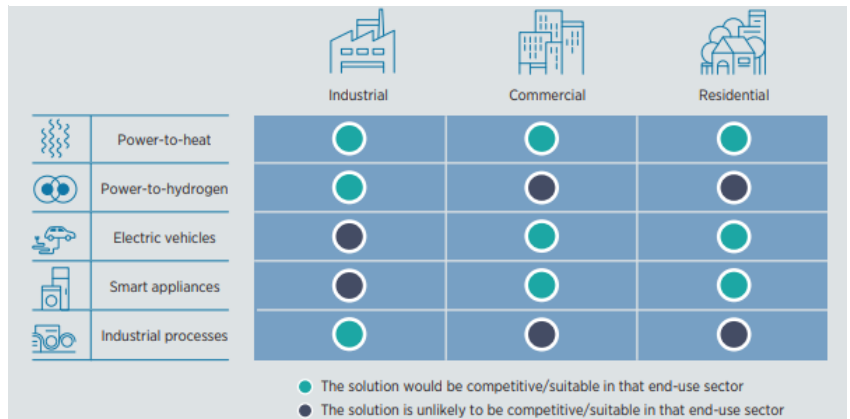
Enabling technologies can play an important role in facilitating the integration of renewable energy. The most relevant enabling technologies are:

- Renewable power-to-heat, including heat pumps, electric water heater and thermal energy storage.
- Renewable power-to-hydrogen, which refers to the production of hydrogen from renewable energy by using an electrolyser.
- Electric vehicle (EV) smart charging, including home and public charging.
- Behind-the-meter batteries, enabling demand-side flexibility in the residential and commercial sectors due to their charging and discharging capabilities.
- The Internet of Things, artificial intelligence, big data, and blockchain.

Business models can enhance the system's flexibility and integration of new technologies by creating the business case for new services. There are several relevant business models:

- Aggregators are a grouping of agents in the power system acting as a single entity when engaging in power system markets or selling services to the operator.
- Energy-as-a-service refers to the shift from selling energy to selling the actual services that energy provides to customers e.g. mileage of EVs.

Figure 1: Demand-side flexibility technology mapping by end-use sector



Source: IRENA

- Pay-as-you go models consist of consumers paying directly for services they use.
- Community ownership models refer to the collective ownership and management of energy-related assets.

Market design consists of new market structures and changes in the regulatory framework that encourage flexibility. The most relevant market design innovations include time-of-use tariffs, innovative ancillary services, market integration of distributed energy resources and increase of time granularity in electricity markets.

System operation refers to innovative ways of operating the electricity system, allowing the integration of higher energy shares of VRE. This includes co-operation between transmission and distribution system operators, the future (expanded) role of distribution system operators, virtual power lines and advanced forecasting of variable renewable power generation.

The potential for demand-side flexibility is expected to grow over the coming decades due to the electrification of transport and buildings.

*Although demand-side flexibility is being leveraged in parts of the world already, there is still a long way to go to reach its full potential. Testing and research must continue to provide a more complete understanding of this aspect of the global energy transformation.*



## Demand-side and supply innovation update

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### **This month saw the launch of the Smart Export Guarantee (SEG), partnerships for electricity supply and a new energy company for London residents.**

Energy suppliers have published their tariff rates under the SEG, which came into effect on 1 January. Under the SEG, electricity suppliers that have more than 150,000 customers are required to offer at least one tariff for power exported to the grid from renewables generators smaller than 5MW. Obligated suppliers are required to offer tariffs with rates above 0p/kWh. The Solar Trade Association has published a SEG League Table, detailing the tariffs and rates being offered by 14 obligated suppliers. At time of writing, fixed rate SEG rates range from 5.6p/kWh (Social Energy) to 1.5p/kWh (British Gas). Octopus Energy is offering an Outgoing Agile tariff, which is pegged to the half-hourly wholesale rate. We will cover this in more detail in *ES700* on 3 February.

A partnership project between Bristol Energy and renewable energy provider Gower Power has enabled households and businesses in and around Swansea and Gower to buy fairly priced renewable electricity directly sourced from a local solar farm with battery storage, through Bristol Energy. The Gower Power Solar Storage scheme was funded by Welsh government and European Regional Development Funds. Announced on 7 January, the deal is available to 300 local households or businesses who can now sign up for the energy supply via the Gower Power website. Bristol Energy handle the technicalities of switching, billing and account management.

Co-op Energy has partnered with Octopus Energy to provide the first energy tariff to offer clean electricity exclusively from community wind and solar projects. Reported by the *Guardian* on 12 January, the Community Power tariff will see customers charged an extra £5 a month over Co-op's regular tariff to provide electricity from renewables, alongside gas that includes a carbon offset in the price. Customers will also be able to "see exactly where it is being generated at small scale sites across the UK, and they know it is benefiting local communities," said Co-op Group Chief Executive Officer, Phil Ponsonby.

