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Comprehensive Review Phase 1: Consultation on Feed-in Tariffs for Solar PV

Response from the Centre for Energy Policy and Technology, Imperial College London (ICEPT), December 2011

PERSONAL DETAILS
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Key points

Tariff levels: We agree that a substantial reduction of tariff levels is required, though the proposed levels are towards the lower end of the range that we consider appropriate.

Timing: The timing of the proposed changes represents extremely bad practice and has the potential to be counterproductive in the medium to long term. We recommend that DECC considers adopting a responsive degression model to reduce the risk of further abrupt changes in the future.

Distributional impacts: We are concerned about the impact of the proposed changes on the least well off. In particular, the reduced rates of return will preclude debt finance and may make innovative social finance schemes unviable.

Export tariff: The export tariff requires greater consideration; we recommend that DECC considers increasing the export tariff to more accurately reflect the value of exported kWh, help encourage energy efficiency and make the economics of PV less marginal under a reduced tariff regime.

Energy efficiency: Whilst DECC's energy efficiency aspirations are laudable, we question the suitability of the FiT scheme as a means to spur energy efficiency renovations. We are concerned that the primary effect of energy efficiency requirements will be to limit the uptake of PV, rather than increasing the uptake of energy efficiency measures.

About ICEPT

ICEPT is an interdisciplinary research centre focused upon the interaction of technology and policy. From its base at Imperial College, the centre is uniquely placed to gather insights into technological and scientific developments relevant to contemporary debates in energy policy. The centre also has policy analysis expertise, drawing upon a wide range of system modelling, scenario and technology assessment techniques. ICEPT runs the Technology and Policy Assessment function of the UK Energy Research Centre. The reports it produces have been widely cited by both select committees and in policy documents. Imperial College has considerable strengths in many aspects of the science of photovoltaics (PV), co-ordinated through the PV network of the Imperial Energy Futures Lab (http://www3.imperial.ac.uk/solar).

ICEPT is also leading the techno-economic work-package of the UK's leading scientific consortium on inorganic photovoltaic devices, PV21 (http://www.pv21.org/). This submission derives from our research interests in the techno-economic potential of PV, and relationships between markets, innovation and policy.

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Response to Consultation Questions

1. DO YOU AGREE OR DISAGREE WITH THE PROPOSED NEW TARIFFS FOR SOLAR PV? GIVE REASONS TO SUPPORT YOUR ANSWER

DISAGREE – though significant reductions are needed

The need for FiT level reductions

We agree that tariff levels should be substantially reduced. DECC states that there has been a 30% reduction in capital costs, and this is broadly consistent with our own view, based upon soundings taken with industry.[1] We have replicated the rate of return calculations contained in the supporting documents and, based on DECC's assumptions and modelling approach, it would appear that the rate of return could be as high as 10.6% (with a FiT of 43.3p/kWh).[2] Real-life rates of returns vary significantly – according to system type, site, consumption patterns and electricity prices. As a result, the proposed new tariffs lie at the lower end of the range that we would consider appropriate. Whilst some systems will be able to make the returns envisaged many will not. We would also caution against the presumption that module prices will fall as rapidly in the near future as they have in the recent past. We have studied 'learning' in the PV industry extensively and although a long term downward cost trends is very clear, short term prices can – and have – go up as well as down.

Concerns about the decreased rate of return

The proposed changes go beyond addressing recent module price and installation cost reductions. They also seek to reduce returns to a level below the 5 to 8% range envisaged in 2010. We would highlight some concerns associated with reducing the rate of return for domestic installations to 4.5%, namely:

- The exclusion of lower income groups: the lower tariff rates will make it difficult for the least well-off to benefit from FiTs. We have reviewed the argumentation provided by Cambridge Econometric Research Associates (CERA) in the supporting analysis cited in the consultation. This suggests that returns of around 4% will be attractive primarily to wealthy, possibly altruistic householders – those with spare cash who are relatively unconcerned about the zero

[1] Saunders, Gross and Wade, 2011, Can FiTs and RHIs help the fuel poor, and if so, how? http://www3.imperial.ac.uk/icept/publications/workingpapers (forthcoming in Energy Policy).
[2] Explanation of rate of return calculation for domestic PV. http://www.decc.gov.uk/assets/decc/11/consultation/fits-comp-review-p1/3742-explanation-rate-return-calc-domestic-pv.pdf

liquidity associated with an investment in PV.[3] Meanwhile, those without upfront capital will struggle to benefit from FiTs, since the rate of return will be too low to enable debt financing, and will make most innovative social finance schemes unviable, as explained in our answer to Q4 below.

