



Department for
Business, Energy
& Industrial Strategy

CAPACITY MARKET AND EMISSIONS PERFORMANCE STANDARD REVIEW

Call for evidence

Closing date: 1 October 2018

August 2018

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Executive summary

The Government is conducting a review of the Capacity Market (CM) as it is five years since the legislation introducing the CM – the Energy Act 2013¹ – was passed. This review will assess whether:

- the CM is still needed in future;
- the CM is meeting its objectives of ensuring security of supply, cost effectiveness, and avoiding unintended consequences;
- these objectives remain appropriate; and
- they can be achieved in the future in a way that imposes less regulation.

This call for evidence is the first step in the review process. It seeks views and evidence on the performance of the CM and on any issues or opportunities to consider in ensuring the CM remains fit for the future.

The Government's current view is that the CM is broadly working as intended and, while we expect the review will identify opportunities to enhance elements of the CM, we do not foresee the need for fundamental change at this point. However, this view will be informed by this call for evidence, and we are aware of some stakeholder concerns relating to certain aspects of the CM's design, such as the inability for some renewables to participate in the CM and interconnector de-rating factors. We would like to use this call for evidence to understand more about these issues and other stakeholder concerns.

This call for evidence also provides a valuable opportunity to explore whether and how the CM needs to adapt in light of recent changes in the energy system and wider energy policy, and to ensure it remains fit for the future. For example, we are aware that the energy market is rapidly changing with new technologies competing effectively with traditional generation assets. We need to consider how the CM can better support technologies such as Demand Side Response (DSR) and enhance participation of aggregators and other smart system services. We need to be mindful of this shifting landscape in assessing the extent to which the CM continues to achieve its objectives and avoid unintended consequences.

Following this call for evidence we intend to consult promptly on the priority issues that emerge, including the participation of renewables and interconnectors de-rating factors. This will ensure that we are in a position to introduce necessary amendments to the CM Regulations and Rules on key or urgent changes ahead of the auctions in winter 2019/20. We expect to consult on other issues identified through the call for evidence to a slower timeframe.

We are also conducting a five year review of the Emissions Performance Standard (EPS), answering similar questions on the performance of this policy. Our current view is that the EPS has been achieving its objective, but we welcome your views on this and whether there are any changes we should consider.

The outcomes of these reviews will be reported to Parliament in summer 2019.

¹ See link for the Energy Act 2013 <http://www.legislation.gov.uk/ukpga/2013/32/contents/enacted>

1. Introduction

The Capacity Market (CM) was introduced in Great Britain (GB) in 2014, as part of the Government's Electricity Market Reform package². It responded to clear evidence that the electricity market was facing new challenges which posed significant risks to security of supply. These challenges included the 'missing money' problem, a number of barriers to entry, rapid closure of a significant amount of existing capacity, and rapid growth of intermittent and inflexible capacity.³

The CM is the Government's main policy mechanism for ensuring security of electricity supply. Its objectives are:

- Security of Supply: to incentivise sufficient investment in capacity to ensure security of electricity supply;
- Cost-effectiveness: to ensure the most efficient level of capacity is secured at minimum cost to consumers; and
- Avoid unintended consequences: to minimise design risks and complement the decarbonisation agenda.

The CM allows eligible existing or new electricity generators, interconnectors and Demand Side Response (DSR) providers to bid into annual, competitive auctions (either one year or four years ahead of the 'delivery year'). Successful bidders secure a capacity agreement which obliges them to generate electricity at times of system stress or, in the case of DSR providers, to reduce demand. The capacity agreement holders are paid the auction's clearing price for each de-rated kilowatt (kW) of capacity they have committed to make available throughout the delivery year in case of system stress. Capacity agreement holders face financial penalties if they fail to deliver electricity (or reduce demand in the case of DSR) when required to do so.

A number of capacity auctions have been held since 2014, the results of which are summarised in Table 1.

² For further information see the publication on Implementing Electricity Market Reform <https://www.gov.uk/government/publications/implementing-electricity-market-reform-emr> and The Electricity Capacity Regulations 2014 <http://www.legislation.gov.uk/ukdsi/2014/9780111116852/contents>

³ For further information see Section 2 of this call for evidence and also 'Implementing Electricity Market Reform' <https://www.gov.uk/government/publications/implementing-electricity-market-reform-emr>

Table 1: Capacity Market auction results

Auction	Delivery year	Target capacity (GW)	Capacity secured (GW)	Clearing price (£/kW)
Dec 2014 T-4	2018/19	48.6	49.3	19.40
Dec 2015 T-4	2019/20	44.7	46.4	18.00
Jan 2016 TA	2016/17	0.9	0.8	27.50
Dec 2016 T-4	2020/21	51.7	52.4	22.50
Jan 2017 Early Auction	2017/18	53.6	54.4	6.95
Mar 2017 T-A	2017/18	0.3	0.3	45.00
Jan 2018 T-1	2018/19	4.9	5.8	6.00
Feb 2018 T-4	2021/22	49.2	50.4	8.40

Notes:

T-4: Four year ahead auction

T-1: One year ahead auction

TA: Transitional Arrangements auction for DSR

Early Auction: the CM was introduced a year early in response to emerging security of supply concerns

Capacity secured: excludes terminated capacity agreements

The Capacity Market Review

The Government regularly reviews the performance of the CM through frequent engagement with stakeholders and by assessing the outcomes of auctions. As a result, over its life so far five formal consultations have been run by Government, proposing changes to certain areas of the CM Regulations and Rules. These regular reviews have helped ensure the CM design adapts to the most pressing issues such as: emerging risks to security of supply, facilitating access to new technologies, removing market distortions and ensuring a level playing field. Additionally, Ofgem has established an annual process for receiving and responding to industry requests for changes to the CM Rules⁴ (which set out the operational and administrative arrangements) in light of operational experience.

However, the policy and market landscape is continually evolving, making it important for the Government to periodically conduct a more holistic formal review of the CM to ensure it is fit for the future. Key developments which could have implications for the CM's design are outlined in Table 2.

⁴ See link for the Capacity Market Rules <https://www.gov.uk/government/publications/capacity-market-rules>

Electricity Market	Energy Policy
<p>There has been significant growth in decentralised, often small scale, innovative sources of capacity, including renewables, and the costs of these technologies have fallen dramatically.</p> <p>The cost of balancing the system and maintaining system stability continues to increase, emphasising the growing importance and value of flexibility.</p> <p>We have seen greater interconnection with other European countries.</p>	<p>The Industrial Strategy, published in 2017, confirms the importance of achieving clean and affordable energy.</p> <p>The independent Cost of Energy Review considers how to reduce costs in the power system in the long-term whilst ensuring the UK meets its climate change targets.</p> <p>The Smart Systems and Flexibility Plan⁵ outlines 29 actions that will remove barriers for smart technology, enable smart homes and businesses, and improve access to energy markets for new technologies and business models.</p>

To this end, the Government established a statutory requirement⁶ for the CM to be reviewed every five years following implementation. The purpose of this review (“the CM Review”) is to answer the following questions:

- Is the CM still needed in the future?
- To what extent has the CM achieved its objectives?
- Do the objectives of the CM remain appropriate?
- Can the CM’s objectives be achieved in the future in a way that imposes less regulation?

The conclusions of the CM Review must be included in a report laid before Parliament by summer 2019. It should outline the Government’s assessment in relation to each of the high-level questions above and, if considered necessary, make recommendations for appropriate changes to the CM’s design.

Purpose of this document

This call for evidence is the first stage of the Government’s CM Review. It will be open for 8 weeks from 8 August until 1 October 2018. A summary of the responses received will be published later in 2018.

⁵ <https://www.gov.uk/government/publications/upgrading-our-energy-system-smart-systems-and-flexibility-plan>

⁶ See section 66 of the Energy Act 2013, regulation 81 of Electricity Capacity Regulations 2014, chapter 15 of the Capacity Market Rules and section 2.2(6) of the State Aid approval for the Capacity Market.

The Government already has a good view of how the CM is performing based on a wide range of evidence (e.g. auction outcomes and information on the delivery / non-delivery of capacity⁷; a wide range of stakeholder feedback; and earlier independent evaluations of the CM⁸ and the Transitional Arrangements auctions⁹). Our working assumptions at this stage are that: there is a continuing need for the CM; its objectives remain valid, and; the existing CM design has been broadly successful in meeting its objectives but there are some desirable design changes that could enhance the CM and ensure it continues to meet its objectives in the future. At the same time, we are aware of the importance of regulatory stability in supporting investment in the sector. Therefore, whilst we do not rule out fundamental change if it is necessary, our intended approach to the CM Review is one of evolution rather than revolution.

Based on previous stakeholder feedback, we have identified two initial priority issues that the CM Review needs to address.

1. As noted in Ofgem's recent consultation,¹⁰ consideration is needed as to whether and how to enable participation by subsidy-free renewables in the CM. As part of this, we will need to: look at how to de-rate these technologies; review whether the existing penalty regime is sufficient to address the risks of non-dispatchable technology and effectively encourage secondary trading, and; consider how to enable participation of hybrid capacity (e.g. renewables linked to storage).
2. There was considerable feedback in relation to interconnector de-rating factors following the latest round of auctions. It has been suggested that the contribution to security of supply made by interconnectors added to the system in future will face diminishing returns, as they are reliant on the same limited pool of spare capacity in the interconnected countries. We need to consider whether changes to the de-rating methodology are required to ensure future interconnectors are not over-compensated relative to their real contribution to security of supply. In the longer term we also recognise that a more optimal solution would be to facilitate the direct participation of cross-border capacity in the capacity market and we need to understand what would be needed to enable this.

