

Understanding and Taking Advantage of Feed-in Tariffs



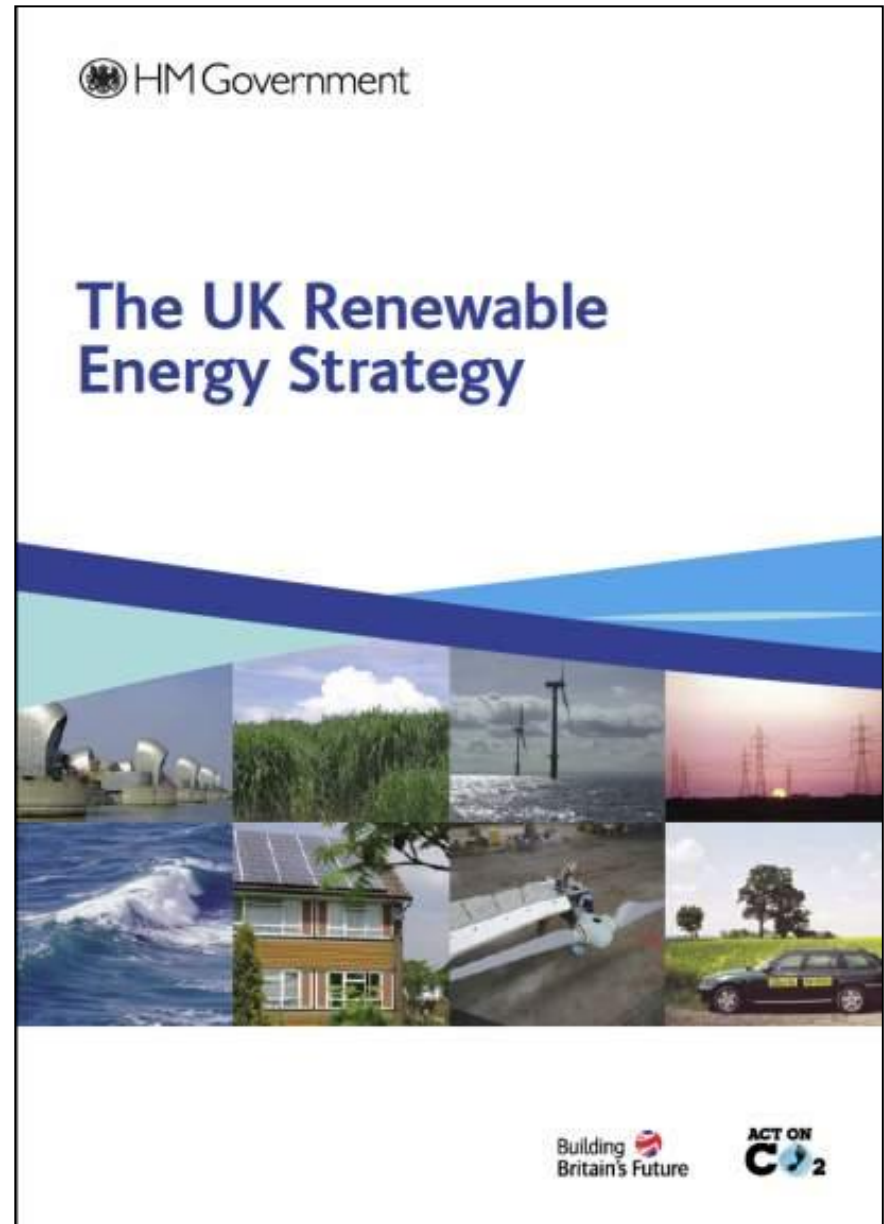
Mike Landy
Renewable Energy Association

The Renewable Energy Association

- ▲ The UK trade association for the renewables sector
- ▲ Membership 960 and rising
- ▲ Members of all sizes – sole traders to multinationals, with a democratic, one member one vote structure
- ▲ Cover all sectors and all renewable technologies
- ▲ Activities include lobbying and policy development, and information dissemination to stakeholders and the wider community

What options are there besides fossil fuels and nuclear power?

The next 10 years will see both energy efficiency and renewables top the priorities for tackling emissions and reducing reliance on fossil fuels.



The need to legislate

Today, the cost to generate a kWh of renewable electricity using microgeneration is more than it can be sold for on the wholesale energy market

