

Consultation on proposals for the levels of banded support for solar PV under the Renewables Obligation for the period 1 April 2013 to 31 March 2017

7 September 2012

Department of Energy and Climate Change
3 Whitehall Place
London
SW1A 2AW

Telephone: 0300 068 4000

Website: www.decc.gov.uk

© Crown copyright 2011

Copyright in the typographical arrangement and design rests with the Crown. This publication (excluding logos) may be re-used free of charge in any format or medium provided that it is re-used accurately and not used in a misleading context. The material must be acknowledged as Crown copyright and the title of the publication specified.

For further information on this consultation, contact:

Renewables Obligation Team
Department of Energy and Climate Change
Area 4A
3 Whitehall Place
London
SW1A 2AW

Telephone: 0300 068 5404

Email: robr@decc.gsi.gov.uk

The consultation documents can be found on DECC's website:
http://www.decc.gov.uk/en/content/cms/consultations/ro_solarpv/ro_solarpv.aspx

Published by the Department of Energy and Climate Change

General Information

Purpose of this consultation:

This consultation sets out the Government's proposals for reduced Renewables Obligation Certificate support for solar PV generating stations which accredit or add additional capacity on or after 1 April 2013. DECC invites interested parties to submit comments and evidence in response to these proposals.

Issued: 7 September 2012

Respond by: 19 October 2012

Enquiries to:

Renewables Obligation Team
Department of Energy & Climate Change
Area 4A
3 Whitehall Place London
SW1A 2AW
Tel: 0300 068 5404
Email: robr@decc.gsi.gov.uk
Consultation reference: 12D/318

Territorial extent:

This consultation applies to England and Wales only. The Scottish Government and Northern Ireland Executive are managing the consultations on banding proposals in relation to the Scottish Renewables Obligation and the Northern Ireland Renewables Obligation separately.

How to respond:

Your response will be most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome. Reasoning and evidence to support your answers will be particularly helpful. If you wish to include any long reports as part of your evidence, please identify the relevant sections.

- Please use the proforma provided to record your response and evidence. Please send completed proforma in an email to robr@decc.gsi.gov.uk. The proforma are available on the DECC website, see:

<http://www.decc.gov.uk/media/viewfile.ashx?filetype=4&filepath=11/consultation/ro-banding/6325-consultation-on-proposals-for-the-levels-of-banded.docx&minwidth=true>;
and

<http://www.decc.gov.uk/media/viewfile.ashx?filetype=4&filepath=11/consultation/ro-banding/6326-proforma-for-the-submission-of-evidence-to-the-con.docx&minwidth=true>

- Alternatively, hard copy replies should be sent to the Renewables Obligation Team at the above address.

Additional copies:

You may make copies of this document without seeking permission. An electronic version of the consultation documents can be found on DECC's website:

http://www.decc.gov.uk/en/content/cms/consultations/ro_solarpv/ro_solarpv.aspx

Confidentiality and data protection:

Information provided in response to this consultation, 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 response to the consultation. 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.

We will summarise all responses and place this summary on our website at www.decc.gov.uk/en/content/cms/consultations/. This summary will include a list of names or organisations that responded but not people's personal names, addresses or other contact details. Responses marked confidential will not appear.

Quality assurance:

This consultation has been carried out in accordance with the Government's Consultation Principles, which can be found here: <http://www.cabinetoffice.gov.uk/resource-library/consultation-principles-guidance>

If you have any complaints about the consultation process (as opposed to comments about the issues which are the subject of the consultation) please address them to:

DECC Consultation Co-ordinator
3 Whitehall Place
London SW1A 2AW
Email: consultation.coordinator@decc.gsi.gov.uk

Contents

1.	Executive Summary:.....	6
2.	The Electricity Act 1989:.....	8
3.	The FITs Equivalence Proposal:.....	9
4.	Proposed Support Levels:.....	10
5.	Controlling the costs of solar PV within the RO:.....	10
6.	Costs Evidence:.....	12
7.	Evidence on deployment potential:.....	14
8.	Responding to the consultation:.....	16

1. Executive Summary

1. Further to the recent consultation on the Renewables Obligation Banding Review (ROBR) and the subsequent Government response to that consultation, the Government is publishing this additional consultation on Renewables Obligation Certificate (ROC) support for solar photovoltaic (PV) generating stations which are accredited or add additional capacity on or after 1 April 2013. The deadline for responses to this consultation is 19 October 2012 and the Government intends to implement changes to the solar PV support regime by 31 March 2013.