Other priority issues may also emerge from this call for evidence. Areas of the CM's design where we are aware of stakeholder concerns include: protecting against delivery risks; tightening the incentives on those with agreements to honour those agreements; simplifying some of the requirements to facilitate access to the CM, particularly for new innovative technologies including DSR; and removing distortions and ensuring a level playing field between the different technologies competing in the CM.

This call for evidence provides a good opportunity to:

- test our working assumptions and gather a wider range of views and evidence to help us respond to the high-level questions posed by the review; and
- identify areas of the CM design which may require improvement, inform the development of potential reforms, and determine whether they are priority issues.

⁷ <https://www.emrdeliverybody.com/CM/Registers.aspx>

⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/468257/Independent_evaluation_of_Electricity_Market_Reform_-_Final_report_-_14_....pdf

⁹ <https://www.gov.uk/government/collections/transitional-arrangements-auction#evaluation-of-transitional-arrangements->

¹⁰ <https://www.ofgem.gov.uk/publications-and-updates/statutory-consultation-amendments-capacity-market-rules-2014-0>

It also seeks views on the CM's institutional framework (i.e. the balance of roles and responsibilities amongst the Government, Ofgem and the other delivery partners).

We expect that, through the call for evidence, we will identify a variety of issues for possible change. We intend to consult promptly on any priority issues, including the two identified on page 8, so that we are in a position to introduce necessary amendments to the CM Regulations and Rules on key or urgent changes ahead of the auctions in winter 2019/20 (subject to the availability of Parliamentary time, and approval). However, for other lower-priority issues identified we would anticipate implementation to a longer timeframe, in line with stakeholder views about the importance of regulatory stability.

The CM Review will be supported by a separate review by Ofgem of those areas of the CM design that are covered in the CM Rules. Ofgem will determine the detailed content and process of this review, but it will build on the annual reviews that Ofgem has undertaken to date. Ofgem will announce arrangements for its review of the CM Rules.

The Emissions Performance Standard Review

The Government also has a statutory obligation to review the Emissions Performance Standard (EPS). The objective of the EPS is to ensure that new fossil fuel-fired electricity generation contributes to electricity security of supply in a manner consistent with the UK's decarbonisation objectives. The mechanism is a limit on the carbon dioxide emissions produced by new fossil-fuel generation plants.

We are taking this opportunity to seek stakeholder views on the effectiveness of the EPS. Our five-year review of the EPS will answer similar high-level questions to the CM Review; whether the measure is achieving its objective, does the objective remain appropriate, and can it be achieved in a way that imposes less regulation.

Section 6 of this document is focused on the EPS review.

How to respond

Please submit your response to this call for evidence by 1 October 2018.

When responding, please state whether you are responding as an individual or representing the views of an organisation.

Your response will most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome.

Email to: energy.security@beis.gov.uk

Write to:

Energy Security Team
Department for Business, Energy and Industrial Strategy
3rd Floor, 1 Victoria Street,
London, SW1H 0ET

Confidentiality and data protection

Information you provide in response to this consultation, including personal information, may be disclosed in accordance with UK legislation (the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004).

If you want the information that you provide to be treated as confidential please tell us, but be aware that we cannot guarantee confidentiality in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not be regarded by us as a confidentiality request.

We will process your personal data in accordance with all applicable data protection laws. See our [privacy policy](#).

We will summarise all responses and publish this summary on [GOV.UK](#). The summary will include a list of names or organisations that responded, but not people's personal names, addresses or other contact details.

Quality assurance

This consultation has been carried out in accordance with the government's [consultation principles](#).

If you have any complaints about the way this consultation has been conducted, please email: beis.bru@beis.gov.uk.

Questions

Capacity Market Review
1. Do you believe there is a need to maintain the Capacity Market? What conditions would be necessary for the Capacity Market to be withdrawn?
2. Do you believe the current objectives of the Capacity Market remain appropriate?
3. Do you think the arrangements outlined in section 3.1 are adequate to ensure sufficient capacity is secured through the auctions to deliver security of supply?
4. What are your views on the split between the T-4 and T-1 auctions and the amount of set aside?
5. Has the Capacity Market been successful in supporting investment in capacity (new and existing), both directly and indirectly? If not, please identify any changes that need to be made.
6. Do the current 1,3 and 15 year agreement lengths support investment in capacity and do they deliver against the objective of cost-effectiveness?
7. Should penalties be adjusted to strengthen incentives for delivery during stress events? If so, how should penalties be adjusted? Please provide a view on the methodology and factors to consider when setting penalties.
8. Do the current arrangements relating to credit cover and delivery milestones provide sufficient incentives / assurance that capacity will be delivered, with particular reference to DSR?

9. Do the termination events and fees need to be adjusted to create the right incentives for delivery? If so, how? Please provide a view on the methodology and factors to be considered.
10. Do any other changes need to be made to ensure delivery of capacity by the different types of technology?
11. To what extent does the CM design ensure capacity resources are used in the most effective manner during stress events? Do you have any ideas on how it can further be improved?
12. Do the de-rating factors correctly recognise the contribution made by different technologies to security of supply? What changes need to be made?
13. Do you think there are there sufficient safeguards in place to reduce the risk of over-procurement? If not, what changes could be made to further reduce the risk of over-procurement?
14. Do you believe that the auctions have been sufficiently liquid to date and to ensure strong competition? If not, how could we improve liquidity and competition?
15. What further changes are needed to better facilitate the participation of new, innovative or smart technologies, including from DSR, in the Capacity Market?
16. How could we go about allowing augmentation of batteries?
17. Please provide any other ideas on how to improve cost effectiveness of the Capacity Market.
18. What are the main distortions in competition that need to be addressed to ensure a level playing field in the CM auctions?
19. Are there distortions in the interaction of the various markets (wholesale, ancillary, CM) or their charging arrangements which impact the effectiveness of the CM?
20. How could the Capacity Market better complement the decarbonisation agenda, whilst still ensuring technology neutrality?
21. Should wind and solar be allowed to participate in the Capacity Market? Why?
22. What factors need to be considered to enable renewables to participate in the Capacity Market whilst ensuring security of supply?
23. What factors need to be considered to enable the participation of hybrid projects in the Capacity Market?
24. What factors need to be considered when developing the de-rating methodology for wind and solar? What approach could be taken to de-rating hybrid CMUs?

25. For co-located projects, do you think that all components of the site (both the CM eligible and the non-CM) will be able provide their full capacity during the system stress event due to local distribution or transmission network constraints?

26. What lessons can be learnt from the participation of renewables in other overseas capacity markets?

27. Is the current de-rating factor methodology for interconnectors appropriate for assessing their contribution to security of supply? Are there any particular challenges or risks you wish to highlight?

28. What other factors need to be considered to ensure that interconnectors and domestic capacity providers compete on a level playing field? Please provide ideas on how any issues you have identified can be addressed.

29. How could we facilitate direct participation of overseas capacity in the future?

30. To what extent do the current institutional arrangements support an effective change process? Please provide suggestions on how issues can be addressed.

31. To what extent do the defined and allocated roles and responsibilities support effective administration and delivery of the annual processes related to pre-qualification, delivery and payments? Please provide suggestions on how issues can be addressed.

32. Please provide any suggestions you have for improving the management of fraud and error risk.

33. Are there any lessons from overseas capacity mechanisms that could be useful in improving the GB Capacity Market?

Emissions Performance Standard Review

34. To what extent has the EPS been achieving its objective? Please provide evidence to support your views.

35. Is this current objective of the EPS still appropriate? Could it be achieved in a way that imposes less regulation?

36. Have any issues arisen in the operation of the EPS which should be considered

2. Assessing the need for the Capacity Market and its objectives

This section considers two of the main high-level questions to be addressed through the CM Review: is the CM still needed and are its objectives still valid? As noted earlier, our working assumptions at this stage are that we should continue to hold CM auctions for the purpose of ensuring security of supply at least cost to the consumer.

The history of the Capacity Market

At the beginning of the decade it was expected that the UK would be facing increasing security of supply risks by the end of the decade. This was primarily due to the rapid closure of existing older, more polluting but flexible capacity and a significant increase in new intermittent, less flexible generation. It was also expected that electricity demand would grow over the coming decades as we increasingly turn to electricity in an effort to decarbonise heat and transport.

The assessment was that potential returns from the electricity-only market were insufficient to incentivise timely investment in the necessary capacity. Government intervention was deemed necessary to ensure security of supply – a quasi-public good – by addressing the ‘missing money’¹¹ problem and barriers to entry.

New approaches, such as demand side response (DSR), storage and new connections to other countries, were thought to offer significant opportunities to maintain security of supply and reduce the overall generating capacity needed at times of peak demand. Market arrangements were needed to ensure that these approaches could play their part in enabling secure supplies for consumers.

Ongoing developments in the electricity market at the time, such as reforming cash out arrangements,¹² increasing the responsiveness of consumer demand and supporting greater levels of interconnection, were seen as important steps in addressing the market failures and ensuring security of supply but were uncertain in terms of their timing and effectiveness. It was therefore identified that intervention was needed and, after consultation on the mechanism, it was decided that a Capacity Market would be introduced.

