

## Renewable energy statistics

### In 2008:

- **Renewable energy accounted for 10.3% of gross final energy consumption in the EU-27.**
- **Electricity generation from renewable energy covered 16.6% of gross electricity consumption.**
- **The share of renewable energy in final energy consumption for heat was 11.9%.**

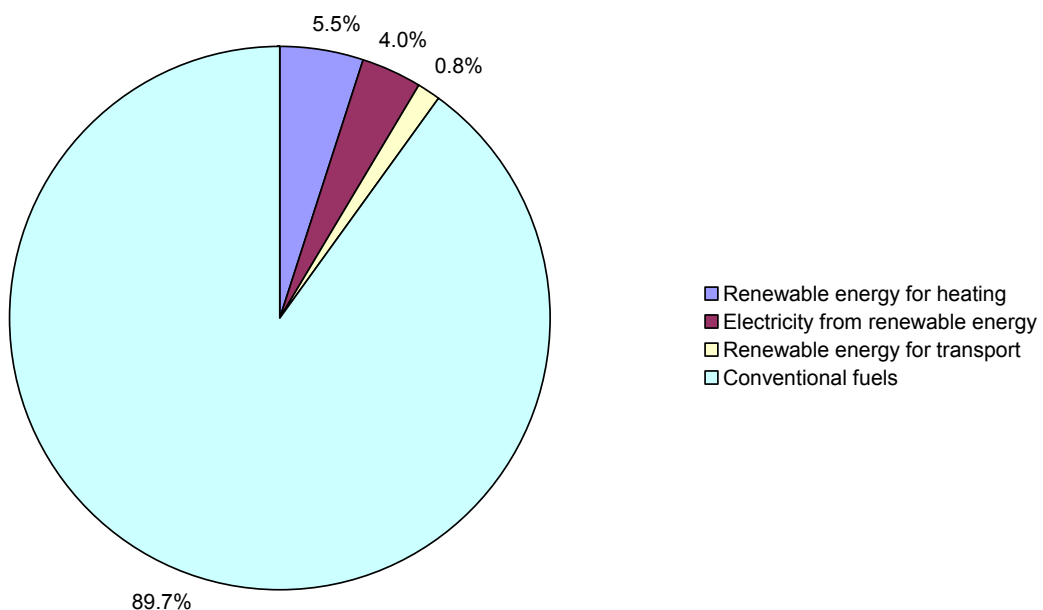
In July 2010 Eurostat published a Data in focus publication (30/2010) presenting renewable energy indicators, including the contribution of renewable energy to gross final energy consumption, a first estimate of the relevant indicator described in Directive 2009/28/EC.

This Statistics in focus publication provides a detailed insight to the background data used for calculating renewable energy indicators. A full description of the annual energy statistics reported by the competent Member State's authorities to Eurostat can be found in Annex B of the Energy Statistics Regulation.

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### The contribution of renewables in gross final energy consumption