2. We are considering whether to issue a separate consultation on a proposal to exclude new solar PV installations at, or below, 5MW from the Renewables Obligation (RO) so that they would be supported only through the Feed-in Tariffs (FITs) scheme.

3. Solar PV is one of a number of renewable technologies that the Government supports under the RO, and solar power is one of the technology areas which underpin the Government's renewable energy strategy. The role of solar power in the UK's energy mix will be reflected in the updated Renewable Energy Roadmap that will be published in the autumn and in the development of a high level strategy for solar PV. Though no stations >5MW have been installed in the UK to date, there is some 120MW already consented. Work by Arup for the ROBR suggested a potential for around 115MW of installed capacity for projects larger than 5MW by 2017, which many of those who responded to the ROBR consultation considered to be an underestimate.

4. The costs of solar PV have fallen dramatically in recent years and small and medium scale deployment has increased substantially over the last 12 months. The pace of cost reduction has been consistently underestimated and we have therefore adopted a cautious approach to support levels, based on the information that is available. Affordability and the need to ensure value for money for electricity consumers are important considerations for the Government when setting support levels under the RO.

5. The consultation on the ROBR, which was published in October 2011, proposed maintaining support for solar PV at 2 ROCs/MWh until 31 March 2015, stepping down to 1.9 ROCs/MWh for new accreditations and additional capacity added from 1 April 2015 to 31 March 2016, and 1.8 ROCs/MWh from 1 April 2016 to 31 March 2017. However, as explained in the [Government response](#) to that consultation, published on 25 July 2012, recent independent reports and evidence produced for the FITs consultation¹ suggest that the costs associated with the deployment of medium-large scale solar between 250kW and 5MW² have come down substantially since the consultation on the ROBR was published. While we have limited evidence on the deployment of large-scale solar >5MW, we expect that these costs have fallen significantly also.

6. While we understand the need for market certainty and stability, it would not have been appropriate for the Government to proceed on the basis of the support set out in the initial ROBR consultation given the risk that this would result in substantial overcompensation for new solar PV at excessive cost to consumers. Therefore, we are consulting on a lower rate of support for new solar PV under the RO. **We want to hear from industry on the levelised costs**

¹ See: www.decc.gov.uk/en/content/cms/consultations/fits_rev_ph2a/fits_rev_ph2a.aspx

² All references in this consultation document to '250kW and 5MW' include stand alone installations for which Parsons Brinckerhoff's assumptions are the same

associated with large-scale solar PV, as well as the deployment potential, so that we can get a more complete picture of the likely costs and deployment potential of large-scale solar PV up to 2017.

7. The Government's initial analysis of the existing evidence suggests that support rates for new large-scale solar PV should be set lower than originally proposed. Our proposal is to set RO support rates based on the rates under the FITs scheme for solar PV up to 5MW. This should help to ensure consistency and clarity for both the industry and the consumer. The proposed rates are:

Table 1

	2013/14	2014/15	2015/16	2016/17
ROCs/MWh (approximate FITs equivalent)	1.5	1.3	1.1	0.9

8. These proposed levels of support are broadly equivalent to the FITs for solar PV (250kW-5MW) if tariff degeneration takes place in line with the FITs central scenario that is set out in the [Impact Assessment that accompanies the Government Response to the FITs consultation Phase 2a: Solar PV Cost Control](#).