The objectives of the CM, as set out in its original impact assessment,¹³ are:

- Security of Supply: to incentivise sufficient investment in capacity to ensure security of electricity supply;
- Cost-effectiveness: to implement changes at minimum cost to consumers; and
- Avoid unintended consequences: to minimise design risks and complement the decarbonisation agenda.

¹¹ The missing money problem refers to the uncertainty in revenues achievable in the energy market due to (i) inability of electricity prices to rise high enough at times of scarcity to reflect the value that consumers attribute to security of supply, and (ii) lack of certainty that prices will rise, even if they can, due to, for example, Government action to cap prices or better than anticipated performance by wind and solar.

¹² For further detail see <https://www.ofgem.gov.uk/gas/wholesale-market/market-efficiency-review-and-reform/cash-out-arrangements>

¹³ See CM impact assessment https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/354677/CM_-_revised_IA_and_front_page_September_2014_pdf_-_Adobe_Acrobat.pdf

The need for a Capacity Market

From the outset it was recognised that the CM may not need to be a permanent feature of the GB electricity market, albeit the precise market conditions that would enable its removal are highly uncertain.

Consideration of some of the fundamentals that led to the introduction of the CM suggest that market failures and threats to security of supply persist:

- Significant plant closures are expected in the 2020's as old nuclear, coal and gas plant retire. Investment will be needed to extend the life of some plant, and bring forward new, replacement capacity to avoid a shortfall in capacity.
- Actions to address the underlying market failures have not been fully delivered. For example, whilst good progress has been made with the development and deployment of technologies needed to deliver a smart and flexible low-carbon electricity system, there is still some way to go before we can fully exploit the expected benefits. Moreover, whilst progress has been made with cash out reform and continues to be made, prices arguably still do not reflect the true value of system scarcity. It is yet to be seen whether cash out reform can cause prices to accurately reflect that scarcity value.
- We consistently hear from industry stakeholders (existing generators and new developers) that the CM remains critical to underpin investment in capacity and remove barriers to entry. Also, that it provides a reliable long-term revenue stream for new build generation projects against which they can access cheaper capital whilst also offering existing generators a means by which they can continue operational excellence through continued maintenance investment.

The auction clearing prices over time can also provide an indication of how critical the CM is for ensuring security of supply. If competition drives the clearing price to almost zero for a sustained period – and the conditions which underpin that result are not expected to change – this could be interpreted as an indication that the 'missing money' problem may have been resolved and there may be grounds to consider withdrawal of the CM. As can be seen in Table 1, clearing prices have varied between auctions. Whilst the clearing price in the most recent round of auctions was low, our analysis suggests prices may increase in future, particularly in years associated with significant plant closures.

The CM continues to be well aligned and central to delivering the Government's energy priorities.

- The Industrial Strategy¹⁴ affirms the Government's priority to achieve clean growth and affordable energy. The CM helps provide confidence and ability for the UK to transition to a low carbon economy.
- The independent Cost of Energy Review¹⁵ refers to the CM as the correct instrument to achieve security of supply, also stating that the capacity auctions will be critical in ensuring that the closure of the old coal and old nuclear over the period to 2025 and 2030 is offset by sufficient new capacity coming onto the systems in an orderly way.

¹⁴ Industrial Strategy. 27 November 2017. <https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future>

¹⁵ Independent Cost of Energy Review. Professor Dieter Helm. 6 August 2017 <https://www.gov.uk/government/publications/cost-of-energy-independent-review>

- The Smart Systems and Flexibility Plan identifies the CM as an important revenue stream for innovative, flexible technologies such as DSR and outlines actions that we are taking to enhance participation.

Our current view is, therefore, that there is a need to maintain the CM and that the objectives remain just as valid now as they were when the CM was introduced. We welcome your feedback and evidence on whether this is the case.

Question 1

Do you believe there is a need to maintain the Capacity Market? What conditions would be necessary for the Capacity Market to be withdrawn?

Please provide evidence to support your views.

Question 2

Do you believe the current objectives of the Capacity Market remain appropriate?

Please provide evidence to support your views.

3. Assessing performance against the Capacity Market’s objectives

3.1 Security of supply

Policy Objective - Security of Supply: to incentivise sufficient timely investment in capacity to ensure security of electricity supply

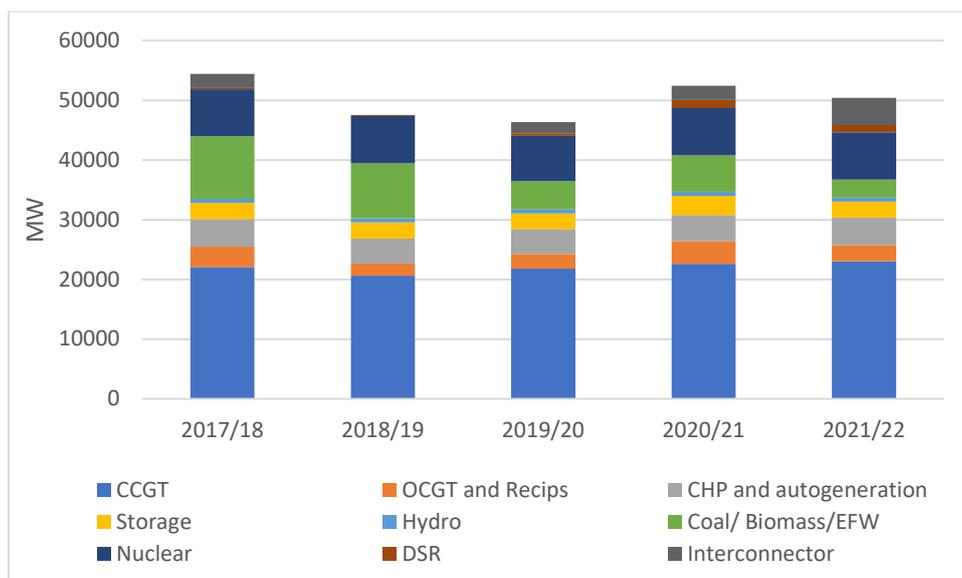
Securing sufficient capacity

There are different aspects to security of electricity supply. The CM, however, is solely concerned with ensuring there is sufficient capacity available to meet forecasts of peak demand. Separate tools are available to the Electricity System Operator to manage other aspects of security of supply, including flexibility.

To date, the CM has secured the required capacity at an affordable price with a high degree of market liquidity (see Tables 1 and 2). Those aspects of the CM’s design intended to ensure sufficient capacity is secured through the auctions are outlined below; we seek your views on the adequacy of these arrangements.

Table 2: The amount of capacity (GW) secured for the delivery years to date

Delivery Year	Capacity secured (GW)			
	T-4	Earlier T-4	T-1	Total
2017/18	n/a	n/a	54.4	54.4
2018/19	47.5	n/a	5.8	53.3
2019/20	46.2	0.8	Tbc	46.2
2020/21	52.4	1.7	Tbc	54.1
2021/22	50.4	4.4	Tbc	54.8

Figure 1: Capacity Agreements by Technology Type (MW)

The Reliability Standard

Each year, the Government sets the amount of capacity to secure through the auctions by targeting the GB Reliability Standard of 3 hours Loss of Load Expectation (LOLE). Securing the target capacity in each auction ensures that the likelihood of expected lost generation is no more than an average of 3 hours per year (over a long number of years). In addition to calling upon the capacity available via the CM auctions, National Grid can also take a variety of emergency actions to prevent the lights going out.

The reliability standard is determined by the ratio of the net Cost of New Entry (CONE) and Value of Lost Load (VoLL). Since the introduction of the CM the values of net CONE and VoLL have remained unchanged. However, developments within the GB electricity industry over the last 5 years suggest that it is appropriate to review each of these. Therefore, as part of the CM Review, the Government plans to commission independent contractors to undertake technical work which will contribute to a separate review of the current GB Reliability Standard. Any proposed changes to the Reliability Standard which result from the conclusions of this independent analysis will be the subject of a future consultation.

The target setting process

A process and methodology has been established for determining the target capacity for specific delivery years.¹⁶ National Grid makes a recommendation on the target capacity to Government based upon analysis that is scrutinised by an independent Panel of Technical Experts¹⁷, who assess the robustness of the analysis and make recommendations for future improvements. In determining their recommendation to Government, National Grid establishes

¹⁶ Described in the annual Electricity Capacity Reports – the latest report is available via <https://www.emrdeliverybody.com/Lists/Latest%20News/DispForm.aspx?ID=189&ContentTypeId=0x010400626754A76E41C74FA81B4D17EBF15511>

¹⁷ See the Panel of Technical Experts 2017 final report on National Grid's Electricity Capacity Report 2017 <https://www.gov.uk/government/publications/electricity-market-reform-panel-of-technical-experts-2017-final-report-on-national-grids-electricity-capacity-report-2017>

a range of potential scenarios¹⁸ and sensitivities¹⁹ for peak electricity demand in the delivery year, and for the capacity needed to be procured through the CM in order to meet it. These scenarios and sensitivities are then used in an optimisation process called Least Worst Regrets²⁰ (LWR) to identify the optimal amount of capacity to secure for the delivery year in question. It does this by weighing up the cost to consumers of buying extra capacity versus the risk of not buying enough capacity because a given scenario materialises.