Meanwhile, Octopus Energy also partnered with Energy Local to trial Energy Local Clubs, where members can purchase power from local generators at reduced rates. The project is funded by BEIS' £6.25m Smart Energy Savings competition. As part of the announcement, Octopus Energy said it would be providing a tariff with four different rates throughout the day to incentivise moving consumption out of peak times. The local generation site must have a power purchase agreement with Octopus Energy and must send half-hourly meter readings, while the Club members require a smart meter to also send half-hourly readings.

Mayor of London Sadiq Khan launched a new energy company for London residents on 13 January. London Power will be delivered in partnership with Octopus Energy and will offer "fair-priced" and 100% renewable energy. The partnership is part of the Mayor's wider Energy for Londoners programme, which aims to make London's homes warm, healthy and affordable, its workplaces more energy efficient and to supply the capital with more local clean energy, as it aims to become a zero carbon city. The mayor claimed that the average direct debit household could save around £300 a year by switching to London Power, whilst the average pre-payment customer could save £160. There will be no exit fees and customers will rollover onto the cheapest similar tariff at the end of their contract.

BEIS published the Whole Life Cost of Energy (WLCofE) calculator on 24 January, allowing building owners and operators to fully understand the full financial cost of the energy their buildings use. The calculator uses a levelised cost approach, enabling for comparison between different generation types with different capital and operational profiles. It was noted that this is the technique used by the power sector to compare the unit costs of wind, solar, nuclear and other means of electricity generation on a consistent basis. The government is hoping that the WLCofE results will prove a useful starting point to consider any offers received for either heat or cooling supply, or both.



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## Centrica and sonnen develop an advanced virtual power plant

Centrica and sonnen have installed a network of 100 domestic batteries to form an advanced virtual power plant.

Announced on [17 January](#), the network of decentralised home energy storage systems has been approved by National Grid, which will allow the batteries to be aggregated in a cloud platform to provide Dynamic Firm Frequency Response (FFR) - selling storage space when the grid is overloaded or providing stored energy during periods of peak demand.

It will therefore enable customers to maximise the amount of solar generated electricity, lowering their energy bills and supporting the stability of the UK electricity system.

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## Asset manager and Danish developer partner on UK storage and solar

Announced on [8 January](#), Armstrong Capital Management Limited and Copenhagen-based European Energy have entered into a joint venture to fund the development of a UK storage and solar pipeline of more than 500MW.

Commenting on the news, Chief Executive of Armstrong, Steve Mahon said: "Armstrong is delighted to have reached agreement with European Energy for the funding of its UK development pipeline. In European Energy, we have found a partner with an excellent track record of delivering high quality renewable energy projects, and who shares our belief in the long-term opportunities for solar and storage projects in the UK."

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## ITM Power expands green hydrogen supply capability

ITM Power posted its half year results for the period that ended on 31 October 2019 on [27 January](#), revealing that it has formed a joint venture with Linde Engineering to help deliver large scale green hydrogen projects.

Graham Cooley, CEO, commented: "The formation of the Joint Venture with Linde and the strategic investment that accompanied it is transformative for ITM Power. The deal allows ITM Power to concentrate on its core competence of developing and manufacturing electrolysis equipment."

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## Gresham House makes series of battery investments

Gresham House Energy Storage Fund announced on [23 January](#) that it has signed a battery optimisation agreement with Habitat Energy to optimise 74MW of Gresham's assets. Three assets will be optimised across the wholesale markets using an algorithm and machine learning. Gresham House previously announced investment in the 49MW Red Scar battery project on [2 January](#).

Gresham House also acquired the 12MW Bumpers battery-ready solar farm from renewables developer Anesco on [28 January](#). Situated close to the Chiltern Main railway line and adjacent to the Ilmer Grid substation, Bumpers is expected to begin generating in March 2020. Once operational, it is forecast to produce enough energy to supply 2,800 homes and save 5,000 tonnes of carbon dioxide each year. The site was sourced, designed and fully developed by Anesco and represents the sixth Anesco solar farm and the first subsidy-free Anesco installation acquired by Gresham House.

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## MCS launches new Battery Storage Standard

The Microgeneration Certification Scheme (MCS) has launched a Battery Storage Standard, outlining the installation requirements for MCS certified installers who supply, design and install electrical energy (battery) storage systems.

Launched on [29 January](#), the standard will help the industry roll out energy storage installations whilst ensuring consumer protection.

It was developed with input from Tesla, Sonnen, Moixa, Powervault, AceOn Group, the STA, REA and more.