9. The present consultation also sets out how we would seek to control costs of solar PV support within the RO by making use of the existing provisions for early review, where this is warranted (see section 5 below). This is intended to ensure that any future rapid cost changes in the industry do not lead to windfall gains for developers and put pressure on the RO budget. The pace of change in the solar PV market has exposed the limitations of support mechanisms in many countries (including the FITs scheme in its original form and the RO) in that they could not respond quickly to market developments. Inflexible tariffs led to higher than expected rates of return, resulting in levels of deployment that were not affordable. This trend has resulted in the restructuring of support in many other countries.

10. This consultation provides an overview of the evidence that is currently available (see the accompanying Impact Assessment for detailed summaries), the Government's initial analysis of the costs and deployment potential based on that evidence, the proposed support rates and measures to maintain consistency between support schemes. **Consultees are encouraged to answer the questions in this consultation document and to provide supporting evidence about generation costs, using the proforma provided on the DECC website.**

11. The changes proposed in this consultation would apply to generating stations accredited, and additional capacity added, on or after 1 April 2013.

12. Stations accredited (and additional capacity added) before 1 April 2013 will be eligible for the existing RO subsidy rate of 2 ROCs/MWh. Some solar PV stations accredited after 1 April 2013 may be able to take advantage of the grace periods set out in chapter 19 of the Government Response to the ROBR, if they can provide the evidence required and meet all of the conditions set out in that chapter.

13. We have no plans to change our policy of grandfathering solar PV installations. Grandfathering is a policy that RO support levels for a generating station should not change once it is accredited (or in the case of additional capacity added to an accredited station, should not change after the additional capacity was added).

2. The Electricity Act 1989

14. Before making any changes to the level of support for renewable electricity under the RO, the Secretary of State is legally required to have regard to a number of statutory factors. These are set out in primary legislation - Section 32D(4) of the Electricity Act 1989 (as amended by the Energy Act 2008) and are outlined below:

- a) the costs (including capital costs) associated with generating electricity from each of the renewable sources or with transmitting or distributing electricity so generated (and including costs associated with the production or supply of heat: section 32D(5));
- b) the income of operators of generating stations in respect of electricity generated from each of those sources or associated with the generation of such electricity (including that connected with the acquisition of the renewable source, the supply of heat and the disposal of any generation by-product: section 32D(6));
- c) the effect of paragraph 19 of Schedule 6 to the Finance Act 2000 (supplies of electricity from renewable sources exempted from climate change levy) in relation to electricity generated from each of those sources;
- d) the desirability of securing the long term growth, and economic viability, of the industries associated with the generation of electricity from renewable sources;
- e) the likely effect of the proposed banding provision on the number of ROCs issued by the Authority, and the impact this will have on the market for such certificates and on consumers;
- f) the potential contribution of electricity generated from each renewable source to the attainment of any target which relates to the generation of electricity or the production of energy and is imposed by, or results from or arises out of, a Community obligation.

15. In putting forward the proposal in this consultation for reduced ROC support for solar PV generating stations which accredit or add additional capacity on or after 1 April 2013, we have considered all of these factors. To summarise:

- Factors (a), (b) and (c) are considered through in house DECC analysis of supply curves and 'required ROC bands', which look at a range of possible costs and revenues for solar PV projects;
- Factor (d) is considered qualitatively;
- Factor (e) is considered through in house DECC modelling, which estimates the total number of ROCs produced and the costs to consumers; and
- Factor (f) is considered through the solar PV supply curve used in DECC modelling, showing solar PV's potential for helping the UK meet its 2020 renewables target. Under the Renewable Energy Directive 2009/28/EC the UK is required to meet a target of 15% of all the energy consumed in 2020 to have come from renewable energy sources.

3. The FITs Equivalence Proposal

16. Large-scale solar PV is one of a number of renewable technologies that the Government intends to support under the RO. The role of solar power in the UK's energy mix will be reflected in the updated Renewable Energy Roadmap that will be published by DECC in the autumn, and in the development of a high level strategy for solar PV. Affordability and the need to ensure value for money for electricity consumers are important considerations for the Government when setting the support levels under the RO. It is crucial that support rates do not over-reward any particular technology. It is therefore our preferred approach to bring on only the most economically sound solar PV projects under the RO rather than risk incentivising a wider range of developments that may be overcompensated and which do not provide value for money. Solar PV has seen a rapid pace of change, including in its costs and deployment. The pace of cost reduction has been consistently underestimated and we have therefore adopted a cautious approach to support levels based on the information that is available.