Splitting the target capacity between T-4 and T-1 auctions

The capacity targets are set over four years ahead of the delivery year. Given inherent uncertainties in forecasting demand there is clearly a risk they could be too low, leading to under-procurement and a failure to meet our reliability standard, or too high, leading to unnecessary cost on consumers from over-procurement. To protect against under or over-procurement we do not procure the full target amount at the T-4 stage, setting aside a small amount each year and have another opportunity to correct for changes in required capacity through the one-year-ahead (T-1) auctions. However, there are limits to the ability of T-1 auctions to do this as they are reliant on sufficient ‘uncontracted’ capacity²¹ being available at the time. In 2016, we took the decision to reduce the amount of capacity set-aside for the T-1 auctions, in light of the potential for significant non-delivery risks to put upward pressure on the T-1 target that might not be able to be met by uncontracted capacity at that stage.

Question 3

Do you think the arrangements outlined in this section are adequate to ensure sufficient capacity is secured through the auctions to deliver security of supply?

Please provide evidence to support your view.

Question 4

What do you think of the split between the T-4 and T-1 auctions and the amount of set aside?

Please provide evidence to support your view.

18 Based on National Grid’s Future Energy Scenarios available at <http://fes.nationalgrid.com/fes-document/>

19 These are included to account for the range of uncertainty in assumptions such as weather, plant availability, demand and non-delivery risks.

20 For further detail see page 85 of the 2018 Electricity Capacity Report

<https://www.emrdeliverybody.com/Lists/Latest%20News/DispForm.aspx?ID=189> 1

21 Capacity that does not already have a capacity agreement from the earlier T-4 auction for that delivery year – this makes T-1 heavily reliant on delays to planned plant closures and additional Demand Side Response resources coming forward

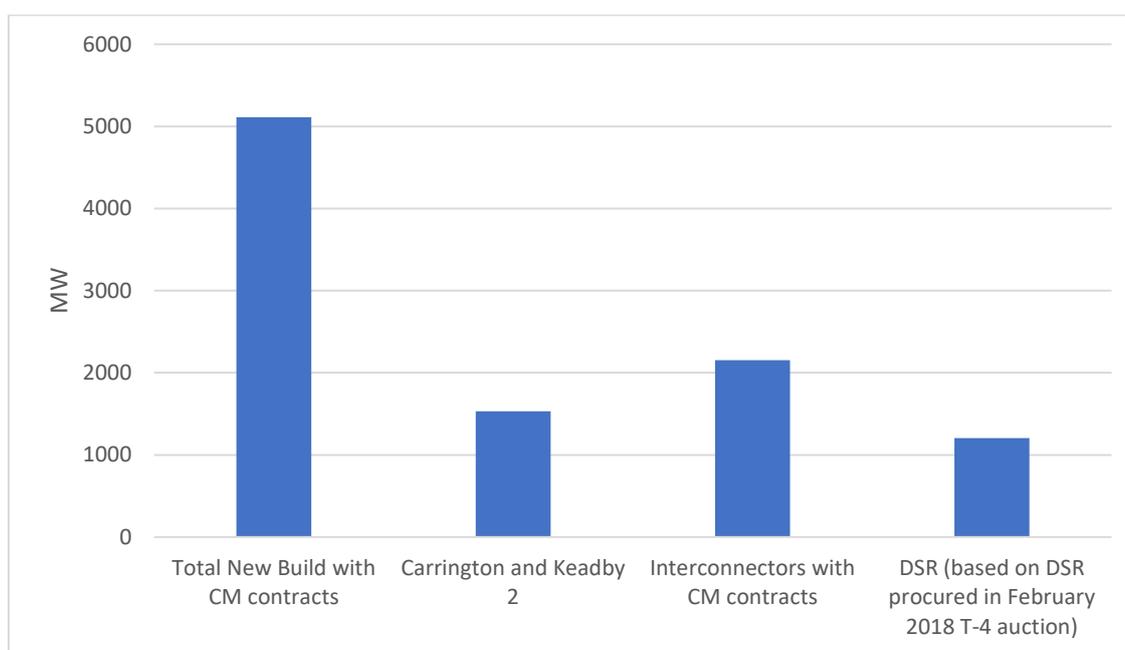
Supporting investment in capacity

To deliver security of supply, the CM has to be capable of supporting timely investment in both existing capacity (so that it remains in the market) and new capacity (to replace coal and other ageing capacity as it retires from the system).

Figure 2 shows that, in addition to supporting existing capacity, the CM has been successful in supporting investment in a range of new types of capacity. In addition to this, we understand that forecast CM revenues were part of the investment case for two other new build CCGTs (Carrington, 783MW de-rated capacity, and Keadby 2, 747MW de-rated capacity). Agreements have also been awarded to a further 2.1GW of new build interconnectors and the amount of DSR securing agreements in the auctions has increased – well over 1GW was successful in the past two T-4 auctions.

Additionally, there was 1 CMU (86MW) that won an agreement for plant refurbishment for the 2019/20 delivery year, and 2 CMUs (173 MW) that won agreements for plant refurbishment for the 2020/21 delivery year.

Figure 2: New Build Capacity (MW of de-rated capacity)



This section outlines those aspects of the CM's design intended to support investment in capacity and the feedback received to date on those arrangements. We welcome your views on the adequacy of these arrangements.

Design features to support investment in capacity

The CM has a number of design features which help provide investors with the confidence needed to commit to investment:

- The CM auctions allow the market to discover the price needed to bring forward the level of capacity required to ensure security of supply.

- Participants awarded a capacity agreement will know that in the delivery year/s they will receive a guaranteed income stream for their capacity, complementing the revenues they receive in the wholesale electricity and balancing markets;
- Holding the main auctions four years ahead of the delivery year provides the lead-time to build new capacity before the delivery year;
- Longer-term capacity agreements for capacity providers (up to 15 years for new build capacity and 3 years for refurbishment capacity), and saving provisions for key terms of individual capacity agreements, provides greater certainty to investors of the obligations and revenues deriving from capacity agreements;
- A cap on penalties and the concept of a four-hour notice period for delivery of capacity during times of system stress helps limit some of the risks for investors.

Potential issues to consider through the CM Review

Feedback suggests there are differing views on the need for longer-term agreements. Some believe they are unnecessary and potentially distort competition in favour of new build, whereas others would like to see longer-term agreements made available to other types of capacity such as DSR.

Concerns have also been expressed in relation to the current penalty regime and four-hour notice period; whilst both are seen as helpful in limiting risk to investors they may inadvertently increase cost to consumers and increase security of supply risks.

Question 5

Has the Capacity Market been successful in supporting investment in capacity (new and existing), both directly and indirectly? If not, please identify any changes that need to be made.

Please provide evidence to support your views.

Question 6

Do the current 1,3 and 15 year agreement lengths support investment in capacity and do they deliver against the objective of cost-effectiveness?

Please provide evidence to support your views.

Delivery of capacity

Whilst securing capacity at auction is an important first step, it is equally important to have confidence that this capacity will be available in the delivery year and deliver on its obligations during stress events.

The CM design incorporates a series of checks, incentives and penalties to ensure the delivery of capacity. There is limited information available on the performance of these measures as we are still in the first delivery year (e.g. no CM Notices have been issued to date), although some information is available on the number of Terminations issued so far (Figure 3 and 4).

This section outlines those aspects of the CM’s design intended to incentivise delivery of the auction acquired capacity and potential issues to be considered through the CM Review based on previous feedback received on those arrangements. It also seeks your views on the adequacy of the existing arrangements.

Figure 3: Terminations (MWs)

