By Tim Pullen

Feed-in Tariffs

Feed-in Tariffs (FiTs) are a wonderful new way of getting paid for electricity (and heat – but we will come on to that) generated from renewable sources. On 1st February 2010 the Government set rates of payment for electricity generated and exported to the grid, as an incentive for the installation of micro generation schemes. These tariffs are set to come into force from 1st April 2010 for electricity and 1st April 2011 for heat.

For small scale schemes FiTs are available for Hydro, Solar and Wind technologies. In addition the first 30,000 micro CHP systems will also qualify as a pilot scheme.

The way it works is that the homeowner installs, say, a wind turbine and applies to the electricity supplier (NPower, British Gas, EON, whoever they buy their electricity from) to be included in the FiTs scheme. The energy supplier is obliged to accept a qualifying technology so long as it is Microgeneration Certification Scheme (MCS) approved equipment, installed by an MCS accredited installer.

Table 1: Tariff levels for electricity financial incentives

Technology	Scale	Year 1: 1.04.10-31.03.11	Year 2: 1.04.11-31.02.12	Year 3: 1.04.12-31.03.12	Tariff lifetime (years)
Hydro	≤15 kW	19.9	19.9	19.9	20
	>15 - 100kW	17.8	17.8	17.8	20
MicroCHP pilot*	≤2 kW*	10*	10*	10*	10*
PV	≤4 kW (new build)	36.1	36.1	33.0	25
	≤4 kW (retrofit)	41.3	41.3	37.8	25
	>4-10kW	36.1	36.1	33.0	25
	>10 - 100kW	31.4	31.4	28.7	25
	Standalone system	29.3	29.3	26.8	25
Wind	≤1.5kW	34.5	34.5	32.6	20
	>1.5 - 15kW	26.7	26.7	25.5	20
	>15 - 100kW	24.1	24.1	23.0	20
Existing microgenerators transferred from the RO		9.0	9.0	9.0	to 2027

Note: Tariff level for new installations in period (p/kWh) [NB tariffs will be inflated annually]

The figures in the table are the rate the homeowner gets for each kWh of electricity **generated**. Smart metering will be used to measure exactly what is produced and to calculate the payment due. The tariff is fixed for the period of the scheme – 20 years for wind and hydro, 25 years for solar PV, but linked to the Retail Price Index, to take account of inflation.

The Export Tariff

The homeowner will get an additional 3p for each kWh of electricity **exported** to the grid. The export tariff is also fixed and linked to the RPI.

The homeowner can opt in or out of the export tariff each year. If the wholesale price of electricity rises significantly then the homeowner can opt out and perhaps get a better price on the open market. The export tariff is, in effect, a guaranteed minimum to allow calculation of returns on the system installed.

Tariff Degression

In the table above, solar PV in a new build in 2010 gets a rate of 36.1p per kWh. In 2012 the rate drops to 33p pr kWh and continues to drop so that in 2021 the rate is just 15.7p per kWh. The same applies to wind turbines, although the degression is less – machines up to 15kW will get 26.7p in 2010, reducing to 17.6p by 2021. Hydro systems have a lower headline rate but there is no degression and the rate remains the same for 20 years.

When tariffs are degressed, they are degressed only for **new** installations. So tariffs paid to existing generators at that time are not affected, only tariffs allocated to new installations from that date. A solar PV installation in 2010 will receive 36.1p for its lifetime (varying each year with indexation). A solar PV system installed in 2012 will receive 33p for its lifetime (again varying with indexation).

The purpose of this is said to be to reduce the financial incentive over time and thereby drive down the price of solar PV and wind turbines. There is thought to be little opportunity to reduce the price of a hydro installation as it is much more labour intensive, so the rationale is that the tariff should be the same whenever the system is installed.

Taxation

To quote from the Government's paper, "In the 2009 Pre-Budget Report, the Chancellor confirmed that households who use renewable technology to generate electricity mainly for their own use will not be subject to income tax on feed-in tariffs."

"Mainly for their own use" is the expression used and it is likely there will be some jiggery-pokery around what this means. So far it is being taken to mean more than 50%. We have to assume that this is a comparison of the annual production of the system and the annual consumption of the household. But this needs to be clarified as the reality can be different.

It is also being suggested that the capital cost of the system can be off-set against income for income tax calculations under the Enhanced Capital Allowance scheme. This could make a huge difference to the potential take-up, especially for higher-rate tax payers but this is still to be confirmed by the Treasury.