Figure 1: EU-27 breakdown of gross final energy consumption in 2008

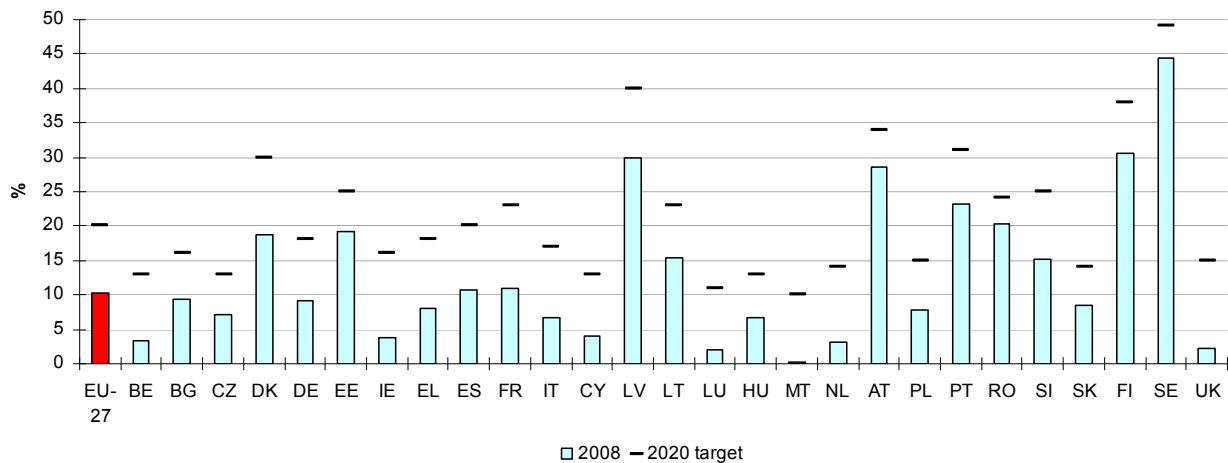


Source: Eurostat

The share of renewable energy in gross final energy consumption was 10.3% in the EU-27 in 2008; the remaining 89.7% was covered through the use of conventional fuels such as natural gas or oil products. The renewable energy share in gross final energy consumption was used for the production of heat (5.5%), electricity (4%) and for transport fuels (0.8%). The greater use of

renewable energy and the lower overall gross final energy consumption in 2007 and 2008 compared with 2006, raised the share of renewable energy from 8.9% in 2006 to 10.3% in 2008. This share varies significantly among Member States, mainly due to differences among them as regards renewable energy potential and early exploitation of the available natural resources.

**Figure 2: Contribution of renewable energy to gross final energy consumption in 2008**

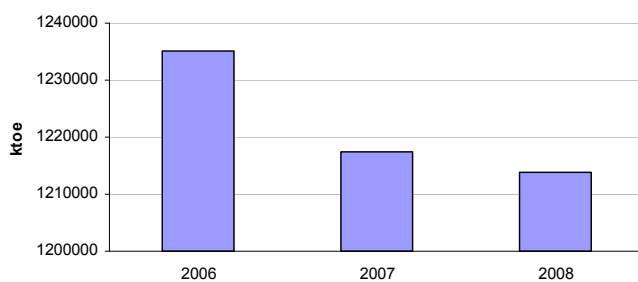


Source: Eurostat

At EU level, in absolute terms, total gross final energy consumption fell by 21.2 Mtoe, from 1 235.1 Mtoe in 2006 to 1 213.9 Mtoe in 2008, while consumption of renewable energy rose by

16.0 Mtoe from 109.5 Mtoe in 2006 to 125.5 Mtoe in 2008, i.e. an average increase of 7.3% per year in the period 2006 to 2008.

**Figure 3: EU-27 gross final energy consumption**



Source: Eurostat

**Figure 4: EU-27 final consumption of renewable energy**



Source: Eurostat

## Sectoral Indicators

The renewables energy Directive 2009/28/EC covers renewable energy use in three sectors:

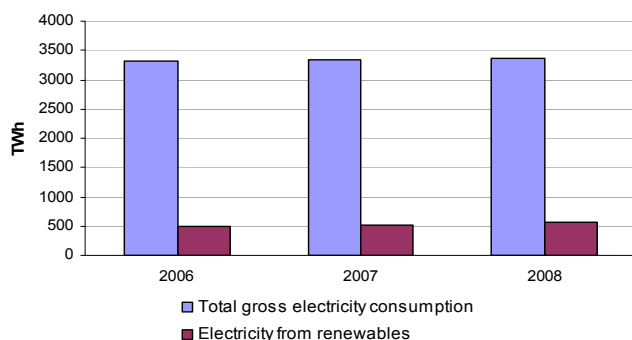
1. Gross final consumption of electricity from renewable energy sources;
2. Gross final consumption of energy from renewable sources for heating and cooling; and

3. Final consumption of energy from renewable sources in transport.

The statistics set out below aim to present the renewable energy contribution in different Member States in each of these three sectors.

