

Electricity Market Reform - Contracts for Difference

Nuclear and CCS CfD allocation – Request for feedback

Ensuring value for money in the allocation of CfDs is central to Government's objective of decarbonising the electricity system at least cost to consumers. Government has set out a process where CfDs for renewables will be allocated on lowest price where demand exceeds availability, and a vision for CfD allocation seeing increasing competition within and between low-carbon technologies. In August 2013, Government set out its intention that future CfD allocation for nuclear and CCS projects would come within this framework. A workshop with CCS and Nuclear developers and other interested parties was held on 9 October 13 to discuss how CfD allocation could work for nuclear and CCS and the potential for using competitive allocation models. The slides presented at the workshop have been published alongside this request for feedback.

We are now seeking more detailed feedback on the issues discussed from those that attended the meeting, as well as inviting comments from others that may have an interest. Below, is a list of the areas on which we would particularly welcome feedback, although please don't feel constrained to these areas if there are other related points you would like to make.

Feedback provided, including personal information, may be subject to publication or disclosure in accordance with the access to information legislation (primarily the Freedom of Information Act 2000, the Data Protection Act 1998 and the Environmental Information Regulations 2004).

If you want information that you provide to be treated as confidential please say so clearly in writing when you send your feedback. It would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded by us as a confidentiality request.

Any feedback should be supported with evidence and emailed to emrcfddesign@decc.gsi.gov.uk by 1700 on 31 October 2013.

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Introduction

This response to DECC's request for feedback is specific to CCS issues and is informed by discussions with the UK CCS Commercial Development Group. It follows a response to DECC's Consultation on the draft Electricity Market Reform Delivery Plan submitted on 25th September 2013 (attached).

The CCS Commercial Development Group is one of three national leadership groups established following recommendation by the CCS Cost Reduction Task Force. The task force was commissioned by DECC in 2012 and delivered its final report to the Energy Minister in May 2013. The CCS Commercial Development Group recognises the role CCS has in abating carbon dioxide emissions and aims to secure ways, together with the UK Government, of making UK CCS projects bankable, and reducing the cost of capital of CCS projects. The CCS Commercial Development Group brings together a range of key CCS stakeholders including potential financiers, insurers and project developers. It is led by the Ecofin Research Foundation with the support of the Energy Technologies Institute (ETI).

Key issues relevant to the allocation of EMR support to CCS projects

The following section is intended to set the context to inform DECC's thinking on the approach to allocating contracts for difference to CCS projects.

- **CCS is uniquely valuable and flexible:** ETI's modelling of the UK energy system robustly shows that a sizeable CCS sector is central to an efficient least-cost approach to meeting carbon targets. Failure to deploy CCS would increase the annual costs of meeting carbon targets by tens of billions of pounds. The value of CCS is evidenced by ETI 2050 pathway analysis that indicate that without CCS, the next least-cost pathway is 1% GDP more expensive. This points to a strong case for ensuring that a significant share of EMR resources is allocated to support the development of an efficient CCS sector.
- **CCS is crucial beyond (as well as within) the electricity sector:** among the technologies eligible for support through EMR, CCS is uniquely flexible and widely applicable. It can deliver baseload and flexible low carbon electricity, but it can also play a critical role in enabling low cost decarbonisation of the broader UK energy system. Wider applications of CCS include industrial CCS, enabling other flexible low carbon fuels such as hydrogen through gasification applications, or delivering highly valuable 'negative emissions' when combined with bioenergy.
- **Support for CCS electricity projects is vital to broader development of CCS:** EMR support for low carbon electricity projects is vitally important in supporting development of early CCS projects. Low and volatile carbon prices make CCS commercially unviable in trade-exposed industrial or

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gasification applications. However, as early CCS projects will be based around the power sector, these projects represent a pathway towards wider application of CCS in industry and other forms of energy (e.g. gasification).

