

## Renewable energy in 2007

### Introduction

This article updates that published in the June 2007 edition of Energy Trends. It looks at the latest position on the Renewables Obligation and presents statistics on renewable energy production and use in the United Kingdom in 2007. The statistics show that in 2007 provisionally 4.9 per cent of electricity sales by licensed suppliers in the UK were from electricity generated from renewables eligible for the Renewables Obligation, up from 4.4 per cent in 2006.

The collection of renewable energy statistics began in 1989, when all relevant renewable energy sources were identified and, where possible, information was collected on the amounts of energy derived from each source. The renewable energy sources currently covered are as follows: active solar heating; photovoltaics; onshore and offshore wind power; wave power; large and small scale hydro; biomass; geothermal aquifers and biofuels used for transport. Prior to 2004 wastes were added in with renewables as a convenient place to record this fuel source but with the publication of the 2003 data the international definition of total renewables was adopted for all reported years and this excludes non-biodegradable wastes.

The database now contains 19 years of data from 1989 to 2007 and this database will be used to provide the detailed figures on renewable sources of energy that will be available in the new Digest of UK Energy Statistics for 2008 to be published on the 31 July 2008. The available detailed data from the Renewables Obligation Certificates (ROCs) system has again made a major contribution to this year's data analysis.

### UK's renewables policy

Prior to 2002, the main instruments for pursuing the development of renewables capacity were the Non Fossil Fuel Obligation (NFFO) Orders for England and Wales and for Northern Ireland (NI-NFFO), and Scottish Renewable Obligation (SRO) Orders; the term "NFFO Orders" is used to refer to these instruments collectively. These aimed to assist the renewables industry by allowing premium prices to be paid for electricity for a fixed period. Since February 2000, however, the United Kingdom's renewables policy has consisted of four key strands:

- a **Renewables Obligation** on all electricity suppliers in Great Britain to supply a specific proportion of electricity from eligible renewables, introduced from April 2002;
- exemption of electricity from renewables<sup>1</sup> from the **Climate Change Levy**, introduced from April 2001;
- an **expanded support programme** for new and renewable energy **including capital grants** and an expanded **research and development** programme;
- development of a **regional strategic approach** to planning and targets for renewables.

In parallel with this, the European Union's Renewables Directive (RD), which came into force in October 2001, proposes that Member States adopt national targets for renewables that are consistent with reaching the overall EU target of 12 per cent of energy (22.1 per cent of electricity) from renewables by 2010. The proposed UK "share" of this target is that renewables source eligible under the RD should account for **10 per cent of UK electricity consumption by 2010**.

In March 2007 the European Council agreed to a common strategy for energy security and tackling climate change. An element of this was establishing a target of 20 per cent of EU's energy to come from renewable sources. In January 2008 the European Commission published proposals for each Member State's contribution to the EU target. The Commission's proposal was that the UK by 2020 15 per cent of final energy consumption should be accounted for by energy from renewable sources.

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<sup>1</sup> Electricity generated by hydro stations with a declared net capacity of more than 10 MW is not exempt from the Climate Change Levy

## Renewables obligation

The obligation is part of the UK's proposed programme to tackle climate change and to encourage a more sustainable approach to energy consumption. Previous policy has been successful in introducing renewables to the UK marketplace and in reducing costs. The focus of current policy is to build on these achievements through the Obligation and a system of capital grants designed to bring forward offshore wind and energy crops, thereby maximising the chances of meeting the Government's targets.

In April 2002 the new Renewables Obligation (RO) covering England and Wales and the analogous Renewables (Scotland) Obligation came into effect<sup>2</sup>. Northern Ireland introduced a similar Renewables Obligation on 1 April 2005. It is an obligation on all electricity suppliers to supply a specific and growing proportion of electricity from eligible renewable sources in order to increase the level of renewable generating capacity and so contribute to the Government's climate change targets. Examples of eligible sources are listed in Table 1. There are, however, specific exclusions. These are generating stations using peat; existing hydro plant of over 20 MW built before 1990 (unless re-furbished); and energy from mixed waste combustion. Mixed waste that is converted to fuel using advanced conversion technology is eligible, but only the biodegradable fraction of any waste is eligible (in line with the EU Directive). All stations outside the UK (which includes its territorial waters and the continental shelf) are also excluded.

