Title: Government response to consultation on changes to FITs degression mechanism for 50kW+ other-than-stand-alone and stand-alone solar PV IA No: DECC 0165 **Lead department or agency: DECC** **Other departments or agencies:**	**Impact Assessment (IA)** **Date:** 29/09/14 **Stage:** Final **Source of intervention:** Domestic **Type of measure:** Secondary legislation **Contact for enquiries:** Michael.Haslam@decc.gsi.gov.uk

Summary: Intervention and Options

RPC Opinion: n/a

Cost of Preferred (or more likely) Option				
Total Net Present Value	**Business Net Present Value**	**Net cost to business per year** (EANCB on 2009 prices)	**In scope of One-In, Two-Out?**	**Measure qualifies as**
-£50m to £40m	n/a	n/a	No	n/a

What is the problem under consideration? Why is government intervention necessary?

Commercial and industrial building mounted/other-than-stand-alone solar PV deployment has been lower than expected and desired. The sector currently shares a degression band with stand-alone/ground mounted installations under FITs. Current levels of stand-alone deployment at all sizes are higher than expected. There is therefore a risk that stand-alone/ground mounted deployment could trigger degressions for 50kW+ building mounted/other-than-stand-alone solar which are not reflective of deployment in the other-than-stand-alone/building mounted sector, which would adversely affect deployment of building-mounted PV.

What are the policy objectives and the intended effects?

Separate degression bands for 50kW+ building mounted/other-than-stand-alone and ground mounted/ stand-alone installations will signal Government's intention to support the building-mounted/other-than-stand-alone sector by reducing the risk of degressions caused largely by ground mounted/ stand-alone deployment. A more stable environment for the building mounted/other-than-stand-alone sector will allow the UK to realise the benefits associated with building-mounted/other-than-stand-alone solar PV deployment (greater energy efficiency/ avoidance of system losses, development of building-integrated solar PV (BIPV) sector, support for more jobs per MW of deployment than ground-mounted/ stand-alone).

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Do Nothing - Current single degression band for 50kW+ building mounted/other-than-stand-alone and ground mounted/ stand-alone installations is maintained.
Lead Option - Separate degression bands created for 1) 50kW+ building-mounted/other-than-stand-alone and 2) ground mounted/stand-alone PV. Thresholds for the 50kW+ building-mounted/other-than-stand-alone band are 65% of those for current 50kW+ building-mounted/other-than-stand-alone and ground mounted/stand-alone band; thresholds for ground mounted/stand-alone band are 35% of those for current band. This is the preferred option as it removes the risk of high levels of stand-alone deployment triggering degressions for the other-than-standalone sector which are not reflective of falls in other-than-stand-alone costs or the removal of barriers to deployment.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 2015

Does implementation go beyond minimum EU requirements?			No		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	**Micro** No	**< 20** No	**Small** No	**Medium** No	**Large** No
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** 0 to -0.3	**Non-traded:**	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible SELECT SIGNATORY: Amber Rudd Date: 01.10.2014

Summary: Analysis & Evidence

Policy Option 1 (Lead option)

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2012	PV Base Year 2014	Time Period Years 40	Net Benefit (Present Value (PV)) (£m)		
			Low: -50	**High:** 40	**Best Estimate:** N/A

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A		N/A	**N/A**
High	N/A		N/A	**N/A**
Best Estimate				

Description and scale of key monetised costs by 'main affected groups'

Compared to the Do Nothing option, in most scenarios the lead option will be higher cost as there is greater deployment of more expensive other-than-stand-alone deployment and less deployment of cheaper stand-alone. One scenario (Fast Growth, 60 / 40 splits) is lower cost as there is less other-than-stand-alone deployment. In some scenarios, overall solar deployment is reduced, meaning the UK faces increased EU ETS permit purchases.

Other key non-monetised costs by 'main affected groups'

No additional costs from this policy have been considered on a qualitative basis.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	N/A		N/A	**N/A**
High	N/A		N/A	**N/A**
Best Estimate				

Description and scale of key monetised benefits by 'main affected groups'

In the scenario where overall solar deployment is increased (Fast Growth, Current Splits) the UK benefits from reduced EU ETS permit purchases compared to the Do Nothing option.

Other key non-monetised benefits by 'main affected groups'

More building mounted/other-than-stand-alone solar PV deployment leads to higher on-site electricity use, reducing pressure on the electricity grid and avoiding distribution losses. More building mounted/other-than-stand-alone deployment could foster the development of the building-integrated solar sector (BIPV) in the UK, encouraging investment in the UK supply chain and greater exports. Based on research by NSC for Part 2 of DECC's Solar Strategy, higher levels of building mounted/other-than-stand-alone deployment could support more UK jobs in the sector than ground mounted/stand-alone deployment, including skilled jobs in manufacturing and R&D

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5

Future deployment of solar PV is very uncertain, as is the split between ground mounted/stand-alone and building mounted/other-than-stand-alone due to (for example) the potential impact of Government proposals to address potential barriers to deployment for building mounted/other-than-stand-alone deployment outlined in the Solar Strategy. The impacts of split degression bands are therefore very uncertain: this IA develops indicative scenarios to cover a range of possible impacts.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:						In scope of OITO?	Measure qualifies as
Costs:	n/a	**Benefits:**	n/a	**Net:**	n/a	n/a	n/a

