

Expectations for the UK solar market

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ABSTRACT

On April 1st 2010, the UK government's Department of Energy and Climate Change (DECC) officially launched its renewable energy policy. The document includes the Carbon Reduction Commitment Energy Efficiency Scheme (CRC EES), designed to improve public and private sector organizations' energy efficiency; and the generous feed-in tariff (FiT) incentive, which pays 41.3p/kWh of solar photovoltaic energy generated. This article will look at the expectations for the UK solar photovoltaics market following the government's policy launch. The paper will focus on the impact of the UK's late arrival to the renewable energy market; why the FiT is so incremental for successful growth; what the expectations are for the development of the UK solar PV market as well as an investigation into whether the UK is really ready for this level of change.

Introduction

Householders who install small-scale solar panel systems in the UK are now eligible to receive up to £1,000 a year – tax-free for 25 years – for the electricity they generate under the new government Clean Energy Cashback scheme, known more widely as the feed-in tariff. Government figures reveal that any UK resident who installs a typical 2.5kW PV system at their existing residence will initially be paid 41.3p per kWh generated [1]. Former Energy and Climate Change Secretary Ed Miliband outlined that such a set-up would result in a reward of up to £900 in the first year on top of a £140-a-year saving on energy bills (UK elections have taken place since this paper was penned).

This policy was long awaited in the UK, as its residents became more aware of neighbouring European countries' renewable energy success. However, the optimistic figures released by the government have been met with a great deal of uncertainty coupled with a severe lack of education in the sector. It remains to be seen just how successful the UK solar photovoltaics market will be, considering its infancy.

The UK feed-in tariff

The generous financial incentive that is the UK feed-in tariff has set the market off to a good start. Its 41.3p/kWh rate is high enough to really push the investment in solar energy in the country. But who is really going to benefit from this incentive? The initial costs – an average installation spend of £8,000-£12,000 – are simply too high for the average citizen to afford.

The £8,000-£12,000 payout secures the customer full installation – including the site assessment, the modules, the inverter and the installer's charge, yet this is still a large sum to pay out upfront. The varying issues and concerns surrounding this aspect of the market will be discussed later.

The Department of Energy and Climate Change (DECC) claims that this initial cost is justified by the rate of return on investment (ROI), which it claims is 5-8%

on a well-sited 2.5kW installation [2]. It also claims that a UK solar generator could earn up to £1,000 a year, meaning that their initial costs would be earned back in a maximum of 12 years. Considering that a solar system usually has a lifetime of 25 years, the owner then earns up to £1,000 a year for an extra 13 years, marking an estimated profit of £13,000.

Size matters

Since releasing the FiT policy guidelines, the DECC has faced the question of who can actually afford to install solar power systems, as the high expense of installation prevents solar from being available to the masses. A spokesperson at the DECC was quick to assure us that low-interest finance options will soon be available to cover these costs: "There are already signs that the finance market is looking to develop products in this area so that future FiT revenues can be used to pay off upfront loans."

UK installer Solarcentury has reported a fourfold increase in sales enquiries since the FiT was initially announced in

February. Thus, supposing the funds are available, the UK residential market looks set for moderate growth. But there is a problem. In the case of solar installations, size does indeed matter. Many UK residents' homes may not have a well-positioned south-facing roof; furthermore, in the event that a resident does have such a roof, it may not be large enough to house the 2.5kW system required for the full ROI. In this case, they will not earn the full payback, and may even lose out on their investment altogether.

Taking this into account, it looks as though the residential market will see success, but it may take a while to get going. However, one aspect of the solar market that looks set to experience immediate growth is the farming sector. Given the large building sizes on most farms in the country, UK farmers are almost guaranteed to receive the ROI that has been quoted in all of the DECC documents. There is already evidence that the solar farmland market is beginning to pick up.



Figure 1. C21e and C21t tiles installed on South Yorkshire Housing Association houses in Rotherham, England.

- Fab & Facilities
- Materials
- Cell Processing
- Thin Film
- PV Modules
- Power Generation
- Market Watch

Jonathan Scurlock, Chief Adviser, Renewable Energy and Climate Change at the National Farmers' Union, sees the potential for this market: "For many farmers and landowners, it now makes environmental and financial sense to consider installing solar PV on farm buildings." Scurlock agrees that farm buildings present a perfect opportunity for the installation of PV, and that it is most likely that the FiT will indeed drive the expected uptake.

"Introduction of feed-in tariffs has resulted in a flood of interest in on-farm generation from farmers and technology providers, and substantial growth in an infant UK industry can be expected over the next five years," he says. However, while Scurlock has already seen a great amount of interest from farmers in PV, he also admits that there is a lack of education in connection with the policy, explaining, "Some details of guidance are still lacking for applicants to the scheme."