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**Table 1: Examples of eligible sources of renewable energy**

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Wind energy (off-shore and on-shore)
Hydro power, excluding hydro power from plants exceeding 20 MW DNC
Tidal and tidal stream
Wave energy
Photovoltaics
Geothermal (hot dry rock and aquifers)
All biodegradable material
Landfill gas and sewage gas
Co-firing of biomass with fossil fuel
Agriculture and forestry wastes, and energy crops

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Monitoring compliance of the Renewables Obligation is the responsibility of the Office for Gas and Electricity Markets (Ofgem), who administer a system of certification. **Renewables Obligation Certificates** (ROCs) are issued to qualifying renewables generators as evidence that the electricity supplier has been generated and supplied or used in a permitted way in the United Kingdom. These certificates may be sold by generators directly to licensed electricity suppliers or traders. ROCs can be traded separately from the electricity to which they relate.

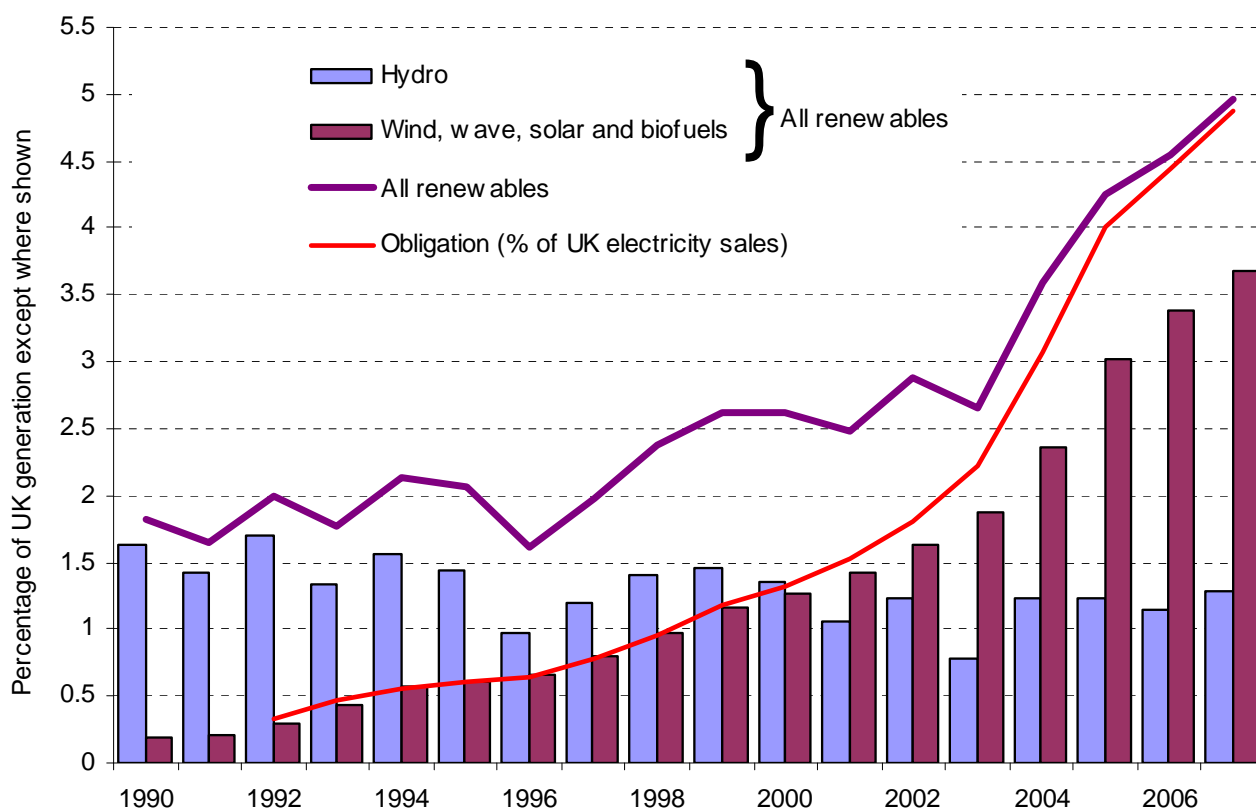
## Renewables - statistics update

Renewables (on the international definition basis) see Table 2, provided 5.0 per cent of the electricity generated in the United Kingdom in 2007, 0.4 percentage points higher than in 2006. Total electricity generation from renewables in 2007 amounted to 19,664 GWh, an increase of 1,548 GWh (8½ per cent) on 2006. The main contributors to this increase were 917 GWh (+26 per cent) from onshore wind, 439 GWh from large scale hydro (+11 per cent), 253 GWh (+6 per cent) from landfill gas, 132 GWh (+20 per cent) from offshore wind, and 94 GWh (+9 per cent) from municipal solid waste combustion. There was a 572 GWh decrease in the co-firing of biomass with solid fuels (-23 per cent). Chart 1 shows the growth in the proportion of electricity produced from renewable sources. It includes the progress towards the renewables targets set under the Renewables Obligation (RO).

In Chart 1 the bars show the growth in the two constituent parts of renewables generation since 1990. The lines show the growth in two of the three percentage measures used for renewables growth. The Renewables Directive percentage closely followed the Renewables Obligation's

