



# PV Financing Guidelines

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PV Financing Project

Deliverable 3.5

## United Kingdom

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## Country PV Environment

The current PV environment in the UK is a challenging one. For domestic and commercial deployment, installations have slowed down significantly as subsidies were cut by around 60% in January 2016<sup>1</sup>. Installations in February 2016 were around 80% down compared to February 2015<sup>2</sup>. It is unclear how the industry will respond, and what innovative financial solutions will be developed over the coming year in this lower-subsidy environment.

At the larger scale, subsidies have also been cut and although there is some discussion of “subsidy-free” solar connecting directly to high electricity demand behind the meter [1] – a purely self-consumption model with no financial subsidy – it is unclear whether this will be able to be replicated at scale. Ketton Cement works, one of the best practice case studies [2], was an example of this technical setup, but the economic case was made through the addition of subsidies rather than purely on the import price offset.

More broadly, the UK government’s strategic view of solar is unclear. The government has promoted a “Smart Energy” vision with reports by the Department of Energy and Climate Change [3], the regulator Ofgem [4] as well as government advisors the National Infrastructure Commission [5]. All these reports agree that a smart and flexible energy system will be better in many ways. However, against this, the UK government is focused on Offshore wind, gas and nuclear [6]. The uncertainty caused by this inconsistent policy strategy, as well as the uncertainty caused by the sudden slashing of green policies, has meant investors are wary of investing in UK renewables [7].

At the domestic scale, self-financing is a mature and well-understood financing scheme. Supporting this, loans are also available, ranging from standard personal loans to specific home improvement loans. “Free” solar (a domestic power purchase agreement (PPA) with a zero rate) was also popular when subsidies were high, although it remains to be seen if this will continue under the new, lower rates. See Appendix 1 for further details.

For commercial rooftop solar, self-funded with debt financing has been the main financing scheme, although the economic case is now less strong as commercial customers typically require high returns.

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<sup>1</sup> See [25] for official release, or Appendix 1 for STA analysis

<sup>2</sup> *ibid*



For large-scale solar farms, the scale of deployment over the past 4 years (~7GW cumulatively) has meant the market has scaled up quickly. Both equity and debt financing in this area has become mature very quickly, with both specialist players and more mainstream investors involved.

The financing schemes that will be examined in this report are:

- Existing: Self-funded and Loans. This has formed the bulk of domestic and commercial installations so far. In this report we will discuss both pure self-funded schemes and debt financed schemes.
- Innovative: Crowdfunding. Equity and debt financing through a large number of private investors has existed for several years. In an era of low interest rates and savings rates, private investors hungry for yield may find success in this financing scheme and therefore it could become more prevalent in the future.

## Financing Schemes

### Financing Scheme 1: Self-funded and Loans

In this model, the building owner or tenant funds the system themselves, and is paid back through energy savings and the Feed-in Tariff. In the pure self-funded scheme, there is no financing player other than the owner themselves and they hold the equity of the system and the tariff as well. The Feed-in Tariff lasts for 20 years, so in many cases this is considered the length of the investment, even though many systems will last long beyond that. The homeowner needs to have sufficient capital to put through the upfront cost. Their decision is typically a sound financial one if they do have this capital, with interest rates for savings much lower than internal rates of return (IRRs) available through solar (e.g. ~2% compared to 10%).

The addition of debt financing allows the installation to be made without a high initial investment. A government-backed scheme called the Green Deal used to provide loans for energy efficiency measures including solar for those consumers who may be unable to get a loan through another route, but the funding for the scheme was closed as of July 2015. Debt-finance based models have been particularly attractive for businesses, as they are typically less willing to provide a large initial investment in return for a payback over a long period (20 years).

### The Green Deal

The Green Deal was a policy set up in 2012 to enable consumers who were not able to afford the upfront costs of energy efficiency measures (and solar) to benefit from these improvements and their savings. The scheme worked by providing loans for the installation costs, which were then repaid through the energy bill savings. The key factor (“known as the golden rule”) was that the bill savings from the measure had to outweigh their cost. The financial backing for this scheme was removed in July 2015.