Following the leader

Residential and farm building figures are reminiscent of the solar success of solar market-leader Germany. The early indications for the UK market – highlighting a fairly successful residential market and an even more successful farm building installation rate – draw parallels with the fully established German market. Dr Henning Wicht, iSuppli's Senior Director and Principal Solar Analyst, says that 40% of the PV installations in Germany are residential and two-thirds of the 50% commercial rooftop installations in the country are on farm buildings. Wicht predicts that the UK market will mirror the success in Germany due to this striking similarity.

Supply and demand

Modules

At time of writing, just over a month after the government's passing of the UK FiT rates, there is an unfortunate shortage of top brand solar equipment. In the case of solar photovoltaic modules, there are two options: cheaper, less efficient modules, or over-inflated high efficiency modules. However, the choice of which product to use usually lies with the installer rather than the customer. If the installer arrives with low-cost, low efficiency modules, such as the 170W Yingli modules offered by one installer in the UK, the system is not likely to be any bigger than 1.2kW based on the average size of UK residents' roofs. The customer will then have a system installed which, again, is not likely to ever earn them back the £8,000-£10,000 they will have paid out initially. Yet if the installer opts for the expensive high efficiency modules, such as BP Solar's range, or the Sanyo HIT module, one can expect to pay the very high-end price for the whole installation, costing £12,000 and approximately £6/W. This, according to iSuppli, is 50% more than customers in Germany pay for exactly the same products.

Inverters

In the UK, at the moment there is really only



Figure 2. C21e solar electric roof tiles on a building in Sturges Farm, southwest England.

Courtesy of Solarcentury.com

one inverter option available – the Fronius inverter. Fronius is not a market leader, yet it is charging a premium price for its inverters for use in the UK. Typically, a Fronius inverter will cost anywhere between £1,170 and £17,100 for systems ranging from 1,300Wp to 40kWp. Considering that this price is included in the initial installation expenditure, it is quite reasonable.

There are, however, two other factors at play here. Firstly, the conversion efficiency loss of Fronius inverters is approximately 4-5%. If we compare this inverter with one of the market leaders, such as SMA's Sunny Boy range, one notices that the price and conversion efficiency loss are not necessarily in synch. The Sunny Boy has a conversion efficiency loss of 2%, making it far more efficient than the Fronius model. The pricing of the SMA inverters (which are certified for use in the UK but not currently available) is around £800-£1,700. In comparison, the SMA option seems preferable, being cheaper as well as more efficient, but UK customers are being railroaded into buying the less attractive option, as there is currently nothing else available on the UK market.

Secondly, inverters have an average expected lifetime of 10 years. This is reflected

in the product warranty, which on average is between five and 10 years. Based on the 25-year average life expectancy of PV modules, the customer could potentially be faced with having to replace the system inverter twice, costing well into the thousands of pounds on top of the initial £8,000-£12,000 already spent. Such a scenario has to be considered when calculating the ROI, potentially extending the time it takes to earn back the initial expense. This becomes all the more aggravating when one considers the prices across Europe in countries such as Germany and Italy, which are significantly lower in comparison to the pound sterling.

Due to the current lack of knowledge on these products in the UK, most installers and customers will be unaware of this price comparison.

When the price is right

It is necessary at this stage to consider why the products available in the UK are so limited, and why the prices of these products are so inflated in comparison to the more successful European markets.

Many European PV leaders, including France, Italy and most significantly Germany, will experience cuts to their FiT



Figure 3. Integrated solar PV on a new build domestic home in south Scotland.

Courtesy of Sundog Energy Ltd.

rates in 2010. For Germany, the cuts will take effect from July 1st, meaning that the market at present is booming as projects are installed while the incentives are high. The UK market is being further impacted as global inverter and module suppliers try to meet demand for their products as a result of this market boom.

On one hand, the UK has launched its financial incentives at the worst possible time, as the German market hits its peak and installations are plentiful. High quality products can be sold at low prices, as the demand is certain. For the UK, distributors are still unsure of the market's stability, and so will charge the maximum for their products, and only supply what is not needed throughout Europe.

On the other hand, this could be a positive start for the UK market. Since the UK is only one month into benefiting from financial incentives for the installation of solar PV, a rush to install at this point is not expected. As the July 1st deadline approaches for Germany, it can be predicted that installations in Europe will slow down, quite possibly by a significant amount. As this decrease starts to take effect, the manufacturers – and, of course, the installers – working in Germany will begin to turn their focus onto the UK market. By this point, the country should be more aware of the FiT incentives available, and indeed more educated in the workings of the technology needed in the UK in order to promote success.

