Title: Government Response to Consultation on the Comprehensive Review Phase 2B - on Feed-in Tariffs for anaerobic digestion, wind, hydro and micro-CHP installations	**Impact Assessment (IA)**
	Date: 20/07/12
IA No: DECC0077	**Stage:** Final
Lead department or agency: DECC	**Source of intervention:** Domestic
	Type of measure: Secondary legislation
Other departments or agencies:	**Enquiries:** Andrew.Jones1@decc.gsi.gov.uk

Summary: Intervention and Options

RPC: N/A

Cost of Preferred (or more likely) Option				
Total Net Present Value	**Business Net Present Value**	**Net cost to business per year** (EANCB in 2009 prices)	**In scope of One-In, One-Out?**	**Measure qualifies as**
£280m	£m	£m	No	N/A

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

Intervention is necessary to ensure that future tariff levels that support investment in low-carbon electricity generation reflect the latest available information, do not provide excessive profits to investors and offer value for money to consumers who fund the scheme through electricity bills. Phase 2B of the FITs review updates evidence on sub-5MW low carbon electricity generation costs and performance of eligible technologies, namely AD, wind, hydro and micro-CHP but excluding solar PV (considered in Phase 2A of the review). As well as tariffs, Phase 2B has looked at a wide range of other issues, including a degression mechanism for eligible technologies, the treatment of community-owned installations, preliminary accreditation, and other administrative issues.

What are the policy objectives and the intended effects?

The overriding policy objective of the scheme is to encourage the uptake of small scale low carbon electricity generation as part of the portfolio approach to meeting the 2020 renewables target; to enable householders and smaller scale investors to engage directly in the transition to a low carbon economy; and to develop the supply chain. The specific aim for Phase 2B is to ensure that these objectives are delivered cost-effectively and within DECC's current spending limits. The intended effects are that future tariff levels reflect latest available evidence on industry costs and performance. This will in turn reduce the risk of overcompensation and ensure that the scheme remains affordable over the longer term.

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

2 Options have been considered in this Impact Assessment:

i) Option 1: Do nothing - this measures the costs and benefits of AD, wind, hydro and micro-CHP uptake under unchanged tariffs (i.e. tariffs as proposed when the scheme was launched in April 2010 and amended under the Fast Track review).

ii) Option 2: Lead Option - implement tariffs for installations installing from December 2012 according to a set of tariff-setting rules; and then 5% annual degression of tariffs for new installations from April 2014, (subject to a cost control mechanism that may trigger steeper/shallower degression steps depending on deployment), and implement the Phase 2A decision increase export tariff to 4.5p/kWh.

Phase 2B decisions related to administrative decisions e.g. related to preliminary accreditation are not included in the analysis.

The preferred option is the lead option (Option 2) which sets tariff levels based on latest technology cost and performance data. This option provides better balance between incentivising deployment whilst reducing the risk of investor overcompensation, and helps to ensure that the scheme remains affordable over the longer term.

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

Does implementation go beyond minimum EU requirements?			**N/A**		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	**Micro** Yes	**< 20** Yes	**Small** Yes	**Medium** Yes	**Large** Yes
What is the CO2 equivalent change in greenhouse gas emissions? (Million tonnes CO2 equivalent)			**Traded:** +3		**Non-traded:** 0

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

Date: 20/07/12

Summary: Analysis & Evidence — Policy Option 2

Description: Lead Option (Option 2) – implement tariffs for installations installing from December 2012 according to a set of tariff-setting rules; and then 5% annual degression of tariffs for new installations from April 2014, subject to a cost control mechanism that may trigger steeper/shallower annual degression steps, plus six monthly degression if there is very high uptake in first 6 months of year. Increase export tariff to 4.5p/kWh.

FULL ECONOMIC ASSESSMENT

Price Base Year 2010	PV Base Year 2010	Time Period Years 30	Net Benefit (Present Value (PV)) (£m)		
			Low: £130m	High: £860m	Best Estimate: £280m

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low			£m	£30m
High			£m	£600m
Best Estimate			£m	£110m

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

The monetised cost of this option is the value of higher EU Emissions Trading Scheme allowance purchases in the UK power sector as a result of lower low-carbon deployment under reduced tariffs for wind, hydro and AD under Option 2 compared with Do Nothing. The high cost estimate reflects much lower deployment under FITs compared to Do Nothing under the low technology cost sensitivity, and feeds into the high NPV figure above. The low figure reflects low FITs deployment for both the lead and the Do Nothing scenarios under the high cost sensitivity, and relates to the low NPV estimate above.

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

This impact assessment doesn't include costs and benefits of future micro-CHP uptake due to data uncertainties. Costs/benefits associated with balancing have not been included. Impacts on energy security have not been measured.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low			£m	£180m
High			£m	£1460m
Best Estimate			£m	£390m

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

The benefit of this option is lower resource costs associated with lower deployment of wind, hydro and AD under Option 2's reduced tariffs. The high estimate is associated with much lower FITs deployment with the lead option compared to Do Nothing under the low technology cost sensitivity, and is used to calculate the high NPV figure above. The low figure is associated with low FITs deployment for both the lead option and Do Nothing under the high costs sensitivity, and relates to the low NPV estimate above.

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

Lower deployment will avoid incurring some variable scheme administration costs. These have not been quantified.

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

Estimates of potential uptake and of corresponding costs/benefits rely heavily on a number of assumptions, including capital and operating costs, technology performance characteristics, future electricity and carbon prices and investor behaviour. Projections are therefore subject to a degree of uncertainty, especially given that FITs is a demand-led scheme. Low/High uptake sensitivities have been developed using high/low capex and opex assumptions.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs:	Benefits:	Net:	No	N/A

Evidence Base (for summary sheets)

A. Strategic overview

1. The Feed-in Tariffs (FITs) scheme was introduced by the Department for Energy and Climate Change (DECC) in April 2010 to work alongside the Renewables Obligation (RO) and the Renewable Heat Incentive (RHI). The scheme is specifically designed to promote take up of small-scale (<5MW) low-carbon electricity generation technologies by the public and communities. This is part of a portfolio approach to meeting the UK's renewable energy target that commits the UK to meeting 15% of its energy needs from renewable resources by 2020.

2. The strategic aim of the FITs programme is that small-scale (up to 5MW) decentralised low-carbon electricity generation will become accessible to communities in a way that provides value for money for bill payers. This is achieved by setting support tariffs that encourage cost-effective deployment and applying cost control mechanisms that keep total spend within the defined affordability parameters as set out in the Levy Control Framework[1].

3. The Comprehensive Review Phase 1 of FITs was announced on 7 February 2011 and looked at all aspects of the FITs scheme including: administration and eligibility of technologies; understanding changes in technology costs; considering whether the original target rates of return remained appropriate; and ensuring that the FITs scheme was able to operate within the spending parameters confirmed by the 2010 Spending Review and Levy Control Framework.

4. Because of the immediate risk to the budget caused by the plummeting costs of solar PV after the launch of the FITs scheme and its substantially increased take-up, it was necessary to address solar PV tariff levels as a priority. A 'fast track review' of tariffs for larger-scale (50-5000kW) solar PV installations was announced in March 2011, and reduced tariffs were introduced for these installations in August 2011. A review of smaller-scale (sub-50kW) solar PV tariffs was launched in October 2011, and reduced tariffs for these installations were introduced from March 2012, thus concluding Phase 1 of the Comprehensive Review.