Problem under consideration

1. The UK Government is keen to support deployment and on-site use of energy by other-than-stand-alone/ building mounted and building integrated solar PV for several reasons:
    a. Energy losses in the UK electricity system are significant: according to the Digest of UK Energy Statistics (DUKES) losses comprised 7.2% of electricity demand (27TWh) in 2013[1]. Building mounted PV has a greater potential for the energy generated to be used on site, so minimising energy losses and reducing pressure on the grid. Savings are significant even compared to other renewable technologies which feed into the distribution network rather than the transmission network (e.g. stand-alone PV)[2].
    b. According to preliminary analysis carried out for the Government's recently-published Solar Strategy, building mounted PV supports significantly more jobs in the sector per 1MW than (ground mounted) solar farms[3].
    c. As set out in the Solar Strategy[4], Building Integrated PV (BIPV) represents a new industrial supply chain with UK companies currently strongly represented. The market for BIPV includes new build and the refurbishment of existing buildings, and some BIPV products can incorporate insulation, thereby improving energy efficiency. The UK already contains world leaders in the building integrated field, who have developed innovative products such as the hybrid solar solution. There is therefore the potential for further development and investment in the UK supply chain and UK academia, research and development, as well as leading to greater exports of technology and services.
2. The Feed in Tariffs scheme (FITs) forms part of the Levy Control Framework (LCF), which imposes an annual cap on costs to energy consumers resulting from DECC's levy-funded policies[5] out to 2020/21. A central feature of FITs policy is the degression mechanism, under which higher levels of deployment lead to higher reductions in tariffs ('degressions'). The FITs degression mechanism is the principal means by which costs are controlled and value for money ensured for energy consumers who meet the costs of FITs through their bills. There are currently three separate degression bands for solar PV covering installations of different sizes (1) 0-10kW, 2) 10-50kW, 3) 50kW+ and stand-alone) with associated triggers based on quarterly deployment[6]. The three degression bands were intended to represent distinct market segments and installations, with installations in each band considered likely to experience similar trends in installation costs.
3. However, within the 50-5000kW and stand-alone degression band, deployment of stand-alone and other-than-stand-alone installations has been occurring at markedly different rates. Deployment of 50kW+ other-than-stand-alone (building mounted) solar PV has been below expectations. For example, DECC modelling for the FITs Comprehensive Review in 2012 projected deployment of 250-5000kW building mounted PV to reach approximately 230MW by July 2014, but actual installed capacity commissioned in this band has only reached around 70MW[7], i.e. less than a third. Recent

[1] See para 5.15 at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/338750/DUKES_2014_printed.pdf.

[2] In 2013, distribution network losses accounted for around 73% (19.6TWh) of total system losses. Source, DUKES (2014), see para 5.15 at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/338750/DUKES_2014_printed.pdf.

[3] Solar Strategy, April 2014, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/302049/uk_solar_pv_strategy_part_2.pdf. See p56: the non-stand-alone/ building mounted and stand-alone/ solar farms sectors are currently seeing around 500MW of deployment a year, with approximately 10,500 jobs supported in the non-stand-alone sector, and 3,500 jobs by stand-alone deployment (i.e. triple for BIPV).

[4] Solar Strategy, April 2014, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/302049/uk_solar_pv_strategy_part_2.pdf.

[5] More details on the LCF can be found at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/223654/emr_consultation_annex_d.pdf.

[6] For more detail on FITs degression policy for solar, see Government response to FITs Comprehensive Review: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/43085/5386-government-response-to-consultation-on-comprehensi.pdf.

[7] Source: DECC, Monthly small-scale renewable deployment, Monthly feed in tariff commissioned installations by month https://www.gov.uk/government/publications/monthly-small-scale-renewable-deployment.

deployment in this band has been particularly slow, with only 10MW total deployment in since January 2013[8].

4. While 50kW+ other-than-stand-alone deployment has been slow, deployment of stand-alone has been higher, with around 60MW applying for full and pre-accreditation in January to June 2014 alone[9]. There is also rapid deployment of stand-alone solar deployment under the Renewables Obligation (RO). Given that tariffs are the same for the 250-5000kW other-than-stand-alone and stand-alone tariff bands, this suggests different costs between the two groups, and/or the existence of barriers to deployment for other-than-stand-alone projects. Indeed, in the Solar Strategy, potential non-financial barriers to deployment specific to 50kW+ other-than-stand-alone installations are outlined: these include planning processes, lease conditions and time taken to submit FITs applications through the ROO-FiT process[10]. Deployment statistics and the potential specific non-financial barriers to deployment for 50kW+ other-than-stand-alone installations suggest that 50kW+ other-than-stand-alone and stand-alone in fact form separate sectors rather than a single one.

5. Given different deployment patterns for 50kW+ other-than-stand-alone and stand-alone outlined above, there is a risk that under current FITs degression policy high levels of stand-alone deployment may trigger degressions for both stand-alone and 50kW+ other-than-stand-alone, even though this may not reflect deployment levels in the other-than-stand-alone sector. In fact, this is what occurred in January to March 2014: 40MW of stand-alone deployment has driven 50kW+ other-than-stand-alone and stand-alone deployment above 50MW, meaning that enough applications were accredited in the period to trigger a 3.5% degression in July 2014. Table 1 sets out applications accredited in the last two degression periods (January to March and April to June 2014) versus the relevant degression trigger of 50,000kW[11]:

Table 1: 50kW+ other-than-stand-alone and stand-alone applications accredited, January to June 2014

kW	**Jan-14**	**Feb-14**	**Mar-14**	***Jan-March total***	**Apr-14**	**May-14**	**Jun-14**	***Apr-Jun total***	**Average quarterly applications accredited, Q4 2013/14 and Q1 2014/15 (MW)**
50-100kW	484	583	1,149	*2,216*	2,251	1,701	1,747	*5,700*	**3,958**
100-150kW	599	2,050	2,056	*4,706*	1,152	1,147	1,659	*3,957*	**4,332**
150-250kW	1,190	3,556	4,535	*9,281*	1,913	3,355	5,190	*10,457*	**9,869**
250-5000kW	69	100	2,741	*2,910*	0	890	588	*1,479*	**2,194**
Stand-alone	8,733	21,130	10,674	*40,536*	1,412	7,296	11,922	*20,630*	**30,583**
Total	11,075	27,419	21,154	*59,649*	6,728	14,389	21,107	*42,224*	**50,936**

Note: Applications accredited include both full accreditation and preaccreditation as both count towards degression triggers.