- **A UK CCS sector requires strategic development, not a collection of atomised projects:** A fully developed CCS sector will rely on an integrated CO₂ transport and storage network and will be made of a variety of applications and technologies, many with linkages beyond the electricity sector (e.g. EOR, gasification, chemical production, industrial decarbonisation). Work by both the UK CCS Cost Reduction Task Force and by the ETI points clearly to the potential for delivering value and economies of scale through developing networks. The development of the sector is likely to be highly path-dependent and geographic in character, which will shape subsequent opportunities to develop clusters, infrastructure and storage resources.
- **Simple price comparisons are the wrong metric for allocation of EMR support:** EMR resources are scarce and should be allocated to deliver the greatest impact on broader UK decarbonisation (rather than just electricity sector decarbonisation). Each early CCS project is likely to have different characteristics, for example in terms of the capture technology they develop, the development of infrastructure, how they contribute to the development of clusters, whether they open up opportunities for subsequent projects or for applications in other sectors. Therefore, each early CCS project is likely to have a specific strategic contribution to make to building capacity for CCS to enable broader decarbonisation. Equally each project is likely to have specific risk characteristics. Simple price comparisons (£/MWh) are unlikely to be a reliable guide to value for money in allocating EMR support resources for some time to come.

Conclusions

- **Allocate sufficient Levy Control Framework to develop CCS:** EMR will be the key source of support to enable the CCS sector to develop to maturity. Given the high value that CCS can deliver to UK decarbonisation there is a strong case for ensuring that a significant portion of LCF resources are allocated to developing CCS within and outside the CCCS Commercialisation Programme. In practice this would mean supporting the construction of at least 4 full-scale projects by 2020. This level and pace of deployment will ensure CCS moves quickly towards realising the vision set out in the CCS cost reduction task force report.
- **Adopt a strategic approach to allocating resources between projects:** Given the heterogeneity of CCS projects and applications, along with the likely inter-dependencies between early projects, simple price comparisons will not be a reliable guide for value for money. A more strategic approach should be adopted, for example by using a set of criteria that take account of broader strategic considerations and their value in evaluating early projects following the CCS Commercialisation Programme projects.
- **Take account of particular characteristics of CCS projects in contract design:** CCS projects will have varied risk characteristics and are likely to be different in terms of scale and their inter-dependency. This needs to be taken into account in the design of contracts and processes for allocating

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support. A range of issues has been raised by the CCS Commercial Development Group. In practice an open and engaged approach should be taken to resolving these issues, rather than attempting to design an enduring template at this early stage.

- **Certainty is needed urgently:** The need for clarity on availability of CfDs for early CCS projects outside of the CCS Commercialisation Programme currently being developed is urgent. There is a real risk that private sector investors will not be able to sustain the required development expenditure to keep these projects alive and result in cancellation of projects. This could set back wider scale development of CCS in the UK by many years.

Further information

- Further details on the challenges to mobilising private sector financing for CCS can be found at:
 - http://eti.co.uk/downloads/related_documents/Ecofin_CCS_Report.pdf OR <http://www.ecofoundation.org/activities/ccs>
- Further information on the significance and value of CCS in the UK can be found at:
 - http://eti.co.uk/downloads/related_documents/ETI_CCS_Insights_Report.pdf
 - http://www.eti.co.uk/news/article/optimising_the_location_of_ccs_in_the_uk_and_a_picture_of_co2_storage_in_th

Response to questions

General allocation issues

1. The Allocation Methodology sets out a system of eligibility checks, milestones and target commissioning windows and longstop dates that are intended to provide developers with certainty of CfD award at earlier stage while ensuring that successful applicants are those with a strong chance of progressing to commissioning. Is the proposed system suitable for nuclear and CCS projects?
 - An Allocation Methodology that provides developers with certainty of a CfD award at an earlier stage and ensures that only applicants with a strong chance of progressing to commission is welcomed by the Commercial Development Group. However the

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suitability of the methodology for CCS is very reliant on the specifics of the measures put in place. The measures should not introduce additional risk to developing or financing the project.

- The currently proposed eligibility checks, milestones and target commissioning windows and longstop dates introduce additional risk to projects which could lead to a higher Strike Price being required and result in a reduced value for money.
- The timescales and costs faced by CCS projects are not directly comparable to renewable projects. CCS projects will likely need to spend multiple tens of millions of pounds of pre-investment in detailed FEED studies before clarity on the potential Strike Price required can be achieved. This FEED process can take approximately 18 months.
- Given the scale of pre-investment required, CCS projects would require a high degree of certainty that there will be sufficient budget for the project to be awarded a CfD subject to the value for money criteria being met. A ‘pre-allocation’ that ring-fences a portion of the CfD budget for the project will provide developers with the confidence required to self-fund the early project development work. Developers are unlikely to commit the high level of resources for early development work if there is significant risk that the CfD budget might be exhausted.
- Private sector financiers are likely to require very high confidence that a project will be awarded a CfD for them to invest through for example, a contract with conditions attached.
- Given the time scale of CCS projects, pre-allocation would need to be made several years before Final Investment Decision (FID) of a project, and when final design and cost of the project will still be uncertain. A range for the acceptable Strike Price that meet the Government’s value for money requirement and economic viability of the project will need to be agreed with the developer.