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## Germany approves 65% renewable energy target

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**German Federal Network Agency Bundesnetzagentur approved an *Electricity Network Development plan (NDP) 2019-2030* on 20 December, which includes the target of increasing the proportion of renewable energy to 65% by 2030.**

The plan is the first to include this target of increasing the proportion of electricity generated from renewable sources to 65% of gross electricity consumption by 2030. Bundesnetzagentur said that, despite the inclusion in the NDP of measures to optimise the grid, such as dynamic line rating of overhead lines and the inclusion of “innovative technical approaches”, additional grid expansion will still be needed to meet the 65% target. The NDP lays the foundation for this.

The “innovative technical approaches” include the grid booster concept – a pilot measure to introduce a reactive operational management approach that allows the grid to be overloaded for a brief period if a fault occurs, thus increasing the transport capacity of the grid. Network capacity is maintained automatically, managing controllable generating installations and consumer equipment in front of the congestion, as well as batteries behind the congestion to ensure electricity supply.

There are 74 new measures in the plan, which Bundesnetzagentur said are “absolutely necessary and sustainable, no matter what electricity future lies ahead”. Amongst these measures is an additional high-voltage direct-current transmission corridor which is required by 2030. It will run from Schleswig-Holstein through Lower Saxony to North Rhine-Westphalia. The primary reason for this is to transport the additional electricity generated from offshore wind turbines and in northern Germany to the main consumption areas further south.

The NDP is the first of its kind to include the planning for offshore transmission links, replacing the previous offshore NDP. For the period up to 2030, seven or eight additional transmission links in the North Sea and Baltic Sea have been approved in order to connect offshore wind farms, depending on the scenario. Bundesnetzagentur

said that the goal of connecting 20GW of offshore wind farms by 2030 will therefore be possible.

It also takes into consideration the final report of the Commission on Growth, Structural Change and Employment, which recommended Germany to entirely phase out and shut down its remaining 84 coal-fired plants by 2038. The NDP includes an additional Scenario C 2038 into the approval process. This goes beyond the scenarios of the scenario framework and assess the implications in which all coal-fired plants in Germany are shut down. This takes account of the long-term effects of a complete coal phase-out on the transmission grid.

The Institute of Energy Economics (EWI) at the University of Cologne responded to the 65% target announcement with some analysis, concluding that it is unlikely to be met on time.

EWI analysis found Germany’s gross electricity consumption could rise to 748TWh by 2030. At the same time, electricity generation from renewables would rise to 345TWh. This would result in a renewable electricity share of just 46%.

The government has assumed a gross electricity consumption of 595TWh slightly below today’s level by 2030. Manager at EWI Max Gierkink said that electricity consumption is likely to grow due to higher numbers of electric vehicles and heat pumps, as well as the growing importance of green hydrogen produced through electrolysis.

The 65% target, EWI argued, could only be reached if a falling demand for electricity is assumed. For example, a demand for electricity of 590TWh according to Scenario B 2030 of the NDP and a generation of 377TWh, according to the assumptions of the government, would result in a 64% share.

*The Energy Information Administration’s latest analysis has predicted that world electricity consumption will rise 79% by 2050, so the German government’s prediction that its domestic consumption will reduce does raise legitimate questions, which EWI’s analysis questions effectively.*

## California approves new energy efficiency frameworks

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**The California Public Utilities Commission (CPUC) voted unanimously to adopt frameworks for two areas of energy efficiency policy on 12 December. This vote could boost emerging technologies as well as provide continued support in the use of Regional Energy Networks (RENs) and expand the use of market transformation initiatives (MTIs).**

The CPUC identified the necessity for a market transition framework in 2018. The framework is designed to promote a set of efficient technologies, processes or building design approaches until they are adopted into specific standards – while also advancing the next generation of efficient technologies, design solutions and processes to market.

As part of the framework, the decision grants a \$250mn (£191mn) five-year budget to advance but declined to set an up-front benefit-cost ratio threshold for individual MTIs.

Current California rules state that technologies or programmes require demonstration of savings in a relatively short space of time. There are ongoing discussions about how these sorts of initiatives can be made the norm in California.

RENs were designed as a mechanism to augment or supplement the existing energy efficiency portfolios. They are aimed at increasing efficiency programme adoption among moderate- to low-income populations and hard to reach populations.

California's first RENs were approved in 2012. At this time, the CPUC was exploring avenues to involve local governments in a more direct capacity in the integration of energy efficiency programmes. Regulators were considering whether to continue RENs in light of growth in community choice aggregators – programmes that allow local governments to procure power on behalf of their residents and businesses.

At the time of introducing RENs, many local governments had experience in administering energy efficiency programmes – particularly due to relationships with the American Recovery and Investment Act (ARRA) where grants and funding were acquired. The introduction of RENs sought

to capitalise on this existing experience and successful approaches through ARRA.

