

# Energy Statistics 1990 – 2007

2008 Report

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Energy Policy Statistical  
Support Unit

## Sustainable Energy Ireland

Sustainable Energy Ireland was established as Ireland's national energy agency under the Sustainable Energy Act 2002. SEI's mission is to promote and assist the development of sustainable energy. This encompasses environmentally and economically sustainable production, supply and use of energy, in support of Government policy, across all sectors of the economy including public bodies, the business sector, local communities and individual consumers. Its remit relates mainly to improving energy efficiency, advancing the development and competitive deployment of renewable sources of energy and combined heat and power, and reducing the environmental impact of energy production and use, particularly in respect of greenhouse gas emissions.

SEI is charged with implementing significant aspects of government policy on sustainable energy and the climate change abatement, including:

- Assisting deployment of superior energy technologies in each sector as required;
- Raising awareness and providing information, advice and publicity on best practice;
- Stimulating research, development and demonstration;
- Stimulating preparation of necessary standards and codes;
- Publishing statistics and projections on sustainable energy and achievement of targets.

It is funded by the Government through the National Development Plan with programmes part financed by the European Union.

## Energy Policy Statistical Support Unit (EPSSU)

SEI has a lead role in developing and maintaining comprehensive national and sectoral statistics for energy production, transformation and end use. This data is a vital input to meeting international reporting obligations, for advising policy makers and informing investment decisions. Based in Cork, EPSSU is SEI's specialist statistics team. Its core functions are to:

- Collect, process and publish energy statistics to support policy analysis and development in line with national needs and international obligations;
- Conduct statistical and economic analyses of energy services sectors and sustainable energy options;
- Contribute to the development and promulgation of appropriate sustainability indicators.

## Highlights – the year 2007

- In 2007 energy use increased by 1.4% and energy-related emissions increased by 0.8% while economic growth remained strong with the economy growing by 6%. If international aviation was excluded then there was an increase of 0.5% in emissions.
- Overall final energy consumption increased by 1.9% in 2007. There was a 5.5 increase in transport energy demand and 3.0% increase in the services sector. Energy demand in industry remained at 2006 levels and residential energy demand reduced by 2.5%.
- Use of fossil fuels increased by 1.4% in 2007 and accounted for 96% of all energy used in Ireland in 2007.
- Imported oil and gas accounted for 82% of energy supply and Ireland's overall import dependency was 89% in 2007.
- Oil dominated as a fuel, accounting for 56% of energy supply. Oil consumption increased by 0.8% in 2007 with growth in transport being offset by reductions in oil use in electricity generation.
- Natural gas increased by 6.8% in 2007 and reached 27% of energy supply.
- Renewable energy increased by 11% in 2007, including a 21% increase in wind energy. Renewable energy accounted for 32% of indigenous energy in 2007.
- All sectors with the exception of transport experienced reductions in energy-related CO<sub>2</sub> emissions.
- In 2007, transport increased its share of energy by mode of application to 36% with thermal at 33% and energy use for electricity generation at 31%.
- In absolute terms, renewable energy doubled (from 224 ktoe to 443 ktoe) between 2003 and 2007.
- Renewable electricity generation accounted for 9.4% of gross electricity consumption in 2007, with wind energy accounting for 71% of this.
- Biofuels increased sevenfold in 2007, albeit from a low base and accounted for 0.5% of petrol and diesel consumption in 2007.
- The estimated amount of CO<sub>2</sub> avoided from renewable energy increased 6.2% per annum on average between 1990 and 2007 reaching 2.1 million tonnes of CO<sub>2</sub> in 2007.
- Energy inputs to electricity generation fell by 3% in 2007 while at the same time final consumption of electricity decreased by just 0.1%.
- Carbon intensity of electricity reduced again in 2007 by 9.7% to a figure of 543 CO<sub>2</sub> g/kWh due to a reduction in energy-related emissions from electricity of 7.2%.
- There was an increase in electricity generation efficiency from 42% in 2006 to 45% in 2007.
- Industry's final energy use increased by 0.1% (to 2.7 Mtoe) in 2007. Fossil fuel use increased by 3.4% and electricity use decreased by 5.7%.
- Transport was again the fastest growing sector in 2007 in terms of primary energy consumption at 5.3%, slightly below the rate of economic growth of 6%. Petrol increased by 1.9%, diesel by 7.4% and aviation kerosene by 5.4%.
- Final energy use in the residential sector fell by 2.4% in 2007 however when corrections for climate effects are taken into account this becomes an increase of 5% in 2007.
- The services sector experienced an increase of 3% in final energy use in 2007.