5. Phase 2 of the Comprehensive Review was announced alongside the Government Response to Phase 1, and consists of two further consultations.

6. **Phase 2A** set out proposals for solar PV tariffs together with proposals for future tariff degression and potential changes to the export tariff, tariff lifetime, and tariff indexation. The Government response to the Phase 2A consultation was published on 24 May, with changes to be implemented from 1 August.

7. **Phase 2B** of the review has focused on changes to the tariffs for non-PV technologies eligible for FITs, namely: Wind, Hydro, Anaerobic Digestion (AD) and micro-combined heat and power (micro-CHP), and set out proposals for future tariff degression and changes to the export tariff for these technologies. At the time of Consultation, tariff proposals reflected research carried out for DECC by Cambridge Economic Policy

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[1] The parameters of affordability have been set for the current spending review period (2011/12 to 2014/15) by the Control Framework for DECC Levy-funded Spending (the 'Levy Control Framework'). Further details on how the costs of the FITs scheme are managed via the Levy Control Framework can be found on the HMT website: http://hm-treasury.gov.uk/psr_controlframework_decc.htm

Associates (CEPA) and Parsons Brinckerhoff (PB)[2]. In addition, the review has focused on various administrative aspects of the scheme to ensure they work as efficiently as possible, as well as on potential measures to support uptake under FITs by community groups.

8. Taking account of further updates to cost assumptions by PB[3], as well as deployment information, this Impact Assessment accompanies the Government Response to the Phase 2B Consultation that sets out final decisions on:

   - The schedule of FITs generation tariffs for AD, wind, hydro and micro-CHP installations installing from December 2012 according to a set of tariff-setting rules;
   - Annual degression rates of tariffs for new installations of these technologies (with the exception of micro-CHP) from April 2014, as well as a mechanism for changing baseline degression rates depending on observed deployment;
   - Setting the level of export tariff for these technologies;
   - A system of preliminary accreditation for all AD and hydro installations, and for wind and solar PV installations above 50kW;
   - A package of measures to support community projects;
   - A range of administrative issues, including site definition.

9. This Impact Assessment analyzes the impact of changes to generation and export tariffs and the tariff degression mechanism.

B. Problem under consideration

10. The evidence base that underpinned tariff-setting for FITs eligible technologies was over two years old when Phase 2B of the FITs review was launched. Phase 2B of the review has updated the evidence on FITs eligible non-PV technology costs, and provided a more accurate evidence base for setting tariff levels that encouraged investment in small-scale low carbon electricity generation, whilst reducing the risk of overcompensating investors.

C. Rationale for intervention

11. Intervention is necessary to ensure that future tariff levels that support investment in low carbon electricity generation reflect the latest available information, do not provide excessive profits to investors and offer value for money to consumers who fund the scheme through their electricity bills.

12. From its establishment in April 2010, the FITs scheme was intended to encourage deployment of additional small scale low carbon electricity generation, particularly by

[2] CEPA/PB, 'Updates to the FITs model: documentation of changes made for non-PV technologies' available at http://www.decc.gov.uk/en/content/cms/consultations/fits_rev_ph2b/fits_rev_ph2b.aspx.
[3] PB for DECC, 'Update of non-PV Data for Feed in Tariff', available at http://www.decc.gov.uk/en/content/cms/consultations/fits_rev_ph2b/fits_rev_ph2b.aspx

individuals, householders, organisations, businesses and communities who have not traditionally engaged in the electricity market. For these investors, delivering a mechanism which is easier to understand and more predictable than the Renewables Obligation (RO), as well as delivering additional support required to incentivise smaller scale and more expensive technologies, were the main drivers behind the development of this policy.

13. A 'rate of return' approach to tariff-setting was considered to deliver the best overall balance between incentivising investment in a mix of technologies, fostering engagement at the household/community level and scheme cost-effectiveness. Providing a 5-8% real, pre-tax rate of return on capital was estimated to lead to a significant increase in deployment of small scale low carbon generation.

14. The data compiled prior to the launch of the Phase 2B consultation by CEPA/PB, and during the Phase 2B Consultation by PB on various technology characteristics, including capital and operating costs and load factors, differs from the original data that informed tariff-setting for the launch of the scheme in April 2010. This suggested that tariffs needed to be revisited to ensure that they are providing the appropriate level of support to drive uptake whilst minimising the extent of any overcompensation.

15. CEPA/PB's evidence on hurdle rates suggested that a rate of return range of between 5% and 8% remains broadly appropriate for non-domestic investors (the key investor group for hydro, wind and AD). This is based on an assessment of what rates of return are currently available for alternative investment opportunities.

16. Analysis by DECC as part of the Phase 2A review suggested that the export tariff (currently set at 3.2p/kWh) does not reflect the value of FITs exported electricity. The 'system sell price' (the price paid by National Grid for electricity spilled[4] onto the system) represents the best estimate of the value of deemed[5] electricity exports. In 2011, the average system sell price was 4.1p/kWh, and this had been increasing in recent years in line with wholesale electricity prices, such that the current and future average system sell price is likely to be higher still[6].

17. There remains significant uncertainty around the costs and performance of non-PV technologies, which tend to vary widely from installation to installation. To minimize the risk of higher than expected deployment which will put pressure on the FITs budget, a mechanism which triggers faster tariff degression if uptake is significantly ahead of expectation is required.

D. Objectives

18. The specific aim for Phase 2B is to ensure that the vision of the FITs scheme (that small-scale, decentralised low-carbon electricity generation will become accessible to communities in a way that provides value for money for bill payers) is delivered within DECC's current spending limits. This can be achieved by ensuring that tariffs levels for AD, wind, hydro and micro-CHP reflected latest evidence on technology costs and performance, thus reducing overcompensation of investors and improving value for money for consumers, and allowing DECC to stay within the spending parameters set

[4] 'Spilled' electricity is that which a generator puts on to the system without notice.
[5] Exports from installations of 30kW or less are generally not metered but are deemed to be 50% of electricity generated. The level of the export tariff is therefore most relevant to these smaller installations.
[6] For more details see p20, DECC, 'Government response to Consultation on Comprehensive Review Phase 2a' available at http://www.decc.gov.uk/en/content/cms/consultations/fits_rev_ph2a/fits_rev_ph2a.aspx

by the Levies Control Framework. The review also aims to drive cost reductions over the longer term to enable the 2020 renewables target to be achieved in a cost-effective manner.

E. Options under consideration

19. Options considered in this final Impact Assessment are:

(i) Option 1: Do Nothing – which considers leaving future tariff levels unchanged from their current proposed levels;

(ii) Option 2: Introduce new tariffs to apply from December 2012 (including an increase in export tariff to 4.5p/kWh, which was decided as part of Phase 2A), plus automatic tariff degression of 5% per annum[7] from April 2014, subject to a cost control mechanism whereby annual degression steps are steeper in the event of higher than expected deployment, and shallower if deployment is less than expected[8]. In addition, the mechanism allows for an extra October degression step if deployment in the first 6 months of the year exceeds expected deployment.

Option 1: Do Nothing

20. The 'Do Nothing' option considers leaving future tariff levels unchanged from those proposed prior to the launch of the FITs scheme in April 2010 and amended following the 2011 Fast Track review[9]. This option attempts to set out what would happen in the absence of a review and provides a benchmark against which the lead option ('Option 2') can be compared.