- Damage to small installation companies: the reduced tariffs will push prices below the level needed by many small installers and new entrants, at least at first.
- Reduced investor confidence: we are cautious about the appropriateness of adjusting the hurdle rate applied to policy, as this has negative implications for investor confidence. It would be preferable to define the level of return that is considered appropriate and stick to it.

We would also like to highlight that many of the assumptions in the supporting documentation's rate of return analysis are uncertain and/or disputed. For instance, the supporting documentation assumes a 35 year system lifespan. This is an increase of 10 years compared to DECC's previous model, which assumed a 25 year lifespan. Although we recognise that PV systems do tend to be robust, the warranty for most modules tends to extend to 25 years only, and we suggest that calculations assuming generation substantially beyond the warranty period are treated with caution. We note that adopting an assumption of **25 years** (instead of 35 years) leads to a rate of return of approximately **3.9%**, based on DECC's model**.**

Increase the export tariff

The Consultation's focus on the generation tariff misses an opportunity to reconsider appropriate values for the export tariff. We welcome Gregory Barker's suggestion to the Energy & Climate Change Committee and Environmental Audit Committee that he is 'actively exploring' the possibility of increasing the export rate.[4] As Mr Barker highlights, the actual benefits of the export tariff to the electricity industry is 'higher than 3p', and could in fact 'be double' or even greater. In light of this, we recommend that alongside reviewing the generation tariff levels, Government also reviews the export tariff levels. This could potentially bring additional energy efficiency benefits, as outlined in our answer to Q6. Table 1 below illustrates the impact of increased export tariffs on overall rates of return. This is illustrative. The effect could equally be to assist with the economics of installations in slightly lower output sites or higher cost, innovative installations (see below).

[3] Unlike most other investments, the PV investment cannot be recovered unless the house is sold and its sale value fully reflects that of the PV system.

[4] 29 Nov 2011. Solar power feed-in tariffs: Corrected Transcript of Oral Evidence to be published as HC 1605-i. Taken before the Energy & Climate Change and Environmental Audit Committees. Q128. http://www.publications.parliament.uk/pa/cm201012/cmselect/cmenvaud/c1605-i/c160501.htm

Increasing the export tariff (Assumes generation tariff is 21p/kWh).		
	Export rate	**Resulting rate of return**
Current	3.0	4.5%
Original (proposed by DECC in 2009)	5.0	4.8%
High	7.0	5.1%

Table 1: The effect of increasing the export tariff on rates of return for <4kWp systems.

Differentiate generation tariffs by system type

At present, the FiTs scheme differentiates its payment levels according to scale and grid connection. The scheme could be improved by introducing further differentiation to reflect the differing costs of different system types. Most notably, there is good reason to increase the tariffs associated with more innovative designs of Building Integrated PV (BIPV), to incentivise its commercialisation and cost reductions by learning by doing, as occurs in Italy and France. We refer here to BIPV that is differentiated from conventional 'on-roof' PV systems in that it displaces roofing materials such as tiles or skylights, thus being directly integrated into the building. BIPV can currently more costly than standard 'on roof' systems, hence the need for additional support. The case for higher BIPV tariffs is particularly strong in the UK due to the country's existing strong skills base in BIPV development and design. Innovations such as Solar Century's C21e solar tiles and the collaboration between Dyesol and Tata illustrate the potential for BIPV technology development and commercialisation in the UK[5].

Recommendation – tariff levels

We suggest that the tariff levels could be further improved and refined to better reflect the value of exported units and to differentiate between system types.