However, costs will come down through economies of scale

Incentives need to be given to grow market and drive cost reduction

When Grid Parity is reached incentives are no longer needed

Cost of microgeneration



Grid Parity



Price of grid electricity

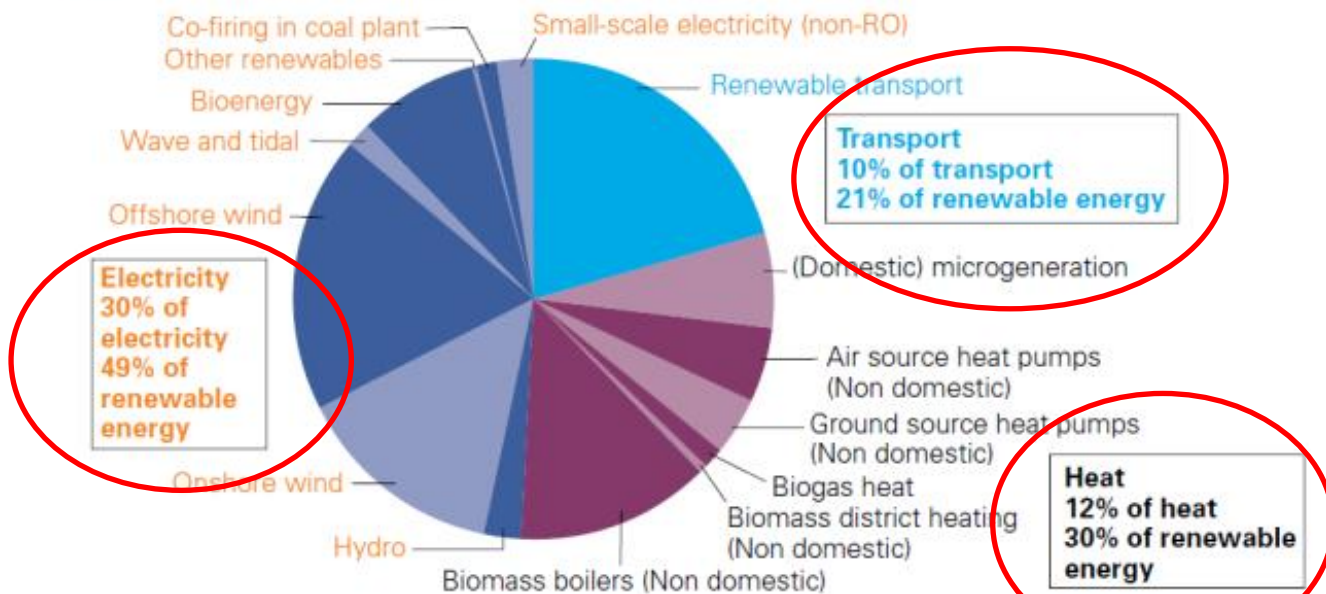
DECC's indicative scenario for renewable energy production in 2020

Renewable Energy Directive requires UK to generate 15% of its energy from renewables sources by 2020

Renewable Energy Strategy preferred scenario

- 10% Transport
- 12% Heat
- **30% renewable electricity (2% of which will be from sub-5MW technologies)**

Illustrative mix of technologies in lead scenario, 2020 (TWh)



Source: DECC analysis based on Redpoint/Trilemma (2009), Element/Pöyry (2009) and Nera (2009) and DfT internal analysis

Key support measures for renewables:

- Renewables Obligation
- **Feed-in Tariff (FiTs)**
- Renewable Heat Incentive

Feed-in Tariffs scope

- ▲ Applicable to England, Scotland and Wales
- ▲ Renewable electricity - PV, Wind, Anaerobic Digestion and Hydropower up to 5MW
- ▲ Systems 50kW or less will only have access to FiTs
- ▲ 50kW to 5MW systems have a one off choice between FiTs and Renewables Obligation (RO)
- ▲ Micro Combined Heat and Power (CHP) up to 2kW*
- ▲ Paid for by adding a charge to all domestic and non-domestic electricity bills

*Micro-CHP tariff available only for 30,000 units

Feed-in Tariffs budget

Control framework for DECC levy-funded spending:

Policy	2011-12 (£m)	2012-13 (£m)	2013-14 (£m)	2014-15 (£m)
Renewables Obligation	1,764	2,191	2,615	3,203
Feed-in Tariffs	80	161	269	357
Renewable Heat Incentive	56	133	251	424