21. Generation tariffs under the Do Nothing option are presented in Table 1 below (see 'Current Tariffs' column). Wind and hydro installations below 100kW are also assumed to receive the pre-Phase 2A export tariff of 3.2p/kWh (2012 prices). Wind and hydro installations larger than 100kW and all AD installations are assumed to receive a price of 5p/kWh (2012 prices) for their exported electricity, reflecting evidence that larger installations tend to opt out of the export tariff in order to negotiate a higher price elsewhere through power purchase agreements (PPAs)[10].

Option 2: Introduce new tariffs for AD, Wind, Hydro and Micro-CHP installations from December 2012, increase export tariff to 4.5p/kWh, with baseline future degression from April 2014 at 5% per year, plus steeper/shallower annual degression steps if uptake is more/less than expected, and an additional October degression step if uptake over first 6 months of year exceeds expected annual deployment

Tariffs

[7] All degression steps in this IA are expressed in real terms, ie degressed tariffs will be uplifted by RPI to account for inflation.
[8] See paragraph 53 below for explanation of how 'expected' deployment is defined.
[9] New tariffs for AD installations up to 500kW were introduced as set out in the FITs Fast Track Review of 9th June 2011. The Do Nothing tariffs for AD up to 500kW therefore refer to these tariffs rather than those introduced prior to the scheme launch.
[10] See DECC, 'Government Response to consultation on Comprehensive Review 2a', p20 (available at http://www.decc.gov.uk/en/content/cms/consultations/fits_rev_ph2a/fits_rev_ph2a.aspx). 5p/kWh is the implied average value of wind and hydro output in the Non-Fossil Fuel Purchasing Agency (NFPA) RO certificate auctioning process.

22. The final tariff schedule is the same as that proposed in the consultation, apart from the introduction of a new tariff band for 100-500kW hydro. This band has been introduced in response to consultee concerns about a perceived 'cliff edge' between the 15-100kW and 100-2000kW proposed tariffs (19.7p/kWh and 12.1p/kWh respectively), which could lead to investors undersizing projects in order to receive the higher tariff. Current, consultation and final tariffs are presented in Table 1 below:

Table 1- Current and Proposed Generation Tariffs

Technology	Tariff Band (kW capacity)	Current tariffs (p/kWh)	Consultation tariffs from Oct 2012 (p/kWh, 2012 prices)	Final tariffs from Dec 2012 (p/kWh, 2012 prices)***
Hydro	≤15	21.9	21.0	21.00
	>15 - ≤100	19.6	19.7*	19.60
	>100 - ≤500	12.1	12.1	15.50
	>500 - ≤2000	12.1	12.1	12.10
	>2000 - ≤5000	4.9	4.5 (2.2 from April 2013)	4.48 **
Wind	≤1.5	35.8	21.0	21.00
	>1.5- ≤15	28.0	21.0	21.00
	>15- ≤100	25.4	21.0	21.00
	>100 - ≤500	20.6	17.5	17.50
	>500 - ≤1500	10.4	9.5	9.50
	>1500 - ≤5000	4.9	4.5 (4.1 from April 2013)	4.48 **
AD	≤250	14.7	14.7	14.70
	>250 - ≤500	13.6	13.7*	13.60
	>500 - ≤5000	9.9	9.0	8.96 **
Micro-CHP	≤2 kW	10.5	12.5	12.50

*2012-13 tariffs in consultation were calculated using a different RPI inflator to that used by Ofgem in determining final tariffs, hence there are slight discrepancies between the two.

** These tariffs will be subject to change in April 2013 to reflect support levels as a result of the RO Banding Review.

*** Current and consultation tariffs are shown to one decimal place as published. Final tariffs from December 2012 are shown to two decimal places for consistency with tariffs published in 'Government Response to consultation on Comprehensive Review Phase 2A: Solar PV cost control'

23. CEPA/PB's evidence on hurdle rates suggests that a 'target' rate of return range of between 5% and 8% (real, pre-tax) [11] remains broadly appropriate for non-domestic investors (the key investor group for hydro, wind and AD).

24. The tariff schedule takes into account the broad 5-8% rate of return range for installations installing in December 2012, alongside the following set of criteria to ensure that value for money, affordability considerations and the objective for long term cost reductions are taken into account:

    i. No generation tariff (with the exception of micro-CHP) will increase beyond its current proposed level for 2012/13 (accounting for RPI index-linking of tariffs);

[11] CEPA/PB, 'Updates to the FITs model: documentation of changes made for non-PV technologies' available at http://www.decc.gov.uk/en/content/cms/consultations/fits_rev_ph2b/fits_rev_ph2b.aspx.

ii. No tariffs will exceed 21p/kWh (the new tariff level for solar installations up to 4kW from April 2012 to end July 2012);

iii. The existing transitions towards RO levels at the 5MW cross-over point between schemes will be retained. This affects the upper bands for hydro, wind and AD;

iv. All technologies will be subject to a version of the cost control regime that is being put in place for solar PV – including annual automatic degression and capacity triggers.

25. The tariff changes will take effect from 1 December 2012, rather than 1 October as proposed in the consultation. This is to reflect the generally longer lead times for non-PV technologies, and the relatively minimal impact of payments for these technologies on the FITs budget, compared with solar PV.

26. In addition, the changes to the export tariff (to 4.5p/kWh for all new entrants to the scheme) will be implemented for non-PV tariffs from 1 December. This is in light of analysis by DECC suggesting that the export tariff (currently set at 3.2p/kWh) does not reflect the value of FITs exported electricity. The 'system sell price' (the price paid by the system operator for electricity spilled onto the system) represents the best estimate of the value of deemed electricity exports, which make up the largest proportion of the export tariff. In 2011, the average system sell price was 4.1p/kWh, and this had been increasing in recent years in line with wholesale electricity prices[12].

27. Further explanation of the new tariffs by technology type is provided in the sections below. It should be noted that outturn rates of return will vary from installation to installation and so in reality could fall above or below any 'target' rates of return. Further details on the cost and technical assumptions underpinning tariff setting are set out in PB's report for DECC, 'Update of non-PV data for Feed in Tariff', published as part of the Government response to the consultation[13].

Tariffs linked to the RO

28. As proposed in the consultation, we will continue to link tariffs for the largest capacity band for each technology to those that that apply to an equivalent installation in the RO. It is important that there are no perverse incentives to choose one instrument over the other – or to inefficiently undersize projects so that they are eligible for FITs rather than the RO.

29. We will adjust tariffs for these bands to levels we consider to be equivalent to the support currently available under the RO. These are calculated using a value of £44.78 (2012 prices) per ROC, which is the 2012/13 buyout price plus 10% to allow for RO headroom. Tariffs from 1 April 2013 until 31 March 2017 will be set at a level equivalent to the levels of support provided under the RO to a 5 MW plant. Tariffs for 2017/18 and beyond are set at the level of 2016/17. However we expect that tariffs will be reviewed before this time, particularly given the wider context of Electricity Market Reform, so this should be taken as an indicative position in the interim.

30. All tariffs will be adjusted annually for changes in the RPI from April 2013.

[12] For more details see DECC, 'Government Response to consultation on Comprehensive Review Phase 2A' p20-21 (available at http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/renewable-energy/5386-government-response-to-consultation-on-comprehensi.pdf).
[13] PB for DECC, ibid.