Quantifying the benefits of FiTs for PV

A key issue that bears upon the consultation question is the benefits the FiT scheme is buying society, hence against what metric cost effectiveness is assessed. Whilst this is a somewhat deeper question than that of PV system prices, we believe it is of fundamental importance to the wider debate about low carbon and renewable energy policies. Some commentators argue that PV FiTs are

[5] Solar Century C21e tiles: http://www.solarcentury.co.uk/homes/about-solar/c21e-solar-tiles-and-slates/
Tata and Dyesol: http://dyesol.com/index.php?page=Dyesol+Commercialisation+of+DSC

bad value for money since PV is expensive relative to other options on a £/tonne carbon basis[6] . The consultation also notes that PV is costlier than offshore wind, the 'marginal' technology for meeting the 2020 renewable target. However, neither carbon costs nor contribution to short term goals are appropriate metrics for full evaluation of the FiT. This is because carbon saving is not the sole, or even the main, goal of the FiT and the real potential for PV lies after 2020. As such, there is an urgent need for DECC to devise a more effective and robust measure of value for money for the FiT scheme.

A key outcome is cost reduction. ICEPT is involved in research that assesses sources of cost reduction through both device development and market development. There is a great deal of potential for innovation in devices. However, this does not mean that policy should focus on R&D alone. The existence of a thriving market for PV modules acts as a spur to device development and innovation, manifested most dramatically in the emergence of low cost thin film devices a few years ago. In our view it is impossible to separate the role of market growth from that of support for PV R&D in the overall picture of PV development. Both are essential.

Many analysts of the PV sector describe global market support as 'buying down' the cost of PV[7]. We believe this to be an appropriate and useful conceptualisation. It has been suggested by the Committee on Climate Change among others that supporting solar should not be a priority in the UK since we can wait for investments elsewhere to deliver cost reductions. However, this is an argument for free riding, which appears inconsistent with the leadership position that the UK wishes to take in the climate change arena.

Some commentators also suggest that the UK is not a sensible place to deploy PV, because PV offers electricity at lower cost where insolation is higher. PV works in many latitudes and climates, but it is of course correct that output is a function of incident sunlight, so PV deployment in desert, equatorial and warm temperate regions in principle offer the best economic proposition for solar technologies. However the highest insolation countries are often not the best placed to provide incentives for PV, given financial constraints, infrastructure issues and competing policy priorities. As yet there is no mechanism to allow wealthy but less sunny countries to support the deployment of PV in poorer, but sunnier locations. Viewed in terms of global learning curves solar resource is in any case largely irrelevant. Module, system and installation costs come down with deployment,

[6] See for example, http://www.policyexchange.org.uk/publications/publication.cgi?id=197

[7] IEA (2000) 'Experience curves for energy policy technology'. OECD/IEA. IEA (2010) 'Technology Roadmap. Solar photovoltaic energy'. International Energy Agency Report. Available at: http://www.iea.org/papers/2010/pv_roadmap.pdf. Nemet, G. F. (2006) 'Beyond the learning curve: factors influencing cost reductions in photovoltaics'. Energy Policy, 34, 3218-3232. Neuhoff, K., Nemet, G. F., Sato, M. & Schumacher, K. (2007) 'The role of the supply chain for innovation. The example of photovoltaic solar cells'. EPRG working paper, www.electricitypolicy.org.uk

irrespective of insolation levels. Recent market growth in Germany, with a similar climate to Britain, has played a substantial role in driving PV along the learning curve. At least for now, we believe that countries like the UK and Germany have an important role to play in buying down the price of PV. Whilst Britain's contribution to module price reductions should not be overstated it should not be neglected either. We suggest that DECC undertakes analysis that seeks to quantify this more effectively, together with the potential for installation costs to continue to fall.

The FiT also brings benefits in terms of engagement, UK jobs and capabilities, and the development of a constituency of support for renewable energy. There is evidence to suggest that households with PV systems may use energy more efficiently[8] but the magnitude and longevity of these effects need to be assessed more thoroughly as experience with PV builds. Moreover, engaging the public in micro-generation may help to build supportive constituencies for renewable energy as a whole, which brings wider benefits to the energy system, as explained in our answer to Q2 below.