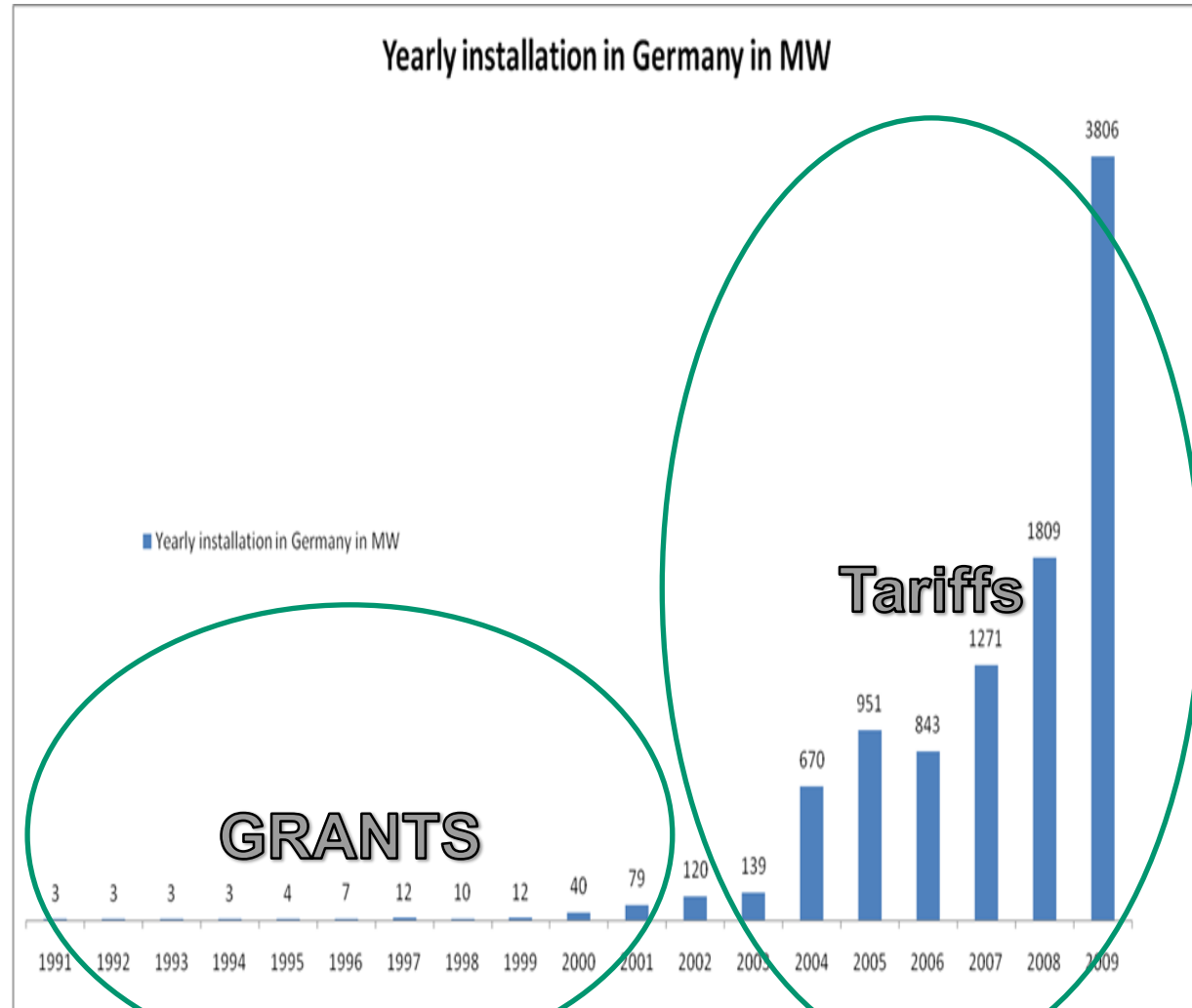
Enshrined in an agreement between Treasury and DECC

Have FiTs been successful elsewhere?





FiTs are now used in over 60 countries/states to incentivise uptake of small-scale renewables

Germany saw annual installed capacity of PV grow by a factor of 70 over 7 years

In 2009 Germany installed 6GW of PV (the equivalent of 3 million installations on homes)