31. Tariffs in the largest bands set at levels equivalent to the RO will not be subject to annual degression changes unless deployment in the relevant band in the previous year is greater than 150% of the expected[14] level, in which case the tariff will be reduced by 10% or 20% according to the criteria set out in the 'Future Tariffs and Cost Control' section below. However, deployment in these bands contributes to the deployment thresholds and may therefore affect degression rates in other bands. If degression is applied to these tariffs, later years' tariffs will be determined according to the normal degression rules (i.e. were the RO equivalence in a band broken by the need for a 10% degression, normal degression rules would apply from that point on).

Hydro

32. Hydro tariffs are largely identical to those proposed in the consultation. There is one exception to this: the **100-2000kW** band, which will be split into **100-500kW** and **500-2000kW** bands**:** the 100-500kW band will receive a tariff of 15.5p/kWh, and the 500-2000kW band will receive 12.1p/kWh as under consultation proposals. This change reflects consultation feedback highlighting the significant difference between the 15-100kW tariff (19.7p/kWh) and the 100-2000kW tariff (12.1p/kWh), giving investors an incentive to undersize projects below 100kW in order to receive the higher tariff, leading to an inefficient use of hydro resource and preventing realization of scale economies.

33. In PB's latest update, hydro capital costs ('capex') and operation and maintenance costs ('opex') are generally higher in real terms[15], reflecting a more extensive data set than in the previous CEPA/PB report providing a more accurate picture of costs, as well as general inflationary pressures. As a result, estimated rates of return are generally lower than those presented in the Consultation, but within the 5-8% target range in most tariff bands. The exception to this is the 500-2000kW band, where they range from 8-12%. This is in line with analysis supporting the consultation, which justified returns of higher than 8% given the uncertainties around hydro costs. It remains difficult to access robust cost data in this band, especially at the larger end (PB were only able to obtain two data points for 1000-2000kW projects). Given continued uncertainty it is appropriate to retain the tariffs proposed in the Consultation.

34. It was proposed in the consultation that tariffs for 2000-5000kW hydro installations would be aligned with RO support levels. It is intended to maintain that equivalence, with tariffs from December 2012 reflecting the current level of RO support, and adjusted if necessary in April 2013 to reflect the final decisions in the Government response to the Banding Review.

Wind

35. Tariffs for wind will be reduced from current levels, but are unchanged from those proposed in the Consultation. Tariffs for the 2000-5000kW band from December 2012 will reflect the current level of RO support, and will be adjusted if necessary in April 2013 to reflect the final decisions in the Government response to the Banding Review.

[14] See paragraph 53 for explanation of how 'expected' deployment is defined.
[15] All comparisons of assumptions in CEPA/PB's earlier report and PB's latest report relate to the central set of assumptions which is used for tariff setting.

36. As a result of PB's latest assumptions update, estimates of the rate of return at the Consultation tariffs have changed. For most bands, tariffs are expected to give rates of return in the target 5-8% range. The exceptions to this are:

- **1.5-15kW:** estimated rate of return of 4%. This is due to increased capex and opex in the latest PB assumptions. The 1.5-15kW band would require a tariff in excess of 21p/kWh for a return in excess of 5%. This would run contrary to criterion ii. at paragraph 24 above, hence the tariff will be 21p/kWh as proposed in the Consultation.

- **100-500kW:** estimated rate of return of approximately 10%. For the 100-500kW band, returns are higher than estimated at the time of the consultation launch due to increased load factors (which more than offsets increases in capex and opex) in PB's latest assumptions. In addition, it is now assumed that installations in this band receive 5p/kWh for their exported electricity, (reflecting evidence that larger installations tend to opt out of the export tariff in order to negotiate a higher price elsewhere) whereas earlier it was assumed that they received the export tariff.

- **500-1500kW:** estimated rate of return of approximately 10%. PB's estimate of capex for this band is unchanged in real terms. PB's latest estimates of load factors are lower, but this is more than offset by decreases in opex and changes to assumptions on export value, leading to a higher rate of return than was estimated at the time of the consultation.

37. Tariffs for the 100-500kW and 500-1500kW bands will be unchanged from those in the consultation, in light of continuing uncertainty around costs (especially in the 100-500kW band, where PB's report highlighted significant variability in the costs and characteristics of the various turbines available), as well as relatively low deployment (less than 20MW installed under FITs so far in these bands). The minimum annual degression rate for these bands will be 5%, rather than the 2.5% minimum rate that will apply in other bands (see 'Future Tariffs and Cost Control' section below for more details). This will ensure that tariffs are reduced appropriately in the event of higher than anticipated deployment.

AD

38. Tariffs for farm-scale AD (i.e. for installations up to 500kW) will be held at the levels introduced in the Fast Track review of FITs in June 2011, consistent with the constraint that no tariffs are increased from their current levels. They will however increase by RPI from 1 April 2013.

39. In their latest update of assumptions for installations up to 500kW, PB's capex estimate has decreased by 10-15% in real terms compared to the previous report. Opex for installations up to 250kW has increased by around 15% in real terms, while it has stayed roughly constant for 250-500kW. In addition, it is now assumed that all AD installations receive 5p/kWh for their exports rather than the export tariff. The net effect of these changes is that (as in the Consultation) these tariffs are expected to provide rates of return of less than 5% for this size of installation.

40. Tariffs for 500kW-5MW installations from December 2012 will reflect the current level of RO support, and will be adjusted if necessary in April 2013 to reflect the final decisions in the Government response to the Banding Review. Installations in this band are expected to be able to achieve a rate of return of over 8% based on the new

PB assumptions, due to real terms falls in both capex and opex, as well as changed assumptions regarding the value of AD exports (see paragraph 64 below).

41. There is a high degree of uncertainty on all aspects of AD, including cost assumptions and load factors as well as non-financial drivers of uptake such as planning. Current tariff levels have led to 8 farm-scale (up to 500kW) installations currently claiming FITs, and 8 installations larger than 500kW (with over 100 projects under 5MW having obtained planning consent), suggesting that maintaining tariffs at current levels will continue to incentivise further uptake. These tariffs are intended to ensure value for money in light of significant uncertainty as to what level of tariff would be 'sufficient' to drive uptake, and the extent to which non-financial drivers of uptake matter.

Micro-CHP

42. Considerable uncertainties remain as to micro-CHP cost and performance characteristics. As a result, the generation tariff will increase to 12.5p/kWh from its current level of 11p/kWh as proposed in the consultation. Although this runs contrary to the criteria set out in paragraph 24, it is justified in view of the modest uptake under FITs so far (i.e. only 362 installations were registered on Central FITs Register by end April 2012).

43. The situation regarding micro-CHP will be kept under close review as part of overall monitoring of uptake under FITs and also as DECC's heat strategy evolves.

Community Tariffs

44. The consultation sought views on whether community installations should receive a higher tariff than private installations.

45. The consultation responses provided little evidence that the actual costs faced by community energy projects are any higher than for commercial projects, despite the existence of other barriers, and it would therefore be difficult to justify a tariff differentiation given potential value for money and state aid issues. Higher tariffs for community projects will not therefore be provided. However, a community tariff will be included in the structure so that if it becomes justified we will be able to offer a preferential tariff in the future.