2. Would the proposed eligibility criteria work for nuclear or CCS? What additional eligibility checks might be needed?

- Eligibility criteria that prevents bed-blocking of CfDs and that ensures only viable projects are awarded CfD contracts are welcomed.
- The currently proposed criteria of planning permission and grid connection offer for generic CfDs are unsuitable for CCS projects as both criteria would require significant financial commitment by developers before they have confidence in the availability of CfDs for the project.
- A “pre-allocation” stage in the Allocation Methodology could provide developers with the confidence to commit the substantial pre-investment needed and demonstrate its ability to meet a stringent eligibility criteria at the time when the CfDs are confirmed by the Government.

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- In addition to meeting design and engineering criteria, eligibility checks should also consider financial credibility of the projects.
 - Given the significant investment required for CCS FEED, the spending of funds on FEED would be a suitable eligibility criteria.
3. What might demonstrate suitable evidence of financial commitment for nuclear and CCS projects? How does DECC/CfD Counterparty ensure developers make progress towards getting the necessary approvals (and eventually commission)?
- CCS requires long time scales. Without a “pre-allocation” stage during which FEED can be undertaken, it is not feasible for CCS project developers to demonstrate financial commitment through a FID within a year of signing a CfD contract. A “pre-allocation” could make it possible for FID as evidence of financial commitment.
 - Significant resources are required for CCS FEED and pre-FID stages. Once the developer has committed the pre-investment and taken FID, they have a strong interest to ensure the project is able to generate the contracted capacity as soon as possible. As CCS projects are large, significant delays ahead of commissioning will be obvious.
4. What variations to target commissioning windows and longstop dates might be needed for nuclear/CCS?
- As CCS projects are large and complex, and there is limited experience in building CCS plants, there is significant uncertainty around development and construction times. It is important that if target commissioning windows and longstop dates are imposed, they reflect fully the longer timescales of CCS.
 - It is also essential that these measures do not penalise developers for risks outside of their control. Appropriate force majeure provisions need to be in place for the project to be completed with manageable penalties.
 - Unsuitable target commissioning windows and longstop dates introduce significant risk, which will increase the price of CCS projects. The addition of these risks could potentially mean CCS projects are viewed as uninvestible by financiers
 - The large sunk costs in design, development and construction of CCS are in themselves a major incentive for developers to commission the project in a timely manner.

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5. Is the proposed structure for adjustments to capacity appropriate or necessary for nuclear / CCS?
 - Clarity is required on whether capacity refers to installed capacity or operational capacity. Installed capacity of CCS plants is not expected to change once a CfD contract is signed post-FEED. Consequently the 5% adjustment of the installed capacity at the milestone date and at the longstop date do not impact CCS.
 - If capacity refers to operating capacity, the requirement to reach 95% capacity before CfD payments are made is unsuitable and adds additional risks to CCS projects. It can take a significant time for fossil fuel plants to fully commission and operate at design capacity. Due to the complex nature of CCS plants this is a bigger issue.

6. How might the system of eligibility, milestones, target commissioning windows and longstop dates need to vary under a competitive allocation process?
 - This question is irrelevant for CCS at this stage. The CCS sector is not sufficiently mature for competitive allocation such as auctions. For example there is currently no CCS transport and storage infrastructure and no established norms for the commercial arrangements that might exist across the chain. Hence projects need to be considered on a case by case basis with bilateral negotiations.

Competitive allocation models

7. What are the barriers to further improvements in underlying competitive conditions for nuclear and CCS? What steps can industry and Government take to resolve these barriers?
 - Lack of confidence in a CCS industry – there is a general lack of confidence that the Government is committed to promoting a CCS industry. Confidence can be increased with a clear statement from the Government on CCS deployment and clarity that CfDs will be made available

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for CCS. A clear signal for an enduring CCS industry would increase confidence among developers and financiers, lead to greater interest and investment in CCS and stimulate greater competition.