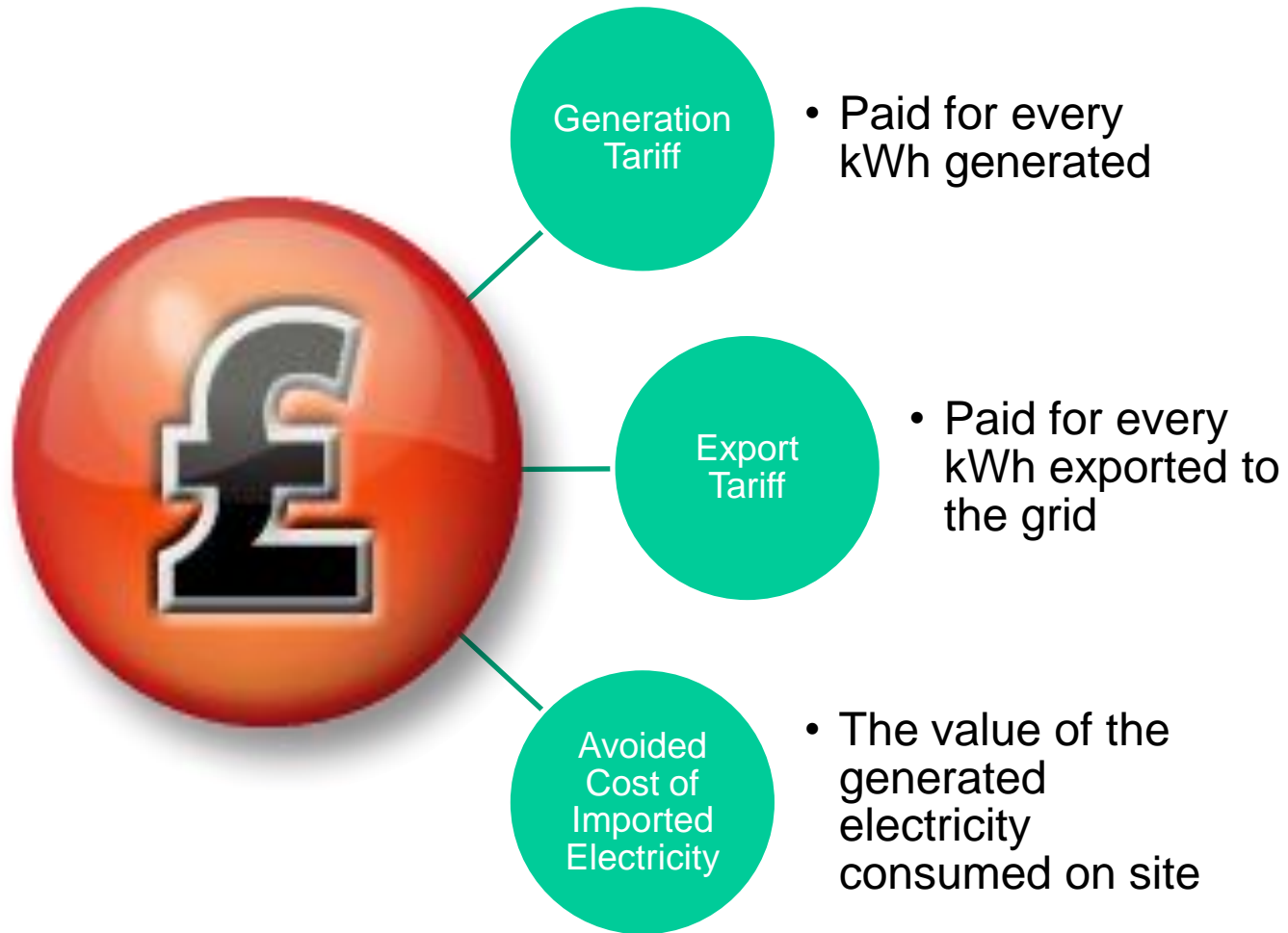
Which technology?

-  AD – farmers, food manufacturers/retailers, refuse treatment
-  Hydro – houses with streams, buildings with rivers, communities (villages)
-  PV – suitable for all
-  Wind – farmers, communities, buildings in open locations (not on buildings in the urban environment)

FiTs – basic principles

A mechanism for providing a financial reward over and above the value of the electricity generated

Tariffs are set at a level that provide a 5-8% return on investment (ROI)



Tariff Rates

Technology - for which a tariff will be paid

Band - the size threshold for a tariff rate

Tariff - the price paid for each kWh generated

Tariff lifetime - the length that a tariff will be paid for

Some tariffs to be “degrossed” from April 2012, then yearly as technology costs decline

Comprehensive review imminent

Technology	Band	Initial Tariff 2011/12	Tariff Lifetime Years
Anaerobic digestion	≤250kW	14.0p	20
Anaerobic digestion	>250 - 500kW	13.0p	20
Anaerobic digestion	>500kW - 5MW	9.4p	20
Hydro	≤15 kW	20.9p	20
Hydro	>15kW - 100kW	18.7p	20
Hydro	>100kW - 2MW	11.5p	20
Hydro	>2MW - 5MW	4.7p	20
MicroCHP pilot*	≤2 kW*	10.5p	10
PV	≤4 kW (new build)	37.8p	25
PV	≤4 kW (retrofit)	43.3p	25
PV	>4-10kW	37.8p	25
PV	>10 - 50kW	32.9p	25
PV	>50 - 150kW	19.0p	25
PV	>150 - 250kW	15.0p	25
PV	>250kW - 5MW	8.5p	25
PV	Standalone system	8.5p	25
Wind	≤1.5kW	36.2p	20
Wind	>1.5 - 15kW	28.0p	20
Wind	>15 - 100kW	25.3p	20
Wind	>100 - 500kW	19.7p	20
Wind	>500kW - 1.5MW	9.9p	20
Wind	>1.5MW - 5MW	4.7p	20
Existing microgenerators transferred from the RO		9.4p	to 2027