46. Given that tariffs for community schemes will be the same as for private installations, they are not considered further in the analysis for this Impact Assessment.

Future tariffs and cost control

47. As announced at the launch of the Comprehensive Review, ensuring that FITs spending stays within the LCF is a major priority. It is also important that the scheme delivers value for money in the longer term.

48. In order to emphasise the Government's commitment to cost-effectiveness and the overriding need to ensure affordable energy for consumers, there should be a general move towards cost reduction across all technologies. Long-term value for money in delivering a low carbon economy also depends on continuing improvement in the costs of all technologies. This is a theme that runs across the Renewables Roadmap, the RO banding Review, and the Electricity Market Reform (EMR). We are therefore proposing a cost-control model that can be applied flexibly to all technologies. This includes a baseline rate of automatic degression and capacity based triggers that

may result in steeper degression steps in the event of higher than expected deployment, and shallower degression steps if uptake is less than expected.

49. Degression will be determined by deployment within each ‘degression band’, which are defined as follows:

Table 2- Degression Bands

Technology	Degression Band
Hydro	All bands
Wind	0 - 100kW
	>100kW - 5MW
AD	<=500kW
	>500kW – 5MW

50. Baseline (automatic) degression will be set at 5% per year, and will occur at the beginning of the FITs year, i.e. in April. This will apply if annual deployment in the previous calendar year is within 75% and 150% of ‘expected’ deployment. In addition to this:

- If annual deployment is less than 75% of expected levels, degression will be 2.5% per year;
- If deployment is between 150-300% of expected levels, degression will be 10% per year; and
- If deployment is in excess of 300% of expected levels, degression of 20% per year will apply.

51. The exceptions to this degression schedule are:

- **100-500kW and 500-1500kW wind:** since estimated rates of return are now much higher than those in the consultation, and in excess of 8%, there will be no 2.5% per year degression for these bands, ie even if deployment is less than 75% of expected levels, degression of 5% per year will continue to apply.
- **Largest bands (all technologies):** tariffs in these bands will continue to be set with reference to level of RO support, unless uptake is greater than 150% of expected levels, in which case degression will apply in the same way as for other bands.

52. The degression schedule is summarised in Table 3 below:

Table 3- Degression schedules

Technology and capacity (kW TIC)		Deployment v. Expected			
		<75%	75-150%	150-300%	300%+
Hydro	≤15	2.5%	5%	10%	20%
	>15-≤100	2.5%	5%	10%	20%
	>100-≤2000	2.5%	5%	10%	20%
	>2000-≤5000	Tariffs track RO		10%	20%
Wind	≤1.5	2.5%	5%	10%	20%
	>1.5-≤15	2.5%	5%	10%	20%
	>15-≤100	2.5%	5%	10%	20%
	>100-≤500	5%	5%	10%	20%
	>500-≤1500	5%	5%	10%	20%
	>1500-≤5000	Tariffs track RO		10%	20%
AD	≤250	2.5%	5%	10%	20%
	>250-≤500	2.5%	5%	10%	20%
	>500-≤5000	Tariffs track RO		10%	20%

53. The ‘expected’ level of deployment by which actual MW thresholds are set is the annual average for new capacity over the 3-year period 2013 to 2015 estimated in the Option 2 central scenario (see ‘Estimated Costs and Benefits (central scenario)’ below). When applied to this expected level of deployment, thresholds are set as in Table 4 below:

Table 4- Degression schedules for each degression band

		Level of annual deployment (January-December) required to prompt degression			
Degression band		**2.5%**	**5%**	**10%**	**20%**
Hydro	all	≤12.5MW	>12.5 – 25.0MW	>25.0 – 50.1MW	>50.1MW
Wind	≤100kW	≤3.3MW	>3.3 – 6.5MW	>6.5 – 13.1MW	>13.1MW
	>100kW – ≤5MW	n/a	>0.0 – 36.7MW	>36.7 – 73.4MW	>73.4MW
AD	≤500kW	≤2.3MW	>2.3 – 4.5MW	>4.5 – 9.0MW	>9.0MW
	>500kW – ≤5MW	≤19.2MW	>19.2 – 38.4MW	>38.4 – 76.9MW	>76.9MW

54. Reinforcing this annual degression mechanism will be an additional mechanism which allows a mid-year (October) degression based on uptake in the first 6 months of the year. This will lessen the risk of very high uptake over a whole year putting additional pressure on the FITs budget. The earliest a mid-year degression could take place would be October 2014.

55. Six-month deployment triggers will be two-thirds of those for annual deployment. Analysis suggests that simply halving the trigger would fail to take account of the fact that some technologies have a construction window across the spring and summer months.

56. A 5% mid-year degression would be prompted if installed capacity had reached the level forecast for the whole year by modelling under our central scenario in the first half of any year.

57. A 10% degression would be prompted if installed capacity had reached the level forecast for the whole year by modelling under our central scenario in the first half of the year.

58. Potential 6-monthly degression scenarios are set out in Table 5 below, together with actual triggers in Table 6 :

Table 5- Triggers for six-monthly degression

Deployment after 6 months	Resulting degression
≤ expected annual	None- annual degression only
> expected annual, ≤ double expected annual	5%
> double expected annual	10%

Table 6- Capacity triggers for 6-monthly degression

		Level of 6 calendar month deployment required to prompt degression	
Degression band		**5%**	**10%**
Hydro	**all**	>16.5 – 33.1MW	>33.1MW
Wind	**≤100kW**	>4.3 – 8.6MW	>8.6MW
	>100kW–≤5MW	>24.2 – 48.5MW	>48.5MW
AD	**≤500kW**	> 3.0 – 5.9MW	>5.9MW
	>500kW–≤5MW	>25.4 – 50.7MW	>50.7MW

59. If deployment at the six month point causes an October degression, this is taken into account in calculating the end of year degression based on deployment over the course of the whole year[16].

60. Table 7 shows the trajectories for all of the proposed tariffs to the end of the policy lifetime of the FITs scheme (2020/21) in 2012 prices under 5% annual degression. Tariffs will be uplifted each year to account for changes to RPI.

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[16] For example, if ≤100kW wind deployment of 5MW at 6 months prompts a 5% tariff degression in October 2014, and total deployment of 6MW across the whole year qualifies for a 5% tariff degression in April 2015 (i.e. deployment in second half of the year was low, such that deployment over the year was less than 150% of expected annual deployment) no degression would occur in April 2015.
However, if ≤100kW wind deployment of 5MW at 6 month prompts a 5% tariff degression in October 2014, and total deployment of 7MW across the whole year qualifies for a 10% tariff degression in April 2015 (i.e. deployment in second half of the year was sufficient that total annual deployment exceeded 150% of expected annual deployment) degression of 5% would apply in April 2015, such that total degression over the course of the year equalled 10%.