The CPUC introduced three elements of criteria to evaluate REN proposals:

- Activities that utilities cannot or do not intend to undertake – effectively demonstrating that a REN can deliver a service to the market that a utility cannot.
- Pilot activities where there is no present utilities programme – the concept would be to test programme delivery that is different or unique for upscale potential to be delivered by RENs in the future.
- Pilot activities in hard to reach markets – the rationale being hard-to-reach markets need help to achieve successful energy efficiency savings.

To date, there have been no cost-effectiveness parameters applied to RENs individually. This is likely due to the aforementioned criteria being designed to allow REN programmes to supplement existing utility portfolios and not as a direct replacement.

Lara Ettenson, director of the Natural Resources Defence Council's energy efficiency initiative and climate and clean energy programme, believes the framework is a good example of the benefits of early stakeholder engagement.

She said: "This decision basically followed a collaborative process that hashed out all the details before we went to the commission. She continued: "It's a great model. When you bring stakeholders together, we can come up with solutions that will help us scale up faster."

*The CPUC decision will allow local governments to continue collaborating on RENs to roll out energy efficiency efforts more flexibly. There are parallels here with the local area-based energy efficiency programmes being deployed in Scotland and Ireland, which we covered in [Energy:2030 issue 20](#).*

## Energy Storage Grand Challenge launched in US

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**A comprehensive programme to accelerate the development, commercialisation and utilisation of next-generation energy storage technologies was launched by the US Department of Energy (DoE) on 8 January.**

Energy Storage Grand Challenge (ESGC) aims to create and sustain the US as global leaders in energy storage utilisation and exports. It builds on the \$158mn (£121mn) Advanced Energy Storage Initiative announced in President Trump's Fiscal Year 2020 budget request.

Through R&D funding opportunities, prizes, partnerships and other programmes, the ESGC sets the following goals for the US to reach by 2030:

- Technology development – the establishment of ambitious but achievable performance goals and a comprehensive R&D portfolio.
- Technology transfer – a technology pipeline ranging from research to system design to private sector adoption, system evaluation and performance validation.
- Policy and valuation – models, data, and analysis to inform the most effective value proposition and use cases for storage technologies.
- Manufacturing and supply chain – new technologies to strengthen manufacturing and recyclability and to reduce dependence on foreign sources of critical materials.
- A properly trained workforce that understand the electricity grid and energy storage value chain.

The DoE plans to release requests for information for stakeholders to feed back on the key questions and issues they wish to see addressed. The DoE will also host a series of workshops with key stakeholders to share information about various storage technologies. This engagement will inform the development a coordinated R&D roadmap to 2030 for a broad suite of storage and flexibility technologies.

**Rocky Mountain Institute** – an independent non-profit based in Colorado that aims to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables.

The launch of the ESGC follows the publication of a *Breakthrough Battery Technologies* report by the Rocky Mountain Institute on 29 October 2019.

The report shows that accelerating investment in battery technologies is “revolutionising the sector much faster than expected”. The report also claims that battery cost and performance improvements are outpacing forecasts. Total manufacturing investment until 2023 represents around \$150bn (£115bn) and the capital cost for new planned battery-manufacturing capacity could drop by more than half from 2018 to 2023. Moreover, lithium-ion batteries will not likely be the universal solution of future energy storage technologies. Companies, governments and investors should explore alternative battery technologies.

The report also makes the following recommendations to exploit opportunities:

- National governments should find ways to incentivise component manufacturing, R&D and battery deployment.
- Manufacturers should work to improve the technology in ways that can reduce cost and reveal new use cases.
- Investors should consider diversifying their portfolios across promising near-term technologies as well as precommercial battery technologies.

*The US is looking to develop its own end-to-end supply chain for the battery market. The ESGC is comparable to the Faraday battery challenge in the UK, which is seeing the UK government invest up to £246mn to develop battery technology.*



# FERC order sets capacity market minimum pricing

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**The Federal Energy Regulatory Commission (FERC) has acted to protect the competitive capacity market administered by PJM Interconnection by directing it to expand its current Minimum Offer Price Rule (MOPR).**

The direction, which was made on 19 December, aims to address the phenomenon of capacity markets creating distortions in wholesale markets.

PJM is the Regional Transmission Operator (RTO) in Pennsylvania, New Jersey, Maryland and states further west and operates the largest electricity market in the US. Its capacity market has been stalled for over a year since FERC identified price distortions in June 2018 and ordered that the market – worth around \$10bn/year (£7.7mn/year) – be suspended.

These distortions have arisen due to out-of-market payments to some generators or generation types by states. This allow the generators receiving subsidy payments to enter very low prices into the Reliability Pricing Model (RPM). These would then be uplifted to the common auction clearing price by other, higher cost resources.

PJM had attempted to solve this issue previously by introducing a MOPR, which sets a price floor.