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## 1. Introduction

This publication, *Energy Statistics – 2008 Report* is intended as a companion publication to *Energy in Ireland* which contains commentary and analysis based on the data presented here. It is also intended to serve as a resource for policy makers, analysts and researchers with an interest in energy use in Ireland and is prepared by SEI's Energy Policy Statistical Support Unit (EPSSU), based in Cork. This Unit was established to deliver on the remit of Sustainable Energy Ireland in respect of the development, collation, analysis, publication and maintenance of national energy statistics, indicators and trends.

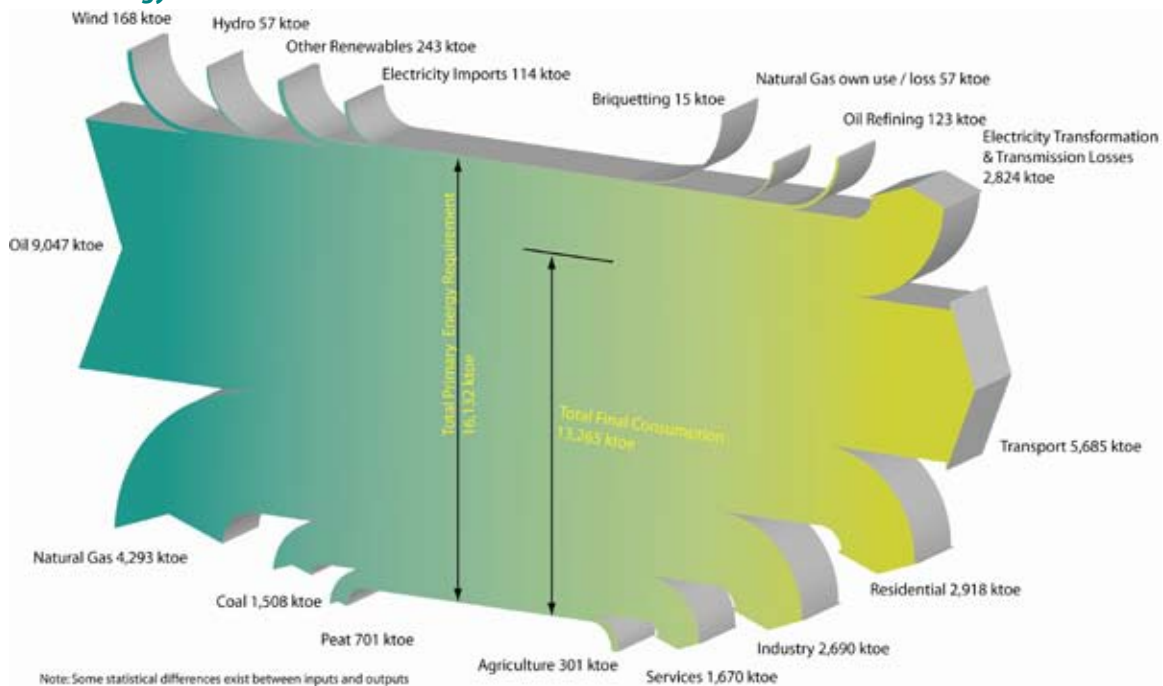
This document details historic energy data from 1990 to 2007. The data are presented in tables showing 1990, 1995 and the last eight years 2000 to 2007.

Energy balance data analysed in this report was frozen on 15<sup>th</sup> October 2008. Balance data are updated whenever more accurate information is known. Data on renewable energy are more up-to-date than that presented in the recently published *Renewable Energy in Ireland 2008 Report*. To obtain the most up-to-date balance figures visit the statistics publications section on Sustainable Energy Ireland's website.

