Solar PV

Ray Noble Co-Chair, DECC Solar Strategy Task Force and NSC Associate

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Agenda to cover:

• Update on the Solar Strategy to 2020
• Predicted UK market growth
• Integration – aesthetics and system
• Energy Storage – viable?
• Costs – PV price
Global demand for Solar rising rapidly, driving down prices

“Solar will dominate the Energy market, 37.7% of the Worlds energy by 2070” - (Shell New Lens Report)

“Now is the time for a Solar “Apollo” movement, 25% of the Worlds energy by 2025” — Sir David King (Ex UK Government Chief Scientist)

“World must move away from fossil fuels” — IPCC Climate Change Report

“Solar Technology could Power the World” — Telegraph

The Solar Industry has talked about this for years, now it is actually happening...
UK Government Solar Strategy - Headlines

Sets out the path for Solar to grow to 12/20GW by 2020

A focus on Solar being installed on all types of buildings

Previously used land OK but avoid agricultural land

Changes to Permitted Development on large buildings

Acknowledge that new buildings will use BIPV products and a push for products to be made in the UK

Presently we have over 500,000 installs, DECC would like to see this double by the end of 2015

Prices continue to reduce (over 60% in the last 3 years)

Recognition that Storage is coming within a few years

Solar output is predictable, quickest to build and connect, and heading to be the lowest cost renewable and acknowledgement that Solar will be part of the future UK energy mix
UK Government Solar Strategy

Issued in two parts – why?

UK Solar PV Strategy Part 1: Roadmap to a Brighter Future

UK Solar PV Strategy Part 2: Delivering a Brighter Future
3GW installed by end of 2013, now 4.5GW by 1\(^{st}\) April 2014 - Equivalent of the annual electricity demand from 1.35M homes

**Figure 9 Technical deployment potential to 2020 for solar PV**

- 20GW Scenario
- 12GW Scenario (Part 2)
- 7GW Scenario
FIT set out to 2015 (FIT2 will run to 2020)

Subsidy to stimulate the market

FIT paid for 20 years

Export tariff = 4.77p/kWh  RPI linked

<table>
<thead>
<tr>
<th>Description</th>
<th>Installed after 1/4/2014 (p/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4kW or less, newbuild</td>
<td>14.38</td>
</tr>
<tr>
<td>4kW or less, retrofit</td>
<td>14.38</td>
</tr>
<tr>
<td>greater than 4kW but not exceeding 10kW</td>
<td>13.03</td>
</tr>
<tr>
<td>greater than 10kW but not exceeding 50kW</td>
<td>12.13</td>
</tr>
<tr>
<td>greater than 50kW but not exceeding 100kW</td>
<td>10.71</td>
</tr>
<tr>
<td>greater than 100kW but not exceeding 150kW</td>
<td>10.71</td>
</tr>
<tr>
<td>greater than 150kW but not exceeding 250kW</td>
<td>10.25</td>
</tr>
<tr>
<td>greater than 250kW</td>
<td>6.61</td>
</tr>
<tr>
<td>Stand-alone (not attached to a building and not wired to provide electricity to an occupied building)</td>
<td>6.61</td>
</tr>
</tbody>
</table>
The FIT Digression Mechanism is based on deployment in the previous 3 months and applies to tariffs starting 3 months later.

<table>
<thead>
<tr>
<th>Degression bands and trigger points</th>
<th>0-10kW</th>
<th>10 – 50kW</th>
<th>&gt;50kW and stand alone</th>
<th>% degression</th>
</tr>
</thead>
<tbody>
<tr>
<td>point 1</td>
<td>100MW</td>
<td>50MW</td>
<td>50MW</td>
<td>0%</td>
</tr>
<tr>
<td>point 2</td>
<td>200MW</td>
<td>100MW</td>
<td>100MW</td>
<td>3.5%</td>
</tr>
<tr>
<td>point 3</td>
<td>250MW</td>
<td>150MW</td>
<td>150MW</td>
<td>7%</td>
</tr>
<tr>
<td>point 4</td>
<td>300MW</td>
<td>200MW</td>
<td>200MW</td>
<td>14%</td>
</tr>
<tr>
<td>point 5</td>
<td>&gt;300MW</td>
<td>&gt;200MW</td>
<td>&gt;200MW</td>
<td>28%</td>
</tr>
</tbody>
</table>