FERC’s December order would expand the MOPR to any generator receiving a “direct or indirect payment, concession, rebate, subsidy, non-bypassable consumer charge, or other financial benefit” from a State or State body. Exemptions would be for renewable generation receiving subsidy as part of a renewable portfolio programme, demand response, energy efficiency and storage and self-supply generation. Generators receiving Federal subsidies would also be exempt.

There is also a proposed grandfathering process for existing resources which have previously bid into the RPM, which would have lower minimum price, offering a “level playing field” for these units. PJM suggested values for these units in an April 2018 proposal, set out in Figure 1 – though note that FERC rejected the broader proposal.

Before FERC’s order, generators protested that the MOPR fails to address wider distortions caused by subsidy to the wholesale markets, where out-of-market payments are believed to be suppressing prices and cutting generator income – particularly in the case of coal and nuclear subsidies in Ohio. This has the effect of increasing required capacity market revenues for units.

The order is believed to be harmful to the chance of renewable generators accessing capacity market value, forcing them to bid much higher than the zero-marginal-cost technologies would ordinarily look to. While renewable resources can also be exempted from the order if they can demonstrate that they would be competitive even without subsidy, the order has drawn immediate criticism from the renewables lobby.

PJM is required to comply with FERC’s order within 90 days. It issued a note on 20 December stating that it would review its process. PJM will also be required to issue a new schedule for the delayed 2022-23 and 2023-24 auctions.

*It is typical for a regulatory body to try to correct a market distortion by implementing further market manipulations. However, it does not appear that this intervention will be free of further unintended consequences.*

**Figure 1: MOPRs by technology, PJM proposal**

Technology type	Default MOPR (\$/MW/day)	Grandfathered MOPR (\$/MW/day)
Nuclear	\$1,451	\$631
Coal	\$1,023	\$593
CCGT	\$438	\$171
OCGT	\$355	\$86
Hydro	\$1,066	\$57 (\$0 for pumped)
Solar	\$387	\$0
Onshore wind	\$2,489	\$0
Offshore wind	\$4,327	\$0

Source: PJM

## AEMC finalises faster switching changes

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**The Australian Energy Market Commission (AEMC) made its final determination on 19 December on rule changes to enable the Australian Energy Market Operator (AEMO) and industry to create and implement an improved customer transfer service.**

Under the current arrangements, the switching process for consumers with an advanced meter installation which is read remotely each day occurs within a few days. The majority - around 73% - of National Energy Market consumers have manually-read meters and these are read every 85-90 days. This means that these consumers can wait up to 90 days for their transfer to complete unless the consumer opts for a one-off special meter read. The AEMC considers that this delay, plus the process that notifies the losing retailer and allows it to conduct “save” activity, could undermine suppliers’ incentives to maintain competitive prices for existing consumers. It could also create confusion for consumers going through the process when they are unsure who is their electricity provider.

As a result of recommendations from the Australian Competition and Consumer Commission’s Retail Electricity Pricing Inquiry in June 2018, AEMO developed a high-level design to improve the switching arrangements, premised on the ability of consumers being able to change supplier within two days, irrespective of metering type. The proposed transfer process is as follows:

1. Day – Supplier raises change request to transfer customer.
2. Day + 1 – Market Settlement and Transfer Solution system completes change request and sends notifications to the Metering Data Provider (MDP), Metering Coordinator (MC) and the Financially Responsible Market Participant (FRMP).
3. After Day + 1 – Send data to the supplier and current FRMP.
4. After Day + 1 – If the MC/MDP’s role does not change, then the process ends. If it does, then metering roles are nominated.

The AEMC highlighted that the changes are largely within AEMO’s control through procedure

changes. The changes required to the National Electricity Rules and the National Electricity Retail Rules are for clarifications and to ensure that consumer protections are adequate for a circumstance where more customers may change suppliers based on estimated reads (either by the meter data provider or the customer). The AEMC notes that market practice, rather than prohibition by the rules, has meant that estimated readings have not commonly be used for switching.

The changes will remove features of the switching process whereby the losing supplier is notified in advance of a customer changing supplier.

The AEMC has not adopted AEMO’s proposal to remove the ability of suppliers to recover any undercharged amount as a result of a customer transfer, currently limited to nine months prior to the date the customer is notified of it. It said the undercharge and overcharge provisions act together to provide rights to customers and retailers to recover revenue when a bill is inaccurate and removing the undercharge provision would create a risk for suppliers and ultimately lead to an increase in costs and prices.

The rule changes were made as of 19 December and suppliers have until 19 March to implement them. The AEMC will soon be consulting on identifying potential barriers to the rollout of advance meters, which it noted that many stakeholders consider is the long-term solution to an efficient customer transfer process, and is currently reviewing the current provisions on cooling-off period (with an Issue paper released on 12 December). It has also committed to commence a review of the competitive metering framework to assess any issues arising from the new customer switching process.

