Solar in the UK: facts & statistics

26 August 2015

There is much discussion at the moment about a review of Government support to renewable energy. The solar industry has been a great British success story supporting 34,000 jobs in the supply chain and delivering unprecedented cost reductions. Solar power is unique because it empowers everyday people and businesses to participate in the delivery of clean energy and to create competition with traditional power supply. We have been expecting the scheduled Feed-in Tariff review, which the Government is obliged to do every three years under the EU’s state aid requirements.

The industry wants to be off subsidy as soon as possible, not least because of policy instability. This is why we published our Solar Independence Plan for Britain, which we believe is the first fully-costed plan to get solar off subsidy that we know of. But the UK industry needs stable support this Parliament to achieve this.

Key Facts

- There was nothing in the Conservative Manifesto about solar power.
- More than 80% of the British public support solar power\(^1\) - it is the most popular source of energy.
- The estimated cost of solar power on consumer energy bills this year 2015/16 is £10 (see working below). Around £7 of this is Feed-In Tariffs and £3 is large-scale solar under the Renewables Obligation.
- 10% of the UK’s renewable power comes from solar power, or 1.5% of total UK electricity (up from nothing in 2010).
- We estimate solar currently accounts for around 18% of expenditure under the Levy Control Framework (LCF), which is effectively the budget that supports renewable power.
- 8GW of solar PV has been deployed in the UK so far (industry data).
- Solar is owned by 670,000 homeowners, and thousands of businesses, farmers, schools and community groups.
- The solar industry is dominated by British small and medium sized businesses, which we believe Government should be backing.
- Our analysis shows that the legacy costs of solar power as a result of the 2011/12 Feed-in Tariff boom and bust accounts for 80% of expenditure on solar power. Due to cost reductions solar is very affordable going forwards.
- The global solar power market is estimated to be worth $5 trillion by Deutsche Bank from today until 2035. And at $3.7 trillion by Bloomberg to 2040\(^2\).
- 62% of the capital and operational costs of large-scale solar accrue to the UK (for small scale solar this is even higher). Modules form an increasingly small part of installed costs underlining the importance of an efficient domestic industry. This is higher than for other technologies e.g. offshore wind.


Our modelling (which has been independently verified by experts from Imperial College) estimates it will cost only another £1.70 on consumer bills in 2020 to deliver more than 1 million more solar homes in 2020 and achieve parity with grid power prices. **Finishing the domestic solar revolution is very affordable.**

- Solar does not require subsidy in some parts off the world where there is more solar insolation, high energy bills and no anti-dumping duties. However, it will continue to need support here for the next few years.

The Feed-in Tariff scheme
The STA recognises that the Feed-in Tariff policy framework can deliver better value for money, hence our Solar Independence Plan shows how to deliver far better ‘bang per buck’, without destabilising the market. Stable support is still needed for all scales of solar over the next five years to deliver competitiveness with fossil-fuels, which remain highly subsidised globally. The solar industry in the UK is just five years old and it has navigated exceptional support reductions of up to 70% over the last Parliament - this momentum needs to be sustained and it is affordable to do so as, due to the cost reductions, solar needs much less public support going forwards than it needed historically.

Our proposal
Our [Solar Independence Plan](#) report shows how UK solar ambition for 2020 could be doubled to 25GW for just over £13 on annual household bills by 2020. The report also shows that solar could be as cheap as fossil fuel electricity by the end of the decade, **given stable policy support.** A solar power revolution in the UK is much more affordable than some commentators suggest.

As of March 2015 much of the cost of solar power (83%) was due to FiT legacy costs as a result of the mismanagement of the scheme in 2011/12 for domestic solar (i.e. the cost of solar that was installed before the major tariff cut then). This legacy cost has been long known. Including it in cost figures hides solar’s affordability today. Indeed, our modelling shows achieving subsidy-free domestic solar, and more than one million further solar homes, will only add a further £1.69 to household bills in 2020, and this will account for just 2.3% of the Levy Control Framework budget in 2020. See a breakdown of the cost data in Appendix 1.

Solar Trade Association analysis, as set out in the Solar Independence Plan, shows that, putting the legacy cost of the Feed-in Tariff scheme to one side, solar can deliver 13% of the UK’s renewable power target in 2020 for just 10% of the Levy Control Framework budget for low carbon energy. This is in large part due to the fact that large-scale roof and ground mounted solar in particular are very cost effective. However, domestic solar can also be subsidy free by 2020 and it is a truly unique technology for empowering consumers and transforming market competition.