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<sup>2</sup> Parliamentary approval of the Renewables Obligation Orders under The Utilities Act 2000 was given in March 2002.

**Chart 1: Growth in electricity generation from renewable sources since 1990**

growth path and is not shown separately. In 2007 all three of the percentages showed strong growth, stronger than in the previous year but not as strong as in 2005. The percentage of UK electricity sales that were of electricity generated from sources eligible for the RO grew by 0.5 percentage points to 4.9 per cent, and, on the basis favoured by the Renewables Directive, the percentage of UK electricity consumption accounted for by RD eligible renewable sources also increased by 0.4 percentage points to 4.9 per cent in 2007. Table 2 sets out the percentages for each of the last five years for each of the three percentage measures.

**Table 2: Percentages of electricity derived from renewable sources**

	2003	2004	2005	2006	2007
<b>Overall renewables percentage</b> (Electricity generated from all renewables as a percentage of all electricity generated in the UK)	2.7	3.6	4.3	4.5	5.0
<b>Percentage on a Renewables Obligation basis</b> (Electricity generated from renewables eligible for the Renewables Obligation - see Table 1 - as a percentage of electricity sales by licensed suppliers in the UK)	2.2	3.1	4.0	4.4	4.9
<b>Percentage on a Renewables Directive basis</b> (Electricity generated from renewable sources eligible under the EU Directive - i.e. all renewables except non-biodegradable wastes - as a percentage of UK electricity consumption)	2.6	3.5	4.2	4.5	4.9

Hydro is no longer the leading technology for the generation of electricity from renewable sources, despite hydro generation being at a new record level in 2007. Twenty seven per cent of renewables generation in 2007 was from wind and only 26 per cent from hydro. Hydro's contribution was higher than the 25 per cent contribution in the "dry" year of 2006 but well below the 29 per cent recorded in 2005. Generation from renewable sources other than hydro was 8 per cent higher than in 2006. Chart 2 shows the growth in generation from renewables.