17. We are proposing to set RO support rates for new solar PV that are broadly equivalent to the tariffs for solar PV (>250kW-5MW) under the revised FITs scheme. The proposed RO support rates are set out in section 4 of this document. The recent comprehensive FITs review examined in detail the current small scale PV costs and the scope for future cost reductions and the related uncertainty. This has shaped our proposed approach to support for new solar PV under the RO. The proposed approach meets our aim of ensuring coordination with other DECC financial incentive schemes.

18. It is also important to note that in putting forward a FITs equivalent model, we are not proposing that the support under the RO automatically adjusts every time there is a change in FIT tariffs. That is not achievable; the RO and the FITs scheme are different mechanisms and offer different levels of responsiveness. Consequently, the proposed support for solar PV under the RO will not track exactly the levels of support under the FITs scheme. We are proposing levels of support under the RO in the period from April 2013 to March 2017, with reductions on an annual basis, whereas FIT tariffs for new installations may reduce on a three-monthly basis, if there has been sufficient deployment to trigger a tariff change.

19. Unlike the FITs scheme, we do not propose to create different solar PV bands for different sizes of generating station. This means that all new solar PV, regardless of its size, if eligible for the RO, would be supported at the levels set out in this consultation, which are intended to be broadly equivalent to the solar PV (>250kW - 5MW) tariff under the FIT scheme.

20. The setting of RO support levels that are broadly equivalent to the solar PV (>250kW - 5MW) tariffs under the FITs scheme reflects the fact that at present there is no clear evidence that levelised costs of large scale solar PV are greater at well positioned larger sites than those for solar PV falling within the >250kW - 5MW band under the FITs scheme. We therefore have no justification for setting the RO solar PV band higher than the FITs equivalent.

21. Of course, the evidence submitted through the FITs consultation was not intended, and did not, provide any evidence on costs and other issues for solar PV installations >5MW. **We are therefore seeking data in relation to developments >5MW.**

4. Proposed Support Levels

22. Solar PV is currently supported at 2 ROCs/MWh. **Table 2** sets out the proposed level of support for new solar PV projects in ROCs/MWh terms: these levels of support are broadly equivalent to tariffs for the largest solar PV FITs band (>250kW - 5MW) with depression as projected in the central deployment scenario as set out in the [impact assessment that accompanies the Government Response to the FITs Consultation Phase 2a: Solar PV Cost Control](#).

Table 2

	2013/14	2014/15	2015/16	2016/17
ROCs/MWh (approximate FITs equivalent)	1.5	1.3	1.1	0.9

23. The FITs equivalent RO support rates are based on the average annual (financial year) FITs tariffs for the largest FITs tariff band (>250kW - 5MW) under the central scenario of quarterly depression set out in [the Impact Assessment supporting FITs consultation 2A](#). The equivalent RO support rate for a given year is calculated by dividing the average annual FITs tariff for the largest solar PV band (>250kW - 5MW) under the central deployment/depression scenario by the value of a ROC, which we assume to be the ROC buyout price plus 10% to account for RO headroom. More details are available in the Impact Assessment accompanying this consultation.

Q1.	Do you agree with the proposal to set the level of RO support for new solar PV broadly in line with the FIT for solar PV (>250kW-5MW) (i.e. 1.5 ROCs for new accreditations and additional capacity added in 2013/14, 1.3 ROCs for new accreditations and additional capacity added in 2014/15, 1.1 ROCs for those in 2015/16 and 0.9 ROCs for those in 2016/17)?
------------	---

5. Controlling the costs of solar PV within the RO

24. As noted in the recent comprehensive review of FITs³, the market for solar PV has seen dramatic changes in recent years, with significant and swift reductions in the global costs of the technology. The pace of change has also exposed the limitations of support mechanisms (including the FITs scheme in its original form and the RO) in that they could not respond quickly to market developments. Inflexible tariffs led to higher than expected rates of return, resulting in levels of deployment that were not affordable within the FITs budget, which is paid for by electricity consumers. This trend has resulted in the restructuring of support in some other countries⁴.