**Detailed cost figures for the UK solar industry**
The latest analysis by Ofgem shows they anticipate ‘environmental & social’ costs will add £83 to energy bills this financial year. This is reduced to £71 by the Government rebate.

Ofgem estimate the Feed-in Tariff this financial year will be £11 on bills, covering all FiT technologies. Although solar dominates the FiT scheme, a significant share of its cost also goes to support other technologies like wind and hydropower. We estimate that solar’s share is around £7 on bills.

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3 Indeed legacy costs to March 2015 account for around half of the cost of our 20GW by 2020 Minimum Ambition scenario

Ofgem does not break the Renewables Obligation (RO) costs on household bills down by technology. However DECC publishes a monthly table breaking RO generation down by technology, including that under the different historic banding levels. At the 1.4 ROC banding that applied to large-scale ground mount in 2014/15, 1GW of capacity produces around 930GWh annual generation at a cost of £55M/year, or £0.52 onto annual bills. Taking account of RO deployment since 2012 (including the rush earlier this year ahead of the RO closure to large-scale), we therefore estimate that RO support for solar will add around £3 to consumer bills this year. Note that solar has a lower load factor than wind, therefore every GW of solar costs consumers notably less.

Therefore solar is expected to account for around £10 or 12% of the £83 Social and Environmental costs levied on bills this financial year.

It should be noted that looking at these support costs in isolation gives a false impression of the impact that solar has on consumer bills. There is mounting evidence that power from solar and other renewable energy technologies is pushing down the wholesale cost of electricity and that this could be of a similar magnitude to the support costs. This would mean that increasing deployment of solar is close to cost neutral to consumers.

**Domestic solar**

There are 670,000 domestic solar homes in the UK, with at present about 150,000 extra homes going solar every year.

Our modelling shows the new solar homes expected this year (around 150,000 in 2015/16), will cost households just an extra 50p on their annual energy bill this year. This shows how affordable solar has become. Indeed, our modelling shows that achieving subsidy-free domestic solar and more than a million further solar homes will only add a further £1.69 to household bills in 2020. Thereafter bill impacts will decline as rooftop solar no longer requires subsidy.

The argument put forward by Policy Exchange and others is that domestic solar provides ‘low value for money’ because the costs are relatively high when compared to capacity and output. However this is not acknowledging the big picture: the aim of the Feed-in Tariff is to increase the volume of solar being installed, bring costs down and ultimately take solar off subsidy over time. The STA’s Solar Independence Plan shows how, with stable support, this could be done by around 2020.

Therefore the domestic Feed-in Tariff is an investment to enable all of the UK’s 26 million households to be able to choose self-supply with solar instead of grid power. This will mean far greater choice and competition in electricity markets, more low carbon power, stable electricity bills and power in the hands of households instead of the Big Six.

**Commercial and community scale solar**

Government has said repeatedly that it wants to shift emphasis to commercial rooftops, which has been welcomed by the solar industry. The Feed-in Tariff is very valuable for non-domestic commercial and industry investors, community-led projects and the public sector.

However, deployment at the commercial and community scale accounts for less than 5% of installed capacity under the Feed-in Tariff. Large roofs (250kW+) fare even worse at only 1% of the market.

As well as barriers to commercial deployment in the structure of the Feed-in Tariff there are complex non-FIT barriers to this sub-market. While the STA supports rebalancing the UK market to ensure far greater deployment on large-roof and community-scale projects, our concern is that substantial work
still needs to be done to unlock this market. Shifting emphasis too fast from ground-mounted solar to this sub-market could seriously damage the non-domestic solar industry. A careful ‘bridging strategy’ is needed to manage this transition. Our Solar Independence Plan sets out how we can secure considerable growth in the commercial and community-scale solar sector.

**Utility solar**

The Renewables Obligation (RO) has been withdrawn for large-scale solar farms above 5MW since April 2015 and the government has recently proposed to also end support for sub-5MW solar a year early, in April 2016. No solar farms will proceed under Contracts for Difference (CfDs) this year and there is now uncertainty with regards to the timing of future CfD auctions.

The removal of Renewables Obligation support and uncertainties over the CfD mechanism could leave ground-mounted solar with no route-to-market. The Feed-in Tariff for ground-mounted solar has gone into what is called ‘hyper-degression’, where a small amount of deployment triggers a big cut in the tariff, which in turn generates a rush and another cut. This means smaller solar farms, including those where ownership is shared with the local community, will struggle to get built going forwards.