Finally, whilst net job creation is difficult to assess, particularly as it varies with the macro-economic climate, the number of jobs 'offset' and a range of other factors, there is clear evidence of direct job creation through the FiT. Recent UK PV sector growth has resulted in a significant amount of new companies in the UK with over 2,400 installers accredited to date. If we use the European PV industry estimate of 30 jobs per MW installed this implies 2,500 new jobs created in 2010. We do not propose that job creation should be a primary goal of energy policy, but since the FiT seeks in part to create a new industry, job creation in the solar sector is one of its benefits.

Recommendation – define a more rigorous metric for evaluating the FiT

Overall we believe that the benefits described above, whilst in some cases difficult to quantify in monetary terms, need to be assessed more effectively so that a more systematic and rigorous metric for cost effectiveness can be developed.

[8] Keirstead , J. (2007) Behavioural Responses to photovoltaics systems in the UK domestic sector http://www.sciencedirect.com/science/article/pii/S0301421507000651

2. DO YOU AGREE OR DISAGREE WITH THE PROPOSAL OF APPLYING THE NEW TARIFFS TO ALL NEW SOLAR PV INSTALLATIONS WITH AN ELIGIBILITY DATE THAT IS ON OR AFTER A REFERENCE DATE THAT COMES BEFORE THE LEGAL IMPLEMENTATION OF THOSE TARIFFS? GIVE REASONS TO SUPPORT YOUR ANSWER.

3. DO YOU AGREE OR DISAGREE WITH THE PROPOSED REFERENCE DATE OF 12 DECEMBER 2011? GIVE REASONS TO SUPPORT YOUR ANSWER.

[We have chosen to answer Questions 2 and 3 together].

DISAGREE

Pace of change too rapid and counterproductive in the medium term

We believe that the timing of the FiT proposals is wholly inappropriate and constitutes bad practice, defying normal expectations of policy in terms of timely and considered change. This view is underscored by the High Court's decision on December 21st to uphold a legal challenge from Friends of the Earth, Solarcentury and Homesun. The ruling indicates that it would be unlawful to implement FiTs cuts to installations completed before the end of the consultation period[9]. The ruling provides an opportunity for the government to rethink its strategy for reducing the cost of the FiT. We hope that the points below are helpful as it seeks to do so.

As the price of solar PV rapidly fell, Government faced a choice:

1. Adhere to conventional policymaking procedures and reset tariff levels in a timely fashion *following* a full consultation process; **or**
2. Deviate from standard consultation processes to bring in lower tariffs very promptly.

We acknowledge that the circumstances surrounding both the pace of module price reduction and the strictures of the Comprehensive Spending Review placed DECC in a difficult position. Nonetheless, we believe that the problems caused by rushing through the tariff changes (Option 2) outweigh the benefits of adhering to a more measured and timely approach (Option 1). The costs associated with each option are compared below in order to underline our view that Government's timeline for tariff changes is disproportionate and unhelpful, and its deviation from standard consultation procedures is unwarranted. Given the High Court intervention, we hope that DECC might pause and reflect, and seek a way forward that brings the tariff into line with prices without undermining the ability of the PV industry to mature, and indeed to deliver ongoing cost reduction.

[9] http://www.businessgreen.com/bg/news/2134194/breaking-court-judge-rules-solar-consultation-unlawful

The costs of implementing tariffs *following* full consultation (Option 1)

The risk of waiting to implement tariff changes is that a high rate of PV installation activity ahead of the tariff reduction (a 'rush') would increase FiT obligations to be paid by billpayers. Yet we would like to stress that in absolute terms the burden of the FiT is small, and so the cost of waiting is similarly small. Using the data published alongside the consultation we estimate that as of September 2011 support specific to PV was costing less than £4 per customer per year,[10] compared (for example) to around £50 per year for the Renewables Obligation.[11] Over time, in the absence of degression or a volume limit on the scheme the burden on consumers will rise. However the pace of change over the next few months cannot possibly be so rapid that the six weeks' notice the government proposed was justified. The points below expand upon some of the negative impacts associated with the pace of change of the government's proposals.