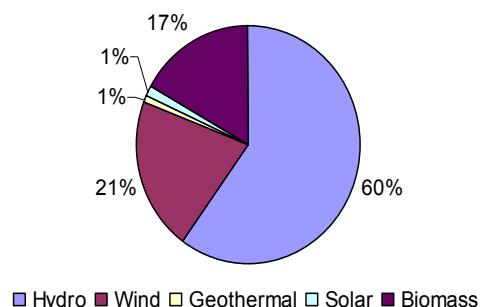
## Electricity from renewable energy sources

Figure 5: EU-27 gross electricity consumption



Source: Eurostat

Figure 6: EU-27 renewable electricity by source in 2008

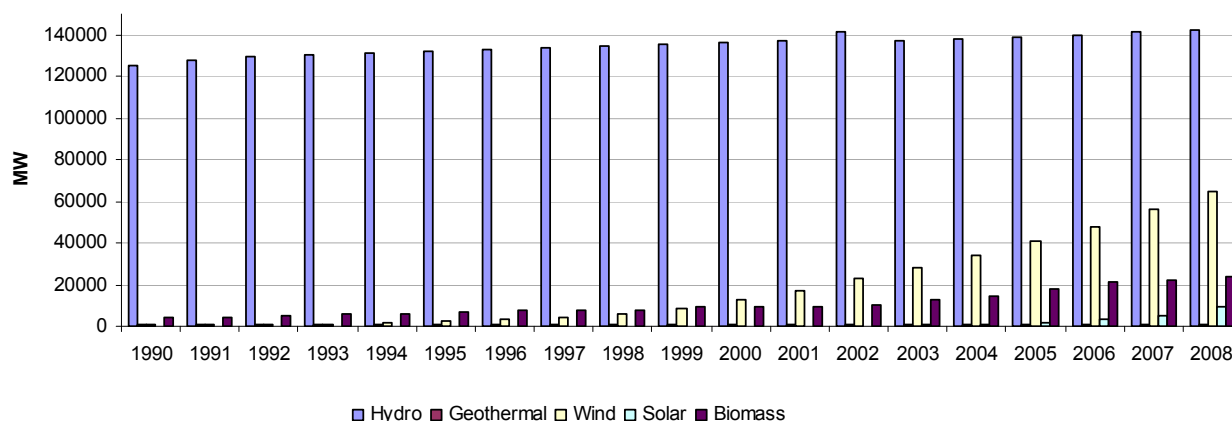


Source: Eurostat

In 2008, renewable electricity comprised electricity from hydro (60%, normalised), wind (21%, normalised), biomass (17%), geothermal energy (1%), and solar energy (1%). The growing share of renewable electricity, 15.1% in 2006, 15.8% in 2007 and 16.6% in 2008 with normalised hydro and wind electricity is mainly due to the increasing installed capacity of wind turbines and solar energy installations (photovoltaics and solar thermal-electric). The non-normalised share of electricity

from renewables in total gross electricity generation in 2008 was 16.7% for the EU-27. The difference between the normalised and non-normalised shares in 2008 varied from 0 to 6.5% at national level, indicating the need for normalisation in monitoring national targets.

Figure 7: EU-27 electrical installed capacity of renewables

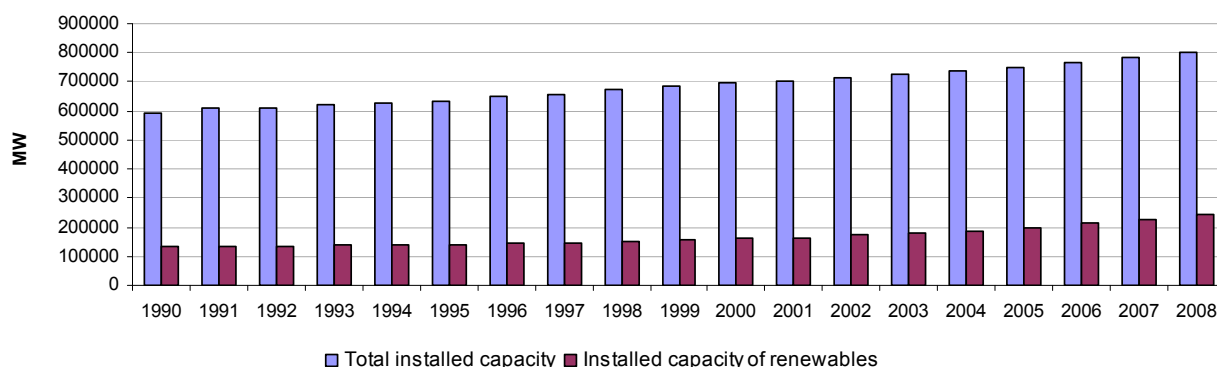


Source: Eurostat

The overall share of installed capacity of renewable technologies for electricity generation also increased, from 22% in 1998 to 30% in 2008. In 2008, the EU's total gross electricity consumption was 3 357 TWh, 558 TWh of

which was produced from renewable sources. The availability of hydro resources in Austria and Sweden is the main reason for the high shares of renewable electricity in these countries (AT 65%, SE 53%).

