

REA response to Ofgem Consultation on the Capacity Market

The Renewable Energy Association (REA) is pleased to submit this response to the above consultation. The REA represents a wide variety of organisations, including generators, project developers, fuel and power suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are over 750 corporate members of the REA, making it the largest renewable energy trade association in the UK and the only trade body covering power heat and transport.

Our view on the Capacity Market (CM) is that it fails to address all required elements of the Energy Trilemma that we face. While the policy takes into account energy security, the transition to low carbon energy supplies and ensuring consumer value for money are utterly absent from considerations.

This consultation represents an opportunity to reform the policy to address these wider elements in future auctions.

Equally, the energy storage helps provide not only security of supply and other important technical support to the grid network, but also a level of stability to the power market and wholesale prices. A summary of the technologies and their benefits can be [read here](#)¹. The CM is the only mechanism for supporting these technologies currently available in the UK but does not provide an adequate framework for doing so, as the past two auction results have shown.

In summary, we believe the following changes should be implemented to the Policy:

- **The Capacity Market should enable energy storage in the UK by:**
 - o **Extending the length of contracts available to all energy storage projects**, from two to at least 7, ideally 15, years. Our members argue this would enable storage companies to secure lower cost finance on the back of the mechanism, which is a significant barrier to many projects.
 - o **Removing the restriction on 'stacking' revenues for energy storage projects** – ie allowing these projects to receive income streams from multiple sources and therefore enable more to go ahead.
 - o **Clarifying the time energy storage and DSR providers would need to provide power for, such that they would not need to supply power for a potentially unlimited time period as at present.** Associated fines for non-delivery should be capped at the minimum required period of supply. Storage projects vary in length in terms of how long they can store and discharge power for but they may not always be fully charged when a request from the SO comes to provide power back to the grid therefore

¹ REA, 2015, 'Energy Storage in the UK: An Overview', http://www.r-e-a.net/upload/rea_uk_energy_storage_report_november_2015_-_final.pdf

need to know how long they should have back up supplies available for.

- **Consider introducing a premium for the fastest responders to delivery notifications.** Storage can provide additional benefits to the network by both regulating voltage levels and responding potentially within milliseconds. Such advantages are of extra value to the network and arguably should be better compensated for as the previous two CM clearing prices have been too low to incentivise storage.
- **Allow baseload renewable generators to apply for a CM contract even if receiving renewables support**, to support new low-carbon energy generation.
- This would also help deliver the rapid increase in capacity required for the UK to fill the looming capacity crunch (200TWh by 2030), exacerbated by the stated intention to close all UK coal-fired generation by 2025. This would not be a form of double subsidy as the CM is projected to reduce wholesale prices, and would rather provide the capacity urgently needed and compensate for the reduction in wholesale prices and therefore renewable project revenues, projected as a result of the CM.
- **Impose a carbon emissions threshold on bids in the mechanism.** Figures show that 600MW alone of high-carbon, polluting diesel generation will be built as a result of the most recent auction, and measures should be introduced to prevent damaging emissions and therefore address a key part of the trilemma. This is important to enable us to reach our 2030 decarbonisation target.

Supporting dispatchable, low-carbon power

The Scheme should recognise and reward technologies/generators that are capable of delivering dispatchable energy. These include Anaerobic Digestion (AD), Energy from Waste (EfW), Advanced Conversion Treatment (ACT), tidal, deep geothermal, AD and these technologies deliver base-load, storable and **flexible/dispatchable** power generation that can be dispatched to match supply with the UK power system's demand. Biogas is one of the most versatile renewables the UK has at its disposal, providing reliable low carbon, high base-load power that can be used to meet demand at peak times, and can help balance the intermittency of other renewables.

Some of the benefits of supporting Anaerobic Digestion in particular include a range of energy and wider environmental benefits:

AD delivers base-load, dispatchable, low carbon power

Biogas from anaerobic digestion is one of the most versatile renewables the UK has at its disposal, providing reliable base-load power that can be stored and used to meet demand at peak times^[1], and helping to balance the intermittency of other renewables.

[1] A reliable AD plant can for instance commit to supply electricity during the November to February TRIAD season, when demand is exceptionally high between 5 pm and 7 pm from Monday to Thursday.