### Heat production

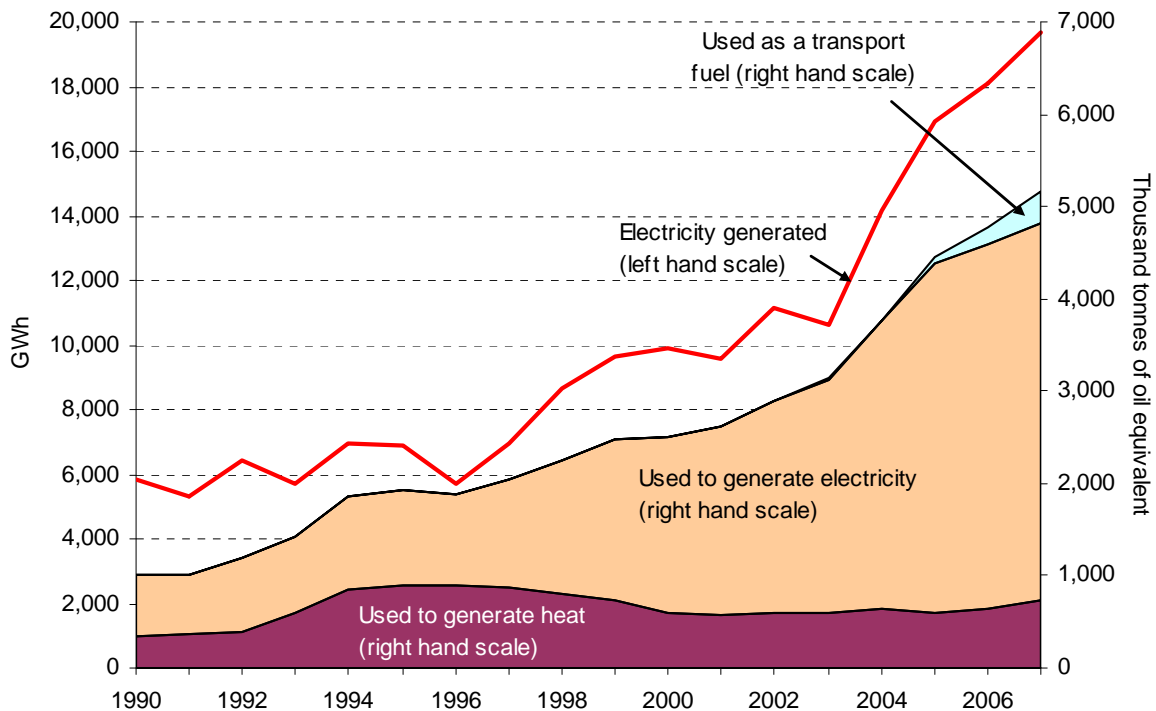
Renewable sources are also used to generate heat. The three sources of heat production in the United Kingdom are: the direct combustion of biomass (94 per cent of the total), active solar heating, and geothermal aquifers. Together they produced energy equivalent to 729 thousand tonnes of oil equivalent. Renewables used to generate heat are now shown as having some growth in the most recent years mainly because of a re-assessment of the figure for domestic wood combustion in the light of recent research. Nonetheless the total use for heat is some 17 per cent lower than it was 10 years earlier in 1997. This decline is mainly due to tighter emission controls discouraging on-site burning of biomass, especially wood waste. Domestic use of wood is the main contributor to renewables used for heat, but plant biomass has overtaken industrial use of wood and wood waste to be the second largest component.

### Biofuels for transport

Renewables statistics produced by BERR will now include liquid biofuels for transport. Two road transport fuels, biodiesel and bioethanol, are sold blended with diesel and petrol. The Renewable Transport Fuel Obligation (RTFO), introduced in April 2008, places a legal requirement on transport fuel suppliers (ie those who supply more than 450,000 litres of fossil fuel per annum to the UK market) to ensure that 5 per cent (by volume) of their overall fuel sales is from a renewable source by 2010/11, with staged required levels of 2.5 per cent (by volume) for 2008/9 and 3.75 per cent (by volume) in 2009/10. Figures from HM Revenue and Customs based on road fuel taxation statistics show that 347 million litres of biodiesel and 153 million litres of bioethanol were consumed in 2007 up from 169 million litres and 95 million litres respectively in 2006.

When renewables used for transport and renewables used for heat are combined with the use of renewable sources for electricity generation, provisionally renewables accounted for 2.0 per cent of the United Kingdom’s total primary energy requirements in 2007, up from 1.9 per cent in 2006 and 1.8 per cent in 2005. The trends in the use of renewable energy for transport, heat and electricity are shown in Chart 2.