*The new arrangements have much the same aspirations as the GB Switching Programme but are far more ambitious in both how much of a leap forward they are over the current timescales and how rapidly they are to be implemented. The AEMC is giving retailers three months, while in GB the Switching Programme has taken years and will not come to fruition until July or August 2021.*

# New Zealand makes consumer data sharing easier

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**The New Zealand Energy Authority (EA) has decided to implement a package of four integrated initiatives aimed at making it easier for consumers to share their consumption data with organisations they trust.**

The decision issued on 14 January will amend the current access arrangements for agents seeking customer data. The EA considers they provide an appropriate balance between efficiency and timeliness, and protecting consumer data. The measures implement part of the Electricity Price Review Panel’s recommendations.

An amendment will be made the Electricity Industry Participation Code 2010. Currently, this requires suppliers to treat a request for information about a customer’s electricity consumption from an authorised agent as if it were a request from the consumer. The EA identified problems with the code arrangements and industry practice arising from the Code’s silence on what constitutes a proper request, and a lack of standardisation in processes and systems for approval of a request. New code provisions will set out what a valid request must contain and the situations when a request may be rejected. They will also require a supplier to respond to an agent’s request within two business days, down from the 20-day limit currently adopted by some suppliers for making a decision.

The existing Electricity Information Exchange Protocols (EIEPs) Hub provides a mechanism for

near-instantaneous delivery of both requests for data and the data itself, but the EA said the timeliness of the process remains dependent on suppliers adopting practices that support prompt decision making. It has decided against creating a new Application Programming Interface (API), but instead will amend one of the existing protocols (EIEP13) by adding an additional field to record the date that the agent’s authority expires. It will also recommend that agents use the EIEP Hub to make requests and require that suppliers respond to such requests by that route also. The protocol amendments also include the monitoring and logging of key data.

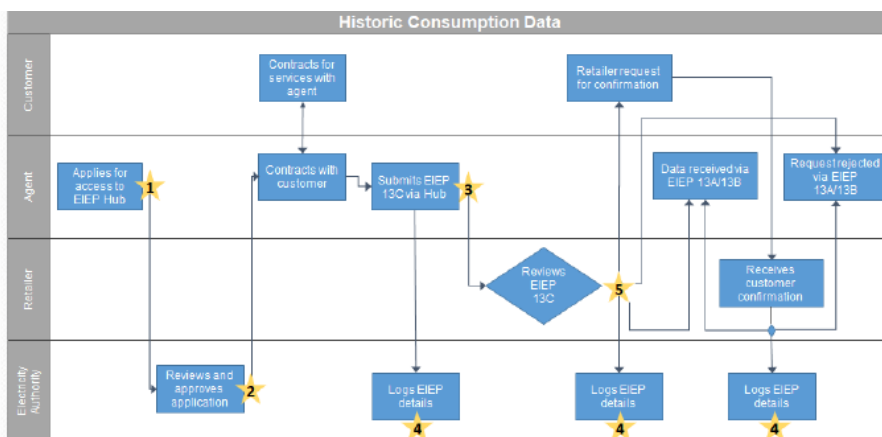
The EA has decided to include an accreditation and approval process for agents into the terms and conditions for use of the EIEP Hub. This will require agents to warrant they hold a valid customer authority, in scope and duration, for each request. Agents will be required not to use data provided in a way the consumer has not consented to, nor in order to provide goods and services the consumer has not agreed to. The new arrangements also give the EA the right to audit and investigate breaches and to restrict or end an offender’s access to the EIEP Hub.

The fourth part of the package will make more elements of data available through the Installation Control Points API that provides information on connections and the My Meter webpage that enables consumers to access information on their meter. This includes address property name, meter settlement indicator and switch status.

The revised process for agents to gain authorisation and make data requests on behalf of consumers is shown in Figure 1. All the changes will come into effect on 1 March except the revised EIEP terms and conditions which are immediate from the date issued.

*The revised arrangements are expected to promote innovation and competition by providing quicker and more certain access to agents seeking customer data.*

**Figure 1: Revised process for data request**



Source: EA



## Auctions update

Tom Andrews, [t.andrews@cornwall-insight.com](mailto:t.andrews@cornwall-insight.com)

### German solar and wind oversubscribed

For the first time in over a year, the December 2019 onshore wind auction held by German Federal network regulator Bundesnetzagentur was oversubscribed, it [announced 20 December](#).

The auction attracted 686MW of bids against a target of 500MW and 509MW of capacity was successful. The average price was €61.10/MWh (£52/MWh) and the highest successful bid at €61.80/MWh (£52.25/MWh), slightly below the price cap at €62/MWh (£52.42/MWh). This indicates that the auction is once more becoming competitive.