The costs of abrupt policy change (Option 2)

Short-term – small businesses and new entrants

The pace of change the government envisaged would have an immediate damaging impact on small UK installation companies and newer entrants who lack the resources to adjust to abrupt policy changes. These small players are unlikely to have sufficient time (or volume of sales) to adjust to rapid global module price reductions, may not be able to renegotiate contracts with component suppliers and may not yet be able to match current 'best practice' PV system prices (which allow profitable returns under reduced tariffs). They may well be carrying stock that they will end up having to install at a loss.

Short-term – consumers who placed deposits

Householders who placed a deposit for a PV system before the Review was announced did so on the understanding that they would receive 43.3p per unit generated. Due to the long lead times of many solar companies, some of these consumers will have been unable to have their systems installed before the deadline. As a result, these consumers will ultimately receive 21p/kWh, despite their original investment decision being based on a generation tariff over twice this amount. The financial implications of this will be particularly difficult for those who have taken out a loan to finance their PV installation, since the new rate of return will barely cover their costs of borrowing.

[10] Our estimate using the DECC Sept 2011 data on installed capacity - 200 MW in the sub-4kW tariff bracket, approximately 30 MW stand alone and 10 MW each in intermediate tariff bands. We assume UK average of 900 kWh/kWp per year in each case. We assume 20 million households. On this approximate basis the cost per household is £3.80 per year.

[11] DECC, 2010. Estimated impacts of energy and climate change policies on energy prices and bills. http://www.decc.gov.uk/assets/decc/what%20we%20do/uk%20energy%20supply/236-impacts-energy-climate-change-policies.pdf

Thankfully, the number of individuals in this position is lower than could have been the case – due to luck rather than good policymaking. November was one of the mildest and driest on record, meaning that solar installers were able to get on roofs and carry out more installations than the weather normally permits at this time of year. This fortuitous clemency of weather does not disguise the fact that six weeks (especially during winter) is generally too short a period for solar companies to fulfil their orders. There is also a risk that installers rushing to beat the deadline will have 'cut corners', and this will have resulted in a crop of poorly performing systems. Fundamentally, we believe it is unfair to consumers to change 'the rules of the game' once deposits have been made, without giving sufficient time for existing orders to be fulfilled.

Long-term – investor confidence

The broader, more fundamental impact of such rushed policy changes is the decreased attractiveness of the UK market to investors, who will be discouraged by the perceived instability of the UK regulatory regime. The pace of this policy change comes very close to undermining the government's commitment to grandfathering and runs counter to the increased long term investor confidence that is being sought through electricity market reform. Such unpredictable tariff changes are likely to increase the overall cost of finance for solar PV above levels that would have existed under a stable FiT regime. This also risks undermining wider investor perceptions. It is of course possible that international investors may view the small scale FiT in isolation, with no impact on other policies, particularly those for larger renewables and the EMR proposals. However, our engagement with the investment community suggests that the rating of regulatory risk generally takes a view of policy in the round. As a result, the pace of change to the FiT risks negative impacts on wider perceptions of UK policy risk.

Long-term – constituency of support

Social science research across several countries indicates the importance of supportive constituencies in facilitating efforts to promote renewable energy and enable innovation and change[12]. Providing sections of the public with the opportunity to benefit directly from renewable energy policy effectively creates champions for renewables able to provide a counterweight to 'NIMBY' type opposition. The evidence is that the UK failed to do this, mainly because the RO and NFFO were too complex. The FiT scheme is the UK's main means to change this legacy. The way this tariff change is being handled will make potential supporters suspicious of the government's

[12] Jacobsson, S., & and Bergek, A. (2004). Transforming the energy sector: the evolution of technological systems in renewable energy technology. *Industrial and Corporate Change*, 13(5), 815-849.
Jacobsson, S., & Lauber, V. (2006). The politics and policy of energy system transformation—explaining the German diffusion of renewable energy technology. *Energy Policy, 34*(3), 256-276.

intentions and undermine the potential to create a larger constituency of support for the government's plans for energy.