Table 7- Generation tariffs baseline degression

Technology	Tariff band (kW capacity)	Generation tariff for new installations (p/kWh, 2012 prices)								
		2012/13 (from 1 Dec)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Hydro	≤15	21.00	21.00	19.95	18.95	18.00	17.10	16.25	15.44	14.67
	>15-≤100	19.70	19.70	18.72	17.78	16.89	16.05	15.24	14.48	13.76
	>100-≤500	15.50	15.50	14.73	13.99	13.29	12.62	11.99	11.39	10.82
	>500-≤2000	12.10	12.10	11.50	10.92	10.37	9.86	9.36	8.89	8.45
	>2000-≤5000	4.48	Tariffs reflect RO support levels							
Wind	≤1.5	21.00	21.00	19.95	18.95	18.00	17.10	16.25	15.44	14.67
	>1.5-≤15	21.00	21.00	19.95	18.95	18.00	17.10	16.25	15.44	14.67
	>15-≤100	21.00	21.00	19.95	18.95	18.00	17.10	16.25	15.44	14.67
	>100-≤500	17.50	17.50	16.63	15.79	15.00	14.25	13.54	12.86	12.22
	>500-≤1500	9.50	9.50	9.03	8.57	8.15	7.74	7.35	6.98	6.63
	>1500-≤5000	4.48	Tariffs reflect RO support levels							
AD	≤250	14.70	14.70	13.97	13.27	12.60	11.97	11.37	10.81	10.27
	>250-≤500	13.70	13.70	13.02	12.36	11.75	11.16	10.60	10.07	9.57
	>500-≤5000	8.96	Tariffs reflect RO support levels							

Methodology

61. This section sets out changes to the modelling methodology underpinning the analysis for the draft Impact Assessment supporting the consultation.

62. The DECC FITs model, updated with the latest evidence on cost and other technology characteristics from CEPA/PB, has been used to provide estimates of uptake and costs for this Impact Assessment.

63. The model has been recalibrated based on uptake over the entire first two years of the FITs scheme (2010/11 and 2011/12). This was not possible for the Consultation Impact Assessment modelling since FITs Year 2 ended after the consultation was published, meaning that only a partial recalibration could be performed.

64. For modelling uptake, it is assumed that exported electricity in wind and hydro bands below 100kW receive the export tariff (i.e. 3.2p/kWh under the Do Nothing option, and 4.5p/kWh under Option 2). Larger wind and hydro bands and all AD bands are assumed to receive 5p/kWh for their exports. This represents a change in approach from modelling for the Consultation, where the largest AD, wind and hydro tariff bands were assumed to receive the wholesale electricity price for their exports and all other bands were assumed to receive the export tariff. This is in light of the analysis by DECC showing that the majority of larger installations, particularly for non-PV technologies, have opted out of export tariffs, reflecting an active market for the exports of these generators through power purchase agreements (PPAs). The wholesale electricity price is an overestimate of the value of FITs electricity. 5p/kWh is a more accurate reflection of the price generators which PPAs are likely to receive, and represents the implied average value of wind and hydro output in the Non-Fossil Fuel Purchasing Agency (NFPA) RO certificate auctioning process.

65. Our carbon savings estimates now include those resulting from the use of the heat output of AD plants. These savings are monetised using the central non-traded sector carbon price projections in DECC guidance[17].

66. It should be noted that while tariff changes will apply from December 2012, modelling is undertaken on a financial year basis and so assumes that tariff changes apply from

[17] See http://www.decc.gov.uk/en/content/cms/about/ec_social_res/iag_guidance/iag_guidance.aspx.

April 2013. This is expected to lead to a slight overestimation of uptake and costs of the scheme under Option 2.

67. All modelled uptake and cost figures reflect potential uptake of AD, wind and hydro installations up to 5MW in size, whether these take place under the FITs scheme or the RO scheme. This approach has been taken given the uncertainty as to whether future investors who choose to deploy at this scale will choose to do so under the FITs or the RO scheme. Given that FITs subsidy levels are intended to smooth to RO levels for MW-scale installations, it is expected that many investors at this scale may be indifferent between the two schemes (whilst FITs provides a more certain revenue stream, the RO has been operating for longer and so may be preferred by some investors).

Estimated costs and benefits (central scenario)

68. This section summarises the costs and benefits under our central assumptions. As explained in the 'Risks and Assumptions' section, there is considerable uncertainty around technology costs. Paragraphs 83 to 86 describe the sensitivity tests that have been undertaken on this.

69. Table 8 below sets out key cost and benefit estimates under the central scenario for both the Do Nothing option and Option 2.

Table 8- Summary Costs and Benefits table

£m, 2010 prices, discounted to 2010	Option 1: Do Nothing	Option 2: New tariffs	Option 2 relative to Option 1
Costs to consumers in 2020	220	160	-60
Costs to consumers cumulative to 2020	1,240	1,020	-220
Costs to consumers-lifetime	3,960	2,930	-1030
Resource costs in 2020	100	80	-20
Resource costs cumulative to 2020	570	490	-80
Resource costs - lifetime	1,720	1,330	-390
Value of carbon savings - lifetime	1010	900	-110
Lifetime NPV (Carbon Savings – Resource Cost)	-710	-430	280

Notes on table:

Subsidy costs (costs to consumers) are presented net of the value of export tariff payments.

Figures may not sum due to rounding.

Installations which were previously on the RO but switched to FITs are accounted for in cost to consumer estimates, but not in resource cost, carbon saving and NPV estimates.

Cost/benefit estimates include micro-CHP installed to date, ie projections of future micro-CHP uptake have not been made due to the high level of uncertainty around the technology. However, it is expected that costs/benefits associated with this technology will be relatively small compared with the total costs/benefits of the non-PV FIT technologies.

70. Option 2 proposes lower tariffs than Do Nothing, as well as baseline degression at 5% per year. Therefore projected uptake is lower under this option – leading to lower associated subsidy and resource costs but also lower associated carbon saving benefits compared with the Do Nothing. Overall, Option 2 has a net present value cost of £430m compared with a net present value cost of £710m under the Do Nothing.

71. These costs are lower than those estimated in the consultation Impact Assessment. This is driven largely by lower capex and opex for AD plants between 500-5000kW in PB's latest assumptions, which leads to higher, more cost effective uptake in this band.

72. Table 9 to Table 11 below set out projected uptake figures for Option 1 (Do Nothing) and Option 2. It should be noted that these figures do not include installations that have transferred from the RO to FITs since FITs started in April 2010. Both the Do Nothing and Option 2 figures therefore underestimate uptake slightly by the same amount, but this does not affect the comparison of Option 2 against the Do Nothing. Installation and MW capacity figures are <u>cumulative</u>, i.e. 2012/13 projections include all 2010/11 and 2011/12 uptake. All figures have been rounded.

Table 9- Projected cumulative installations

		2012/13	2013/14	2014/15	2015/16	**2020/21**
Do-nothing	Hydro	270	320	380	430	770
	Wind	2,830	3,670	4,440	5,150	7,940
	AD	50	60	80	100	180
Option 2	Hydro	280	340	390	440	610
	Wind	2,850	3,310	3,730	4,090	5,390
	AD	50	60	80	100	180

Table 10- Projected cumulative MW capacity

		2012/13	2013/14	2014/15	2015/16	**2020/21**
Do-nothing	Hydro	30	50	70	90	200
	Wind	90	130	170	220	470
	AD	30	50	70	110	220
Option 2	Hydro	30	50	70	80	160
	Wind	90	120	150	170	290
	AD	30	50	70	110	220

Table 11- Projected GWh generation

		2012/13	2013/14	2014/15	2015/16	**2020/21**
Do-nothing	Hydro	80	130	180	230	560
	Wind	120	200	280	370	870
	AD	140	260	420	620	1550
Option 2	Hydro	80	130	190	240	460
	Wind	120	190	250	310	600
	AD	140	260	420	620	1550

73. Hydro uptake under Option 2 is slightly higher by 2014-15 than under the Do Nothing option. This is due to additional uptake under the new, higher 100-500kW tariff. Uptake to 2020 is lower under Option 2. This is because hydro tariffs are degressed at 5% annually from 2014-15 onwards under Option 2, whereas under Do Nothing, it is assumed that there is no degression of hydro tariffs, in line with policy at the time of FITs launch.