Since this mechanism was put in place the digression applied to tariffs has been either 0% or a max of 3.5%.
Large Roofs work with ROC’s

Another Subsidy mechanism – overlaps with FIT above 50kWp

ROC’s paid for 20 years

One ROC is presently worth 4.257p/kWh

Exported electricity sold to the highest bidder, around 5.2p / kWh to grid operator and more as a PPA to building owner

<table>
<thead>
<tr>
<th>ROCs/MWh and bands</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>2016/17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building-mounted</td>
<td>1.7</td>
<td>1.6</td>
<td>1.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Ground mounted</td>
<td>1.6</td>
<td>1.4</td>
<td>1.3</td>
<td>1.2</td>
</tr>
</tbody>
</table>
At present the majority of Domestic Roofs have been retrofit using standard modules.

Some look OK, but some look dreadful
Integrated systems look better

Integrated systems replace the roof covering

Some still use standard modules

Others use designed products
How much Solar is required?

A typical house electricity usage is 3,300kWh / year.
Area of Solar to match with annual demand equates to 24m²

To date many new houses have installed the minimum Solar to comply with Codes or Planners requirements (Merton Rule)

A limited number have tried to maximise the generation to the benefit of the occupants
Installation

Systems can be installed by trained roofers (no longer is a Solar specialist required)

Systems fixed to suitable battens

Flashings with other roof coverings all included

Future will be no interface with other roof coverings

Electrics can be installed by trained domestic electricians
Standard house builders now starting to introduce Solar

Testing the market generally with small systems!

Red Solar products on its way!

Roofs do not need to face South.

East and West also work well
FREQUENTLY ASKED QUESTIONS

1. _What does it mean?_
   - A solar PV array is a device that converts sunlight into electricity. This process uses solar cells, which are made from materials like silicon, that absorb sunlight and generate an electric current.

2. _Why choose Redrow for a solar installation?_
   - Redrow offers comprehensive support and services for solar installations. They provide installation services, as well as ongoing maintenance and support to ensure your solar system operates efficiently.

3. _How do solar PV panels work?_
   - Solar PV panels work by capturing solar energy and converting it into electricity. This process occurs through the interaction of solar cells, which are made from materials like silicon, with light. As the sunlight hits the cells, it transfers energy to the electrons in the material, allowing them to flow through the circuit, creating electricity.

4. _What is the ERODE scheme?_
   - The ERODE scheme is a government initiative that supports the installation of renewable energy systems, including solar PV. It provides financial incentives for homeowners and businesses to install solar panels, helping them save on energy costs and reduce their carbon footprint.

5. _What does SOL prescription mean?_
   - SOL prescription is a term used to describe solar panels that are specifically designed for installation on the roof of a building. These panels are typically pre-wired and pre-attached, making them easy to install and reducing installation time.

6. _What is the ERODE scheme?_
   - The ERODE scheme is a government initiative that supports the installation of renewable energy systems, including solar PV. It provides financial incentives for homeowners and businesses to install solar panels, helping them save on energy costs and reduce their carbon footprint.

7. _How much does a solar PV installation cost?_
   - The cost of a solar PV installation can vary depending on several factors, such as the size of the system, the location, and the type of panels used. On average, the cost of installation can range from several thousand to tens of thousands of pounds, but it can also be higher or lower depending on the specific circumstances.

8. _Is solar PV maintenance expensive?_
   - While some maintenance may be required, the cost of maintaining solar panels is generally quite low. Most solar installations require minimal maintenance, with annual inspections and occasional cleaning of the panels to keep them operating at peak efficiency.

9. _What is the expected lifetime of solar PV panels?_
   - The expected lifetime of solar PV panels is typically around 25 to 30 years, although some high-quality panels can last even longer. Over this period, the panels maintain a high level of output, providing cost savings and environmental benefits.