Long-term – solar sector resilience

The international evidence is that high tariffs have almost always been needed to kick-start an installer industry. However, once a market is sufficiently well established it becomes more adept at accommodating policy change and responding to the rapidly moving international module price. Competition reduces margins, innovation accelerates, and skills build. The UK market is still nascent; the proposed changes risk preventing it from maturing by encouraging exit, reducing competition and undermining the perceived viability of the sector. The development of the 'national system of innovation' for PV will be set back. The effect could be to leave the UK with a small, shallow market with high costs and a less resilient, more policy sensitive character. This could make it more difficult to establish a tariff regime for the long term that can respond effectively to global prices. By contrast, a little perseverance at this key stage could yield a mature market well placed to deliver sustained cost reductions over time and able to absorb policy changes with relative ease.

Summary

Deviating from standard procedures to rush through changes brings a number of costs, namely:

- Imposing unreasonable burdens on solar companies – especially smaller companies;
- On consumers who have already placed deposits;
- Undermining wider investor confidence;
- Undermining the constituency of support for renewables; and
- Threatening the solar sector before it becomes resilient.

Conventions for the timing and implementation of consultation procedures and policy changes exist *precisely to avoid such costs*. As such, we strongly urge government to recognise the significance of the High Court's ruling, and use it as an opportunity to develop a more measured strategy that gives the UK solar market time to adjust and allows it to mature.

Recommendation – review fixed annual degression rates

Since two Fast Track Reviews have been conducted within the last year alone, it is imperative that DECC re-examines its approach to adjusting FiT payment levels. The UK's model of fixed annual degression rates have been unable to keep up with the pace of changes in the PV market, and future occurrences of rushed tariff changes must be avoided to maintain investor confidence. There are a

number of payment adjustment models available, and DECC is right to be considering these alternatives.[13]

Since Germany's FiT scheme is considered to be 'best in class', we recommend that DECC considers the German model of responsive (contingent) degression rates.[14] This system is more nuanced than the current UK model, being responsive to installed capacity. For instance, if installed capacity is particularly high within a predefined period, the degression rate for the following period is increased, which reduces/stabilises the installation rate for the following period.

The advantage of this more responsive system is that it can potentially limit the need for direct policy intervention (thus avoiding damaging events such as the current UK Fast Track Review). Since the system is self-correcting, it should prevent the market from overheating, and be better able at ensuring that FiT levels keep up to speed with changes in the market.

Responsive degression rates still require scheduled reviews every 2-3 years to ensure that they are performing as expecting, and the German example illustrates that additional intervention can still be required in order to ensure that the payment adjustment design is suitable. Nonetheless, given the failure of fixed degression rates in the UK context, we recommend that alternative models such as responsive degression are now explored.

[13] Kreycik, Couture and Cory, 2011. *Innovative Feed-In Tariff Designs that Limit Policy Costs*, NREL/TP-6A20-50225. NREL, Colorado.
[14] Deutsche Bank Group, *The German Feed-in Tariff for PV: Managing Volume Success with Price Response,* May 2011.

4. DO YOU AGREE OR DISAGREE WITH THE PROPOSAL TO INTRODUCE NEW MULTI-INSTALLATION TARIFF RATES FOR ALL NEW SOLAR PV INSTALLATIONS THAT MEET THE DEFINITION SET OUT ABOVE AND HAVE AN ELIGIBILITY DATE OF ON OR AFTER 1 APRIL 2012? GIVE REASONS TO SUPPORT YOUR ANSWER.

5. DO YOU AGREE OR DISAGREE WITH THE PROPOSED MULTI-INSTALLATION TARIFF RATES? GIVE REASONS TO SUPPORT YOUR ANSWER.

[We have chosen to answer Questions 4 and 5 together].