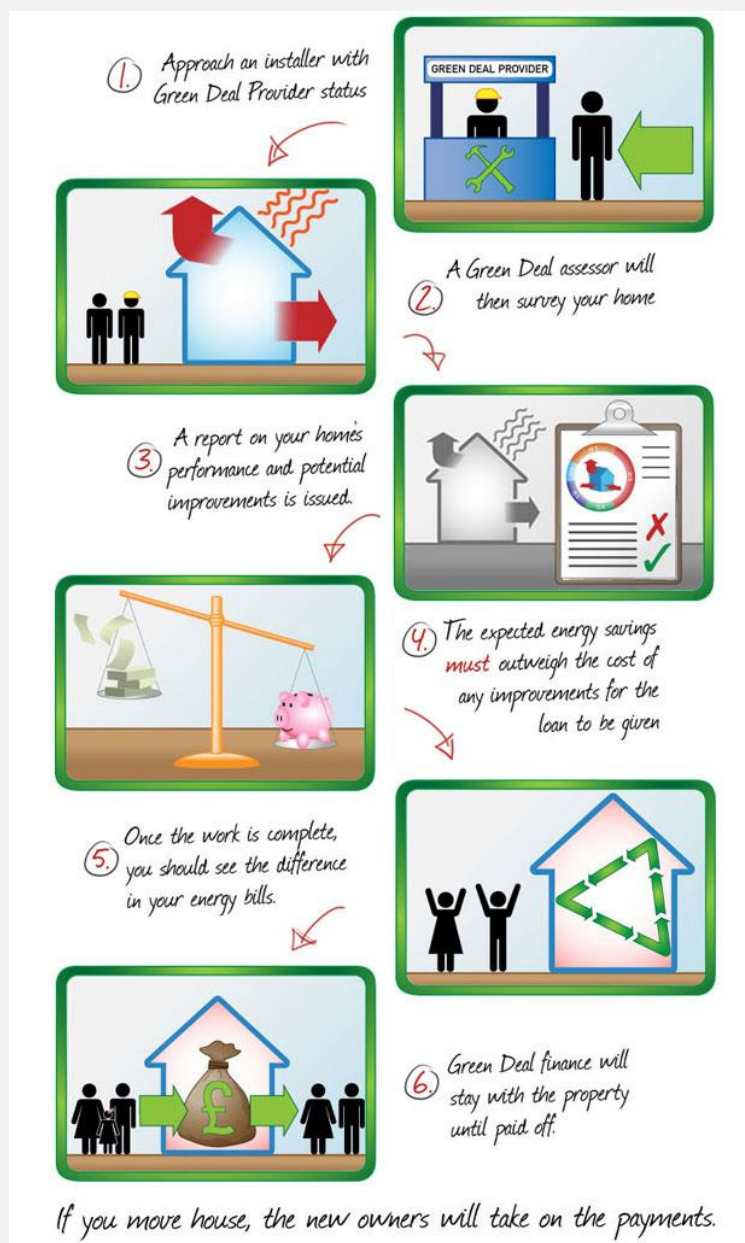


Figure 1: Green Deal process. Reproduced from [24]

## Application Segments

In the United Kingdom the self-funded and loan scheme for single residential homes has been very popular. There are around 840,000 domestic solar homes in the UK, with about 175,000 extra homes going solar in 2015. However, due to the reduced economic viability of projects due to the recent cuts in Feed-in Tariffs<sup>3</sup>, as well as a cap on the amount of subsidised deployment each quarter, only a maximum of 63,000 houses can go solar in 2016. The justification for this cut was to reduce the budgetary impact of solar PV.

This scheme has also been popular in the commercial rooftop sector, with around 25,000 rooftop projects 10kW-5MW installed to date (7,500 in 2015). In a similar way to the domestic market, the capped market in the new Feed-in Tariff regime means that a maximum of 2,340 systems can be installed in 2016.

A shift in mindset is currently underway from selling solar as a financial product to selling the energy that the system will produce. In the future the focus is likely to be on benefits other than pure financial return such as energy independence and building value.

## Related Business Models

The most prevalent model linked to the self-funded and loan financing schemes is self-consumption supported by the Feed-in Tariff<sup>4</sup>. Increasing self-consumption will become more important to ensure the financial case makes sense as subsidies reduce and are eliminated.