**Figure 8: EU-27 installed capacity for electricity generation**



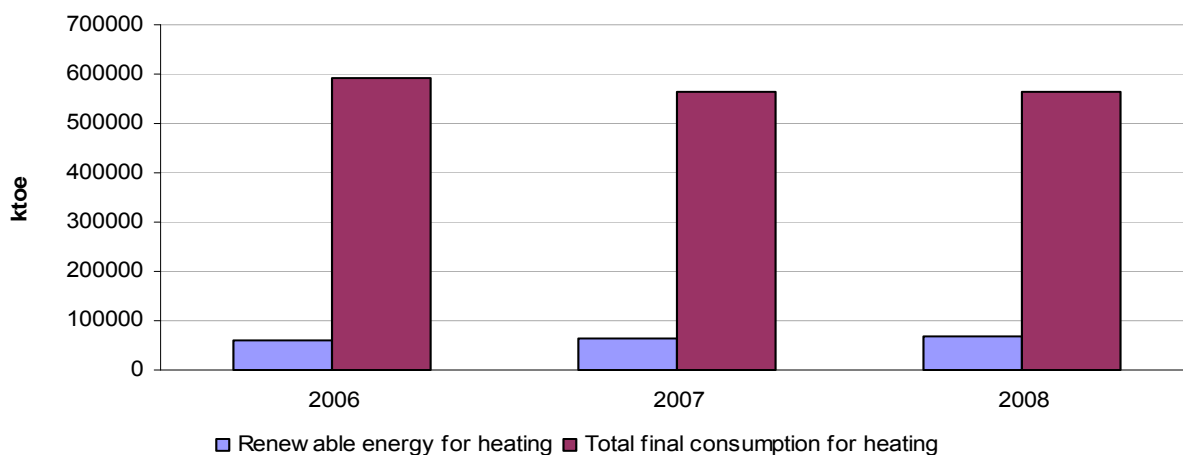
Source: Eurostat

### Renewable energy for heating

Renewable energy for heating covered 11.9% of total final energy consumption for heating in 2008 and 5.5% of the total gross final energy consumption of the EU-27. Of the 564.7 Mtoe total final energy consumption for heating, 67.8 Mtoe was covered by renewable energy. High shares of renewable energy use for heat production are observed in Sweden (63.1%), Latvia (43%) and Finland (42%), mainly due to the extensive use of wood in households and in industry. At EU level direct use of biomass, covering wood and wood waste, renewable municipal wastes and biogas, contributed 55.1 Mtoe in 2008 and liquid biofuels used for heating contributed 0.6 Mtoe. Also in

2008, derived heat, produced from heating and CHP plants using biomass, contributed 7.8 Mtoe of renewable energy, solar thermal energy contributed 1.1 Mtoe and low enthalpy geothermal energy 0.7 Mtoe. Eight Member States that had information on heat pumps provided an estimate of the renewable energy output of heat pumps. In total, 2.2 Mtoe of renewable energy from heat pumps is included in final consumption. The direct use of liquid biofuels for heat production in industry and households, the services sector and in agriculture increased significantly, from 128 ktoe in 2006 to 617 ktoe in 2008.