- Risk sharing – it has been previously suggested that CCS projects outside the CCS Commercialisation Programme would be required to take full technical and non-technical risks. Competition could be promoted if it is acknowledged that early follow-on projects will still face significant uncertainties and will require some of the special terms in the Commercialisation Programme to be maintained. Also early follow-on projects would require bilateral negotiations and bespoke CfD contracts. A failure of early follow-on projects being commissioned will likely lead to a significant delay in development or stalling of a CCS industry in the UK.

8. What options for competitive allocation should Government be considering?

- CCS is a technology that is not mature enough for competitive allocation. Additionally, given the range of potential CCS projects, CCS projects cannot be directly compared to each another.
- In the near to medium term tenders with bilateral negotiations are the best method to take CCS projects forward as it allows CCS projects to be evaluated based on other strategic criteria (addressed in question 10) that contribute to a cheaper and low carbon energy sector along with cost of the specific project.
- Auctions will not be an appropriate allocation mechanism for CCS in the near to medium term. Due to the unpredictability of auctions, developers are unlikely to commit the significant resources required for initial stages of a project ahead of the auction. An auction approach will also not enable the other strategic criteria to be considered fully.

9. Does the structure of evaluation and price-setting of the “constrained allocation” process in the Allocation Methodology work for nuclear and CCS?

- Due to the significant upfront cost required for CCS projects, a constrained allocation approach will not be suitable for CCS.
- Constrained allocation creates uncertainty around the CfD available and does not incentivise developers to invest the significant pre-investment required to get CCS projects to the point of application.

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- The constrained allocation approach poses a risk to the Government as the discouragement of investing necessary pre-investment could lead to projects being over optimistic and result in them not being delivered at the time/cost expected.

10. Are there criteria other than price that are important in selecting nuclear and CCS projects? If so, which? How can these criteria be assessed? How can delivery against these criteria be monitored?

- Market segment – CCS is variable and can be used for baseload or flexible energy. The role a project fulfils in balancing the wider energy system should be considered.
- Fuel source – CCS can be applied to both gas and coal. The diversity a project adds to the energy system needs to be considered.
- Clusters – CCS projects that contribute to development of shared and integrated transport and storage infrastructure that can be utilised by future CCS projects could appear more expensive in the near term but lead to significant cost savings in the long term. Factors such as oversizing of infrastructure and distance to storage sites/hubs needs to be considered.
- Other industries – Unlike renewables, power stations with CCS could provide infrastructure that enable high CO2 emitting industrial sectors to employ CCS thereby helping the UK further reduce its emissions.

11. Does the position in the Allocation Methodology on adjustments to the Strike Price reflect an efficient balance of risks, given the specifics of nuclear and CCS projects?

- CCS projects are very unlikely to alter their planned capacity. This means Strike Price adjustment due to installed capacity being lower than contracted is irrelevant for CCS. It should be noted that as with other fossil fuel plants, it could take some time for full operating capacity to be reached in a CCS plant.
- There is some uncertainty around the efficiency losses in CCS plants. Efficiency will have an inversely proportional relationship with Strike Price requirements i.e. a less efficient plant would require a higher Strike Price.
- It is important that any Strike Price management does not lead to uncertainty in the value of CfDs as this leads to additional risks to developers and financiers.

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12. Can contract terms for nuclear or CCS projects be largely fixed ahead of launching the allocation process?

- Owing to the fact that CCS is a maturing technology, and that CCS projects are diverse, there are limited terms that can be fixed ahead of the allocation process. A “one size fits all” approach is unsuitable for CCS at this stage.
- CCS projects will have different risks and costs due to its variable applications (gas/coal, baseload/flexible) and differences in availability of transport and storage infrastructure. In the near to medium term CfD contracts for CCS will need to be bespoke and result from bilateral negotiations.
- Contract terms such as force majeure will need to be flexible to evolve as the CCS industry moves from the current phase to an enduring regime.
- CCS is still undergoing its cost discovery process (capex and opex) so a fixed Strike Price will be difficult to set. It is suggested that, if prices are set pre-FEED, a range is used and that the final price is negotiated within the range on FEED completion.
- Terms that could potentially be standardised include CfD length, reference price, metering arrangements, change in law and indexation of Strike Price to global fossil fuel. Due to the reliance of CCS on global fossil fuel prices, it is essential that the Strike Price includes fossil fuel indexation as failure to do so may lead to CCS projects being viewed as uninvestible.