## Implementation

First, the homeowner (for domestic) or commercial manager (commercial) will engage a number of installers to obtain quotes. For domestic and smaller commercial systems (<50kW), the nature of this quoting is bound by the Renewable Energy Consumer Code (RECC) and the Micro-generation Certification Scheme (MCS). Both of these are required for eligibility for the Feed-in Tariff, and comprise the minimum standards required for selling and installing solar PV.

The installers will prepare quotes based on components, installation, technical performance estimation and modelling to produce a financial model for the customer.

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<sup>3</sup> See Appendix 1 for further details.

<sup>4</sup> Note that the Feed in Tariff in the UK is made up of two parts: a payment for generation (generation tariff) and an additional payment for exporting to the grid (export tariff).

If required, the installers will also source debt financing. In some cases, this could also be sourced directly by the customer. Some installers have a smaller number of financing sources, and others have more of a selection. Depending on the size of a project and individual installer relationships, the financing could simply be an introduction to a finance provider or a fully managed finance agreement. The finance providers will vary on their terms, rates, scale and specialisation. There are some banks which have a specific focus on sustainable investment, such as Triodos Bank [8]. In some cases an installer may provide the customer with multiple options (this is more common for commercial than domestic).

Typical interest rates for a domestic loan are around 4 to 10%, over a 5 to 10 year period. For commercial, interest rates are closer to 5% over 10 years. Individual rates are based on credit rating of the homeowner or business as well as macroeconomics such as the UK's base interest rate [9]. Both specific solar loans and non-specific home improvement or personal loans exist in the market.

Having received the quotes, the customer will examine these and do their due diligence. They will then choose the best installer for the job. This decision is not always based on financial performance, but other aspects such as their company's standing, reviews from previous customers, membership of a trade association or a personal connection to the company.

After choosing the installer, the business case is signed off internally by the customer. The installer then arranges the necessary paperwork and contracts to set up debt financing if required and the installation work required.

These legal documents are then signed off by the customer, and the payments are made. Depending on the contract, there may be guaranteed performance in which case this is monitored and reported on.

### **External Conditions**

Financial incentives through the Feed-in Tariff or other measures are key to building the market. In addition, political and long-term policy certainty and support are important for the market. This applies for individual projects and also for companies to invest into the market and develop products.

Low interest rates are an advantage for this financing scheme, as private investors are hungry for yield. For commercial investors, their longevity is important as they are investing for the long term.



### **Example of key players and sources of information**

The key players are the homeowners themselves in terms of providing financing. Banks also including RBS, Santander, Investec provide the debt financing for commercial building solar. There are other debt financiers at the domestic level which include Hitachi Finance and Nationwide who provide specific home improvement loans as well as other non-specific personal loans from all standard banks.



## Financing Scheme 2: Crowdfunding

Crowdfunding is an innovative way of raising money for investments directly from a large number of people putting in relatively small amounts of money. In the UK, there are many ‘crowdfunding platforms’ where individuals can post a project in need of funding. Any user can contribute to the project’s finance. Crowdfunding enables people with great ideas to raise the money they need, in return for ‘rewards’. The public can back your idea with pledges of money and project owners can ‘thank’ their backers with rewards that reflect the money contributed. It is also being labelled “democratic finance” because it enables people on ordinary incomes who do not have access to expensive funds to decide what to do with their money.

### Application Segments

Crowdfunding could apply to many different application segments. Successful projects have already been applied to programs of single-family residential, multi-family residential, and public sector (e.g. schools). Industrial and commercial sectors have yet to raise funding through these methods, but this is very possible.

For many cases there is a “social good” aspect for this investment, in addition to the pure financial return. See below for an example advert recently run by one crowdfunding platform, abundance investment:



Figure 2: Abundance investment example advertisement

Key aspects of crowdfunding are a low barrier to entry – allowing investors to small amounts – and security. Almost all projects funded so far have been secured against subsidized projects, which are viewed as secure as the government has committed to not retroactively changing the rates of these. The risk is therefore very low. Typically crowdfunding projects do not take construction risk, or development risk.

### Related Business Models

The key business model associated with the crowdfunding scheme is a PPA model. The power is sold to the consumer at a rate lower than the imported price. This enables the crowdfunders to receive a return, while also benefitting the business/home/school by providing them with inexpensive power.