An energy data service is available at <http://www.sei.ie/statistics>, follow the links for Energy Statistics Databank. This service is hosted by the Central Statistics Office with data provided by SEI.

Feedback and comment on the report are welcome and should be addressed by post to the address on the rear cover or by email to [EPSSU@SEI.ie](mailto:EPSSU@SEI.ie).

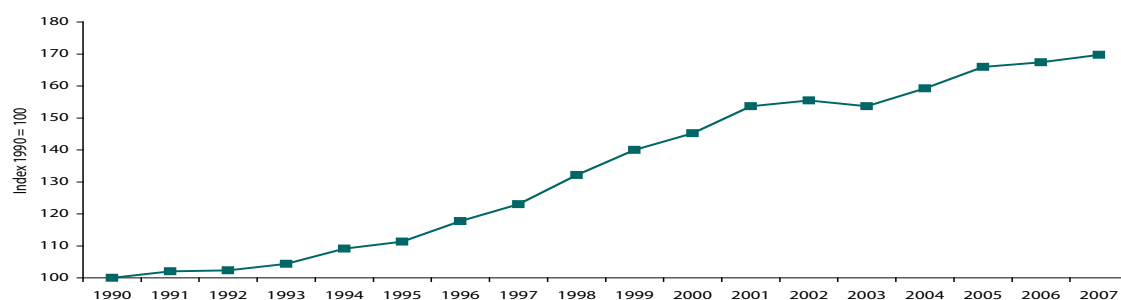
**Figure 1 Energy Flow 2007**



## 2. Energy Balance 2007

kilo tonnes of oil equivalent (ktoe)	COAL	PEAT	OIL	NATURAL GAS	RENEWABLES	ELECTRICITY	TOTAL
Indigenous Production	-	591	-	370	449	-	1,410
Imports	1,420	-	10,560	3,924	25	121	16,051
Exports	3	8	1,299	-	0	7	1,317
Mar. Bunkers	-	-	114	-	-	-	114
Stock Change	91	118	190	-1	-7	-	391
<b>Primary Energy Supply (incl. non-energy)</b>	<b>1,508</b>	<b>701</b>	<b>9,337</b>	<b>4,293</b>	<b>468</b>	<b>114</b>	<b>16,422</b>
<b>Primary Energy Requirement (excl. non-energy)</b>	<b>1,508</b>	<b>701</b>	<b>9,047</b>	<b>4,293</b>	<b>468</b>	<b>114</b>	<b>16,132</b>
<b>Transformation Input</b>	<b>1,124</b>	<b>532</b>	<b>3,838</b>	<b>2,737</b>	<b>33</b>	<b>63</b>	<b>8,326</b>
Public Thermal Power Plants	1,124	431	368	2,501	24	-	4,448
Combined Heat and Power Plants	-	7	8	235	9	-	260
Pumped Storage Consumption	-	-	-	-	-	47	47
Briquetting Plants	-	94	-	-	-	-	94
Oil Refineries & other energy sector	-	-	3,462	-	-	16	3,478
<b>Transformation Output</b>	<b>-</b>	<b>95</b>	<b>3,358</b>	<b>-</b>	<b>11</b>	<b>2,193</b>	<b>5,657</b>
Public Thermal Power Plants	-	-	-	-	9	2,006	2,015
Combined Heat and Power Plants - Electricity	-	-	-	-	3	157	160
Combined Heat and Power Plants - Heat	-	-	-	-	-	-	-
Pumped Storage Generation	-	-	-	-	-	30	30
Briquetting Plants	-	95	-	-	-	-	95
Oil Refineries	-	-	3,358	-	-	-	3,358
<b>Exchanges and transfers</b>	<b>17</b>	<b>-</b>	<b>-7</b>	<b>-</b>	<b>-237</b>	<b>237</b>	<b>9</b>
Electricity	-	-	-	-	-237	237	-
Heat	-	-	-	-	-	-	-
Other	17	-	-7	-	-	-	9
<b>Own Use and Distribution Losses</b>	<b>-</b>	<b>15</b>	<b>123</b>	<b>57</b>	<b>-</b>	<b>229</b>	<b>425</b>