**Figure 9: EU-27 energy consumption for heating**

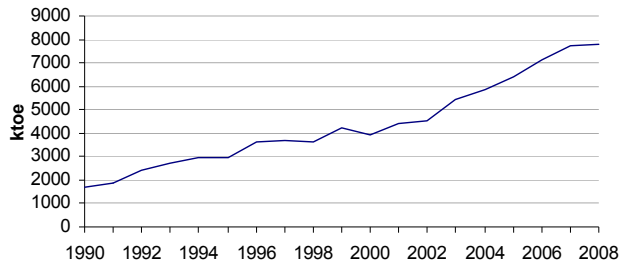


Source: Eurostat

Statistical data on the contribution of wood/wood waste, available since 1990, demonstrate that the use of woody biomass for centralised production of heat increased faster than the direct use of wood in

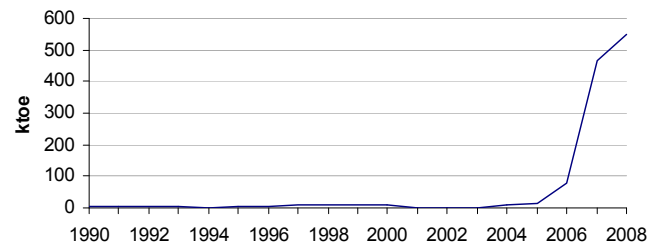
households and in industry. The use of solar heat also increased by a factor of 7, while geothermal heat increased by a factor of 1.8 since 1990.