Example – domestic PV



Annual electricity demand
= **4,500 kWh**

PV System = **2 kWp**

Cost = **£5,000 - £7,000**

PV annual generation = **1,700 kWh**

Generation tariff = **43.3p/kWh**

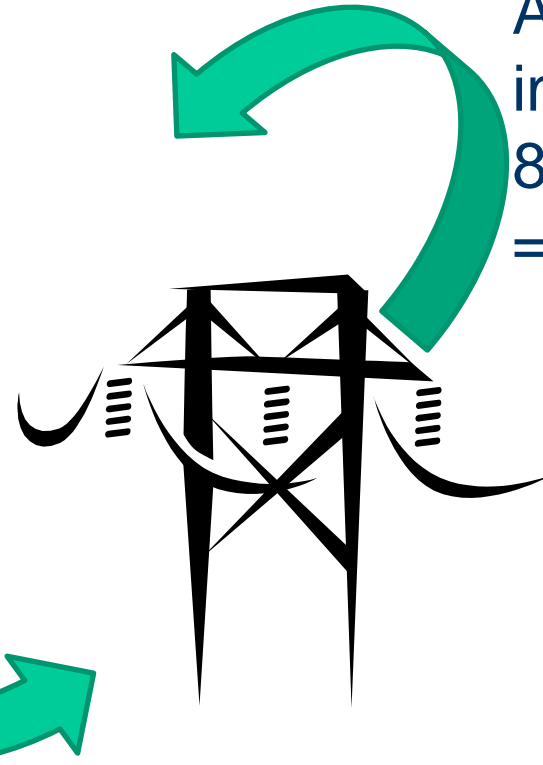
Export tariff = **3.1p/kWh**

Imported electricity = **12p/kWh**

Annual return

Annual PV production (Generation Tariff)

$$1,700 \text{ kWh} \times 43.3\text{p} = \text{£}736.10$$



Avoided imports:
 $850\text{kWh} \times 12\text{p}$
 $= \text{£}102.00$

50% exported to grid (Export Tariff)

$$850 \text{ kWh} \times 3.1\text{p} = \text{£}26.35$$

What does it add up to?



Generation £736.10

Export £26.35

Avoided imports £102.00

Total benefit £864.45

... paid for 25 years

... index linked to RPI

... free of income tax for individuals

**... for an investment of
£5,000 - £7,000**

Who can benefit?



**Anyone installing
an allowable
technology with an
installed capacity
up to and
including 5MW**



Fast track review of FiTs

(February – June 2011)

Source	Tariff band	1.4.11 - 31.7.11 (p/kWh)	After 1.8.11 (p/kWh)
Anaerobic digestion	≤250kW	12.1	14.0
Anaerobic digestion	>250-500kW	12.1	13.0
Solar PV	>50 - 100kW	32.9	19.0
Solar PV	>100 - 150kW	30.7	19.0
Solar PV	>150 - 250kW	30.7	15.0
Solar PV	>250kW - 5MW	30.7	8.5
Solar PV	Standalone	30.7	8.5

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Extension loophole, allowing smaller projects commissioned before 1st August to be extended at previous tariff rate within 12 months, will be closed by 18th October 2011.

Number of installations

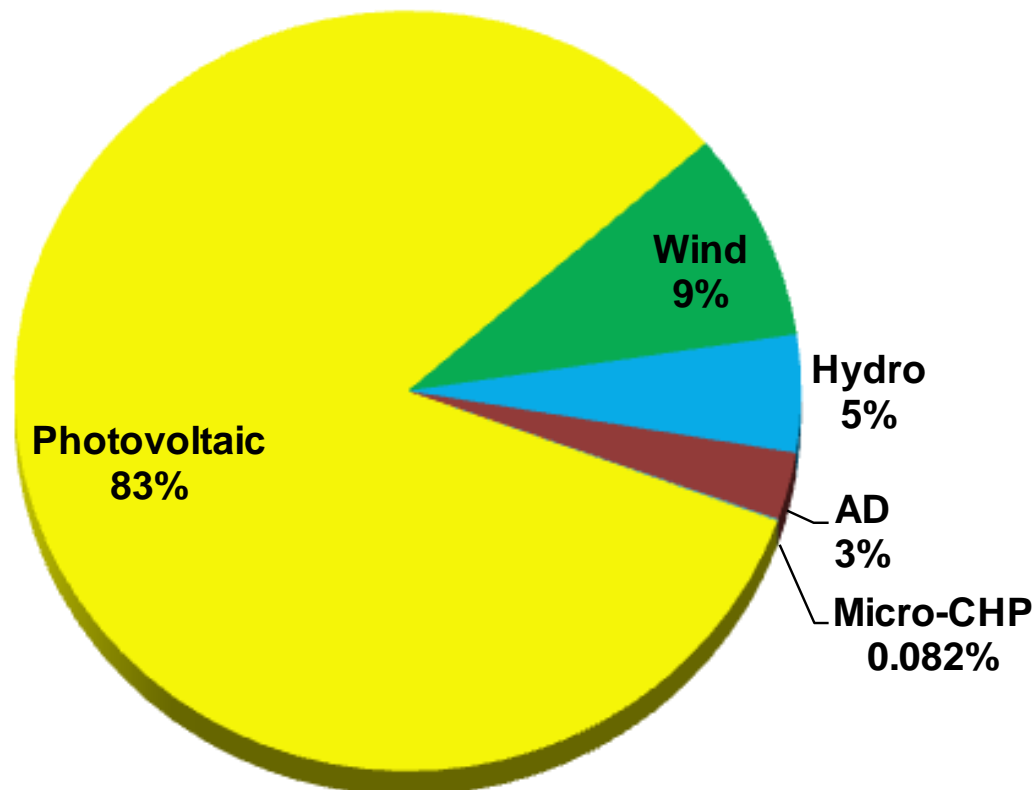
Registered with Ofgem to 30 September 2011