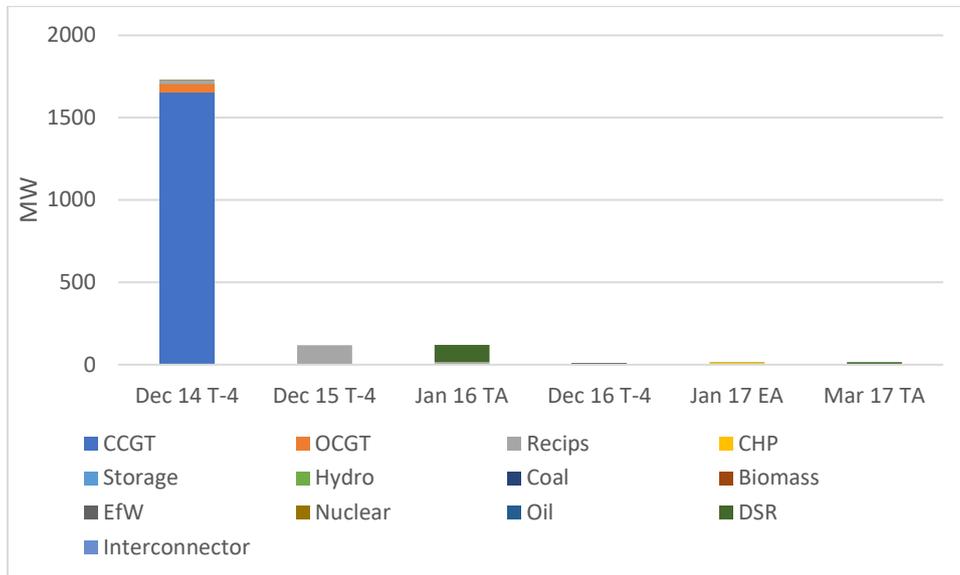
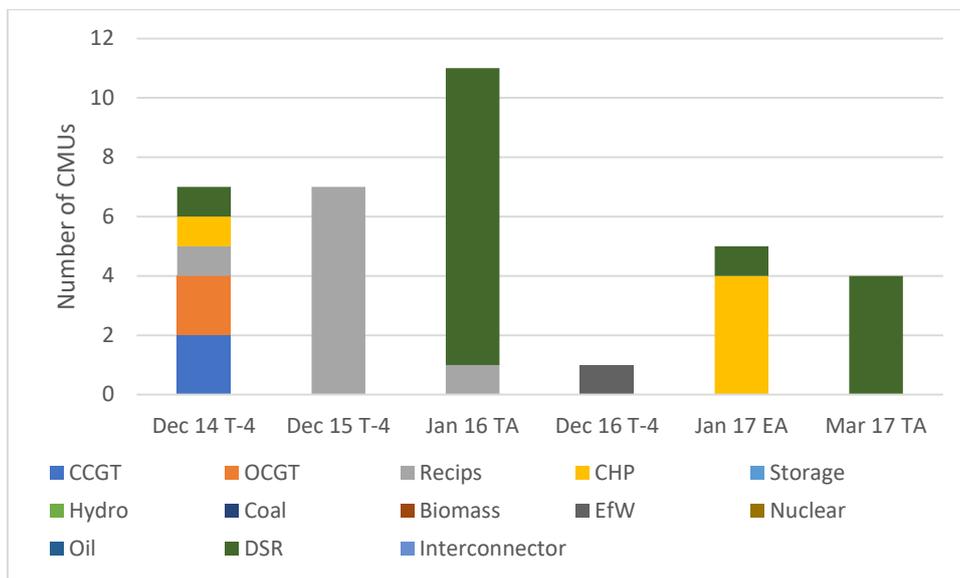


Figure 4: Terminations (Number of CMUs)



Design features to incentivise delivery of auction acquired capacity

The CM design incorporates a series of checks, incentives and penalties to ensure the delivery of capacity:

- Credit cover and delivery milestones – certain types of capacity have a higher delivery risk, such as new build and Unproven DSR. Consequently, this capacity is required to provide credit cover and meet a number of milestones in the lead up to the delivery year to demonstrate a commitment to and progress towards delivery. Credit cover for new

build capacity was increased to £10,000/MW in 2016, following the non-delivery of a major new build CCGT, but was left at £5,000/MW for Unproven DSR.²² In terms of delivery milestones, new build capacity must meet a Financial Commitment Milestone and Substantial Completion Milestone, and Unproven DSR has to complete a Metering Assessment and DSR Test. Failure to meet these milestones can lead to termination of the capacity agreement and imposition of a termination fee. Since 2014, several changes have been made to the delivery milestones, and the associated termination events and fees, to improve delivery assurance.

- Satisfactory Performance Days – all successful capacity providers are required to demonstrate they are physically capable of delivering as per their capacity obligations on three occasions of their choosing over the winter period of the delivery year for which they hold a capacity agreement. Failure to meet this requirement can lead to termination of the agreement and imposition of a termination fee.
- Penalties – all capacity providers holding an agreement must deliver sufficient electricity during a stress event to meet their obligation or pay a penalty. The penalty rate (on a MWh basis) is set at 1/24th of a provider's annual capacity payments and capped at 200% of its monthly capacity payments and 100% of its annual capacity payments.
- Secondary Trading – the possibility for capacity providers to trade out their capacity obligation provides further incentives for efficient market behaviour and helps mitigate risks to security of supply and to capacity providers (e.g. providers can trade their obligation during plant maintenance to avoid the risk of penalties).

Potential issues to consider through the CM Review

Previous feedback has raised several concerns with these current arrangements. It has been suggested that penalties are set too low to provide an effective incentive for reliable capacity and/or to facilitate liquid secondary trading markets. Originally the penalties were capped at a relatively low level to limit risks to investors and expected to reinforce existing market signals for delivery of electricity during times of system stress.²³ However, some types of capacity are less exposed to these other signals (or would be unable to control dispatch in response to those signals, in the case of renewables participating in the CM). It has therefore been suggested that the penalty regime should be strengthened, potentially amending so that it is market-based and reflects the value of the lost load (VOLL) during periods of scarcity.

There are differing views on whether the credit cover and delivery milestones for Unproven DSR provide a sufficient level of assurance, or whether these arrangements place Unproven DSR at an advantage over new build generation which face more onerous requirements. This issue has been the subject of previous consultations and the Government has made prior commitments to consider further.²⁴

²² See October 2015 CM consultation <https://www.gov.uk/government/consultations/2015-consultation-on-capacity-market-supplementary-design-proposals-and-changes-to-the-rules-and-regulations>

²³ See the October 2013 consultation

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/324170/Government_Response_to_EMR_implementation_consultation.pdf

²⁴ See October 2015 and October 2016 consultation documents

<https://www.gov.uk/government/consultations/capacity-market-proposals-to-simplify-and-improve-accessibility-in-future-capacity-auctions> <https://www.gov.uk/government/consultations/2015-consultation-on-capacity-market-supplementary-design-proposals-and-changes-to-the-rules-and-regulations>

More broadly, some stakeholders have been critical of the complexity of the termination events and fees currently in place, and inconsistencies in treatment between some types of technology. The Government has also committed to considering a more proportionate approach to termination, including partial termination where this may be appropriate.²⁵

There is also increasing recognition that new, innovative capacity sources, such as duration-limited storage, DSR (possibly including 'Vehicle to Grid' from the transport sector in future), wind and solar (if allowed to participate in the CM in future), and to some extent embedded non-Balancing-Market-participant conventional units, may behave differently to Balancing-Market-participant conventional plant. Further, it may be that the present CM design does not incentivise such resources to be used in the most effective manner in terms of maximising their contribution to adequacy during periods of system stress. Such issues may be caused by, for example:

- incomplete coordination signals for these capacity sources during an emerging capacity adequacy stress event,
- inability of individual commercial parties to forecast the duration and depth/shape of the precise system capacity shortage (noting that the response of duration-limited resources will influence the residual shortage in itself), and
- the fact that system stress events are determined 'ex-post' (i.e. nobody knows in real-time when a stress event precisely starts and finishes).

While the risk to the system at present penetration levels of these resources is likely to be limited, these issues are likely to increase in relevance if the growth trends of these kinds of capacity resources persist at the present rates forecast.

Finally, concerns have been raised that the four-hour notice period for delivery of capacity favours inflexible capacity and increases security of supply risks (i.e. stress events may occur rapidly with less than four hours notice).

Question 7

Should penalties be adjusted to strengthen incentives for delivery during stress events? If so, how should penalties be adjusted? Please provide evidence to support your view.

Please provide a view on the methodology and factors to consider when setting penalties.

Question 8

Do the current arrangements relating to credit cover and delivery milestones provide sufficient incentives / assurance that capacity will be delivered, with particular reference to DSR?

Please provide evidence to support your views.

²⁵ Paragraph 113 of the Government Response to the Capacity Market Consultation – Improving the Framework, December 2017 <https://www.gov.uk/government/consultations/capacity-market-consultation-improving-the-framework-detailed-proposals>

Question 9

Do the termination events and fees need to be adjusted to create the right incentives for delivery? If so, how? Please provide evidence to support your views.

Please provide a view on the methodology and factors to be considered.

Question 10

Do any other changes need to be made to ensure delivery of capacity by the different types of technology?

Please provide evidence to support your views.

Question 11

To what extent does the CM design ensure capacity resources are used in the most effective manner during stress events? Do you have any ideas on how it can further be improved?

Please provide evidence to support your views.

Assessing contribution made to security of supply

This section outlines those aspects of the CM's design intended to ensure the contribution made to security of supply by different types of capacity is appropriately valued and accounted for and seeks your views on the adequacy of these arrangements.

De-rating factors

The de-rating process allows us to determine the amount of reliable capacity that can be ascribed to each potential type of capacity resource. For the majority of technology types this process is relatively straightforward and based upon historic, technical performance.

However, there has been considerable recent interest and concern expressed in relation to the existing approach to de-rating interconnectors. We discuss interconnector de-rating in more detail in Section 4.2 below.

Additionally, during 2017, in light of evidence that some types of storage were potentially unable to generate for the full length of stress events, the Government changed the approach to de-rating storage to one based on Equivalent Firm Capacity (EFC).²⁶ During the consultation process, some stakeholders argued that the same de-rating approach should be applied to other technologies that may also be 'duration limited', most notably DSR and diesel engines. The CM Review provides an opportunity to develop a methodology for verifying the duration of these technologies if considered appropriate.

Connection capacity

²⁶ See March 2017 consultation <https://www.gov.uk/government/consultations/capacity-market-consultation-improving-the-framework-detailed-proposals>

Stakeholders have also raised, in the past, the issue of generators potentially overstating their connection capacity, creating a ‘capacity gap’ for which consumers would still pay, but without the corresponding capacity being available in the event of a stress event. Ofgem has consulted previously on its preferred proposal to address this issue²⁷ but has not taken it forward as it requires changes to the CM Regulations.