**Figure 10: EU-27 derived heat from biomass**



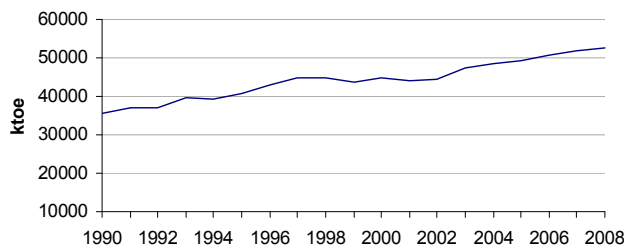
Source: Eurostat

**Figure 11: EU-27 final energy consumption of liquid biofuels for heat production**



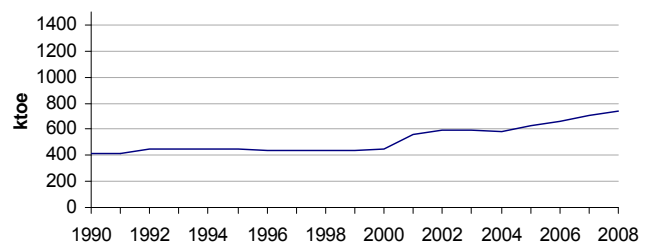
Source: Eurostat

**Figure 12: EU-27 final energy consumption of wood for heat production**



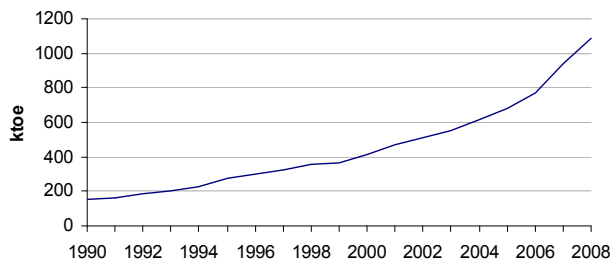
Source: Eurostat

**Figure 13: EU-27 final energy consumption of geothermal heat**



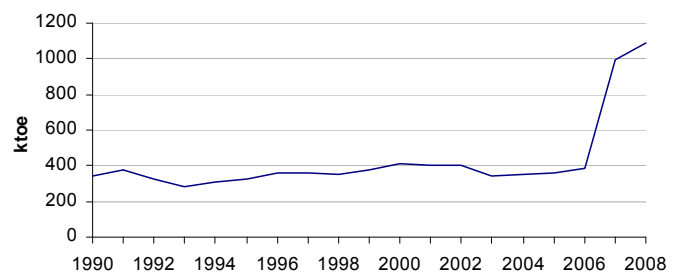
Source: Eurostat

**Figure 14: EU-27 final energy consumption of solar heat**



Source: Eurostat

**Figure 15: EU-27 final energy consumption of biogas**



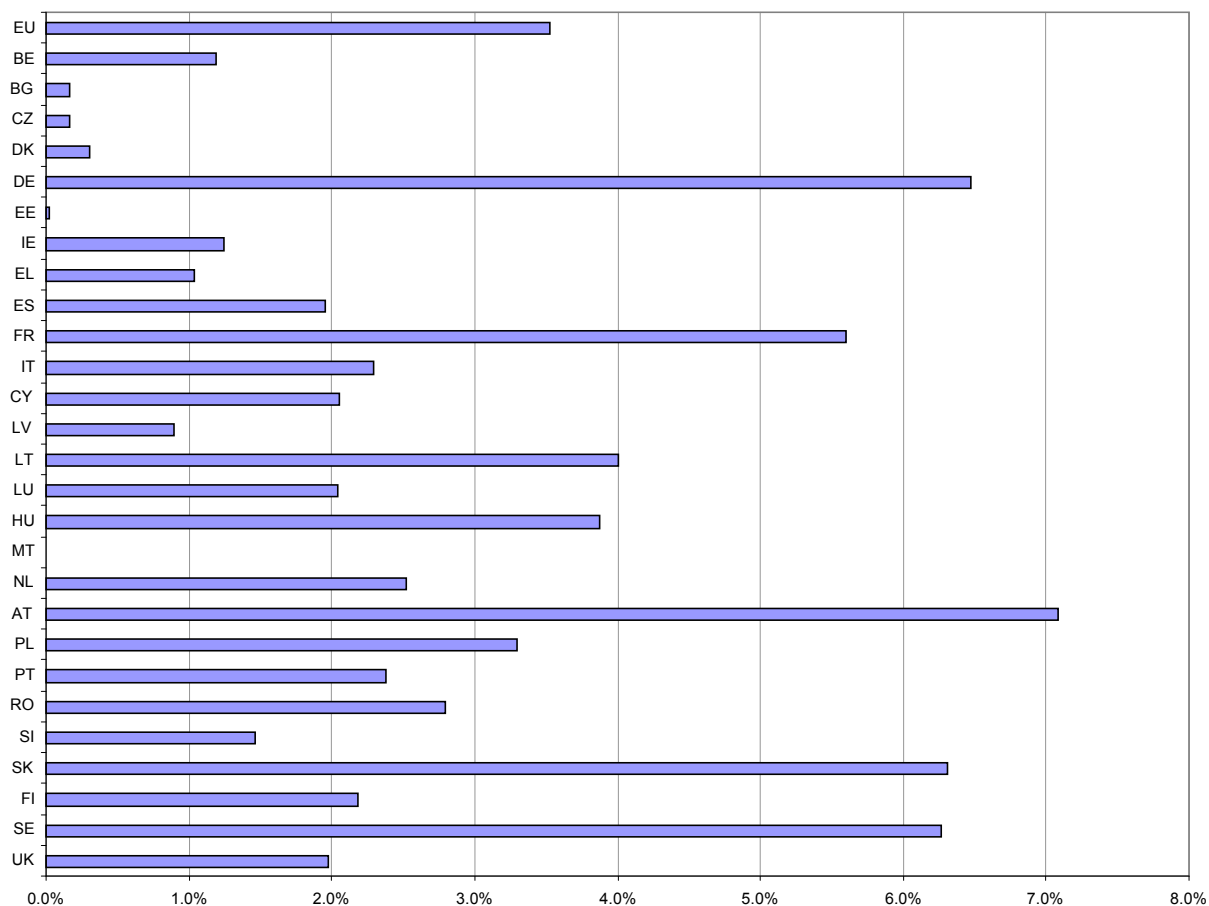
Source: Eurostat

## Renewable energy used in transport

The transport sector, accounting for one third of final energy consumption, used 374 Mtoe of energy in 2008, 304 Mtoe of which in road transport. 95% of transport consumption is covered by petroleum products, mainly petrol and diesel for land transport. The use of biogasoline and biodiesel, practically all blended with fossil petrol and diesel, increased

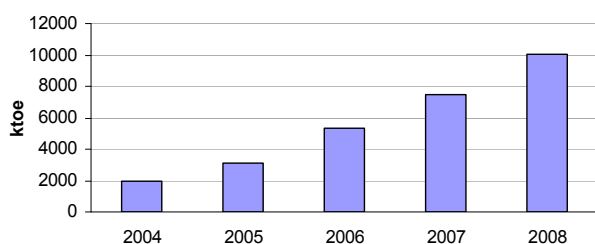
significantly since 2004 (2 Mtoe), reaching 10 Mtoe in 2008. The lower use of fossil petrol and diesel in transport in 2008 compared with 2007 raised the share of renewable energy in transport from 2.6% in 2007 to 3.5% in 2008, with 5 Member States having more than 5% of renewable energy in their land transport fuel mix.