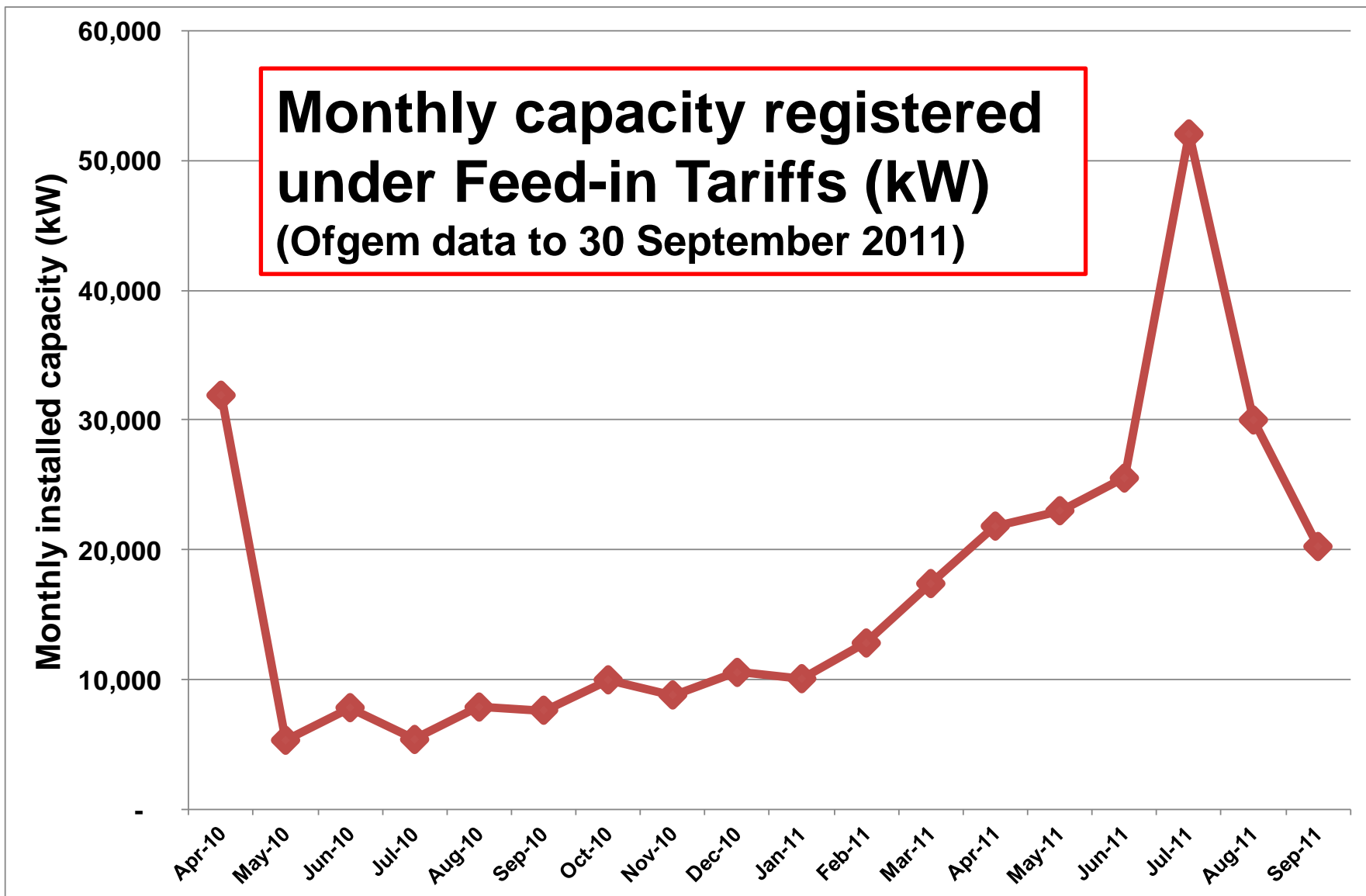
Photovoltaic	77,838	97%
Wind	1,810	2.3%
Hydro	235	0.3%
AD	10	0.01%
Micro-CHP	253	0.3%
Total	80,146	100%

Installed capacity

Registered with Ofgem to 30 September 2011

Photovoltaic	256 MW
Wind	28 MW
Hydro	15 MW
AD	8.8 MW
Micro-CHP	0.25 MW
Total	308 MW





Cumulative capacity (kW)

**Cumulative capacity registered
under Feed-in Tariffs (kW)
(Ofgem data to 30 September 2011)**



Comprehensive FiTs Review

Year ending	PV capacity (MW) DECC forecast		Ofgem registered
	New	Cumulative	
31 March 2011	51	51	89
31 March 2012	86	137	256 (so far!)
31 March 2013	147	284	
31 March 2014	249	533	
31 March 2015	299	832	
31 March 2016	337	1,170	
31 March 2017	264	1,434	
31 March 2018	204	1,638	
31 March 2019	153	1,791	
31 March 2020	114	1,905	