Early Adopters

Early adopters are defined as those people that installed systems prior to July 2009. And the simple fact is that these people, who took the risk and kept the industries going while the Government prevaricated, are being penalised. They will receive only 9p per kWh generation tariff and 3p export tariff, irrespective of the technology.

Renewable Heat Incentives

Equally interesting to the self builder thinking about low running costs will be the Renewable Heat Incentive scheme (RHI), coming into operation from April 2011. Like FiTs homeowners will receive a payment if they heat their home using renewable energy.

And, as with FiTs, the RHI payment is made by the energy company to the homeowner. The obvious question is where does the energy company get the money to make these payments. Obviously the answer is from their customers. The big 6 energy companies have been given permission by the Government to raise their prices for electricity and gas to generate the funds necessary. So it is people without renewable energy system that will pay those people with a system.

Table 2: Tariff levels for Renewable Heat Incentives

Technology	Scale	Tariffs (pence/kWh)	Tariff lifetime (years)
Solid biomass	Up to 45kW	9	15
Biodiesel	Up to 45kW	6.5	15
Ground source heat pumps	Up to 45kW	7	23
Air source heat pumps	Up to 45kW	7.5	18
Solar thermal	Up to 20kW	18	20

Note: Small installations

These payments are not subject to degression but are RPI linked. The RHI scheme is in a consultation phase until April 2010 when the rates and administration will be finalized (*NOTE: As of July 2010 this has still not happened)*. It has to be said that the rates currently being considered are far higher than previously suggested, so some downward adjustment might not be a surprise. For small, i.e. domestic scale, installations the payment due will be based on a calculation using the SAP calculation produced when the property was built. The property will be deemed to have an energy need for space heating and hot water and the payment will be based on that deemed requirement.

This seems to be a very messy approach, as it ignores everything to do with the amount of energy actually used. Nonetheless it is potentially a shot in the arm for the industry and should alter the way self builders think about the design of their house.

Example

Taking a 200m2 floor area house, insulated to slightly better than Building Regs standard as the example, with 4 people living in it. The self builders are intending to install a ground source heat pump, solar panels and they have sufficient wind for a 5kW turbine.

Typical energy consumption will be 8,000kWh per year for space heating, say 3,000kWh for hot water and 7,000kWh for light and power. If this is an all electric house their demand will be 2,000kWh for space heating (heat pump with a COP of 4), 1,200kWh for hot water (balance from the solar panels) and 7,000kWh for light and power. A total of 10,200kWh, which would cost around £1,600 to buy (at today's prices).

With annual average wind speed of 6 metres per second a 5kW turbine will produce around 11,000kWh per year. But assume only 60% of this is usable in the house.

Capital costs will be around £22,000 for the wind turbine, £5,000 for the solar panels and £8,000 for the heat pump, all installed and connected.

Returns will be:

Generation tariff 26.7p x 11,000kWh	£2,937 p.a.
Export tariff 3p x 40% of 11,000kWh	£132 p.a.
RHI for heat pump at 7p for 8,000kWh	£560 p.a.
Value of electricity used in the house 60% of 11,000kWh at 15p/kWh	£990 p.a. *
Subtract 3,600kW purchased at 15p/kWh	£540 p.a.
Total value of the systems	£4,079 p.a.

For an investment of £35,000 the house is free to run and provides an income of over £3,000 per year (* ignored for the purposes of cash return calculation). Equivalent to an 8.5% return – better than you get at the building society.

The reality will be a little different as the index linking, maintenance costs and the general wholesale price of electricity need to be considered. But these are all to some extent crystal-ball gazing and do not move us far from this rate of return.

By way of comparison a solar PV system will have a payback of around 10 years and a typical hydro scheme less than 4 years.

What does it all mean?

In short, renewable energy has moved from a marginal activity to a commercially viable, even profitable, option. The Government is even moving towards low cost loans to support homeowners wishing to install equipment. The probability, and prediction, is that some 100's of thousands of systems will be installed in the first few years of the scheme. Renewable energy will without doubt increase the value of the house and the impact of this, together with the requirement for zero carbon homes from 2016, will be to drive forward low running cost housing.

Self builders have now to give renewable energy serious consideration – if they haven't already. An average house built to current building regulations standard with no renewable energy could, according to energy price comparison companies, cost up to £5,000 p.a. to run by 2020. The means and the financial incentives are now in place to get that figure close to zero.