It has the potential to provide output matched to the 24-hour demand cycle. Biogas can be stored for short periods of time (e.g. through the use of gas bag storage) and used when and where it is required.

Gas engine technology is well suited to peaking station applications. Since the gas store can hold several hours of gas, the CHP unit can be turned down during off-peak generating times without loss of biogas; the stored biogas can then be burned during high –peak electricity demand hours to maximise revenue efficiency. In addition the gas store provides a steady supply to the generator during peaks and troughs in methane production, reducing wear on the generator and eliminating waste.

Biogas CHP engines have a modest footprint and can be supplied, installed and commissioned in less than 10 months.

In summary biogas engine technology represents an appropriate, proven, high efficiency solution for project developers and operators for the UK's Capacity Market auctions. Higher efficiency translates to a lower switch on price, and hence higher operational hours and greater revenue for the operator. The plants can be deployed readily across the UK in a range of different settings, close to the site of use and maximising the fuel efficiency of the project.

In addition to the benefits above, AD can deliver additional, multiple benefits, some of which are described below:

Diverging food wastes from landfill

Millions of tonnes of food wastes are being landfilled every year, with substantial costs (estimated to be at least in the region of £ 600m), environmental implications and a risk for the UK to fail to achieve its legally binding WFD recycling targets and upcoming potential EU Circular Economy targets. Treating food waste through AD offers the “greatest environmental benefit” of any food waste treatment, according to Defra's 2011 Review of Waste Policy in England. This enables the diversion of food wastes from landfill, cutting GHG emissions and reducing Landfill Tax for councils and business. In addition to environmental benefits and avoided carbon costs, diverting food wastes from landfill would also reduce Landfill Tax for councils and business, increase revenues by creating economic and business opportunities, and stimulating creation of new jobs. It would also increase market certainty regarding the development of collection, reprocessing and treatment infrastructure. The REA has recently launched a campaign to persuade Government that we should build on the example of Scotland and Wales where the separate collection of food waste is mandatory. See here for further information on the campaign.

Abating GHG emissions from agriculture and improving economic and environmental sustainability of farming, local/rural communities and businesses

AD is a perfect example of how renewables can fit into, and improve, already existing processes, with the potential for hundreds of farms, local communities and food and beverage factories across the UK to reduce greenhouse gas emissions (GHG) by digesting their manures, slurries, agricultural and food production residues.

The recent report published by Bangor University and the REA shows that small scale farm AD <100 kWe, primarily by slurry/manure and waste residues, would only cost **£60 per tonne of CO2 saved**, which compares very favourably to GHG reduction costs accepted for other renewable energy technologies, which are up to £180/t CO2e saved. If slurry from all UK medium and large dairy farms was treated in AD

plants, **1.8 Mt CO₂e** could be saved each year across the UK, which is the equivalent of taking almost **900,000 cars** off the road.

As highlighted by NFU, 'AD can support profitable farming in the future, helping to manage volatility in the weather as well as in commodity prices and input costs, and helping to make our agricultural sector more resilient. AD can contribute to the rural economy from farm diversification into on-site energy production, the income from which helps to make farm enterprises more profitable and resilient in a volatile world'.

Increasing farm productivity, enhancing soil fertility and adapting to climate change

Digestate can help farmers to deliver more and better food. Using quality digestate in agriculture can improve soil fertility and provides valuable plant nutrients. Utilising the nutrients in digestate to grow crops will improve sustainability of farming by reducing emissions of greenhouse gases associated with fertiliser manufacture, reconnect nutrient cycles, and improve the efficient use of resources, particularly from the energy intensive manufacture of nitrogen fertilisers and the mining of phosphate from non-renewable resources. Digestates have a vital role to achieve the objectives of preserving fertility and organic content of agricultural soils and adapt to the impact of climate change, highlighted by the recent progress report issued by the Committee on Climate Change to Parliament on reducing emissions and preparing for climate change. Growing break crops for AD as part of farming rotations, and returning organic matter back to the soil through repeated digestate applications can play a fundamental role in enhancing soil quality and improving crop yields through balanced rotation.