25. It was a key objective of the FITs review to correct this fundamental limitation of the scheme and to address the budget risks it gave rise to. The FITs review introduced a new, more responsive, mechanism for tariff depression. The mechanism aims to provide a reliable method of financial control while at the same time giving a good measure of certainty to the sector and to consumers about the future path of tariffs. The review re-calibrated tariff levels on the basis of

³ See www.decc.gov.uk/en/content/cms/consultations/fits_rev_ph2a/fits_rev_ph2a.aspx

⁴ Including Germany, Spain and France.

the latest available costs, and introduced a degression mechanism where tariffs are adjusted quarterly based on the level of deployment.

26. Similarly under the RO, we wish to ensure that any future rapid cost changes in the industry do not lead to windfall gains for developers and put pressure on the RO budget. Under the current RO legislation, it is not considered feasible to introduce a contingent degression mechanism that responds as quickly and flexibly as the FITs mechanism. However, the RO does contain a mechanism for early reviews⁵ which we would look to use to ensure that support levels for solar PV within the RO remain sustainable.

27. As set out in section 3, we propose to set solar PV support rates under the RO at levels which are broadly equivalent to the average FITs tariffs under the central deployment scenario for the highest capacity FITs band (>250kW - 5MW) in the same period. Under the central deployment scenario for the FITs scheme, tariffs for this FITs band are predicted to be reduced by approximately 7-13% per year in the next few years. However, in extreme cases, the rate of degression over a year could be as high as 73% (i.e. equivalent to the maximum degression in four successive quarters); or as low as 3.5% (as up to two successive degression steps can be skipped).

28. Low degression rates will reflect slower than expected reductions in costs or higher hurdle rates, which is likely also to affect RO-scale projects. High degression rates will reflect much more rapid cost reductions for FITs projects. This would lead to a divergence of support levels between the RO and FITs and pressure on the RO budget because:

- projects that would otherwise choose the FITs scheme would be expected to choose the RO if they are eligible to do so⁶; and
- there is a risk that the same cost reductions that have triggered the FITs degression could result in excessive returns for RO developers and unexpected calls on the RO budget from solar PV.

29. While we consider that this is unlikely within the expected deployment levels, the evidence of the last few years regarding the potential for cost reductions and the ease of deployment means that we need to be live to the potential risks. We therefore intend to monitor the industry closely and to consider holding an early review if there is evidence that the legal criteria for an early review are met. In particular, we will consider evidence on industry costs, on levels of deployment within both the RO and the FITs scheme compared to predicted levels and on any significant divergence of support levels between the FITs and the RO. This however should not be taken to limit the discretion of the Secretary of State to hold an early review based on the criteria in article 33(3) at any time if he considers it is warranted.

30. Without limiting the outcome, it is our intention that any review will take steps to ensure that the RO delivers returns for solar PV developers in the RO that are reasonable and consistent with the FITs scheme, can deliver a level of deployment consistent with our expectations and are affordable within the RO budget.

31. We expect to implement any changes to support levels that result from such a review within the normal RO cycle (i.e. to take effect from the start of an obligation year on 1 April).

⁵ [Renewables Obligation Order 2009, article 33](#)

⁶ This depends to some extent on whether new projects at, or below, 5 MW will continue to be able to opt for the RO. We will be consulting shortly on proposals to exclude new solar PV installations at or below 5MW from the RO. However, even if installations at or below 5MW are excluded from the RO, they may re-size in order to become eligible for support under the RO.

However, if there is evidence that a more urgent change is needed, we may consider changes within the RO year. This will be justified if there is a serious threat to the RO budget or to the value of ROCs and the viability of the scheme. In this case, any review may make use of information available to the Department as a result of our ongoing monitoring of costs of solar PV deployment. We will then be able to respond promptly to any observed changes and to move quickly to a consultation on any proposed changes on banding levels.