Rationale for Intervention

6. In order to fully realise the benefits associated with other-than-stand-alone PV set out in paragraph 1 above, it is necessary for the Government to signal its support for the sector in order to attract

[8] Source: https://www.gov.uk/government/statistical-data-sets/monthly-mcs-and-roofit-statistics.

[9] Source: DECC, Monthly Roofit and MCS degression statistics, https://www.gov.uk/government/collections/feed-in-tariff-statistics.

[10] Solar Strategy

[11] Source: https://www.gov.uk/government/statistical-data-sets/monthly-mcs-and-roofit-statistics.

investors. The policy proposals in this IA are intended to remove the risk of high levels of stand-alone deployment triggering degressions for the other-than-stand-alone sector which are not reflective of falls in other-than-stand-alone costs or the removal of other barriers to deployment.

Policy Objective

7. The policy assessed in this Impact Assessment is intended to acknowledge the differences between the 50kW+ other-than-stand-alone and stand-alone sectors, and signal Government support for the other-than-stand-alone sector by creating a separate degression band for stand-alone installations.
8. With the closure of the RO in March 2017, there will be no incentive mechanism open to sub-5MW technologies besides FITs. It is not the intention of this policy change to prevent the FIT offering an affordable level of support to stand-alone solar deployment, in the short term. It is noted that overall deployment and levels of support will be considered further as part of an intended review of the FIT scheme in 2015.

Description of Options considered

Do Nothing

9. Under the Do Nothing option, FITs degression policy for the 50kW+ other-than-stand-alone and stand-alone sector would remain unchanged and tariffs would continue to degress according to current rules (these are set out in Table 2 below[12]) ie a single set of degression thresholds would continue to apply to both 50kW+ other-than-stand-alone and stand-alone installations.

Lead Option

10. Under this option the current 50kW+ and stand-alone degression band will be split into separate degression bands for a) 50kW+ other-than-stand-alone and b) stand-alone installations. The new degression bands are introduced in January 2015, i.e. tariffs start to degress according to the new policy from July 2015.

11. LCF budgetary constraints and the consequent need to control FITs scheme costs mean that it is not proposed to add any new capacity into the degression mechanism: the sum of degression thresholds in the two new bands is equal to the thresholds in the current, single band.

12. In the consultation it was proposed to apportion 75% of the capacity in the current 50kW+ and stand-alone band to 50kW+ other-than-stand-alone installations, with the remaining 25% going to stand-alone installations. Respondents to the consultation generally thought that this split would not be sufficient to allow the continued steady deployment of stand-alone, and that steep degressions would make stand-alone PV uneconomic. Based on responses from the consultation, modelling projections and our intention to make a policy change that will allow standalone deployment to continue under the FIT if steady levels of deployment continue to be seen, it has been decided to apportion 65% of the existing degression band to other-than-stand-alone and the remaining 35% to stand-alone.

Table 2: degression thresholds for 50kW+ other-than-stand-alone and stand-alone bands (Government response and consultation)

[12] For more detail on FITs degression policy for solar, see Government response to FITs Comprehensive Review: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/43085/5386-government-response-to-consultation-on-comprehensi.pdf.

Levels of quarterly deployment (MW) necessary to trigger degression for current degression band	***Proposed levels of quarterly deployment (MW) necessary to trigger degression for new degression bands - CONSULTATION PROPOSAL (25%/75%)***		**Proposed levels of quarterly deployment (MW) necessary to trigger degression for new degression bands - FINAL POLICY (35%/65%)**		**Degression triggered**
>50kW and all Stand-alone	***Stand-alone (MW)***	**Other-than-stand-*alone, above 50kW (MW)***	**Stand-alone (MW)**	**Other-than-stand-alone, above 50kW (MW)**	
Not more than 50MW	*Not more than 12.5*	*Not more than 37.5*	Not more than 17.5MW	Not more than 32.5MW	0%
More than 50MW but not more than 100MW	*More than 12.5MW but not more than 25.MW*	*More than 37.5 but not more than 75MW*	More than 17.5MW but not more than 35MW	More than 32.5MW but not more than 65MW	3.50%
More than 100MW but not more than 150MW	*More than 25MW but not more than 37.5MW*	*More than 75MW but not more than 112.5MW*	More than 35MW but not more than 52.5MW	More than 65MW but not more than 97.5MW	7%
More than 150MW but not more than 200MW	*More than 37.5MW but not more than 50MW*	*More than 112.5MW but not more than 150MW*	More than 52.5MW but not more than 70MW	More than 97.5MW but not more than 130MW	14%
More than 200MW	*More than 50MW*	*More than 150MW*	More than 70MW	More than 130MW	28%