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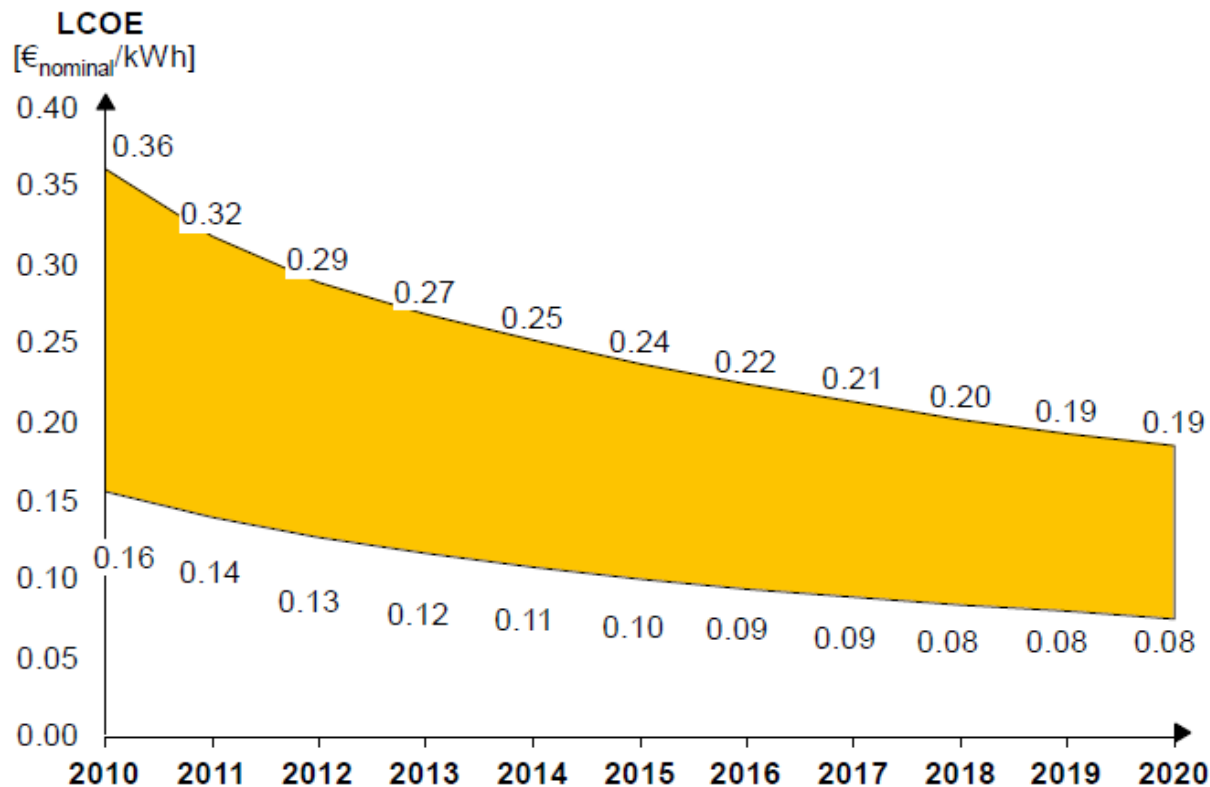
David Owen, CEO of Solar Media Ltd*:

“Based on what I have heard, coupled with the deployment and budget conditions, we should see at least a **30 to 50% decrease** in the domestic PV feed-in tariff”

*His blog on www.solarpowerportal.co.uk dated 7 October 2011

The levelized cost of PV generation in Europe is expected to decline by around 50% until 2020