DISAGREE

Social impacts

We are concerned that the multi-installation tariff changes will make innovative schemes assisting the least well-off unviable. DECC highlights in its Consultation Document that nearly 20% of PV installations are associated with generators who have more than one PV installation registered for FITs. A significant proportion of these have either been by social housing providers offering free electricity to their occupants or are 'rent a roof' schemes offered by commercial outfits. Experience in other countries, Germany in particular, demonstrates that a combination of FITs with soft loan schemes can help address the capital cost barrier otherwise not directly addressed by the FIT scheme itself. We hope that this might become possible in the UK. Alternative innovative financial solutions can be used to allow FiT revenue to reach the fuel poor, as research at ICEPT indicates[15]. This can go beyond 'rent a roof' and offer a share of the FiT income to the occupier. However, such schemes require sufficiently high returns to share out between the social financier and the household. The lower rate of return implied by the overall tariff cuts jeopardises such schemes, and lower multi-installation rates compounds the problem.

Since a key aim of FiTs is to give the public a direct stake in the transition to a low-carbon economy, we strongly urge the Government to consider the distributional impacts of its proposals. The financial benefits and energy engagement of the FiT should be accessible to all social groups.

Impacts on commercial investors

In addition to the impact on affordability, we note that the proposed lower multi-installation tariffs could threaten the viability of the operations of larger scale commercial investors – the very investors who have already been negatively affected by the first Fast Track Review. Yet experience in other countries suggests that large commercial premises provide some of the best opportunities for PV, as well as offering engagement and 'supportive constituency' benefits of their own.

[15] Saunders, Gross and Wade, 2011, Can FiTs and RHIs help the fuel poor, and if so, how? http://www3.imperial.ac.uk/icept/publications/workingpapers (final version available in Energy Policy)

6. DO YOU AGREE OR DISAGREE WITH THE PROPOSAL THAT FOR SOLAR PV ATTACHED TO A BUILDING, ELIGIBILITY FOR THE STANDARD TARIFFS PROPOSED IN CHAPTER 2 SHOULD BE CONTINGENT ON A MINIMUM ENERGY EFFICIENCY REQUIREMENT BEING MET? DO YOU HAVE VIEWS ON WHETHER SUCH A REQUIREMENT SHOULD APPLY IN RELATION TO ALL BUILDINGS OR JUST TO DWELLINGS OR NON-DOMESTIC BUILDINGS? GIVE REASONS TO SUPPORT YOUR ANSWER.

DISAGREE

Although DECC's energy efficiency goals are laudable, we question the appropriateness of using the FiTs scheme as a means for encouraging energy efficiency renovations.

Negative impacts of mandatory efficiency measures

We are concerned that the energy efficiency measures proposed may have two negative consequences:

- Additionally burdening solar companies: PV installation and energy efficiency installation require different competencies. The main energy savings available to domestic consumers arise from improving the building fabric (lowering U values, through loft and wall insulation, double glazing etc) and from replacing inefficient boilers. This requires building and plumbing, not electrical, skills. Moreover, efficiency gains in domestic insulation and heating have little to do with the energy produced by PV for the simple reason that PV generates *electricity*, whereas residential energy efficiency measures are primarily concerned with heating, which is typically *gas-fuelled*. Thus, introducing mandatory requirements for energy efficiency creates additional burdens for solar companies (especially smaller companies and new entrants). These burdens will be particularly challenging to deal with at a time when FiTs are being cut by half.
- Restricting access to PV uptake: One key goal of FiTs is widespread public participation in sustainable energy, yet mandatory energy efficiency standards may exclude the very hard-to-tackle properties which we most desperately need to engage with. The efficiency requirement could be perceived as an additional hurdle and 'hassle factor' which ultimately deters individual/organisations from engaging in solar PV and sustainable energy altogether[16].

[16] The literature notes the importance of non-economic criteria such as the 'hassle factor' when understanding barriers to energy efficiency and microgeneration uptake – e.g.: Watson, J., Sauter, R., Bahaj, B., James, P., Myers, L., & Wing, R. (2008). Domestic micro-generation: Economic, regulatory and policy issues for the UK. *Energy Policy, 36*(8), 3095-3106.