Question 12

Do the de-rating factors correctly recognise the contribution made by different technologies to security of supply? What changes need to be made?

Please provide evidence to support your views.

For questions on interconnector de-rating, see Section 4.2

²⁷ <https://www.ofgem.gov.uk/publications-and-updates/decision-statutory-consultation-amendments-capacity-market-rules-1>

3.2 Cost effectiveness

Policy objective - Cost-effectiveness: to ensure that the most efficient level of capacity is secured at minimum cost to consumers

Avoiding over-procurement

This section outlines those aspects of the CM's design intended to minimise the risks of securing more capacity than needed to ensure security of supply and seeks your views on the adequacy of these arrangements. It also identifies a number of potential issues, based on previous feedback from stakeholders, to be considered through the CM Review.

The Reliability Standard

The methodology and process by which the auction targets are set each year, as described in Section 3.1, are equally important for delivering value for money for consumers. The Reliability Standard limits the level of capacity secured through the capacity auctions based on the cost of unserved energy (or value of lost load) versus the cost of capacity to prevent them. The enduring nature of the Reliability Standard limits the Government's discretion on the amount of capacity to secure and ensures that there are no big variations from year to year. As noted in Section 3.1, the Government will be reviewing the Reliability Standard as part of the CM Review.

Target setting process

Additionally, the Least Worst Regrets methodology, the set-aside of target capacity to the T-1 auction and the scrutiny by the independent Panel of Technical Experts all help reduce the risk of over-procurement. National Grid regularly make improvements to their modelling and seek out better sources of information. Comments on the balance between the T-4 and T-1 auctions were sought in Section 3.1.

Auction parameters

The shape of the auction demand curve also provides a further trade-off between cost and security of supply. If the price in the auction is lower than the Cost of New Entry (CONE), the auction can secure more capacity than the target volume, whereas if the auction price is higher then the auction will secure less. Stakeholders have suggested that there could be value in re-considering, through the CM Review, the shape of the auction demand curve to help reduce auction costs.

Institutional framework

There also remains a concern amongst some stakeholders that the Government and National Grid, as the Electricity System Operator, are inherently motivated to over-procure to minimise security of supply risks. It may be possible to address this to some extent through changes to the institutional framework (see Section 5).

Question 13

Do you think there are there sufficient safeguards in place to reduce the risk of over-procurement?

If not, what changes could be made to further reduce the risk of over-procurement?

Increasing liquidity and competition

The level of payments in the CM are determined through a competitive central auction based on clear, transparent and non-discriminatory criteria which allows for the discovery of the lowest sustainable price at which the necessary capacity can be brought forward. The degree of liquidity and competition in the auctions is critical to ensuring value for money.

As noted earlier, the results of the auctions held to date suggest there has been good liquidity and competition. Table 3 shows that the amount of capacity prequalifying for the auctions has been far in excess of the auction targets.

Table 3: CM results and total cost

	Capacity prequalified (GW)	Capacity secured (GW)	Target Capacity (GW)	Clearing price £/kW	Total cost £million
Dec 14 T-4	64.96	49.3*	48.6	19.40	956
Dec 15 T-4	57.72	46.4	45.4	18.00	835
Dec 16 T-4	69.77	52.4	51.7	22.50	1,179
Jan 17 EA	59.28	54.4	53.6	6.95	378
Jan 18 T-1	10.66	5.8	4.9	6.00	34.7
Feb 18 T-4	74.2	50.4	49.2	8.40	423.3

Notes:

The total cost of the auction is calculated using the capacity procured at auction multiplied by the auction clearing price.

*After terminations as at February 2018, the amount procured in auction was 47.5GW, at a total cost of £922 million.

This section outlines those aspects of the CM's design intended to strengthen competition in the auctions and the feedback received on those arrangements to date. It also seeks your views on the adequacy of these arrangements.

Design features to encourage competition

Many of the CM's design features were developed with a view to strengthening competition in the auctions in order to put downward pressure on bids by market participants. For example, the CM:

- is market-wide and technology neutral – existing capacity, new build capacity, DSR, and interconnectors can compete against one another, with no advantage given to any particular type or class of participant and agreements awarded to the cheapest sources of capacity (except capacity already in receipt of support from other policy measures is not eligible to participate to avoid overcompensation);
- operates alongside the wholesale electricity and balancing markets – participants can stack revenues from different markets, thereby reducing their reliance on CM revenues;
- limits risks to investors – for example, longer-term agreements are available for new and refurbishing capacity, penalties are capped, there is a four-hour notice period ahead of delivery and capacity providers have the ability to trade their obligations;
- has a 'pay-as-clear' and 'descending clock' auction format which encourages competition between participants; and
- limits opportunities for participants to exercise market power – for example, a price cap is set to limit auction bids and existing capacity is expected to participate as 'price-takers' unless they can justify bids above a threshold currently set at £25/kW.

Potential issues to consider through the CM Review

Feedback from stakeholders has suggested there may be opportunities to increase competition within the CM by doing more to facilitate greater access to a wider variety of capacity. Most notably there have been indications that the costs of wind have fallen to the point where some projects appear to be viable without low-carbon subsidy and developers are now showing an active interest in participating in the CM, either in their own right or combined with another technology type to improve reliability. Section 4.1 identifies the participation of renewables in the CM as a priority issue to be considered through the CM Review.

There have also been calls for the introduction of a framework which allows overseas capacity to participate directly in the CM. Such calls are generally coupled with complaints that the existing model, which allows for interconnector participation as a proxy, is flawed as interconnectors are perceived as benefiting from several competitive advantages that arise outside the CM. We discuss these issues further in Section 4.2 below.

There have also been suggestions that some of the CM's requirements can prove problematic for newer and innovative forms of capacity such as DSR and storage. A number of challenges were identified through the Smart Systems and Flexibility Plan and some progress has been made in addressing these. Moreover, Ofgem's annual rule change process has provided a vehicle for resolving a number of barriers to participation. However, it is possible that some require a more fundamental change in CM policy design. For example, Ofgem has identified that solutions to enable the participation of behind-the-meter Combined Heat and Power systems (CHPs) potentially require amendments to the CM Regulations. The Government has

also previously indicated²⁸ it is keen to explore facilitating the ability of battery storage projects to augment their capacity/duration during their lifespan.

Finally, it has been highlighted that the appeals process relating to prequalification (as established in Regulation 69) is sub-optimal – simple administrative errors by providers can potentially lead to the significant amounts of capacity not qualifying for an auction – and introduces a risk to auction liquidity.

It is also worth noting that some of the suggestions identified in Section 3.1 for improving security of supply have the potential to increase the costs of the CM (e.g. increase in the penalty cap). However, provided any changes are made in a proportionate and appropriate manner, these should still lead to improvements in the CM's overall cost-effectiveness.

Question 14

Do you believe that the auctions have been sufficiently liquid to date and to ensure strong competition? If not, how could we improve liquidity and competition?

Please provide evidence to support your views.

Question 15

What further changes are needed to better facilitate the participation of new, innovative or smart technologies, including from DSR, in the Capacity Market?

Please provide evidence to support your views.

Question 16

How could we go about allowing augmentation of batteries?

Please provide evidence to support your views.

Question 17

Please provide any other ideas on how to improve cost effectiveness of the Capacity Market.

²⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/664272/capacity-market-consultation-improving-framework-response.pdf

3.3 Avoiding unintended consequences

Policy objective - Avoid unintended consequences: to minimise design risks and complement the decarbonisation agenda

Ensuring a level playing field

The CM is now a major driver of the future technology mix. To ensure the optimal mix of projects and technologies (in terms of minimising whole system costs) wins in the auctions, it is critical that all eligible capacity providers can compete fairly. This requires that there is a level playing field in the CM between technologies,²⁹ other energy policies do not create distortions, and other energy policies ensure generators and DSR are correctly rewarded for the value they bring to the system, but also have to bear any costs for which they are responsible. Distortions in competition can undermine achievement of the CM's objectives and have broader, undesirable consequences which, given capacity can win agreements of up to 15 years, can persist for a long time.

The results of previous auctions have flagged potential distortions in competition and prompted corrective action. For example, the unexpected and rapid increase in new, distribution-connected generators was one of the drivers for Ofgem's review of embedded benefits³⁰ and DEFRA's work on establishing emission limits for nitrogen oxides from small generation.³¹

Feedback from stakeholders suggests there may be other areas which need addressing through the CM Review to ensure a level playing field, including:

- CM supplier charging arrangements – in 2017, to remove the potential for distribution connected generators to benefit from a form of 'double payment', we changed the methodology for calculating suppliers' share of the CM costs from net demand to gross demand. However, stakeholder responses to the consultation noted that this change would not prevent behind-the-meter generation from continuing to benefit from the double payment. The Government made a commitment to considering this issue further.³²
- DSR de-rating – there have been suggestions that the de-rating factor for DSR should be more closely linked to the technology type of its components, as the current de-rating may be unjustifiably high and creating market distortions. For example, it has been suggested that developers of short duration batteries may be encouraged to locate behind-the-meter to benefit from the higher de-rating factor attributable to DSR.
- DSR delivery assurance arrangements – as noted earlier, it has been suggested that DSR may be given a competitive advantage in the auctions due to the lighter touch arrangements in place in relation to credit cover, terminations and delivery assurance. Conversely, DSR is only able to access 1-year agreements.