**Chart 2: Trends in the use of renewable energy for heat, electricity, and transport**



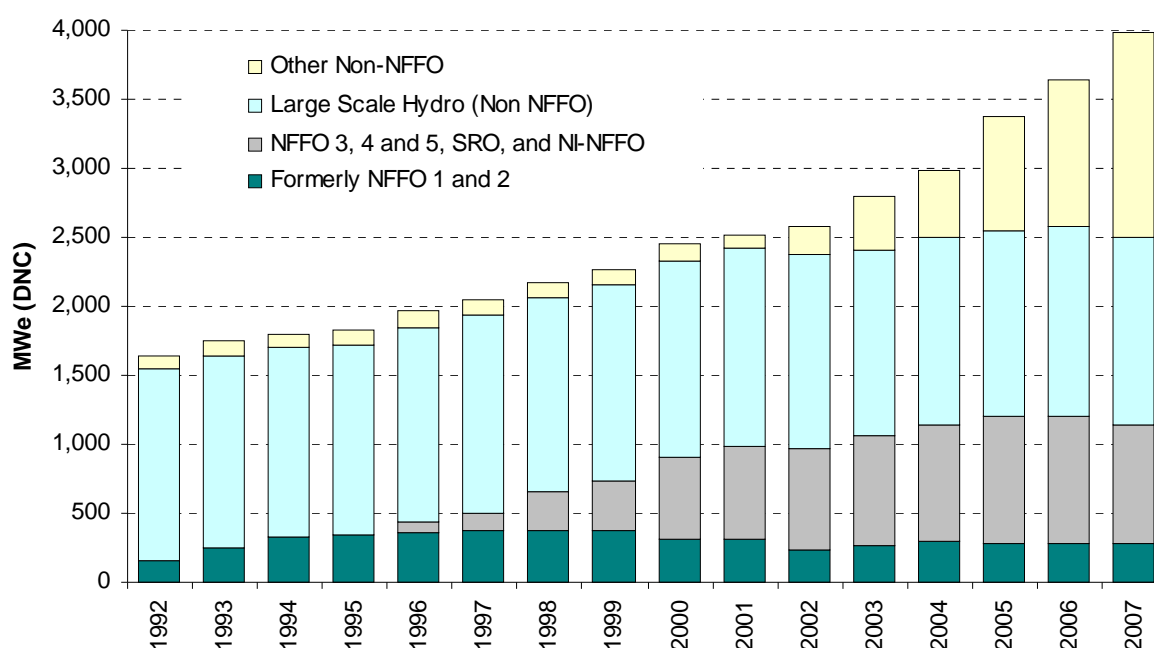
On the basis favoured by the Statistical Office of the European Communities (Eurostat) for measuring the proposed targets for Member States towards the EU's 20 per cent of all energy from renewables in 2020, provisionally in the UK in 2007, 1.8 per cent of final energy consumption was from renewables in 2007 up from 1.5 per cent in 2006 and 1.3 per cent in 2005.

## NFFO

Before the Renewables Obligation was introduced in 2002, the Non Fossil Fuels Obligation (NFFO) along with the Scottish Renewables Orders and Northern Ireland NFFO, was the main means of encouraging the development of renewable sources to generate electricity. Much of the capacity to generate originates from NFFO contracted projects as Chart 3 shows.

While live projects under NFFO accounted for 1,142 MW DNC of renewables capacity at the end of 2007, this was only 28.7 per cent of the total renewables generating capacity in the United Kingdom at that date (3,983 MW DNC). Forty eight per cent of the other 2,841 MW is accounted for by large-scale hydro capacity operated mainly by major power producers, a decline from over 80 per cent as recently as 2002. This is because new onshore and offshore windfarms and other new schemes eligible for ROCs are taking a progressively larger proportion. Trends in capacity since 1992 (in DNC terms) are shown in Chart 3.

**Chart 3: Renewable generating capacity from NFFO, former NFFO contracts (including equivalents in Scotland and Northern Ireland) and capacity outside of NFFO**



## Regional statistics

The Government encourages a regional strategic approach to planning and targets for renewables and as a result regional statistics in support of both these regional initiatives are now produced. Since 2002 regional renewables statistics have appeared in the September issues of Energy Trends and an article updating the figures to 2007 is planned for September 2008.

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