<b>Available Final Energy Consumption</b>	<b>401</b>	<b>249</b>	<b>8,727</b>	<b>1,498</b>	<b>209</b>	<b>2,253</b>	<b>13,337</b>
<b>Non-Energy Consumption</b>	<b>-</b>	<b>-</b>	<b>290</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>290</b>
Final non-Energy Consumption (Feedstocks)	-	-	290	-	-	-	290
<b>Total Final Energy Consumption</b>	<b>374</b>	<b>272</b>	<b>8,604</b>	<b>1,584</b>	<b>207</b>	<b>2,224</b>	<b>13,265</b>
<b>Industry</b>	<b>140</b>	<b>0</b>	<b>1,015</b>	<b>655</b>	<b>152</b>	<b>729</b>	<b>2,691</b>
Non-Energy Mining	-	-	42	36	-	57	136
Food, beverages and tobacco	14	-	125	174	59	171	543
Textiles and textile products	6	-	10	1	-	8	26
Wood and wood products	-	-	13	4	93	30	140
Pulp, paper, publishing and printing	0	-	8	23	-	32	62
Chemicals & man-made fibres	-	-	48	123	-	102	274
Rubber and plastic products	-	-	6	10	-	32	48
Other non-metallic mineral products	120	-	336	55	-	55	565
Basic metals and fabricated metal products	-	-	324	177	-	75	575
Machinery and equipment n.e.c.	-	-	8	13	-	17	39
Electrical and optical equipment	-	-	73	28	-	114	215
Transport equipment manufacture	-	-	3	8	-	9	20
Other manufacturing	-	0	18	2	-	26	47
<b>Transport</b>	<b>-</b>	<b>-</b>	<b>5,659</b>	<b>-</b>	<b>21</b>	<b>4</b>	<b>5,685</b>
Road Freight	-	-	1,186	-	-	-	1,186
Road Private Car	-	-	2,162	-	21	-	2,183
Public Passenger Services	-	-	180	-	-	-	180
Rail	-	-	43	-	-	4	47
Domestic Aviation	-	-	54	-	-	-	54
International Aviation	-	-	991	-	-	-	991
Fuel Tourism	-	-	633	-	-	-	633
Unspecified	-	-	410	-	-	-	410
<b>Residential</b>	<b>208</b>	<b>271</b>	<b>1,127</b>	<b>593</b>	<b>25</b>	<b>693</b>	<b>2,918</b>
<b>Commercial/Public Services</b>	<b>26</b>	<b>-</b>	<b>551</b>	<b>336</b>	<b>8</b>	<b>749</b>	<b>1,670</b>
Commercial Services	26	-	359	147	6	537	1,076
Public Services	-	-	191	189	2	212	595
<b>Agricultural</b>	<b>-</b>	<b>-</b>	<b>252</b>	<b>-</b>	<b>0</b>	<b>48</b>	<b>301</b>
Statistical Difference	27	-23	-167	-86	2	28	-219

Figure 2 Primary Energy Growth 1990 – 2007(Index)