²⁹ This does not mean that all types of capacity have to be subject to identical rules and requirements in the CM. Sometimes differential treatment can be justified on technical grounds to achieve equal access to the CM and fair competition. Distortions arising due to other energy policies can also impact competition in the CM and auction outcomes.

³⁰ <https://www.ofgem.gov.uk/publications-and-updates/embedded-benefits-impact-assessment-and-decision-industry-proposals-cmp264-and-cmp265-change-electricity-transmission-charging-arrangements-embedded-generators>

³¹ <https://consult.defra.gov.uk/airquality/medium-combustion-plant-and-controls-on-generators/>

³² See Section 1 of the Government response to the Consultation available at <https://www.gov.uk/government/consultations/capacity-market-proposals-to-simplify-and-improve-accessibility-in-future-capacity-auctions>

- Interconnectors – as noted earlier, a range of concerns have been raised in relation to interconnectors. In addition to calls for a review of the approach to de-rating interconnectors and exploration of the potential for direct participation of overseas capacity (see Section 4.2), there have been suggestions that the cap and floor regime, which guarantees rates of return for new interconnectors, may unfairly benefit interconnectors in the CM.
- EU Emissions Trading System³³ – stakeholders have highlighted that very small thermal plant are exempt from the EU ETS. Whilst the value of the EU ETS is currently low, this is forecast to increase and may affect competition in the CM.
- Carbon Capture and Readiness – feedback suggests that peaking thermal plant are unable to pass the technical and economic feasibility tests for the retrofit of carbon capture and storage, which is currently a requirement for plant 300MW and above. Therefore the planning system effectively limits the size of this type of plant to below 300MW.

Question 18

What are the main distortions in competition that need to be addressed to ensure a level playing field in the CM auctions?

Please provide evidence to support your views and suggestions on how these could be addressed.

Question 19

Are there distortions in the interaction of the various markets (wholesale, ancillary, CM) or their charging arrangements which impact the effectiveness of the CM?

Please provide evidence to support your views and suggestions on how these could be addressed.

Complementing the decarbonisation agenda

The CM is not intended in itself to drive decarbonisation of the electricity sector. However, it has been designed to operate alongside decarbonisation policies, such as Contracts for Difference (CfDs) and Carbon Price Support (CPS). For example:

- CfDs are driving greater deployment of renewable capacity which results in reductions in the CM targets; and

³³ On 23 June 2016, the EU referendum took place and the people of the United Kingdom voted to leave the European Union. Until exit negotiations are concluded, the UK remains a full member of the European Union and all the rights and obligations of EU membership remain in force. During this period the Government will continue to negotiate, implement and apply EU legislation. The outcome of these negotiations will determine what arrangements apply in relation to EU legislation in future once the UK has left the EU.

- the CPS increases the costs faced by more carbon-intensive forms of generation which reduces their competitiveness in the CM auctions relative to cleaner forms of generation.

Our projections show that CO₂ emissions from electricity production will fall in the period over the next few years, from an intensity between 210-220 gCO₂e/kWh in 2017/18 to an intensity between 185-195 gCO₂e/kWh in 2020/21.³⁴

Moreover, by maintaining security of supply the CM ensures the Government continues to have societal support for proceeding with the transition to a low carbon economy.

There may be scope to strengthen the extent to which the CM supports the decarbonisation agenda in a way that is technology neutral through design changes that are currently under consideration. For example, as noted earlier, we intend to consider the participation of renewables in the CM as part of the CM Review. Additionally, the introduction of a carbon emissions intensity limit within CMs is being considered by the EU, as part of the European ‘Winter Package’ of measures which are currently at a draft stage and under negotiation.

Question 20

How could the Capacity Market better complement the decarbonisation agenda, whilst still ensuring technology neutrality?

Please provide evidence to support your views.

³⁴ For further information refer to figure 5.2 on page 36 of the “Updated Energy and Emissions Projection 2017”, and data available in annexes B and C available at <https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2017>

4. Priority issues

4.1 Renewables

Background

The CM's eligibility framework does not currently provide a route for some types of renewable capacity, specifically wind and solar, to participate in the auctions. Up until recently it was expected that such technologies would already benefit from low-carbon support schemes such as Contracts for Difference (CfD) or the Renewables Obligation (RO) and so be excluded from the CM. Moreover, until recent evidence which may suggest the contrary, it was considered that solar was not capable of providing any contribution to security of supply.

The CM Regulations do, however, already contain provisions which enable renewable capacity to move from the RO and CfD to the CM. The first RO projects begin to see their subsidy end in 2027 and consequently they will be allowed to participate in the CM once their RO contracts expire (in practice this means participation from the four year-ahead auction in 2023 onwards), if they don't hold a CfD. It was, therefore, always anticipated that the CM's eligibility framework would need to be amended to allow wind to participate at some point in the future.

However, the costs of new wind and solar have fallen more quickly than anticipated, and we understand that a limited number of new on-shore wind and solar projects are reaching the point where they may soon be viable without subsidy.

Ofgem received three formal requests from industry to change the CM framework to allow participation in future auctions. Ofgem consulted on these proposals from 22 March – 3 May 2018 – its decision, published on 5 July,³⁵ concluded:

“We consider that allowing renewable technology not in receipt of other forms of State Aid would be consistent with the European Commission’s Capacity Market State Aid clearance, so long as preference is given to low-carbon generators ‘in case of equivalent technical and economic parameters.’

Therefore, we believe that the long-term goal should be that onshore wind, wider renewable technologies, and hybrid CMUs composed of multiple technologies should be able to participate in the CM. However, we believe that it is necessary to properly understand and define the “equivalent technical and economic parameters” before making the change to Schedule 3 to add on-shore wind as a technology class.”

“On balance, we have decided that it would be most appropriate for these issues to be considered further as part of the Ofgem and BEIS Five Year Reviews.”

Issues to consider through the CM Review

There are good reasons to allow wind, and potentially solar, to participate in the CM; the CM is intended to be a market wide and technology neutral mechanism and opening the CM up to

³⁵ <https://www.ofgem.gov.uk/publications-and-updates/decision-statutory-consultation-amendments-capacity-market-rules-2018>

participation by wind and solar could increase competition, auction liquidity and value for money for consumers.

However, wind and solar, unlike all other technologies that participate in the CM, are non-dispatchable forms of capacity. Whilst this does not necessarily preclude their participation in the CM (and we already account for their contribution to security of supply when setting the targets for the CM auctions), it does raise unique challenges that need to be overcome if they are to be allowed to participate and in a manner that does not create unintended consequences. Challenges to be worked through include:

- Reviewing the existing approach to de-rating wind and solar to ensure it is fit for purpose – this will entail development of a revised methodology, consultation on said methodology and consequent amendments to the CM Rules. We will also need to consider whether arrangements remain robust to ensure security of supply as increasing amounts of renewables come online and enter the CM.
- Considering how to facilitate access by hybrid projects (two or more different technologies operated together, but not necessarily located on the same site for example wind/solar and batteries). This could have real advantages from a security of supply perspective but will require changes to the legislative framework and consideration of the most appropriate method for de-rating such projects.
- Reviewing the penalty regime. Originally the penalty regime was designed to reinforce existing market signals for the delivery of electricity during times of system stress. However, this synergistic effect does not materialise in the context of non-dispatchable renewables (because these generators cannot control dispatch) leading to concerns that the existing penalty regime may not be robust enough. Stronger penalties could incentivise effective secondary trading strategies and encourage renewable developers to look closely at the viability of hybrid projects.

Through the CM Review, the Government intends to consider whether (unsubsidised) renewables such as wind and solar should be allowed to participate in the CM and how the challenges identified above might best be addressed. As one of the identified ‘priority issues’, we intend to develop proposals for consultation later this year so that, if considered appropriate, we are in a position to prepare amendments to the CM Regulations and Rules for laying in Parliament ahead of the auctions in winter 2019/20.

Question 21
Should wind and solar be allowed to participate in the Capacity Market? Why?
Please provide evidence to support your views.
Question 22
What factors need to be considered to enable renewables to participate in the Capacity Market whilst ensuring security of supply?
Please provide evidence to support your views.

Question 23

What factors need to be considered to enable the participation of hybrid projects in the Capacity Market?

Please provide evidence to support your views.

Question 24

For co-located projects, do you think that all components of the site (both the CM eligible and the non-CM) will be able provide their full capacity during the system stress event due to local distribution or transmission network constraints?

Please provide evidence to support your views.

Question 25

What factors need to be considered when developing the de-rating methodology for wind and solar?

What approach could be taken to de-rating hybrid CMUs?

Please provide evidence to support your views.

Question 26

What lessons can be learnt from the participation of renewables in other overseas capacity markets?

Please provide evidence to support your views.

4.2 Interconnectors and cross border participation

Cross-border participation of overseas capacity in the capacity market would help to ensure security of supply at an overall lower cost for consumers by promoting more competition in the CM auctions. In the absence of a technical solution to enable cross-border participation, interconnectors have been allowed to participate in the CM since 2015. This was an explicitly interim position, in recognition that cross-border participation would be preferable.³⁶

Since 2015 the amount of interconnection capacity with CM agreements has increased from 1.6 GWs of de-rated capacity in 2015 T-4 to 4.6 GW in 2018 T-4. Following the latest round of auctions in 2018, the Government received extensive feedback in relation to the existing approach to de-rating interconnectors. This feedback was considered when setting the interconnector de-rating factors for the upcoming auctions this winter (within the boundaries set by the current Rules) – the CM Review provides an opportunity to go further if necessary.