Methodology for assessing Costs and Benefits

13. The methodology used for assessing the costs and benefits of this policy change is very similar to that used in the consultation Impact Assessment, ie a scenario-based approach to capture the considerable uncertainty about the impact of split degression bands on tariffs and deployment. The future level of solar PV deployment at all sizes is inherently uncertain, due to PV module costs that change rapidly in response to global market conditions, and the speed with which solar PV can be deployed in response to reductions in cost. Within the 50kW+ other-than-stand-alone and stand-alone sector in the UK, there is additional uncertainty around stand-alone and other-than-stand-alone's respective shares of future deployment. For a given amount of total deployment, degression under the Lead Option can vary depending on the split between other-than-stand-alone and stand-alone capacity.
14. **The scenarios in this IA are designed to illustrate a range of potential outcomes with split degression bands given levels of deployment observed so far under FITs, rather than a new 'central' projection of deployment.**
15. As with the consultation IA, we have developed 4 scenarios. These are as follows:
    a. 'Slow Growth, Current Splits'
    b. 'Slow Growth, 60% other-than-stand-alone/ 40% stand-alone splits'
    c. 'Fast Growth, Current Splits'
    d. 'Fast Growth, 60% other-than-stand-alone/ 40% stand-alone splits'
16. 'Slow growth' and 'fast growth' scenarios are based on different assumptions around how deployment reacts to tariff degression. These assumptions have been revised since the consultation IA, as set out in Table 3 below:

Table 3: Deployment in quarter following a degression, slow and fast growth scenarios (Government response and consultation)

Deployment as % of that in previous quarter	Slow growth scenarios- Government response		Fast growth scenarios- Government response		*Slow Growth scenarios- consultation*	*Fast Growth scenarios- consultation*
Degression	50-250kW	250-5000kW and Stand-alone	50-250kW	250-5000kW and Stand-alone	*All Bands*	*All Bands*
0%	105%	105%	120%	105%	*105%*	*120%*
3.50%	95%	90%	97%	90%	*80%*	*102%*
7%	50%	40%	60%	50%	*40%*	*60%*
14%	25%	15%	30%	25%	*20%*	*30%*
28%	0%	0%	10%	5%	*0%*	*10%*

17. Smaller (sub-250kW) other-than-stand-alone deployment is now assumed to react to degression in a different way to larger (250-5000kW) other-than-stand-alone and stand-alone. Based on historic deployment there is thought to be less scope for deployment in large capacity bands to grow rapidly, even if degression is low. As a result, it has been assumed that 250-5000kW and stand-alone deployment will grow by 5% per quarter if there is no degression in the Slow Growth and Fast Growth scenarios, whereas 50-250kW deployment will grow at 20% per quarter if there is no degression. In addition, it is assumed that degression will have a greater dampening effect on 250-5000kW and stand-alone deployment than it will on 50-250kW deployment.

18. 'Current splits' and '60% other-than-stand-alone/ 40% stand-alone splits' (henceforth referred to as '60/40 splits') scenarios are based on different assumptions around the level of deployment and how deployment will be split between stand-alone and other-than-stand-alone installations when the policy is introduced in January 2015.

19. 'Current splits' scenarios assume that deployment in the January-March 2015 solar deployment period equals average quarterly deployment in the January-March and April-June 2014 solar deployment period. In the consultation IA, 'current splits' scenarios were based on deployment in the January-March 2014 solar deployment period alone. As a result, total deployment for January-March 2014 and the share of stand-alone deployment were assumed to be higher in the consultation IA, as Table 4 below indicates:

Table 4: assumed January-March 2015 deployment, 'current splits' scenarios (Government response and consultation)

Additional capacity (MW) in Jan-Mar 2015	**Government response**	***Consultation***
50-100kW	4	*2*
100-150kW	4	*5*
150-250kW	10	*9*
250-5000kW	2	*3*
Stand-alone	31	*41*
Quarterly total	**51**	***60***
% stand-alone	*60%*	*68%*

20. There is considerable uncertainty around the future split of stand-alone and other-than-stand-alone deployment. Although the majority of deployment in the 50kW+ degression band is stand-alone, the Government's Solar Strategy outlines proposals to address removing some of the potential non-tariff-related barriers to other-than-stand-alone deployment: it is uncertain what impact this will have on how future deployment is split between stand-alone and other-than-stand-alone deployment.

21. In addition, the overall level of deployment after the policy change is introduced is also uncertain. The initial impact of the policy change on degression is highly sensitive to the overall level of deployment. If overall quarterly deployment is between 50 and 100MW, degression under Do Nothing will be 3.5%, meaning that degression under the Lead Option is unlikely to exceed this. However, if overall quarterly deployment is below 50MW, degression under Do Nothing will be 0%, meaning that degression under the Lead Option is likely to be higher.

22. The 60/40 splits scenario accounts for the possibility of other-than-stand-alone installations making up an increased share of deployment, and for overall deployment to be below 50MW when the policy is introduced.

23. Assumed January-March 2015 deployment under the 60/40 splits scenarios is set out in Table 5 below. Total deployment (other-than-stand-alone plus stand-alone) is 49MW, i.e. slightly below the trigger for 3.5% degression under current policy (50MW):

Table 5: assumed January-March 2015 deployment, '60/40 splits' scenarios (Government response and consultation)

Additional capacity (MW) in Jan-Mar 2015	**Government response**	***Consultation***
50-100kW	7	*9*
100-150kW	7	*9*
150-250kW	7	*9*
250-5000kW	7	*9*
Stand-alone	20	*24*
Quarterly total	**49**	***60***
% stand-alone	*40%*	*40%*

24. For the purposes of these scenarios, degression policy **is assumed to re-start in January 2015, with tariffs at current levels.** This implies that there will be no degression in the April-June 2015 Solar Tariff Period (degression is determined by deployment in the previous quarter but one). Therefore, tariffs and deployment in the April-June 2015 quarter (Solar Deployment and Tariff Periods) are assumed to be equal to those in January-March 2015. It is important to note that this **does not reflect the possible outcomes of FITs policy:** it is possible that tariffs for the October-December 2014 and January-March 2015 Solar Tariff Period will degress, and any degression for the April-June 2015 Solar Tariff Period will be determined by deployment prior to the policy change (as a result of deployment in the October-December 2014 quarter or if no degression triggers are reached in Q3 and Q4 calendar year 2014 we will see a 3.5% contingent degression in April 2015). Because tariff levels are uncertain rather than try to predict resulting degressions, we have assumed a re-start at current tariffs as a simplifying assumption for the purpose of the modelling.