74. Projected hydro uptake is lower than estimated in the consultation Impact Assessment[18] due to increases in capex and opex in PB's latest update of assumptions.

75. AD uptake is equal for the Do Nothing option and Option 2 out to 2020, despite lower tariffs for AD installations above 500kW under Option 2. This result is driven by a fall in capex and opex in PB's latest update. Under the new assumptions, rates of return are sufficient for the maximum amount of uptake for AD over 500kW permitted by the FITs model to be reached in each year under both Option 2 and Do Nothing.

76. Projected AD uptake is higher than projected in the consultation Impact Assessment[19]. This is due to lower capex and opex estimates for installations larger than 500kW under PB's latest update of assumptions.

77. Given that minimum hurdle rates in the FITs model are assumed to be 5%, and given that both the Do Nothing and Option 2 tariffs for installations up to 500kW are expected to give a lower than 5% rate of return for a reference installation, our modelling analysis shows that there would be no additional uptake of farm-scale (up to 500kW) AD over the period to 2020/21. It should be noted however that there is a

[18] In the consultation IA, cumulative hydro capacity by 2020/21 was estimated at 190MW under the lead option.
[19] In the consultation IA, cumulative AD capacity by 2020/21 was estimated at 160MW under the lead option.

high degree of uncertainty on all aspects of AD, including around cost assumptions and load factors as well as non-financial drivers of uptake such as planning. Current tariff levels have led to 8 farm-scale installations currently claiming FITs, suggesting that maintaining tariffs at current levels could incentivise further uptake. AD tariffs will be subject to degression of 10-20% per year if uptake is higher than expected.

78. Projected wind uptake is considerably lower under Option 2 than it is under Do Nothing as a result of significantly reduced tariffs. Projected wind uptake is roughly the same as estimated in the consultation Impact Assessment[20]. This is due to the combined effect of changes to capex, opex and load factor in PB's latest update, as well as to updated assumptions around the value of exported electricity (see paragraph 64 above).

Bill Impacts

79. Given the relatively low projected level of subsidy costs associated with AD, wind and hydro uptake, the estimated bill impacts are also relatively low and are similar across the Do Nothing option and Option 2. Option 2 has slightly lower projected bill impacts due to lower uptake under lower tariffs. Bill Impacts for an average domestic and non-domestic electricity consumer[21] versus a no FITs baseline are set out in Table 12 and Table 13 below, as well as the combined bill impacts of Option 2 and the lead option from the Phase 2A Impact Assessment on solar PV:

Table 12- Bill Impacts for average domestic electricity consumers (2010 prices, undiscounted)

	Do Nothing	Option 2	Difference	Option 2 + Solar PV central scenario (from Phase 2A IA)	
Year	£/year	£/year	£/year	£/year	% increase vs no FITs baseline
2011	0	0	0	1	0%
2012	0	0	0	5	1%
2013	1	1	0	7	1%
2014	1	1	0	8	1%
2015	1	1	0	9	2%
2016	2	2	0	10	2%
2017	2	2	0	11	2%
2018	3	2	-1	11	2%
2019	3	2	-1	11	2%
2020	3	2	-1	11	2%

[20] In the consultation IA, cumulative wind capacity by 2020/21 was estimated at 300MW under the lead option.

[21] Defined as Medium-sized non-domestic user based on mid-points of Eurostat "medium" industrial size-bands: 11,000MWh p.a. electricity (before efficiency savings). Large EII based on CCA user consuming 100,000MWh p.a. electricity (before efficiency savings).

Table 13- Bill impacts for average non-domestic electricity consumer (2010 prices, undiscounted)

	Do Nothing	Option 2	Difference	Option 2 + Solar PV central scenario (from Phase 2A IA)	
Year	£/year	£/year	£/year	£/year	% increase vs no FITs baseline
2011	500	500	0	3,900	0%
2012	1,200	1,200	0	13,100	1%
2013	2,000	2,000	-100	18,700	1%
2014	3,000	2,800	-200	22,700	2%
2015	4,100	3,700	-500	26,400	2%
2016	5,400	4,600	-800	29,800	2%
2017	6,900	5,700	-1200	32,700	2%
2018	8,200	6,500	-1700	34,800	2%
2019	9,100	7,000	-2100	36,300	3%
2020	9,800	7,300	-2500	37,600	3%

Note: figures in tables may not exactly match due to rounding.

Wider considerations

80. There are a number of wider benefits to FITs-eligible technologies, including:

- There are significant holistic benefits to AD development in terms of avoided landfill and closed-loop on-farm energy solutions (with associated emissions reductions and benefits from improved management of manures and slurries).
- Middle-sized wind turbines are ideal opportunities for community projects, enabling communities to self-generate and engage in the renewable energy agenda.
- Many investors in small scale wind are also investors in large scale wind. Maintaining industry confidence by providing a measured reduction in tariffs is therefore important in our wider goals of meeting the renewables target.
- Hydro generates with minimal intermittency and is therefore more likely (than some other renewable technologies) to be generating reliably at times of peak load.
- The size of small scale hydro installations together with the fact that hydro is a proven technology and generally considered to be reliable make this an attractive option for communities wishing to engage in renewable energy generation, and often provides an option for refurbishing old mills and weirs of historical interest.

Recommended (Lead) Option

81. Based on the above assessment of costs and benefits, Option 2 is the recommended option. This option includes a schedule of tariffs that aims to ensure continued support for AD, wind, hydro and micro-CHP installations whilst also having regard for cost-effectiveness, value for money and affordability over the longer term.

82. Option 2 is estimated to lead to a net present value cost of approximately £430m compared to £710m under the Do Nothing. Choosing Option 2 over the Do Nothing option is therefore estimated to lead to a lifetime present value benefit of £280m.

Risks and Assumptions

83. There are a number of assumptions that underpin the analysis of uptake and costs. These include technology costs and other technology performance characteristics, investor hurdle rates, and electricity prices. Assumptions have also been made for the extent to which electricity generated by FITs installations is used onsite versus exported on to the grid, and the price that generators may be able to secure for their exports. These assumptions impact on the potential rate of return that investors could receive and therefore also affect modelled uptake and costs.

84. One significant uncertainty is the level of costs of different technologies going forward. The analysis in Table 14 shows how total costs of the policy change and cumulative deployment varies as underlying cost assumptions vary. The high and low capex scenarios below are modelled using uptake from the FITs model under high and low assumptions for future capital and operating costs from the latest PB update.