The critical factor for this model is that the PPA rate must be less than the market rate for importing power for the consumer, while high enough to deliver the required return for the crowdfunders. Additionally, the PPA counterparty must be credit-worthy enough to have a



20-year contract for power. This means that typically schools, council buildings and other public buildings are more bankable than a business with a 5-year building lease.

## Implementation

The first step on the implementation of a project is to decide on the way in which the crowdfunding will be raised. There are multiple crowdfunding platforms in the UK and therefore the developer will need to enquire with the platforms as well as considering whether it is worth in fact displaying their project on a platform or going it alone.

The discussions with platforms feed into the more general process of deciding how to structure the crowdfunding. The different platforms have different options in terms of financing instruments, social requirements and fees so the decision to pick a particular platform will shape the nature of the crowdfunding. If a project decides to develop their own product without a platform, they will potentially have more freedom to define the structure but will have to partner with a regulated company which can provide the necessary financial structuring. For example, for Big60Million, Rockfire Capital is the bond manager. In this case, the project was still crowdfunded but without the advertising and draw of an existing platform. Big60Million ran its own advertising campaign to obtain similar investors to those through a platform, including adverts in national newspapers.

The crowdfunding platform will undertake due diligence to ensure that the project meets their financial and social requirements. This would typically include information on annual reviews, business plans and forecasts as well as any social audits or other triple bottom line metrics.

Assuming that the project passes this due diligence check, the developer and platform work together to finalize the crowdfunding structure, organizing the payment of fees to the platform and defining a strategy for marketing and launching the fundraising.

When the offer has been launched on the platform's website, the platform and developer work together to promote it widely to investors, through marketing and advertising campaigns. Investors can then examine the offer documentation and decide to invest in the project.

## External Conditions

One of the important external conditions in the crowdfunding scheme is the consumer confidence in investing in a long-term asset.

The regulation for crowdfunding is relatively clear and mature in the UK and there are a number of peer to peer investment schemes [10], [11], [12], [13], [14] so this area is well-understood.

Financial incentives and subsidies help the economic case and the return that can be provided to the crowdfunders but these are or have been removed. In addition, a number of tax relief measures that existed for community investment have been removed. The “investor confidence” of crowdfunders is important, as is not having retroactive changes.

The general investment environment is also important – if interest rates are high, then the majority of private investors will simply invest in a savings account. However, when rates are low – as they are currently – private investors will look at other options to obtain yield. A number of innovative financial mechanisms have been developed over recent years in the UK, and renewable crowdfunding investment forms part of that innovative finance market.

## Example of key players and sources of information

There are a number of key players in this market. Abundance are the most well-known crowdfunding project platform, and provide a gateway for community schemes to seek crowdfunders. Trillion Fund and Ethex are similar platforms. All of these platforms cover a range of different renewable energy technologies, application segments and investment types, and list details of previously funded projects as well as current live projects [15],[16],[17].

In addition to the platforms above, individual projects can set up their own crowdfunding platforms. Repowering London and Big60Million [18], [19] are both examples of these community groups that have set up crowdfunding offers for their individual projects.

## Appendix 1: STA Analysis of old and new tariff rates and deployment

Generation tariff rate (p/kWh)	Previously-planned Q1 2016 tariffs [20]	Reduced tariffs (15 <sup>th</sup> January onwards)[21]	Difference (%)
<b>0-10kW</b>	12.03 / 10.90	4.39	64%
<b>10-50kW</b>	10.9	4.59	58%
<b>50-150kW</b>	9.29	2.7	71%
<b>150-250kW</b>	8.89	2.7	70%
<b>250kW-1MW</b>	5.73	2.27	60%
<b>1MW-5MW</b>	5.73	0.87	85%
<b>Standalone</b>	3.08	0.87	72%

Monthly deployment (MW)	Feb 2016 [22]	Feb 2015 [23]	Average 2015 [23]	Feb 2016 vs Feb 2015	Feb 2016 vs Average 2015
<b>Domestic</b>	9.6	28.5	45.6	-66%	-79%
<b>Small Commercial</b>	2.6	5.7	14.8	-53%	-82%
<b>Large Commercial</b>	7.9	13.5	15.6	-41%	-49%
<b>Solar Farms</b>	9.1	42.1	68.5	-78%	-87%
<b>Total</b>	<b>29.3</b>	<b>89.6</b>	<b>144.4</b>	<b>-67%</b>	<b>-80%</b>

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