25. From July 2015 onwards, degression is determined by deployment in the previous quarter but one, and deployment is determined in each scenario according to the assumptions in Table 3 above.

26. Resource costs and carbon savings (tCO2 and monetised) are calculated based on estimates of generation over the assumed lifetime of PV installations under DECC FITs assumptions[13]. Assumptions underlying these calculations are set out in 'Description of impacts' below.

[13] 35 years, see https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42835/3365-updates-to-fits-model-doc.pdf. Given that the analysis assumes new deployment up to 2020/21, costs up to 2054/55 are incorporated.

Description of Impacts

Deployment

27. Cumulative deployment out to 2020/21 for each of the scenarios is set out in Table 6 below, plus a comparison of deployment under Do Nothing and the Lead Option. Tables 7 and 8 show these figures disaggregated into other-than-stand-alone and stand-alone deployment:

Table 6: Cumulative deployment (50kW+ other-than-stand-alone, and stand-alone) under Do Nothing and Lead Policy Option under different deployment scenarios out to 2020/21 (figures rounded)

Cumulative capacity, MW	Scenario	2020/21
Do Nothing	Slow Growth, current splits	**1160**
	Slow growth, 60% other-than-stand-alone/ 40% stand-alone split	**1190**
	Fast Growth, current splits	**1290**
	Fast growth, 60% other-than-stand-alone/ 40% stand-alone split	**1350**
Lead Option	Slow Growth, current splits	**1050**
	Difference with Do Nothing	***-100***
	Slow growth, 60% other-than-stand-alone/ 40% stand-alone split	**1150**
	Difference with Do Nothing	***-40***
	Fast Growth, current splits	**1290**
	Difference with Do Nothing	***0***
	Fast growth, 60% other-than-stand-alone/ 40% stand-alone split	**1290**
	Difference with Do Nothing	***-60***

Table 7: Cumulative 50kW+ other-than-stand-alone deployment under different scenarios (figures rounded)

Cumulative capacity, MW	Scenario	2020/21
Do Nothing	Slow Growth, current splits	**530**
	Slow growth, 60% other-than-stand-alone/ 40% stand-alone split	**770**
	Fast Growth, current splits	**850**
	Fast growth, 60% other-than-stand-alone/ 40% stand-alone split	**1060**
Lead Option	Slow Growth, current splits	**620**
	Difference with Do Nothing	***90***
	Slow growth, 60% other-than-stand-alone/ 40% stand-alone split	**780**
	Difference with Do Nothing	***10***
	Fast Growth, current splits	**860**
	Difference with Do Nothing	***10***

	Fast growth, 60% other-than-stand-alone/ 40% stand-alone split	**910**
	Difference with Do Nothing	***-150***

Table 8: Cumulative stand-alone deployment under different scenarios (figures rounded)

Cumulative capacity, MW	Scenario	2020/21
Do Nothing	Slow Growth, current splits	**620**
	Slow growth, 60% other-than-stand-alone/ 40% stand-alone split	**420**
	Fast Growth, current splits	**450**
	Fast growth, 60% other-than-stand-alone/ 40% stand-alone split	**290**
Lead Option	Slow Growth, current splits	**430**
	Difference with Do Nothing	***-190***
	Slow growth, 60% other-than-stand-alone/ 40% stand-alone split	**370**
	Difference with Do Nothing	***-50***
	Fast Growth, current splits	**430**
	Difference with Do Nothing	***-10***
	Fast growth, 60% other-than-stand-alone/ 40% stand-alone split	**370**
	Difference with Do Nothing	***80***

Note: deployment estimates rounded to nearest 10MW. Estimates of difference between Lead Option and Do Nothing are calculated on the underlying, unrounded figures and may not correspond exactly to the rounded figures in these tables.

28. In most scenarios, other-than-stand-alone deployment is higher under the Lead Option, reflecting the policy intent to incentivise higher levels of other-than-stand-alone deployment. The exception to this is the Fast Growth, 60/40 splits scenario, where stand-alone deployment is higher under the lead option and other-than-stand-alone deployment lower. This is because in this scenario, other-than-stand-alone deployment comes to make up a very high percentage of overall deployment, such that degression triggers giving 65% of the current triggers to other-than-stand-alone deployment result in degressions being triggered leading to steeper tariff reductions (and lower deployment) for other-than-stand-alone under the Lead Option. Conversely, stand-alone deployment comes to make up a small percentage of overall deployment, such that degression triggers giving 35% of current triggers to stand-alone deployment are not triggered and tariffs do not fall very rapidly for the stand-alone. The reason that other-than-stand-alone now makes up a relatively high percentage of overall deployment is that the degression thresholds for other-than-stand-alone are now lower than in the consultation IA and the degression thresholds for stand-alone are higher.