Q2. Do you agree with our proposals to control costs of solar PV support within the RO by making use of the existing provisions for early review?

6. Costs Evidence

32. At the time of publication, there are no solar PV sites larger than 5MW operational in the UK, although we are aware of a number of schemes in the pipeline. As a result, our initial analysis is mainly based on two pieces of existing evidence which, although relevant, do not include specific information relating to very large solar PV sites. We also recognise that the pace at which the solar PV industry changes means that new evidence may be available.

33. The original solar PV cost assumptions for the ROBR were taken from [the original Arup work commissioned for the review and published in October 2011](#). This evidence, relating to solar PV installations over 5MW, is now out of date.

34. As there was a very limited amount of evidence provided during the original ROBR consultation exercise, the analysis in this consultation is based on evidence arising from the recent FITs consultation on solar PV cost control (FITs consultation Phase 2a). This consists of:

- [The evidence submitted to the FITs consultation Phase 2a and summarised in the Government's response to that consultation, published May 2012](#); and
- [The solar PV cost update undertaken in May 2012 by Parsons Brinckerhoff \(PB\) which was used in DECC's model for FITs](#), which took account of evidence submitted as part of the FIT consultation as well as additional research.

35. The analysis supporting this consultation uses the cost and performance assumptions for the largest tariff band under FITs (>250kW - 5MW) developed by PB to support the FITs Phase 2a Government response. The key assumptions for PB's central cost reduction scenario are summarised in **Table 3** below:

Table 3

Variable	Unit	Value
Capital cost (capex) of 2013-14 installation	£/kW, 2012 prices	1053
Annual O&M cost of 2013-14 installation	£/kW, 2012 prices	22
Load Factor	kWh/kW/yr	850
Technology Lifetime	yrs	35
Capex learning rate out to 2016-17	Approx %	4

36. The solar PV supply curve used to calculate uptake at the proposed support levels is based on DECC's assessment of the technical deployment potential for large-scale solar PV (see section 7).

37. We assume an investor hurdle rate of 7.5% for large-scale solar PV, in line with assumptions for the ROBR.

38. This analysis, while recent and in-depth, relates to sub-5MW solar installations. **We are particularly keen to receive further information relating to the costs and performance characteristics of installations >5MW.** We have developed a proforma for the submission of evidence to help the industry provide such information. This is available from the DECC website.

39. We would like to better understand how the cost of installing >5MW solar PV compares to smaller sites. We want to know what specific factors, if any, are affected by increased project size.

40. We are of the view that solar PV deployment costs can be split into the following areas:

- capital costs (e.g. solar modules, inverters as well as installation/operation and maintenance costs);
- project costs (e.g. planning, grid and legal fees); and
- financial costs (e.g. cost of capital, interest and bad debt).

41. It is our understanding that solar PV is a broadly scalable technology, indicating that the costs per MW installed are linear. We are of the view that capital costs (e.g. purchase of solar panel modules, inverters, cabling, fencing and mounting systems) increase proportionally with size. However we would like to have greater clarity on any exceptions to this e.g. the potential benefits of bulk buying capital equipment.

42. As solar installations >5MW are in some respects first of a kind developments, there is significant potential for technology learning as has been witnessed in other countries, particularly in installation methodology. **We would like to know whether installation costs benefit from significant economies of scale.**

43. It is our understanding that project costs associated with the deployment of solar farms >5MW such as insurance, planning process, grid connection, legal requirements and securing land options are highly variable and site specific. **We would like to better understand the costs associated with non-capital expenditure and whether there is a large variance in installed cost per MW between sites of different scale.**

Q3.	Do the capital costs of solar PV projects >5MW benefit from economies of scale? If so, which cost elements benefit?
-----	---

44. It is possible that many project costs will not benefit from repeated developments or economies of scale. However the engineering, procurement and construction market is competitive and this would be expected to drive down costs over time. The availability of suitable land and good grid connection points are likely to be bottlenecks which could result in higher project costs.

45. We recognise that the wider economic considerations which drive the development of solar PV sites and financial costs are very sensitive to market conditions. The large scale solar PV sector is in the early stages of development in the UK, and we would like to establish whether financial institutions have developed a structured approach to the sector, or are continuing to consider funding on a case by case basis.