Dedicated Biomass, and Bioliquids

There is no CfD strike price for either of the above technologies at present, meaning that after spring 2017 no support will be available for such plants whatsoever under renewables policy, yet there are compelling reasons for supporting their use for electricity production in the UK.

Both bioliquids and dedicated biomass power provide the fundamental benefits of dispatchability and baseload power. These two aspects are vital to stable grid supplies in a system with far higher penetration of intermittent power generation.

These technologies should therefore be further supported in the Capacity Market and able to access a premium for being low-carbon and dispatchable.

Baseload renewables including biomass

Baseload renewable technologies should be able to access the CM even if they are receiving renewable electricity support. Biomass conversion is a particularly attractive option as it utilises existing infrastructure, providing baseload, dispatchable power while directly replacing fossil fuels with renewables. As the CM has consistently been described as 'cost neutral' to the consumer (because of the projected drop in wholesale prices as a result of the policy) this would not constitute a 'double-subsidy'.

Indeed, if the CM is found to lower wholesale prices, then the RO and FiT support for renewable generators will have been undermined by the policy and therefore they should arguably be compensated for this loss of revenue, which this would allow for.

Renewable projects have already seen the removal or proposed removal of several other revenue streams which allow projects to be built, namely the removal of Levy

Exemption Certificates (LECs) at less than one month's notice, removal of all venture capital support in the CSR, and the imposition of the 20% rate of VAT on equipment (from 5% at present). It is difficult to think of another sector which operates under such uncertainty and short term changes in the regulatory regime.

Changes to support for new-build energy storage projects

New-build energy storage projects help balance the energy system and incentivise and enable low-carbon technologies to provide a greater supply of the UK's power. They help stabilise energy prices by enabling peak shifting and can discharge (provide power) with only milliseconds' notice in the case of battery storage. Storage projects can also be used to strengthen the grid network, at a lower cost than building new overhead lines. The Low Carbon Network Fund projects provide case studies of these benefits- for example replacing grid infrastructure with new storage capacity at lower net cost to consumers. The benefits to the System Operator are illustrated by the fact that National Grid are currently running an auction process for support for 'Enhanced frequency response' services, which is specifically targeted at energy storage providers due to the speed and scale at which they can respond.

These projects, due to the current regulatory and legal framework, and only short term nature of support currently available, often struggle to secure finance in the market. Our energy storage member companies tell us that if changes were made, including longer term support then securing finance would be eased and more capacity would be built. We believe 5 GW of capacity by 2020 is an appropriate target for the UK. A Carbon Trust report into the benefits of storage discusses the net saving to UK consumers of large amounts of storage on the system, for example a £2 billion net saving from 5GW of storage capacity, which rises to £10 billion by 2050 in a system with high levels of renewables penetration².

With all the benefits energy storage projects can bring to the UK's energy system, we believe several changes should be made to enable more capacity to come forwards in the Capacity Market.

Specifically:

- New build and existing energy storage projects should be eligible for longer term contracts – this should be the 15 years available to new build conventional plants, or at least seven years in order to offer adequate options for finance. This will enable financeable contracts with lower equity costs leading to greater savings for consumers – enabling more capacity to be added.
- Remove the restriction on 'stacking' revenues for energy storage projects – ie allowing these projects to receive income streams from multiple sources and therefore enable more to go ahead.
- Clarify the time restrictions for energy storage and DSR providers, so they know how long they would need to supply power for. Associated fines for non-delivery should be capped at the minimum required period of supply. Storage

² Strbac et al, 2012, 'Imperial College/Carbon Trust: Strategic Assessment of the Role and Value of Energy Storage Systems in the UK Low Carbon Energy Future', <https://www.carbontrust.com/media/129310/energy-storage-systems-role-value-strategic-assessment.pdf>

projects vary in length in terms of how long they can store and discharge power for but they may not always be fully charged when a request from the SO comes to provide power back to the grid.

- Storage projects could be further incentivised by allowing higher payments to projects able to provide quicker response times and additional services to the grid such as frequency response.

Barriers to the deployment of energy storage

Ofgem are actively involved with DECC in examining barriers to energy storage in the UK and we understand the two organisations' work will be linked together.