10. _Are solar PV panels a good investment?_
    - Solar PV panels can be a good investment for homeowners and businesses, as they provide long-term cost savings and a positive environmental impact. The initial investment may be high, but over time, the savings on energy bills can outweigh the cost, making solar PV an attractive option for those looking to reduce their energy costs and carbon footprint.
DID YOU KNOW?

Electricity costs have risen year on year - so there has never been a better time to invest in your own electricity.

WHY GO SOLAR?

With state of the art solar panels by Redrow, you could enjoy saving money as well as the environment, here are just a few of the benefits:

- Enjoy a few extra quid for your home
- Cut your electricity bills.
- Get paid for the electricity your generate
- Sell electricity back to the grid
- Reduce your carbon footprint

TAKE ADVANTAGE NOW OF OUR UNIQUE OFFER TO BENEFIT FROM SOLAR PV

SUNLIGHT IS FREE!

Or your sunshine back, you've paid for the initial installation your energy costs will be reduced!

GET PAID FOR ELECTRICITY YOU GENERATE!

For every unit of electricity you generate, Redrow will pay you for the electricity you generate, even if you aren't.

SELL ELECTRICITY BACK TO THE GRID!

If your system is producing more electricity than you need, or when the sun isn't up, you can sell it back to the national grid.

CUT YOUR CARBON FOOTPRINT!

As solar panels absorb energy, renewable energy, from the sun, it reduces your carbon footprint and saves you money.

THE BENEFITS OF SOLAR PV

ALL ABOUT PV

PV panels are solar energy converters, which are made up of photovoltaic cells that convert sunlight into electricity. PV panels can be installed on roofs of buildings, walls, or even on the ground.

HOW IT WORKS

In a PV panel, light from the sun is converted into electricity by the photovoltaic cells. The electricity is then sent to a battery bank where it is stored. When the electricity is needed, it is supplied to the electrical grid or a load, such as a light bulb.

FIT'S - FEED IN TARIFF

What is the Feed in Tariff?

- The Feed in Tariff is a government scheme, where you are paid for the electricity you generate. The amount you are paid depends on the size of your system and the output it generates.

THE BENEFITS OF SOLAR ELECTRICITY

- Solar PV panels can help reduce your energy costs.
- Solar PV panels can help reduce your carbon footprint.
- The electricity generated is clean and renewable.
- The electricity generated is clean and renewable.

Why not call in today to discuss Solar on your new Redrow Home!

This page may be subject to change.
Social housing starting to include Solar as an add on to their existing housing stock but also specify on their new build strategy
Private House builders realise customers want Solar

Industry now developing products to match the needs of the building industry
Future proofing!

Fully integrated Solar roof can be installed today

Storage is going to impact the market within 3 years – export electricity only at high value times

EV / Range extender hybrids will become common place, need charging

National Grid Future Scenario’s now allowing for no gas in the future – electric heating and all EV’s

Design for the future and benefit from subsidy today (<2020)
Future Costing’s

As manufacturing volumes increase, due to Global demand, costs continue to reduce

Reductions predicted to continue for at least another 5 / 8 years

Product efficiency continues to improve – no step changes on the horizon
Typical retrofit one off 4kWp system is £6,414 (£245/m²). Around 50 similar installs reduces the price to £4,526 (£173/m²).

Figures for New Build is £4,838 (£185/m²) and £3,589 (£137/m²).

Prices still reducing year on year.
4kWp integrated system as a one off, but on new build, is £5,419 (£207/m2)

Around 50 similar installs reduces the price to £4,020 (£153/m2)

Prices still reducing year on year.
Based at the Eden Project in Cornwall (South West England)
The NSC will provide independent evidence based information and advice to assist the Solar industry to thrive and grow
Solar and Building industry at last working together to develop appropriate products
• Solar can provide electricity to the building for at least 50 years
• System may last longer than the building!
• With electricity prices continuing to rise, base price of electricity to double by 2023 (Nuclear deal!)
• The savings to the customer will be enormous.
• Met Office predicting improved light conditions as a result of Climate Change
• **Nothing will stop Solar now..**
Thank You

nobler@bre.co.uk

www.bre.co.uk/nsc