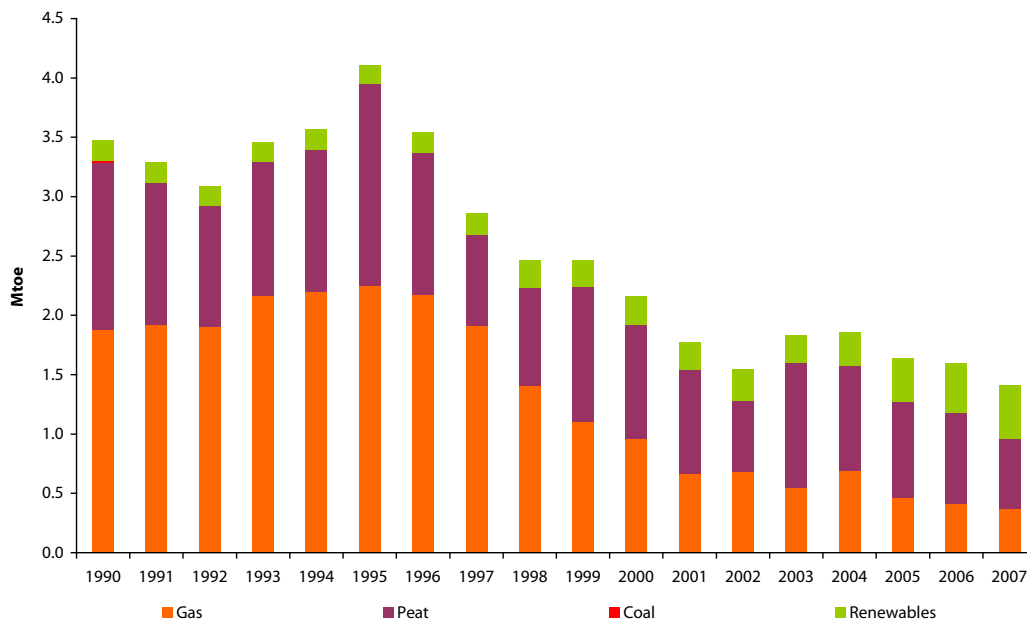
## 3. Energy Production

### 3.1 Primary Energy Production

#### Primary Production

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Indigenous Production</b>	<b>3,471</b>	<b>4,105</b>	<b>2,161</b>	<b>1,776</b>	<b>1,546</b>	<b>1,836</b>	<b>1,862</b>	<b>1,638</b>	<b>1,596</b>	<b>1,410</b>
Coal	16	1	0	0	0	0	0	0	0	0
Peat	1,411	1,697	965	883	606	1,056	889	810	766	591
Natural Gas	1,877	2,253	960	660	679	545	690	462	410	370
<b>Renewables</b>	<b>168</b>	<b>155</b>	<b>235</b>	<b>234</b>	<b>261</b>	<b>235</b>	<b>282</b>	<b>367</b>	<b>420</b>	<b>449</b>
Hydro	60	61	73	51	78	51	54	54	62	57
Wind	0	1	21	29	33	39	56	96	139	168
Biomass	105	89	113	125	125	119	141	180	181	171
Landfill Gas	0	0	24	24	19	16	20	25	25	24
Biogas	2	3	4	4	4	9	10	9	7	10
Liquid Biofuel	0	0	0	0	0	0	0	1	3	15
Solar	0	0	0	0	0	0	0	0	1	1
Geothermal	0	0	0	0	0	0	0	0	1	2