Overall, DECC aims that the introduction of energy efficiency requirements will act 'as a vehicle to help drive energy efficiency improvements', thus spurring energy efficiency renovations.[17] We fear it is more likely that small solar companies will struggle to provide efficiency services, and prospective generators will decide not to proceed with PV altogether. If this is so, the overall effect will be a reduction in PV uptake rather than an increase in energy efficiency uptake.

Recommendation – increasing the export tariff

If DECC is committed to using FiTs as a means to promote energy efficiency, we propose that this is best pursued through rebalancing the levels of the generation and export tariffs, rather than introducing mandatory energy efficiency requirements.

At 3.1p/unit, the current export tariff is too low to provide FiT recipients with a strong incentive for increased efficiency and reduced electrical consumption. It also does not reflect the full value of exported units. Thus, we recommend that DECC considers increasing the export tariff in order to create a meaningful incentive for FiT recipients to reduce their onsite electrical energy consumption[18].

Benefits of raising the export tariff

Raising the export tariff could bring a range of benefits:

- Promoting sustainable energy usage: There is already evidence that the installation of PV systems can lead to positive behavioural changes in energy usage.[19] Increasing the export rate could amplify this effect, due to the rational economic motivation of FiT recipients to maximise export earnings. Of course, in addition to incentivising energy efficiency, it is also desirable for consumers to shift their electricity use to when their PV system is generating, in order to minimise transmission and distribution losses. Designing generation tariffs and export tariffs to incentivise both load-shifting and energy efficiency is complex, but it is nonetheless worth exploring how consumers could be better incentivised to maximise their FiT revenue by minimising their overall electrical consumption. Increasing the export tariff would help.
- No additional burden for solar installers: Changing the export tariff targets the behaviour of consumers directly, rather than creating additional burdens for solar installation companies.

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[17] Consultation document, p. 24.
[18] We assume that the energy exported is measured via a meter, rather than 'deemed'.
[19] Keirstead, 2007, Behavioural Responses to photovoltaics systems in the UK domestic sector http://www.sciencedirect.com/science/article/pii/S0301421507000651.

- No barriers to participation: The export tariff works by providing positive incentives, rather than creating additional hurdles. Thus, no properties/buildings are excluded from benefiting from FiTs.
- Separation of policy goals: Increasing the export tariff would stimulate *behavioural changes* relating to *electrical* efficiency. This distinguishes the FiT scheme from the Green Deal, which promotes *physical* renovations such as loft insulation, which primarily target reduced *heat* loss.

-- We have not answered Q7-11 --

Summary

Our central objection to the proposed changes is the proposed *timing* of their implementation; Six weeks' notice for a halving of FiT rates is simply too short. As the High Court's ruling will oblige DECC to change the timeline, we hope the opportunity will be taken to reconsider how best to balance objectives. We understand the need for reasonable urgency, but this market is new and the sector has not yet had time to build resilience. In addition to immediate damaging impacts on installation companies and consumers, such an extremely abrupt policy change also has long-term implications: it undermines investor confidence in the UK policy regime and jeopardises the creation of a constituency of support for renewables.

We understand that substantial reductions in FiTs are required, given rapid drops in PV module prices, public enthusiasm for the scheme and the overall cap on the FiT and other subsidies. Nonetheless, the magnitude of cuts proposed by Government is aggressive, and the proposed levels lie towards the lower end of a range that we would consider acceptable. Moreover, we are particularly concerned about the ability of the least well-off to participate in the FiTs scheme. This is because the 4.5% rate of return will preclude debt and social financing, whilst the lower multi-installation tariffs will make innovative social housing schemes unviable. Combined with the introduction of energy efficiency requirements, the overall effect of the lower tariffs will be to substantially reduce PV uptake.

We recommend that Government considers a number of refinements to the FiTs scheme – namely a responsive degression model, higher generation tariffs for building-integrated PV, and higher export tariffs. More generally, we urge DECC to develop a new, more comprehensive metric for assessing the cost-effectiveness of FiTs for PV.