46. Other than the constraints mentioned previously, there are no known capital equipment supply chain bottlenecks that have the potential to drive costs upwards. **If you consider that there are constraints in the supply chain then please provide information about their impact on the deployment and the cost of installing large-scale solar PV in the UK.**

47. At present there is no clear evidence that average costs of large scale solar PV are greater at well positioned larger sites than those for solar PV falling within the >250kW-5MW band under the FITs scheme and we have no justification for setting bands higher than the FITs equivalent. **We would welcome further information about the deployment costs associated with installations >5MW.**

Q4.	Are there additional costs or hurdles associated with large scale solar PV that are not present in sub 5MW solar PV, for example supply chain constraints? Do you expect these costs to change as the UK's large scale solar PV sector matures?
-----	--

48. In addition to pure cost considerations, technology performance characteristics, principally load factor but also technology lifetime/panel degradation, are important in driving the attractiveness of a solar PV project from an investment perspective. At present we have no reason to consider that the performance characteristics of installations >5MW would be different to sub 5MW installations.

Q5.	Do the performance characteristics of >5MW projects differ from sub 5MW?
-----	--

7. Evidence on deployment potential

49. Overall, the information available on the UK potential for >5MW solar PV is limited because, at the time of publication, no >5MW projects have been installed in the UK.

50. The Arup data provided for the ROBR consultation⁷ showed a potential deployment trajectory for large scale solar PV (high scenario) for around 115MW of installed capacity for >5MW projects by 2017, although consultation responses considered it was underestimated. Several respondents thought the Arup assessment of deployment was too low, whilst only one thought the assessment of >5MW potential was unachievable. This, in combination with a considerable number of other responses noting that costs move quickly in the sector, and that the analysis was already out of date, meant that there were some gaps in our evidence base that needed further analysis.

⁷<http://www.decc.gov.uk/assets/decc/11/consultation/ro-banding/3237-cons-ro-banding-arup-report.pdf>

51. As a result, some further investigation was undertaken of the historical growth curve of >5MW solar PV in Germany⁸. Data from 2009 to June 2012 was analysed and showed that there has been a significant increase in the deployment of >5MW solar PV in Germany since 2010 with over 2.6GW deployed to June 2012. However, this level of deployment in Germany is considered to be higher as a result of three key factors: overall higher levels of irradiation (even though, of the countries with substantial levels of solar PV deployment, Germany is most closely aligned in latitude with the UK), a fundamentally different structure to their renewables support mechanisms and greater grid flexibility. These levels of deployment may not therefore be directly comparable to the UK. They do however, support the premise that there could be the potential for a greater level of uptake in the UK than previously thought.

52. In addition to this, we have completed some high level analysis of the potential pipeline of >5MW projects in the UK and it shows that several projects are already in the planning process. There are shown to be potentially 30MW of >5MW projects that have received planning permission (with no conditions) and around 90MW that have received planning permission subject to conditions. As a result, there is already some ambition to deploy more >5MW projects than Arup had first considered.

53. In analysing deployment data from FITs for projects that are most closely matched in size, e.g. those installations that are between 4 and 5MW, our analysis shows that some deployment is occurring and is becoming increasingly attractive. According to Ofgem data, in December 2011⁹ there were 18 projects sized 4-5MW amounting to 86MW cumulative installed capacity whereas in June 2012, there were 22 projects¹⁰ sized between 4 and 5MW, amounting to approximately 107 MW cumulative installed capacity.

54. However, projections of future solar PV uptake are extremely uncertain. There are numerous factors which will affect the pricing of solar PV systems in the future including support levels, the price of raw materials and the resultant equipment costs through the supply chain, project costs in the UK's nascent market for projects over 5MW and ongoing developments in global supply and demand. In addition, the absence of large-scale solar PV projects in the UK means there is a lack of evidence of the performance characteristics of installations >5MW.