Ground-mounted solar could be competitive with new combined cycle gas power stations on an LCOE basis by 2018, if it were given stable support. (It should be noted however that new gas power stations will require subsidy compared to the wholesale price.) It is the large-scale ground mount solar sector that has, thanks to economies of scale and the establishment of a supply chain, brought down the cost of solar in general internationally including in the UK.

**DECC’s announcements on 22 July 2015**

DECC launched two consultations relevant to solar power on 22 July 2015:

A consultation on removing pre-accreditation from the Feed-in Tariff scheme, which currently allows applicants for larger PV installations over 50kW to ‘reserve’ a tariff for a period of six months while the project is being developed. The STA’s response rejects the premise for the consultation and argues that pre-accreditation is essential to underpin the financing of larger solar installations.

As noted above, a consultation to close the Renewables Obligation to solar PV installations below 5MW from April 2016, which also proposes removing ‘grandfathering’ with immediate effect for projects that cannot prove they had made a significant financial commitment. Grandfathering is the means by which the government undertakes to maintain a stable support level over the 20 year lifetime, which is the very bedrock of investor confidence. The consultation also proposes that DECC will undertake a banding review to revise support levels for new projects. The STA believes that a banding review is justified but that the RO should remain open to all solar projects until its planned closure at the end of March 2017.

The reason DECC gives for undertaking these consultations is to tackle the newly projected 2020 LCF overspend and reduce the resulting cost to consumers. However no details have been given of the contribution that solar makes to this ‘overspend’ and, as stated above, the impact on consumer bills must also take into account solar’s downward pressure on wholesale electricity costs.
Appendix 1

Feed in Tariff Analytical Briefing Note

The current cost of the FiT scheme broken down by scale is below:

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<thead>
<tr>
<th>Fit cost to April 2015</th>
<th>Overall cost</th>
<th>Cost per household</th>
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</thead>
<tbody>
<tr>
<td>Domestic⁵</td>
<td>£447m</td>
<td>£4.20</td>
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<tr>
<td>Commercial⁶</td>
<td>£140m</td>
<td>£1.31</td>
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<tr>
<td>Solar Farms⁷</td>
<td>£46m</td>
<td>£0.43</td>
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<tr>
<td>Total</td>
<td>£633m</td>
<td>£5.94</td>
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Additionally, we expect the forward cost of solar under these scales to be (under the Minimum Ambition 20GW scenario):

<table>
<thead>
<tr>
<th>Additional cost per year to households</th>
<th>2015/16</th>
<th>2016/17</th>
<th>2017/18</th>
<th>2018/19</th>
<th>2019/20</th>
<th>2020/21</th>
<th>Overall Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic⁵</td>
<td>£0.46</td>
<td>£0.49</td>
<td>£0.38</td>
<td>£0.21</td>
<td>£0.11</td>
<td>£0.06</td>
<td>£1.69</td>
</tr>
<tr>
<td>Commercial⁶</td>
<td>£0.32</td>
<td>£0.37</td>
<td>£0.30</td>
<td>£0.18</td>
<td>£0.10</td>
<td>£0.05</td>
<td>£1.31</td>
</tr>
<tr>
<td>Solar Farms⁷</td>
<td>£0.06</td>
<td>£0.08</td>
<td>£0.07</td>
<td>£0.05</td>
<td>£0.03</td>
<td>£0.02</td>
<td>£0.32</td>
</tr>
<tr>
<td>Total cost per year</td>
<td>£0.84</td>
<td>£0.94</td>
<td>£0.75</td>
<td>£0.44</td>
<td>£0.24</td>
<td>£0.13</td>
<td>£3.33</td>
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These are the additional costs for each year’s deployment.

Taking the legacy cost and additional costs together, we obtain the following:

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<td>Legacy costs</td>
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<td>£5.94</td>
<td>£6.78</td>
<td>£7.72</td>
<td>£8.47</td>
<td>£8.91</td>
<td>£9.14</td>
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⁵ Domestic is considered to be 0-4kW.

⁶ This is everything 4kW-5MW that isn’t standalone.

⁷ Standalone FiT – Note doesn’t include Ro or CfD costs.
From these tables, we can construct the following graphs:

**Additional consumer cost per year for Domestic Solar FiT (0-4kW)**

- 2015/16: £0.46
- 2016/17: £0.49
- 2017/18: £0.38
- 2018/19: £0.21
- 2019/20: £0.11
- 2020/21: £0.06

**Additional consumer cost per year for total Solar FiT**

- 2015/16: £0.84
- 2016/17: £0.94
- 2017/18: £0.75
- 2018/19: £0.44
- 2019/20: £0.24
- 2020/21: £0.13