The REA and our members have identified a number of barriers and suggestions for improving the market for storage in the UK, which are summarised below:

Barriers to the development of energy storage in the UK:

- Lack of clear route to market for UK energy storage providers. There is only one public mechanism supporting storage in the UK, the Capacity Market (CM), yet this policy is failing to deliver new energy storage as the past two auctions have proven. We are calling for several changes to be made to the mechanism, which are detailed below.
- Application of final consumption levies to energy storage despite this being in clear conflict with the spirit of final consumption levies (suggest the calculation charge = imports – exports is adopted)
- Lack of longer term contractual mechanisms (via either the CM or National Grid mechanisms) creates problems accessing finance, either being completely unavailable, or unavailable at economic rates.
- At the grid-scale, DNOs are unsure whether they are currently prevented from installing and running energy storage due to the EU market un-coupling legislation preventing them 'putting power back down the wires' (effectively acting as a generator). This uncertainty may deter the development of the distribution network storage market. Consumers could be paying for unnecessarily expensive grid reinforcements when cheaper, more effective storage options exist.
- The position of storage within the UK legal and regulatory framework is unclear. This creates a perception of regulatory risk for investors. It also results in the absence of common terminology, which is a key tool in the development of appropriate market and network rules.
- There is a lack of a common terminology and knowledge in the wider market.
- There is no standard technical guidance or best practice, to prevent 'cowboys' entering the market and dangerous installations.
- No central tracking of installations (especially behind the meter) – this could develop into a problem for the DNOs as there is no central database of installations.
- CfD uncertainty and eligibility and design issues for hybrid systems

Opportunities for overcoming these barriers and developing storage in the UK:

Capacity Market Reform consultation – REA response

- Provide signals of high-profile Government support to provide investor confidence, potentially in the form of a 2020 capacity target for storage.
- Reform the Capacity Market:
 - All forms of energy storage projects should be eligible for longer term contracts – this should be the 15 years available to new build conventional plants, or at least of seven years in order to offer adequate options for finance. This will enable financeable contracts with lower equity costs leading to greater savings for consumers – enabling more capacity for the same amount of money.
 - Remove the restriction on 'stacking' revenues for energy storage projects – ie allowing these projects to receive income streams from multiple sources and therefore enable more to go ahead.
 - Clarify the time restrictions for energy storage and DSR providers, so they know how long they would need to supply power for. Associated fines for non-delivery should be capped at the minimum required period of supply. Storage projects vary in length in terms of how long they can store and discharge power for but they may not always be fully charged when a request from the SO comes to provide power back to the grid.
 - Storage projects could be further incentivised by allowing higher payments to projects able to provide quicker response times and additional services to the grid such as frequency response.
- Improve access to finance – eg through providing Green Investment Bank finance
- Government should continue to shift their mindset from seeing storage as an collective industry at the R&D stage, to one capable of delivering at scale now via numerous technologies (although some are at other stages)
- Develop support for joint renewable energy / storage deployment, for example altering the CfD mechanism to allow applications from 'hybrid' renewables + storage projects. We would be happy to work with Government & Ofgem on policy proposals in this area.
- Set an agreed 'definition' for energy storage in legislation and clarify its regulatory position.
- Amend licence conditions to enable DNOs to install and operate storage, introducing a new class for storage
- Develop technical standards and consumer guidance for installing and using energy storage technologies – the REA is working on this at present with a number of partners

Conclusion

As numerous independent studies illustrate, energy storage and baseload renewable power offer significant benefits to the UK's energy system. Relatively small changes to the Capacity Market will enable these projects to fully contribute and help address the imbalance in the mechanism to provide low carbon power and replace

Capacity Market Reform consultation – REA response

capacity coming off stream as 26% of our electricity supplies, via the current coal fleet, is phased out by 2025.

We look forward to working with Ofgem on developing storage in the UK and can provide cost information and market knowledge we hope will be of use.

Energy storage can transition us to a low carbon energy system in line with Government targets and legally binding commitments as well as reducing net costs to consumers. As the price of the technologies reduce rapidly the costs of not taking advantage of the technologies becomes ever greater. If the UK acts quickly it can reap numerous benefits, which extend beyond the energy system, into the creation of new jobs, supply chains and Intellectual Property.