29. Overall deployment is higher in the slow growth scenarios relative to the consultation IA and lower in the fast growth scenarios for both Do Nothing and the Lead Option. This was due to a change in the assumed impact on deployment of degression for the slow and fast growth scenarios. Furthermore, under the Lead Option, overall deployment is now either constant or falls in all scenarios. This is also different from the consultation IA, where overall deployment under the Lead Option rose in the 60% other-than-stand-alone/40% stand-alone scenarios and fell in the 'current splits' scenarios. This follows the adjustments to the degression thresholds between the two IAs, mentioned above. Actual deployment data on which the analysis was based was also updated for the Government Response.

Costs to consumers

30. Costs to consumers[14] under each scenario in 2020/21 are set out in Table 9 below. These are based on cumulative deployment out to 2020/21 in each of the FITs tariff bands in Table 1 above, the tariffs received by deployment in each quarter given degression, and the central FITs annual load factor assumption (9.7%)[15]. Costs to consumers represent the gross costs of generation tariff payments under each scenario; the difference with the Do Nothing option is also presented for each scenario:

Table 9: Total costs to consumers in 2020/21, 2011/12 prices, undiscounted, for cumulative deployment out to 2020/21 (figures rounded)

£m, 2011/12 prices	Scenario	2020/21
Do Nothing	Slow Growth, current splits	**50**
	Slow growth, 60% other than stand-alone/ 40% stand-alone split	**50**
	Fast Growth, current splits	**50**
	Fast growth, 60% other than stand-alone/ 40% stand-alone split	**60**
Lead Option	Slow Growth, current splits	**50**
	Difference with Do Nothing	***0***
	Slow growth, 60% other than stand-alone/ 40% stand-alone split	**50**
	Difference with Do Nothing	***0***
	Fast Growth, current splits	**60**
	Difference with Do Nothing	***0***
	Fast growth, 60% other than stand-alone/ 40% stand-alone split	**60**
	Difference with Do Nothing	***0***

Note: costs to consumers rounded to nearest £10m. Estimates of difference between Lead Option and Do Nothing are calculated on the underlying, unrounded figures and may not correspond exactly to the rounded figures in these tables.

31. Costs to consumers are very similar for Do Nothing and the Lead Option across all scenarios even though overall deployment is generally lower (see Table 6 above). This is because under the Lead Option, a larger proportion of other-than-stand-alone is deployed, which receives higher generation tariffs than stand-alone.

32. Overall cost to consumers has increased slightly under Do Nothing and the Lead Option, relative to the consultation IA, due to the changes assumptions underpinning deployment outlined above and some resulting changes to the tariffs, as deployment determines degression, which impacts on the level of the tariff in each period.

[14] Costs to consumers are based on our estimate of generation tariff payments. The export tariff payable to investors for electricity not used on site and exported back to the grid does not count as subsidy, since the export tariff is set to reflect the value of exported electricity from small-scale, embedded installations.

[15] So Costs to Consumers = Capacity * Tariff * Load Factor

Resource Costs

33. The resource costs[16] of solar PV deployment are assessed against a counterfactual of the long-run variable cost (LRVC) of electricity supplied to the commercial sector (central scenario) from updated supplementary Green Book guidance[17] over solar PV's technology lifetime[18]. Solar costs are based on cost and performance assumptions developed for the FITs Comprehensive Review in 2012[19]. Lifetime resource cost estimates[20] are set out in Table 10 below:

Table 10: Lifetime resource costs of solar PV deployment out to 2020/21 under different deployment scenarios, 2012 prices, discounted to 2014 at 3.5% (figures rounded)

Resource Costs, £m, 2012 prices, discounted to 2014	Scenario	Lifetime
Do Nothing	Slow Growth, current splits	**50**
	Slow growth, 60% other than stand-alone/ 40% stand-alone split	**120**
	Fast Growth, current splits	**140**
	Fast growth, 60% other than stand-alone/ 40% stand-alone split	**230**
Lead Option	Slow Growth, current splits	**90**
	Difference with Do Nothing	***40***
	Slow growth, 60% other than stand-alone/ 40% stand-alone split	**120**
	Difference with Do Nothing	***10***
	Fast Growth, current splits	**160**
	Difference with Do Nothing	***20***
	Fast growth, 60% other than stand-alone/ 40% stand-alone split	**180**
	Difference with Do Nothing	***-50***

Note: resource costs rounded to nearest £10m. Estimates of difference between Lead Option and Do Nothing are calculated on the underlying, unrounded figures and may not correspond exactly to the rounded figures in these tables.

34. Resource Costs are generally higher in the Lead Option. This reflects the higher proportion of other-than-stand-alone deployment under the Lead Option in most scenarios, which leads to higher resource costs due to the higher capital costs of other-than-stand-alone deployment. The exception to this is the Fast Growth, 60/40 splits scenario, where there is a higher proportion of cheaper stand-alone deployment (although it is worth noting that a scenario where policy was leading to lower levels of other-than-stand-alone deployment might trigger Government intervention). Moreover, the resource costs due not take into account the lower system losses associated with other-than-stand-

[16] Resource costs are costs related to building and running an installation, as opposed to costs to consumers which are based on subsidies (generation tariff) paid out to investors.

[17] See Table 9 at https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal.

[18] Assumed to be 35 years in line with DECC technology assumptions for small-scale solar PV, see https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42835/3365-updates-to-fits-model-doc.pdf

[19] For more details, see https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/43083/5381-solar-pv-cost-update.pdf, and https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42835/3365-updates-to-fits-model-doc.pdf.