Results of the December solar auction were [announced 15 January](#). The auction received 1.3GW of bids against a 500MW target, with 501MW successful. Despite oversubscription, the average cost was €56.80/MWh (£48/MWh), 16% higher than the previous auction for 150MW of capacity held in October and 4% above the June price, again for 150MW. The price was, 14% lower than the March 2019 price, the last time a 500MW solar auction was held.

Seven auctions are planned for 2020: February (900MW), March (300MW), June (900MW), July (300MW), September (400MW), October (900MW) and December (400MW). There will also be solar auctions in the same months, two solar-wind auctions and two each in CHP, innovative CHP and biomass.

### Poland sells wind, solar capacity

On 20 December, Poland's energy regulator, Urząd Regulacji Energetyki (URE) [announced the results](#) of its auctions for wind and solar projects over 1MW in capacity. The auction delivered over 2.2GW of capacity which will produce – over the 15-year subsidy term – 78TWh of power.

Wind capacity accounted for 99% of the total subsidy, though for the first time more than one solar project was successful. The minimum price was Zloty 162.83/MWh (£32.60/MWh), while the [Polish Wind Energy Association](#) said that the

average price was Zloty 208/MWh (£41.60/MWh), adding that this was under current wholesale prices at Zloty 220/MWh.

The Ministry of State Assets also [published a draft law](#) for the promotion of offshore wind in the country on 15 January. Contracts for Difference will be available up to October 2022 for 4.6GW of projects currently in development, with further auctions in 2025 and 2027 for 2.5GW each with a potential top-up auction of 500MW in 2028.

### Lithuania secures subsidy-free wind

The UAB Windfarm Akmene One project has won a Lithuanian technology neutral auction for an annual power output of 300GWh with a zero subsidy bid, the country's energy regulatory council said. According to UAB Akmene's website, the first phase of the project near the country's northern border with Latvia has a capacity of 75MW, with a construction start for 15 5MW turbines foreseen in mid-2020. A 2<sup>nd</sup> phase with 325MW is planned a year later.

### Portugal to seek solar

Portuguese media reported 14 January that the government would seek 700-800MW solar in the first quarter of 2020, following success of a 1,400MW round in 2019. The auction will also reportedly include energy storage.

### Japanese solar auction underdelivers

The fifth solar auction in Japan delivered just 40MW of a 416MW target, according to [results published](#) by the Ministry of Economy, Trade and Industry on 22 January. 186MW was bid into the auction in total. the average price of the successful 40MW was 12,570yen/MWh (£88.50/MWh)

### New York to seek further GW offshore wind

State Governor Andrew Cuomo announced on 8 January that New York would seek an additional 1GW of offshore wind in a solicitation during 2020.



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## Europe

### EU Green Investment Plan and Just Transition Mechanism

The European Green Deal Investment Plan was presented on 14 January. This will mobilise EU funding and create an enabling framework to facilitate and stimulate the public and private investments needed for the transition to carbon neutrality. At least €1tn (£85bn) of sustainable investments is expected to be mobilised over the next decade.

A Just Transition Mechanism will ensure that the transition happens in a fair way. It will consist of three main sources of financing. A Just Transition Fund, which will primarily provide grants to regions, will receive €7.5bn (£6.35bn) of EU funds. A dedicated just transition scheme under InvestEU will mobilise up to €45bn (£38.1bn) of private investments. A public sector loan facility with the European Investment Bank backed by the EU budget will mobilise between €25-30bn (£21.17-25.4bn) of investments. It will be used for loans to the public sector, for investments in district heating networks and building renovations.

### Europe-wide Replacement Reserves Platform

The Replacement Reserves Platform was launched on 6 January by transmission system operators from Czech Republic, the UK, Poland, Spain, Portugal, France, Switzerland and Italy. The platform, as part of the Trans European Replacement Reserves Exchange project, will enable the exchange and optimised activation of a standard product for balancing energy throughout Europe.

### Blockchain, storage aggregation and PPA trading in Italy

Snam announced on 2 January that it has, for the first time in the sector globally, managed bilateral transactions for the purchase and sale of natural gas based on blockchain technology. The transactions took place from 17 December on the Virtual Trading Point – Snam's Trading Hub. It involved two users: Axpo Italia and Sorgenia. The experimentation, which will continue in 2020, "aims to exploit the advantages in terms of immutability, security and transparency of the data guaranteed by the blockchain."

Enel X announced on 14 January that, for the first time in Italy, residential energy storage systems will be aggregated to offer balancing services to the grid. Marco Gazzino, Enel X's Head of Innovation and Product Lab, said: "The potential of this experimentation is enormous: there are thousands of residential batteries in Italy that will help ensure the stability of the power system. This is a milestone for the country on its path towards an increasingly sustainable energy model."