Figure 3 Indigenous Production by Fuel 1990 – 2007

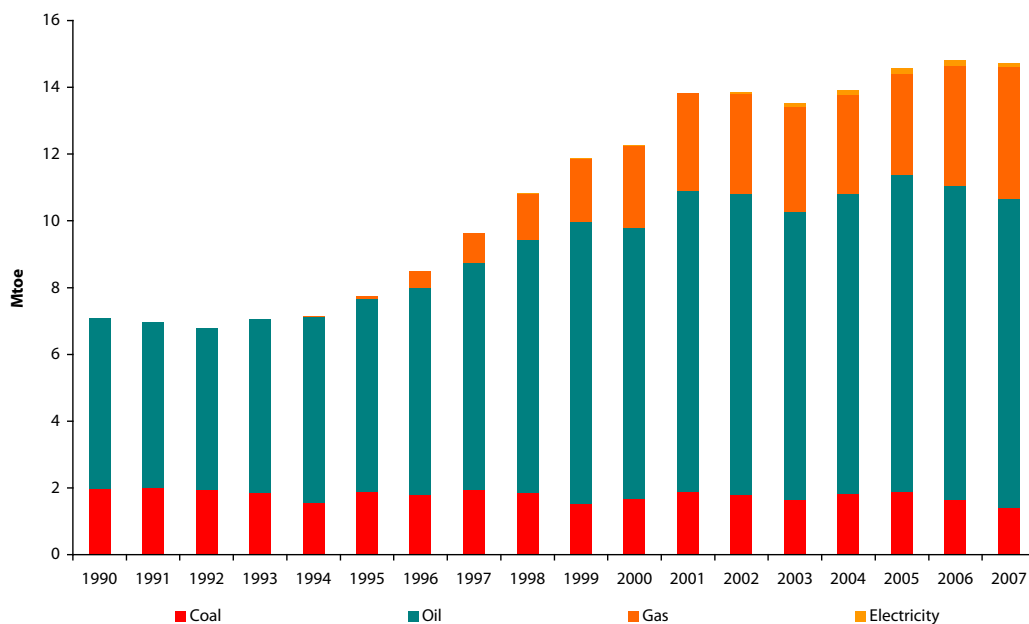


## 3.2 Net Energy Imports

### Net Energy Imports

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Net Imports</b>	<b>6,979</b>	<b>7,704</b>	<b>12,219</b>	<b>13,632</b>	<b>13,651</b>	<b>13,307</b>	<b>13,661</b>	<b>14,280</b>	<b>14,525</b>	<b>14,431</b>
<b>Coal</b>	<b>1,992</b>	<b>1,886</b>	<b>1,692</b>	<b>1,887</b>	<b>1,801</b>	<b>1,627</b>	<b>1,831</b>	<b>1,879</b>	<b>1,631</b>	<b>1,417</b>
Bituminous Coal	1,974	1,817	1,643	1,831	1,748	1,570	1,775	1,822	1,590	1,382
Anthracite + Manufactured Ovoids	0	47	32	35	28	33	37	33	35	30
Lignite	18	21	18	20	25	24	19	25	6	5
<b>Peat Briquettes</b>	<b>-4</b>	<b>-6</b>	<b>-8</b>	<b>-8</b>	<b>-8</b>	<b>-12</b>	<b>-10</b>	<b>-10</b>	<b>-10</b>	<b>-8</b>
<b>Oil</b>	<b>4,991</b>	<b>5,740</b>	<b>8,044</b>	<b>8,843</b>	<b>8,808</b>	<b>8,452</b>	<b>8,739</b>	<b>9,219</b>	<b>9,142</b>	<b>8,984</b>
Crude	2,035	2,283	3,010	3,429	3,402	3,324	2,959	3,342	3,254	3,489
Refinery Gas	0	0	0	0	0	0	0	0	0	0
Gasoline	586	686	1,059	934	929	982	1,137	1,085	1,168	1,246
Kerosene	96	224	357	334	264	326	391	390	442	483
Jet Kerosene	370	350	724	910	1,046	1,031	1,016	1,177	1,214	1,111
Fuel Oil	504	677	426	724	453	95	370	116	-28	-543
LPG	118	112	121	99	90	91	104	111	114	116
Gasoil / Diesel/ DERV	1,212	1,291	2,111	2,092	2,348	2,311	2,468	2,686	2,705	2,750
Petroleum Coke	70	118	237	322	276	292	293	312	274	333
<b>Natural Gas</b>	<b>0</b>	<b>85</b>	<b>2,483</b>	<b>2,931</b>	<b>3,007</b>	<b>3,140</b>	<b>2,965</b>	<b>3,016</b>	<b>3,610</b>	<b>3,924</b>
<b>Electricity</b>	<b>0</b>	<b>-1</b>	<b>8</b>	<b>-22</b>	<b>43</b>	<b>100</b>	<b>135</b>	<b>176</b>	<b>153</b>	<b>114</b>
<b>Renewables</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>25</b>
Biomass	0	0	0	0	0	0	0	0	2	12