[20] Lifetime resource costs cover the period from 2015 (when the policy would be introduced) to 2054 (when installations deploying in 2020/21 decommission based on the 35 year assumed technology lifetime of solar PV)

alone deployment compared to stand-alone deployment. Updated DECC departmental guidance on the electricity long-run variable cost, the long-run marginal grid emissions factor and the traded price on carbon have contributed to changes in overall resource cost between the consultation IA and the Government Response.

Carbon Savings

35. Lifetime carbon savings have been calculated based on the long-run marginal grid emissions factor (generation based) from supplementary Green Book guidance[21] for valuing greenhouse gas emissions in appraisal. These are then valued using the central scenario for the traded sector carbon price (also from supplementary Green book guidance[22]). Carbon savings are set out in Table 11 below, and monetised in Table 12. Carbon savings in each scenario reflect capacity and generation, ie greater solar PV deployment leads to greater carbon savings and *vice versa.* However, it is important to note that this methodology does not take into account the energy efficiency benefits of other-than-stand-alone PV with its higher levels of on-site electricity use compared to stand-alone PV[23]:

Table 11: Lifetime Carbon savings under different deployment scenarios from solar deployment out to 2020/21, mtCO2

Carbon Savings, mTCO2	Scenario	Lifetime
Do Nothing	Slow Growth, current splits	**3.9**
	Slow growth, 60% other-than-stand-alone/ 40% stand-alone split	**4.0**
	Fast Growth, current splits	**4.3**
	Fast growth, 60% other-than-stand-alone/ 40% stand-alone split	**4.5**
Lead Option	Slow Growth, current splits	**3.6**
	Difference with Do Nothing	***-0.3***
	Slow growth, 60% other-than-stand-alone/ 40% stand-alone split	**3.9**
	Difference with Do Nothing	***-0.1***
	Fast Growth, current splits	**4.4**
	Difference with Do Nothing	***0.0***
	Fast growth, 60% other-than-stand-alone/ 40% stand-alone split	**4.3**
	Difference with Do Nothing	***-0.2***

Note: Carbon savings have been rounded to the nearest 0.1mTCO2. Estimates of difference between Lead Option and Do Nothing are calculated on the underlying, unrounded figures and may not correspond exactly to the rounded figures in these tables.

Table 12: Lifetime monetised carbon savings from solar deployment out to 2020/21, £m, discounted, (lifetime totals rounded)

[21] The table is based on 2014 figures, which have not yet been published

[22] Also yet to be published

[23] Electricity generated by non-stand-alone installations and consumed on-site is not subject to losses in the transmission and distribution systems. 1 MWh of electricity generated and used on-site there displaces more than 1MWh of electricity bought from elsewhere (which will be subject to system losses). Displacing more electricity means greater carbon savings (assuming the displaced electricity is not zero-carbon).

Monetised Carbon Savings, £m discounted	Scenario	Lifetime
Do Nothing	Slow Growth, current splits	**110**
	Slow growth, 60% other than stand-alone/ 40% stand-alone split	**120**
	Fast Growth, current splits	**130**
	Fast growth, 60% other than stand-alone/ 40% stand-alone split	**130**
Lead Option	Slow Growth, current splits	**100**
	Difference with Do Nothing	***-10***
	Slow growth, 60% other than stand-alone/ 40% stand-alone split	**110**
	Difference with Do Nothing	***0***
	Fast Growth, current splits	**130**
	Difference with Do Nothing	***0***
	Fast growth, 60% other than stand-alone/ 40% stand-alone split	**130**
	Difference with Do Nothing	***-10***

Note: monetised carbon savings are rounded to nearest £10m. Estimates of difference between Lead Option and Do Nothing are calculated on the underlying, unrounded figures and may not correspond exactly to the rounded figures in these tables.

Net Cost

36. The net social cost of each option/scenario is calculated by subtracting lifetime carbon savings from lifetime resource costs. These are presented (for lifetime costs only) in Table 13:

Table 13: Net cost (resource cost minus carbon savings) of policy options under different scenarios

Net Cost, £m discounted	Scenario	Lifetime
Do Nothing	Slow Growth, current splits	**-60**
	Slow growth, 60% other than stand-alone/ 40% stand-alone split	**0**
	Fast Growth, current splits	**20**
	Fast growth, 60% other than stand-alone/ 40% stand-alone split	**90**
Lead Option	Slow Growth, current splits	**-10**
	Difference with Do Nothing	***50***
	Slow growth, 60% other than stand-alone/ 40% stand-alone split	**10**
	Difference with Do Nothing	***10***
	Fast Growth, current splits	**40**
	Difference with Do Nothing	***20***

	Fast growth, 60% other than stand-alone/ 40% stand-alone split	**50**
	Difference with Do Nothing	***-40***

Note: Net costs have been rounded to the nearest £10m. Estimates of difference between Lead Option and Do Nothing are calculated on the underlying, unrounded figures and may not correspond exactly to the rounded figures in these tables.

37. As with resource costs, net costs are generally higher under the Lead Option under most scenarios due to the higher proportion of more expensive other-than-stand-alone deployment. The exception to this is the Fast Growth, 60/40 splits scenario, which is lower cost due to a higher proportion of stand-alone deployment. Moreover, the results do not reflect that other-than-stand-alone deployment is typically associated with lower system losses than stand-alone deployment. Compared to the Consultation IA estimated net costs are reduced, primarily reflecting a lower estimated impact on deployment of other-than-stand-alone PV.