Italian energy market operator GME launched a consultation on 23 January on a trading platform for power purchase agreements (PPAs). Under the proposals, GME would be the central counterparty for five or 10-year contracts. All interested parties are invited to make comments by 14 February.

### Total to install 20,000 electric vehicle charge points in the Netherlands

Total announced on 22 January that it will install and operate up to 20,000 new EV charging points for Metropolitan Region Amsterdam in the three provinces of North-Holland, Flevoland and Utrecht. This new contract intends to address "the fast-growing demand" for public electric vehicle (EV) charge points in the country. As part of the contract, the electricity supplied by Total Netherlands to the EV charging network will be 100% sourced from renewables.

### Hydrogen developments in Belgium, Germany, Denmark and the Netherlands

German transmission system operators presented a vision for a first nationwide hydrogen infrastructure in the form of a network map on 28 January. The pipeline system covers 5,900km and is based on over 90% of the existing natural gas network and is continuously being developed. It was also announced that future hydrogen production and requirements will be included in the modelling of the *Network Development Plan Gas 2020-2030* for the first time.

Offshore engineering company DEME announced two partnerships on 27 January with Port of Oostende and Financier PMV to operate the world's first commercial-scale green hydrogen plant to be powered solely by surplus offshore wind energy. The goal is to have the plant operational in the port area of Ostend by

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2025. The hydrogen will both serve as an energy source for electricity, transport, heat and fuel purposes, as well as a raw material for industrial purposes.

Ørsted announced on [20 January](#) that it and six other industrial partners have been awarded funding for a demonstration project in Denmark using offshore wind power to produce renewable hydrogen for road transport. The companies received funding of DKK34.6mn (£3.92mn) for the construction of a 2MW electrolysis plant with hydrogen storage. The plant will use electricity from offshore wind turbines to produce renewable hydrogen for buses, lorries and potentially taxis.

A consortium comprising Nouryon, Gasunie and four other partners will receive an €11mn European grant towards their proposed green hydrogen project in Delfzijl, the Netherlands, it was announced on [22 January](#). The project is a “front-runner” among several hydrogen initiatives and will be “a significant milestone in the transition to a more sustainable, circular economy”, the companies said.

The Hydrogen Council showed, in its report *Hydrogen Council, Path to Hydrogen Competitiveness: A Cost Perspective*, published on [20 January](#), that the cost of hydrogen solutions will fall sharply within the next decade, sooner than previously expected. The cost is projected to decrease by up to 50% by 2030 for a wide range of applications, making hydrogen competitive with other low-carbon alternatives and in some cases, even conventional options. We will look at this report in more detail in next month’s issue.

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## **US: New York EV, energy efficiency and grid announcements**

The New York Department of Public Service recommended utilities take the lead on building out charging infrastructure and put charging costs into their annual capital planning process in a white paper released on [13 January](#) regarding electric vehicle supply equipment and infrastructure deployment. The recommended programme would also cover up to 90% of the costs for “make-ready” charging stations, or stations with all the necessary electric infrastructure in place, to lower cost barriers for developers.

New York Governor Andrew Cuomo announced on [16 January](#) an additional \$2bn (£1.54bn) in energy efficiency and building electrification initiatives. The new targets will reduce 3mn metric tonnes of carbon pollution – the equivalent of removing 600,000 diesel cars from the road.

New York Independent System Operator President and CEO Rich Dewey presented stakeholders with his “State of the Grid” address on [22 January](#), focusing on pro-active steps it is taking to shape the grid in the future. Many of the themes discussed were further detailed in October 2019’s *A Grid In Transition* report. These themes include integrating carbon pricing into the markets, employing energy and ancillary services design enhancements, improving the resource adequacy model and conducting a comprehensive review into maintaining competitive market structures.

Seattle City Light – the public utility that provides power to Seattle and Washington – is taking applications for an innovative energy efficiency pilot aimed at commercial buildings. It proposes paying for energy savings through 15- to 20-year power purchase agreements that allow for deeper retrofits with longer payback periods. An initial 15 buildings will be accepted to the trial

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## **Australia: ARENA responds to market design issues paper**

The Australian Renewable Energy Agency (ARENA) published a submission on the Council of Australian Governments’ *Post-2025 Market Design Issues Paper* on [31 January](#). The paper was originally published in September 2019. The submission provides background information and insight from projects funded by ARENA as relevant to the Energy Security Board’s five key challenges: driving innovation to benefit the consumer; investment signals to ensure reliability; integration of DER into the electricity market; system security services and resilience; integration of variable renewable energy into the power system. We will look at this in more detail in next month’s issue.

Renewable power producer Vena Energy announced on [29 January](#) that it will soon begin construction of Queensland’s largest grid-scale battery. The storage system will have an initial capacity of 100MW and store 150MWh hours of energy, which could power up to 57,000 households annually.

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