Table 14- **Deployment and net present value under high/low capex and opex scenarios**

Costs and Benefits under High cost assumptions			
£m, 2010 prices, discounted to 2010	**Do-Nothing, High Capex**	**Option 2: High Capex**	**Option 2 relative to Option 1**
2020 deployment GWh (wind, hydro and AD)	630	480	-150
Resource costs – lifetime	890	710	-180
Value of carbon savings - lifetime	150	120	-30
Lifetime NPV (Carbon Savings – Resource Costs)	-730	-600	130
Costs and Benefits under Low cost assumptions			
	Do-Nothing Low Capex	**Option 2: Low Capex**	**Option 2 relative to Option 1**
2020 deployment GWh (wind, hydro and AD)	4,900	3,330	-1,570
Resource costs - lifetime	1830	370	-1460
Value of carbon savings - lifetime	1730	1130	-600
Lifetime NPV	-100	760	860

Notes on table

Figures may not sum due to rounding.

Annual degression is assumed to apply according to the mechanism set out in the 'Future Tariffs and Cost Control' section above. Potential six-monthly degressions have not been accounted for in modelling.

Installations switching from the RO to FITs are not included in estimates.

Estimates include micro-CHP installed to date, ie projections of future micro-CHP uptake have not been made due to the high level of uncertainty around the technology. However, it is expected that costs/benefits associated with this technology will be relatively small compared with the total costs/benefits of the non-PV FIT technologies

85. Table 14 above shows that under a low capex/opex scenario there is higher deployment and carbon savings than under the central scenario for both the Do Nothing and lead option. Lifetime resource costs are slightly higher than in the central scenario for the Do Nothing option, and considerably lower under Option 2. The large difference in lifetime resource costs between Do Nothing and Option 2 under a low capex scenario is due to much higher levels of sub-500kW AD uptake under the Do Nothing scenario: although sub-500kW AD is incentivized by the level of FITs support assumed under the Do Nothing scenario, it remains significantly more expensive than the counterfactual (wholesale electricity price). The net cost (lifetime NPV) under both the Do Nothing option and proposed Option 2 is lower than in the central case, as the increased amount of deployment is outweighed by the significantly lower generation costs and greater carbon savings.

86. Under high capex assumptions there is much lower deployment and carbon savings than in the central case for both Do Nothing and Option 2. Resource costs are also lower than under the central scenario, although the decrease in resource costs is small compared to the decrease in deployment and carbon savings. As a result, lifetime NPV for both Do Nothing and Option 2 is lower than in the central case.

87. These sensitivities illustrate the uncertainty surrounding projections of uptake and costs under FITs, and the sensitivity of results to key input assumptions. This means that projections of uptake and costs should not be viewed as firm predictions of the future. They are illustrations of what could happen under proposed tariffs and serve as a useful guide to inform the comparison of the cost-effectiveness of different tariff options.

Equality

88. The policy proposals have been screened for equality impacts. We consider that a decision on the options would not have a positive or negative effect on any particular protected characteristic. (or "equality strand"). We have therefore not undertaken a detailed Equality Impact Assessment.

Environmental Impacts

89. The proposed option, Option 2, is estimated to lead to just under 3m tonnes less of CO_2 savings (under the central scenario) than under Do Nothing in the traded sector, leading to a lifetime cost of approximately £110m (2010 prices, discounted) associated with need for the UK to purchase more EUAs. Non-traded sector savings are the same under both Do Nothing and Option 2, as AD uptake is the same under both in the central scenario.

Wider Environmental Impacts

90. There are wider potential environmental impacts associated with the development of these technologies. For example if maize is used as a purpose grown crop to support Anaerobic Digestion, it is a relatively poor crop for biodiversity, with evidence for reduced weed, invertebrate and farmland bird diversity compared with other crops.

Maize is also an inherently risky crop for soil sediment and associated phosphorous loss to water due to soil structural damage associated with late harvest. These risks left unmanaged, could undermine our ability to increase the extent and quality of our water and priority habitats, which we committed to in the Natural Environment White Paper and the new Biodiversity Strategy for England. Both of these commitments are aimed at allowing us to meet EU and global targets to halt biodiversity loss. This could also affect our ability to meet our commitments under the Water Framework Directive.

91. The code of practice currently being developed with the AD industry and other stakeholders will agree a set of management practices designed to deliver both environmental benefits and minimise or avoid the environmental risks associated with purpose grown crops supporting AD.

92. On hydro power, their construction can involve large infrastructure works and wide land use resulting in disturbance and siltation which can adversely affect the natural environment – biodiversity, hydrology, landscape etc. Poorly-designed or poorly-operated hydropower schemes *can* have deleterious effects on fish stocks, for example where fish are killed by turbines, prevented from moving up and down rivers (e.g. to access feeding/spawning grounds) affecting up and downstream composition of a range of aquatic wildlife, or where there are other undesirable effects on rivers themselves (e.g. on flow or sedimentation) which in turn adversely affect fish/river ecology.

93. Wind generation can have significant impacts on the aesthetic values of land and seascapes, particularly as the best location for the turbines is often in the uplands and on the coast which can be of high aesthetic value. There can also be some direct habitat loss and the possibility of collisions for some species of wildlife in certain situations.

94. To ensure environmental risks are mitigated and given that the overall aim of the FITs is to secure environmental benefit by reducing carbon emissions, it will remain that the deployment of renewable energy infrastructure continues to be subject to all relevant environmental legislation, controls, and aims to contribute to policy objectives to enhance the natural environment.

Social Impacts

95. There are no significant social impacts associated with Option 2 compared with the Do Nothing.

Sustainable Development

96. There are no significant sustainable development impacts associated with Option 2 compared with the Do Nothing.

Distributional Impacts

97. Option 2 is estimated to lead to lower impacts on domestic electricity bills as set out in Table 12 and Table 13 above.

Economic Impact

98. The proposed new tariff levels under Option 2 lead to lower estimated installation numbers compared with leaving tariffs unchanged for wind and hydro. However, there

is insufficient data to estimate potential impacts on jobs both within these sectors and across the economy as a whole. Estimating job impacts as a result of the proposed policy change is inherently uncertain because estimates would rely heavily on factors such as how many installations will come forward (which is difficult to predict), installation times and how many associated supply chain jobs are created.

99. There may be a positive impact from lower electricity bills feeding through to the rest of the economy.

Micro business exemption

100. Since FITs does not count as regulation, the micro-business exemption does not apply.

Annex- FITs costs under Levy Control Framework

The table below shows the DECC budget for all FIT technologies in nominal undiscounted terms:

Table 15- FITs budget for Spending Review period

Costs to consumers, £m, nominal undiscounted	2011/12	2012/13	2013/14	2014/15	Total
FITs budget[22]	94	196	328	446	1064

Cost projections against the FITs budget

Table 16 shows estimates of the costs of the lead options from the 2A and 2B Impact Assessments (central scenarios) versus the FITs budget. Costs and budget are presented in nominal, undiscounted terms.

Table 16- FITs costs to consumers versus budget, PV and non-PV lead options

Costs to consumers, £m, nominal undiscounted	2011/12	2012/13	2013/14	2014/15	Total
FITs budget	90	200	330	450	1,060
PV committed to end March 2012	140	420	430	440	1,420
PV additional spend from April 2012	0	40	140	270	450
PV total	**140**	**460**	**570**	**710**	**1,870**
Non-PV committed to April 2012	20	30	30	30	110
Non-PV additional	0	10	40	70	120
Non-PV total	**20**	**40**	**70**	**100**	**230**
Total	160	500	640	810	2,110
Surplus (+) or Deficit (-) against FITs budget	-70	-300	-310	-360	-1,040

[22] Note this was adjusted from the original published figures to take account of small scale installations that are more likely to come forward under FITs than the RO