Uncertainties and Assumptions

38. Future solar PV deployment is inherently uncertain: a major driver of system costs is the price of panels, which depend on global market conditions and are highly sensitive to fluctuations in supply and demand. In addition, solar PV can be deployed very quickly, meaning deployment is very sensitive to any changes in cost. Furthermore, there is considerable uncertainty over the future split of 50kW+ deployment under FITs between other-than-stand-alone and stand-alone systems, and between deployment coming forward under the FIT or under the RO, which makes it hard to anticipate what the impact of the new degression bands will be. Estimates of future costs of solar PV, electricity and carbon prices, and grid emissions factors used to calculate the net present value estimates are also inherently uncertain.
39. In addition, the scenarios make assumptions about how the 50kW+ other-than-stand-alone and stand-alone sectors will react to degressions. Given limited evidence around the effects of degression, there is considerable uncertainty around this: since August 2012, the solar sector as a whole has experienced only automatic degressions every 9 months, with the first non-automatic degression in the >50kW bands of 3.5% occurring on 1 July 2014 , based on deployment between January and March 2014 (see Table 1 above). Under our scenarios, non-automatic degressions also occur, and it is uncertain how the sector would react to the increased risks posed by more frequent, less predictable degression. In addition, it is uncertain how investors in other-than-stand-alone will react to the creation of a separate other-than-stand-alone degression band. If they believe this significantly de-risks the sector (by removing the possibility of stand-alone-driven degressions) activity levels in the sector could increase. Furthermore, it is uncertain how investors will react if Government proposals to remove non-financial barriers to deployment, as set out in the Solar Strategy, are successful.
40. As a result, these scenarios should be treated as **indicative,** and intended to show a range of potential impacts for the policy.
41. These scenarios assume that there is some inflexibility between transferring across from FITs to RO and vice versa, and that some investors are not equipped to invest under the RO[24]. If all investors were able to invest under the RO, there would be no deployment under FITs in scenarios where tariffs reduce quickly while the RO remains open, as all investors would seek to invest under the RO as it is likely to offer significantly higher returns.

[24] The RO will remain open to solar PV projects up to and including 5MW until it closes in March 2017.

Sensitivities

42. No additional sensitivity analysis has been carried out in addition to the scenarios described above.

Non-monetised Impacts

Energy Efficiency (reduced system losses)

43. As explained in paragraph 1 above, other-than-stand-alone solar PV has a greater potential for the energy generated to be used on site. This reduces demand for imported energy, thereby minimising energy loss and reducing pressure on the electricity grid. This benefit (in terms of reduced resource costs and reduce emissions) has not been reflected in the resource costs calculations.

Wider Impacts

Bill Impacts

44. The estimated costs of supporting FITs generation to energy consumers (including households and businesses) in 2020/21 under the Lead Option are the same as the Do Nothing. .

Employment

45. As set out in paragraph 1 above, initial research for the Solar Strategy suggests that other-than-stand-alone/ building mounted PV supports significantly more jobs in the sector per 1MWP than stand-alone/ solar farms, i.e. triple. These include highly skilled jobs in R&D and manufacturing which, according to BRE research, the stand-alone sector in the UK does not appear to support.

RO Closure

46. The RO is scheduled to close to new solar installations <5MW in March 2017: this means that after that date, solar installations of up to and including 5MW that would previously have sought to accredit under the RO are likely to seek to accredit under FITs, since (under current policy) Contracts for Difference will not be available to plants of this size. Although current deployment of installations of up to 5MW under the RO is low (only 3MW of new capacity has commissioned in the last year, since September 2013[25]) previous months saw high levels of deployment by installations of up to and including 5MW (e.g. 150MW deployed in March 2013 before the 1 April cut in ROCs) and future deployment is uncertain. Furthermore, it appears that almost all deployment of installations of up to and including 5MW under the RO since separate ground mount and roof mount bands were created in April 2013 has been ground mounted. There is therefore the possibility that RO closure could lead to significantly higher stand-alone deployment under FITs from 2017/18 onwards. Under current policy, this could lead to substantial degressions for 50kW+ other-than-stand-alone as well as stand-alone, even though this would not reflect falls in other-than-stand-alone costs. The Lead Option protects other-than-stand-alone installations from such tariff reductions in the event of RO closure, by limiting the impact of degressions triggered by increased stand-alone deployment under the FIT, to stand-alone installations.

47. We have assumed that changes in solar PV deployment resulting from this policy will have no effect on the cost of the UK meeting its 2020 renewables target. This is because the maximum change in solar PV deployment under FITs we have estimated is a reduction of 100MW: the amount of electricity generated by this capacity (0.85TWh/year) is small in comparison with projected UK total

[25] Source: https://www.gov.uk/government/publications/renewables-section-6-energy-trends, Table 6.4

renewable electricity generation in 2020 (109TWh)[26]. Moreover, it is uncertain what the reduction would be in net terms (i.e. across FITs and RO) because some projects may move across from FITs into the RO.

Conclusion

48. As stated in paragraph 26 above, we have estimated a range for the net cost of the lead option of **-£40m to +£50m**. In most scenarios the lead option has a positive net cost (i.e. more expensive); the exception to this is the Fast Growth, 60/40 splits scenario, where there is a higher proportion of cheaper stand-alone deployment. This range does not reflect the additional benefits to the UK from other-than-stand-alone PV as outlined above (employment impacts in the sector, skills, energy efficiency (reduced system losses), supply chain impacts, protection for other-than-stand-alone against RO closure) which make the UK Government keen to promote greater deployment of building mounted installations. In recognition of these non-monetised and wider benefits, **the Lead Option is the recommended preferred option**.

[26] Source: DECC, Electricity Market Reform Delivery Plan, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/268221/181213_2013_EMR_Delivery_Plan_FINAL.pdf