Total Energy Consumption in UK.

Note. 1. These figures are derived from government statistics for 2003.
2. We will be redoing them for more recent stats, but they will not be very different.

Units for Energy.

Energy can be measured in all kinds of different units. Some of these for large amounts of energy are given below:-

1. Gigawatt hours. That is in millions of kilowatt hours (the units our electricity bills come in.
2. Tonnes of oil equivalent. The amount of energy in 1 standard tonne of oil.
3. Million tonnes of o.e. Energy equivalent to 1 million tonnes of standard oil. (etc)
4. Tera-joules 1,000s of billions of joules.

Conversion factors:-

3,600 Gjoules	=	1 Gwatt hour.	1 Gjoule	=	278 kilowatt hours.
3,600 Tera joules	=	1,000 Gwatt hours	1 Tjoule	=	278 megawatt hours.
1 tonne o.e.	=	11.6 Mwatt hours	1 Mwatt hr	=	0.086 tons o.e.
1 M tonnes o.e.	=	11.6 Twatt hours	1 Twatt hr	=	86,000 tons o.e.
1 kg o.e	=	11.6 Kwatt hours	1 Kwatt hr	=	0.086 kg o.e. (about 1 litre)
1tonne o.e.	=	0.042 Tjoules	1 Tjoule	=	24 tonnes o.e.
1 M tonnes o.e	=	42,000 T joules			

Energy Data for UK. (2003 figures)

	Oil Equiv	Actual	C cont	CO_2
Coal net	40.1 M tons o,e.	62.4 M tons	40	146 M ton
Coke etc Import	0.7 (act)	1.1 M tons	1	3.7 M t
Oil net	87.0 M tons	87 M tons	64.1	234 M tons
Gas net	91.6 M tons	87	65	238 M tons
Energy fr nuc Elec	20.8 M tons		-	0
Elect from renewl	0.4 M tons			
Total Fuel o.e.	244 M tons	238	170	622 Mtons
Fossil Fuel o.e.	223.2			

Total Input Energy 10,300 T joules = 2,870,000 Gwh

Total CO_2 from Fossil Fuel.
c. 622 M tons (Total Greenhouse gases c. 716Mt includes gases other than CO_2.)
Assume 60 M population 10.3 tons CO_2 /person (c. 12 tons All greenhouse gases.)

Electricity.

Capacity	79,500 Mega watts		
Fuel energy used	1,021,444 Gigawatts hours	(= 87.8 M tons Oil)	
Production	399,820 Gigawatts hours	(= 34.4 M tons oil equiv)	
Energy lost Elec generation and distribution			
Elec geng	21,784	5.5%	
Losses	29,862	8%	
Electricity available from fuel		348,174 Gwh	29.9 Mt o.e.
+ Heating		37,379	3.2 Mt o.e.

Total Useful energy		385,553	33.2 Mt o.e.
Electricity used in other energy industries			
Oil/Petrol	6700	0.16 % ish	0.05
Gas	975	1.6 %	0.5
Coal	870		

Generation efficiency 37% (coal 31% Gas 40% Nuc 31% Ren 100%)
Overall average 37%

Usable Energy.

Lots of the energy that is consumed in the UK (as elsewhere) is used in the industries which produce energy. In particular a huge proportion is used to make, very much less, electricity than is available for use elsewhere.

Coal	2.7 Mt o.e.	(most coal is used to make electricity some converted to special fuel)
Special fuel	3.6 Mt o.e.	2%
Oil	77.7 Mt o.e.	44%
Gas	60.2 Mt o.e.	34%
Electricity	33.2 Mt o.e.	19%
TOTAL	177 Mt o.e.	

That is out of 244 Mt o.e. which we consume in the UK only 177 Mt o.e. (72%) is available for useful productive purposes.

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