Through the feedback, stakeholders have suggested that the contribution to security of supply made by new interconnectors will diminish as the amount of interconnection on the system grows, and that a changing energy system (including growing deployment of renewables) will result in more correlated stress events in interconnected markets (e.g. both markets could experience high demand and low wind at the same time), thus reducing the contribution that interconnectors make to security of supply. Market conditions have also changed since the interconnector-led solution to cross-border participation was introduced in 2015. In particular, some other EU member states have introduced capacity mechanisms (with different penalty regimes), raising concerns about potential ‘double-commitment’ of interconnectors during correlated stress events. Certain stakeholders have argued that interconnector de-ratings should therefore be more conservative, particularly as levels of interconnection increase. Concerns have also been raised about the role that historic interconnector performance currently plays in setting de-rating factors, and the extent to which historic performance is an accurate predictor of future performance given the changing EU electricity system.

In light of this feedback, and as one of the identified ‘priority issues’, we will consider whether to make changes to the de-rating methodology for interconnectors in order to ensure that interconnectors are not over-compensated relative to their real contribution to security of supply. If considered necessary, we will develop proposals for consultation later this year, so that we are in a position to prepare amendments to the CM Regulations and Rules for laying in Parliament ahead of the auctions in winter 2019/20.

There have also been calls for the introduction of a framework which allows overseas capacity to participate directly in the CM, in line with the ambitions set out in the Clean Energy package of measures which is currently being negotiated in the EU. It remains our intention to explore ways to enable cross-border participation in future CM auctions. However, this is likely to require substantial and complex changes to the CM’s design and so not something we expect to consult on later this year. We would welcome your views on potential models that would facilitate the participation of overseas capacity.

³⁶ See page 7 of the Government response to the consultation, available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/396566/Government_Response_to_CM_Supplementary_Design_Consultation_v.pdf

Question 27

Is the current de-rating factor methodology for interconnectors appropriate for assessing their contribution to security of supply? Are there any particular challenges or risks you wish to highlight?

Please provide evidence to support your views.

Question 28

What other factors need to be considered to ensure that interconnectors and domestic capacity providers compete on a level playing field? Please provide ideas on how any issues you have identified can be addressed.

Please provide evidence to support your views.

Question 29

How could we facilitate direct participation of overseas capacity in the future?

Please provide evidence to support your views.

5. Institutional Framework

The CM's existing institutional framework – the responsibilities of Government, Ofgem, National Grid (Delivery Body) and Electricity Settlements Company (Capacity Market Settlement Body) – is outlined below.³⁷

The Government

The Government introduced the CM and is responsible for the strategic oversight of the CM, and the policy framework. It is responsible for any changes to the Regulations which govern the scheme. The Regulations include, for example, general eligibility criteria for prequalification to bid in CM auctions, functions of the Electricity System Operator for delivery of the CM, and the settlement of payments. Government also takes final decisions on the parameters for the auctions, including the target level, and on de-rating factors for interconnectors, based on extensive technical advice and recommendations from National Grid. The Secretary of State hears appeals made against capacity agreement terminations.

Ofgem

The Government made the first set of CM Rules for the Capacity Market, but the Government or Ofgem may also initiate changes to Rules. The Rules generally set out the operational and administrative detail (as opposed to the policy framework in the Regulations), but the line between the two is not always clear-cut. Ofgem has developed a process for both receiving change requests to the Rules and making changes to them. When considering changes to the Rules, Ofgem is bound by a set of objectives set out in the Regulations, which ensures transparency and confidence in the governance of the Capacity Market. Ofgem is also responsible for resolution of disputes if National Grid and an applicant remain in dispute regarding decisions on pre-qualification, rectifying the CM Register or a capacity agreement or the issuing of a termination notice. Ofgem also oversees National Grid's compliance with their CM duties, as these are generally enshrined in National Grid's operating licence for which Ofgem as regulator is responsible.

National Grid

The Electricity System Operator undertakes the delivery role for the Capacity Market. It is responsible for pre-qualifying auction participants, running the capacity auctions and issuing and monitoring capacity agreements; and for issuing Capacity Market Notices. It is also responsible for proving security of supply analysis, including recommendations to Government for the auction targets, and for setting de-rating factors for the majority of technology types.

The Government has set out the delivery functions of the Electricity System Operator in secondary legislation. This gives the Government certainty about what will be delivered and a clear basis for Ofgem to manage National Grid's performance in its delivery role. A panel of technical experts has been created to provide independent scrutiny of National Grid's advice on the recommended amount of capacity to auction.

³⁷ See also

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/448153/Roles_and_responsibilities_under_the_Capacity_Market.pdf

The Electricity Settlements Company

The Government has set up the Electricity Settlements Company to provide ultimate accountability, governance and control of the settlement process and payments disbursed under capacity agreements. This includes managing credit cover, capacity payments, penalties, meter verification and monitoring, and secondary trading volume reallocation. The Electricity Settlements Company is a private company owned by the Government and limited by shares. ESC is supported in the delivery of its settlement activities by its settlement services provider, Electricity Market Reform Settlement (EMRS) Ltd, a subsidiary of Elexon.

While the current roles of the various delivery parties are set out in law, feedback suggests there can be uncertainty at times for auction participants about who is responsible for what. For example:

- stakeholders who are keen to see amendments to the auction framework may be unsure whether the issue relates to regulations or rules, and whether they should be discussing with Ofgem or Government.
- similarly, stakeholders who have concerns about the way the scheme is being operated may be unsure to whom they should address their concerns and/or from whom they should seek guidance.

Any such uncertainty is unhelpful to participants and could ultimately affect their propensity to participate and auction liquidity. We would be concerned if any lack of clarity about the roles and responsibilities of the various bodies increased the possibility of fraud occurring or errors being made, as the CM manages significant sums of bill payers money. We therefore welcome views as to whether more can be done to clarify roles and responsibilities.

In this context, we also propose to review the experience of equivalent capacity mechanisms overseas. Since the CM was designed, a number of other countries have begun to implement capacity mechanisms of some form, and an initial view suggests these overseas CMs tend to have a very clear lead responsibility allocated either to the regulator or the system operator, often with a much lesser role (if any) for Government.

The CM Review provides an opportunity to re-consider the balance of roles and responsibilities between the government and its delivery partners. We welcome views on the effectiveness of existing institutional arrangements and how it can be improved to facilitate a more transparent and cohesive framework.

Question 30

To what extent do the current institutional arrangements support an effective change process?

Please provide suggestions on how issues can be addressed.

Please provide evidence to support your views.

Question 31

To what extent do the defined and allocated roles and responsibilities support effective administration and delivery of the annual processes related to pre-qualification, delivery and payments?

Please provide suggestions on how issues can be addressed.

Please provide evidence to support your views.

Question 32

Please provide any suggestions you have for improving the management of fraud and error risk.

Please provide evidence to support your views.

Question 33

Are there any lessons from overseas capacity mechanisms that could be useful in improving the GB Capacity Market?

Please provide evidence to support your views.

6. Emissions Performance Standard

The Emissions Performance Standard (EPS) was introduced by the Energy Act 2013³⁸ and implemented via the Emissions Performance Standard Regulations 2015³⁹.

The objective of the EPS is to ensure that new fossil fuel-fired electricity generation contributes to electricity security of supply in a manner consistent with the UK's decarbonisation objectives.

In outline, the EPS places a limit on the carbon dioxide emissions produced by new fossil-fuel generation plants.⁴⁰ It works alongside other policies to ensure that the construction of new coal and gas generation plants is consistent with meeting the UK's emissions reduction objectives. The EPS also complements the National Planning policy,⁴¹ which requires new coal fired power station to be equipped with Carbon Capture and Storage (CCS).

The Government is under a statutory obligation to review the EPS five years following its implementation. The purpose of this review is to answer the following questions:

1. To what extent has the EPS achieved its objective?
2. Does the objective of the EPS remain appropriate?
3. Can the EPS objective be achieved in a way that imposes less regulation?

Our current view is that the EPS has been achieving its objective – all generation plants in scope of the EPS that have been constructed since its introduction are compliant. Whilst there have been no concerns raised in the operation of this measure, we welcome your views on the performance of the EPS and whether there are any issues to consider.

Question 34

To what extent has the EPS been achieving its objective? Please provide evidence to support your views.

Question 35

Is this current objective of the EPS still appropriate? Could it be achieved in a way that imposes less regulation?

Please provide evidence to support your views.

Question 36

Have any issues arisen in the operation of the EPS which should be considered?

Please provide evidence to support your views.

³⁸ <http://www.legislation.gov.uk/ukpga/2013/32/contents/enacted>

³⁹ <https://www.legislation.gov.uk/ukdsi/2015/9780111127186/introduction>

⁴⁰ New plants mean those that received consent on or after 18 February 2014. The EPS also applies to plants that received consent before 18 February 2014, when they replace or add a main boiler on or after 18 February 2014.

⁴¹ <http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/consents-planning/nps2011/1939-nps-for-fossil-fuel-en2.pdf>

This consultation is available from: <https://www.gov.uk/government/consultations/capacity-market-and-emissions-performance-standard-review-call-for-evidence>

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