Light at the end of the tunnel

Even with some uncertainty surrounding the UK solar market, expectations for its success are high. Ash Sharma, Research Director and Report Analyst at IMS Research, predicts that the UK's feed-in tariff will significantly accelerate the market. "Quite simply, the UK PV market will not grow to any substantial volume without large subsidies. The low insolation levels and high PV system prices would prevent any major uptake in the UK," said Sharma.

He foresees that the UK could see 40-60MW of installed PV in 2010, in comparison with the 5MW installed in 2009 when there was no FiT available. "From a demand point of view, I think UK consumers and investors are generally quite savvy and the FiT will be viewed very

favourably. Many in the country invest heavily in property and the average age of a house-buyer in the UK is much lower than countries like Germany – [those in the UK] like investing money in property and adding PV systems will be an extension to this."

“Even with some uncertainty surrounding the UK solar market, expectations for its success are high.”

Although Sharma is optimistic about the growth of the UK market, predicting that 150MW of installations is achievable by 2011, he does recognize that the lack of inverters available could slow its progress. But despite this potential pitfall, IMS Research's widespread study of other markets makes him confident that the UK's solar growth will soon accelerate as he has seen the evidence of how the dynamics can change rapidly once full government support is given. "All indications in the medium term are positive: the FiT is reasonably generous and supports systems up to 5MW. And although the UK is not the sunniest country in Europe, it does have a reasonable amount of free roof-space and an appetite for investment," he said.

Independent solar expert Michael Pitcher from BFC Solutions, an associate consultancy, also acknowledges the potential of the UK solar market. "Countries like Germany and Belgium have embraced PV and are already reaping the rewards, but solar panels perform very well in the British climate so there's no reason why the UK shouldn't also harness the benefits of solar energy," he said.

Energy companies such as npower and E.ON have also begun to show optimism for the future of the solar photovoltaics market. By May 1st, one month after the FiT took effect, npower was already seeing an 80% increase in customer interest in solar energy. Louisa Gilchrist, solar expert for npower, said, "It's fantastic to see feed-in tariffs generating so much interest with homeowners and the scheme should be applauded for energizing the solar industry in the UK."

E.ON has also released positive feedback from customers in connection with the use of solar energy; however, the company also recognizes that many UK customers need assistance when choosing to install a PV system, due to the lack of knowledge on the products, installers and information available. As a result, E.ON launched the SolarSavers scheme, which provides a one-stop-shop service for installing and generating solar power.

Andrew Barrow at E.ON said, "As one of the leading power and gas providers in the world and the UK, we can provide

customers with the quality assurance for solar energy systems. Now that the UK is working to cut its CO₂ emissions down, we think it is important to offer residents the opportunity to be a part of this themselves."

Ignorance is not bliss

All things considered, there is still this recurring theme of education, or indeed the lack thereof. At present, there is a severe gap in awareness of the subsidies available, of what products should be used and how they should be installed. The lack of education does not lie solely with the customer, but also with the installers. This is something that will have to change dramatically before the market is able to progress into a noteworthy league. Sharma reinforces this point: "This will be one of the key restraints for the UK market. A great deal of education will be needed to allow the market to develop. It is also likely that a number of integrators from Europe will set up subsidiaries in the UK to target this market."

The migration of experienced European PV companies is highly likely as the majority of installers currently working in the UK are not PV specialists. While this is not a criticism of the UK installers, as the market was not nearly large enough to warrant UK-based specialized installers before the introduction of the FiT, it will be a great benefit to the market if experienced PV companies begin to move into the country, setting up subsidiaries in order to accelerate the uptake.

Conclusion

The UK photovoltaics market certainly has some obstacles to overcome before it matures. While the country was late in receiving its FiT policy, this incentive is now set to drive the market forward in 2010. Its generous payback, combined with further government financial support, will significantly increase the amount of PV uptake in the UK. While there is a lack of product availability in the country, there are positive signs of improvement, as European suppliers start to focus on the UK's growing market, and foreign installers begin work in the country. Industry professionals predict a drop in product cost and an increase in product availability, and also foresee that an emphasis on customer as well as company education will occur within the coming months. The significant parallels with market-leader Germany only reinforce the experts' predication that the UK solar market is set for success.

References

- [1] Department of Energy and Climate Change (DECC) report [available online at: http://www.decc.gov.uk/en/content/cms/news/pn10_010/pn10_010.aspx].
- [2] 'The UK Renewable Energy Strategy 2009', Department of Energy & Climate Change.

Courtesy of Sundog Energy Ltd



Figure 4. Integrated solar PV retrofit on a home near York, England.