55. On the basis that the Arup numbers are considered too low, and that there is some evidence to support a higher trajectory potential, the deployment levels from Arup have been brought forward (as shown in **Table 4** below) to account for this potential underestimation. The table provides an estimate of the total capacity of >5MW solar PV which could be delivered by 31 March 2016/17, assuming no limit to the level of subsidy. It is therefore considered to be the maximum amount of deployment that might occur in the timeframe.

⁸http://www.bundesnetzagentur.de/cln_1932/DE/Sachgebiete/ElektrizitaetGas/ErneuerbareEnergienGesetz/VerquetungssaetzePVAnlagen/VerquetungssaetzePhotovoltaik_Basepage.html?nn=34704#doc149586bodyText2

⁹<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=27&refer=Sustainability/Environment/fits>

¹⁰<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=37&refer=Sustainability/Environment/fits>

Table 4

Deployment potential (MW), years refer to commissioning year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Large Scale Solar PV (MW)	0.0	63.1	94.8	187.0	200.0	175.4
Accumulated Total (MW)	0.0	63.1	157.9	344.9	544.9	720.3

56. With support in line with the approximate FITs equivalent, we estimate that deployment could be between 0% and 20% of the potential highlighted in **Table 4** above. The cost assumptions for this are taken from the central cost reduction scenario for 250kW-5MW installations in [PB's May 2012 solar PV costs update](#) which was used to generate the central scenario for the recent Impact Assessment for the Government Response to the Consultation on Phase 2a of the Feed-in Tariffs Comprehensive Review. **However, there are significant uncertainties with this assessment and you are encouraged to offer your views.**

57. There are also significant uncertainties around the revenues that generators will receive and the costs of the technology in the future as >5MW installations are essentially first of a kind developments in the UK and are therefore untested business models. **A proforma for the submission of evidence has been developed to assist the industry provide information. This is available from the DECC website.**

58. We understand that the time it takes to deploy a large scale solar project will vary from site to site. Our understanding of the project development cycle (i.e. from pre-planning discussions to operation and FITs accreditation) is that first generation can be achieved in anything from 4 to 18 months; however the securing of grid connections and land options can lengthen the project development cycle.

59. We estimate that the proposed RO support levels for large-scale solar PV will result in RO spending on large scale solar PV up to £140m (2011/12 prices, undiscounted) over the lifetime of the scheme. The ROBR keeps the UK on track to meet a target of 15% of all the energy consumed in 2020 to have come from renewable energy sources. At the RO support levels for solar PV proposed in this consultation, the technology could provide a relatively cost-effective contribution to meeting the UK's targets, though we currently expect the majority of deployment of solar PV to be in the sub-5MW range, under the FITs scheme.

Q6.	Do you agree with this assessment of the deployment potential of large scale solar PV out to 31 March 2017?
-----	--

8. Responding to the consultation

60. This consultation, which sets out the Government proposals for reduced ROC support for solar PV generating stations which accredit or add additional capacity on or after 1 April 2013, is being held over a 6 week period to ensure that the Government is able to publish its response to the consultation in late November, enabling legislation to be made to come into force for 1 April 2013. The key dates are set out in **Table 5** below:

Table 5

Milestone	Date
Consultation Issued	7 September
Active Stakeholder Engagement	7 September to 19 October
Consultation closes	19 October
Government consideration of responses to the consultation	Ongoing until 30 November
The Government's response to the consultation is published	30 November
Updates to the EU State Aid clearance process	30 November
Legislation giving effect to the banding review is laid in Parliament	Early 2013
Legislation giving effect to the banding review comes into force (subject to Parliamentary approval and State Aid clearance).	1 April 2013

61. Consultees are encouraged to answer the questions in this consultation document along with supporting evidence and to provide any information about generation costs using the proforma provided on the DECC website. The Government will review the proposed support levels further to the information provided as part of this consultation exercise.

62. For further information on this consultation, contact:

Renewables Obligation Team
 Department of Energy and Climate Change
 Area 4A
 3 Whitehall Place
 London
 SW1A 2AW

Telephone: 0300 068 5404

Email: robr@decc.gsi.gov.uk