European PV LCOE range projection 2010 – 2020

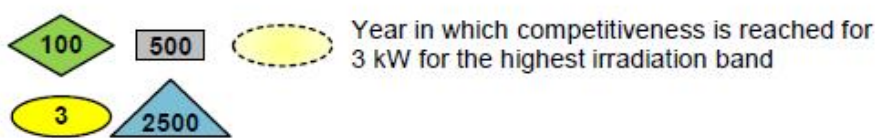
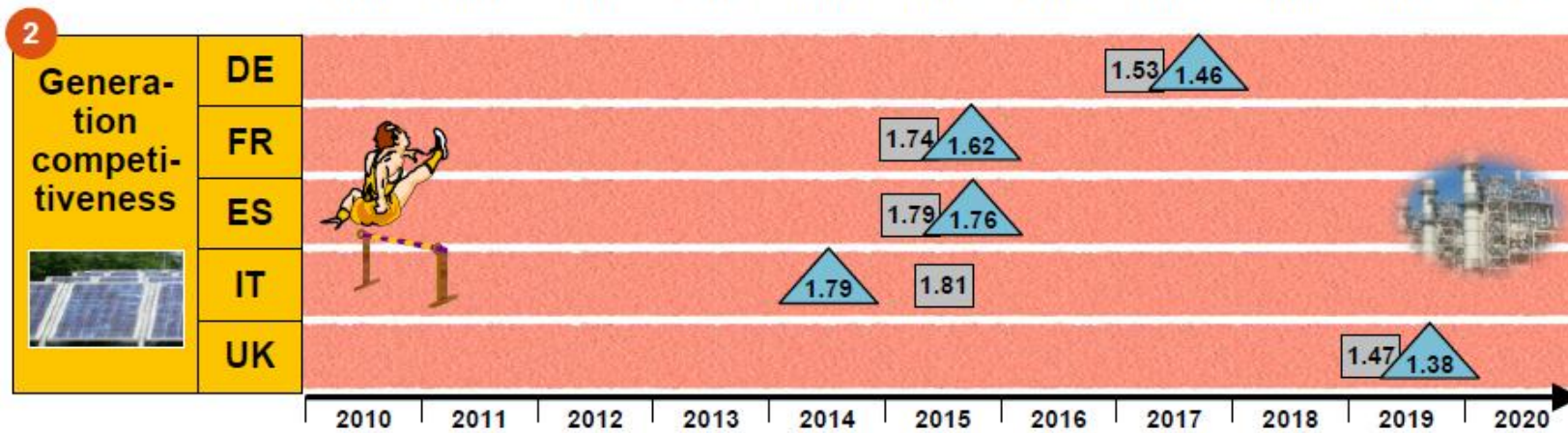
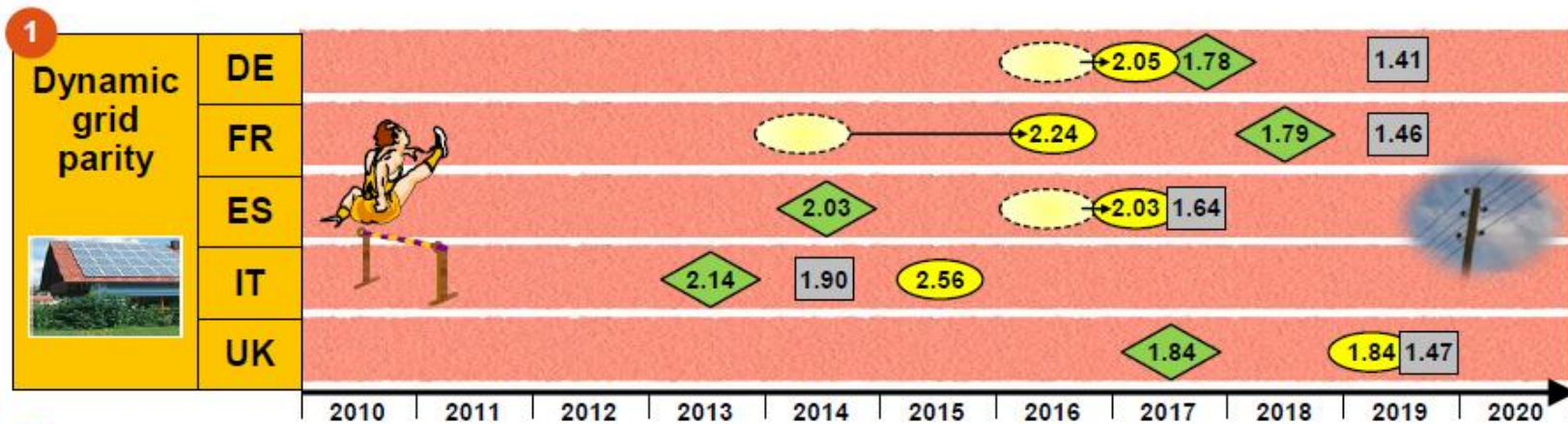


Band of LCOE reflects:

- Four different system size segments
- Crystalline Silicon and Thin Film technologies
- Differences in national installed system and operations cost
- Differences in national irradiation
- Different WACC for different countries considered
- VAT for residential segment

PV can successfully compete in both races for all segments and countries by 2018

Year of competitiveness and level of system prices in €/Wp



1) Data based on average irradiation
Source: A.T. Kearney analysis

Size of PV system in kW

What is the opportunity now?

- ▲ FiTs are a major success story
 - > We estimate 25,000 PV jobs, and growing
- ▲ Comprehensive FiTs Review will be crucial
- ▲ Key questions:
 - > How much capacity will be accredited under FiTs by 31st March 2012
 - > What will be its spend be versus the budget?
 - > Is there any scope for increasing the FiTs budget?
- ▲ Watch this space carefully!

Thank you

Renewable Energy Association
7th Floor, Capital Tower
91 Waterloo Road
London SE1 8RT

mmandy@r-e-a.net

Tel: 020 7925 3570

Web: www.r-e-a.net