**Figure 16: Share of renewable energy in transport in 2008**



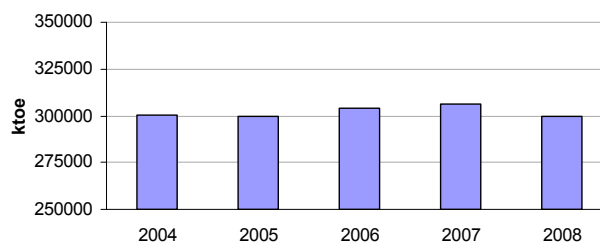
Source: Eurostat

**Figure 17: EU-27 biogasoline and biodiesel consumption in transport**



Source: Eurostat

**Figure 18: EU-27 petrol and diesel consumption in transport including biofuels**



## Methodology

### **The contribution of renewable energy to gross final energy consumption**

Gross final energy consumption is defined in Directive 2009/28/EC as the sum of:

- final energy consumption, i.e. energy delivered to industry for manufacturing processes, to the transport sector, including international aviation, and to other sectors (households, services, agriculture, etc.),
- consumption of electricity and heat by the energy branch for electricity and heat generation (own use by plant),
- losses of electricity and heat in transmission and distribution.

To improve accuracy and consistency with national statistics in calculating the renewable energy shares, national calorific values for oil products were used where available for converting quantities of petroleum products into energy units, instead of the Eurostat ones used in published energy balances. Energy production from non-renewable municipal wastes was deducted from the contribution of biomass to heating and electricity generation, and consumption for pipeline transport was included in gross final energy consumption, in line with the sectoral classification of the Energy Statistics Regulation. Finally, despite the lack of an adopted statistical methodology on heat pumps and for reasons of completeness, the contribution of renewable energy from heat pumps was taken into account where sufficient information was available. For these reasons some small differences exist between data used for this publication and the published energy balances. Finally, it should be noted that the statistical system for biofuels does not yet distinguish between biofuels that are compliant and non-compliant with the sustainability criteria.

### **Electricity from renewable energy sources**

As stipulated in Article 5 of Directive 2009/28/EC, for the purpose of calculating the electricity target, gross final consumption of electricity from renewable sources is the electricity produced from renewable energy sources, excluding hydro electricity produced from pumped storage. Annex II to the Directive also requires electricity production from hydro and wind energy to be normalised. To calculate the indicator "share of electricity from renewable sources in gross electricity consumption", electricity from renewables is divided by total gross electricity consumption, defined in the National Renewable Energy Action Plans (NREAP, Table 1) as gross electricity production, including autoproduction, plus electricity imports, minus exports. Given the 15 year normalisation requirement for hydro production and the availability of energy statistics (for the EU-27, starting from 1990), long time series of this indicator are not available.

### **Renewable energy for heating**

For the purpose of calculating the share of renewable energy in heating and cooling, final consumption of energy from renewable sources is defined as the final consumption of renewable energy in industry, households, services, agriculture, forestry and fisheries for heating and cooling purposes, plus district heating produced from renewables. The total final consumption for heating and cooling is the final consumption of all energy commodities, except electricity, for purposes other than transport, plus the consumption of heat for own use at electricity and heat plants and the heat losses in networks.

### **Renewable energy used in transport**

Progress made in reaching the 10% share of renewable energy consumption in transport cannot be evaluated accurately with existing statistics as biofuel consumption cannot yet distinguish biofuels complying with the sustainability criteria. Data currently available cover the consumption of biogasoline and biodiesel used directly or blended with gasoline or diesel oil for transport purposes. Also, electricity consumption in road transport is not available for all Member States, as it is not yet an explicit requirement of the Energy Statistics Regulation.

More information about the methodology for calculating renewable energy shares and Eurostat's annual energy statistics can be found in [the Renewable Energy Directive 2009/28/EC](#), the [Energy Statistics Regulation 1099/2008](#) and on DG ENERGY's transparency platform: [http://ec.europa.eu/energy/renewables/index\\_en.htm](http://ec.europa.eu/energy/renewables/index_en.htm).

## Further information

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<http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/data/database>

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