Figure 4 Net Imported Energy by Fuel 1990 – 2007

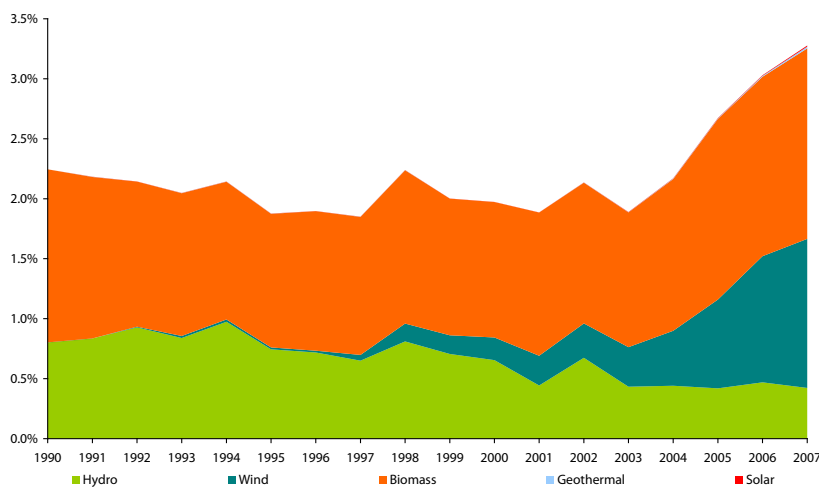


### 3.3 Renewable Production

#### Renewable Production

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Total Renewable Production</b>	<b>168</b>	<b>155</b>	<b>235</b>	<b>234</b>	<b>261</b>	<b>235</b>	<b>282</b>	<b>367</b>	<b>420</b>	<b>449</b>
Hydro	60	61	73	51	78	51	54	54	62	57
Wind	0	1	21	29	33	39	56	96	139	168
Biomass	105	89	113	125	125	119	141	180	181	171
Landfill Gas	0	0	24	24	19	16	20	25	25	24
Biogas	2	3	4	4	4	9	10	9	7	10
Liquid Biofuel	0	0	0	0	0	0	0	1	3	15
Solar	0	0	0	0	0	0	0	0	1	1
Geothermal	0	0	0	0	0	0	0	0	1	2

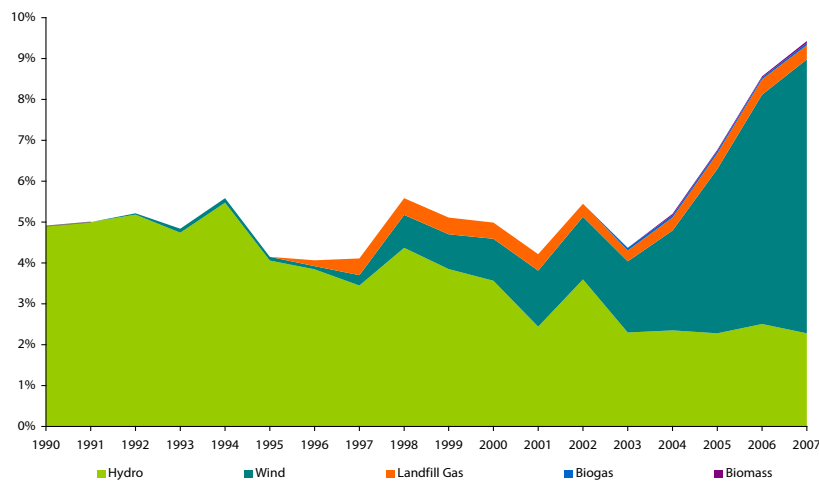
Figure 5 Renewable Energy Contribution to Final Consumption (Directive 2008)



### 3.4 Renewable Electricity as percentage of Gross Electricity Consumption

Renewables % of Gross Electricity	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
Hydro	4.90%	4.06%	3.56%	2.44%	3.60%	2.30%	2.35%	2.28%	2.51%	2.28%
Wind	0.00%	0.09%	1.03%	1.37%	1.53%	1.74%	2.44%	4.02%	5.61%	6.70%
Biomass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.03%	0.03%	0.05%
Landfill Gas	0.00%	0.00%	0.40%	0.40%	0.32%	0.27%	0.32%	0.38%	0.38%	0.35%
Biogas	0.00%	0.00%	0.00%	0.00%	0.00%	0.06%	0.06%	0.06%	0.04%	0.06%

Figure 6 Renewable Energy Contribution to Gross Electricity Consumption 1990 – 2007

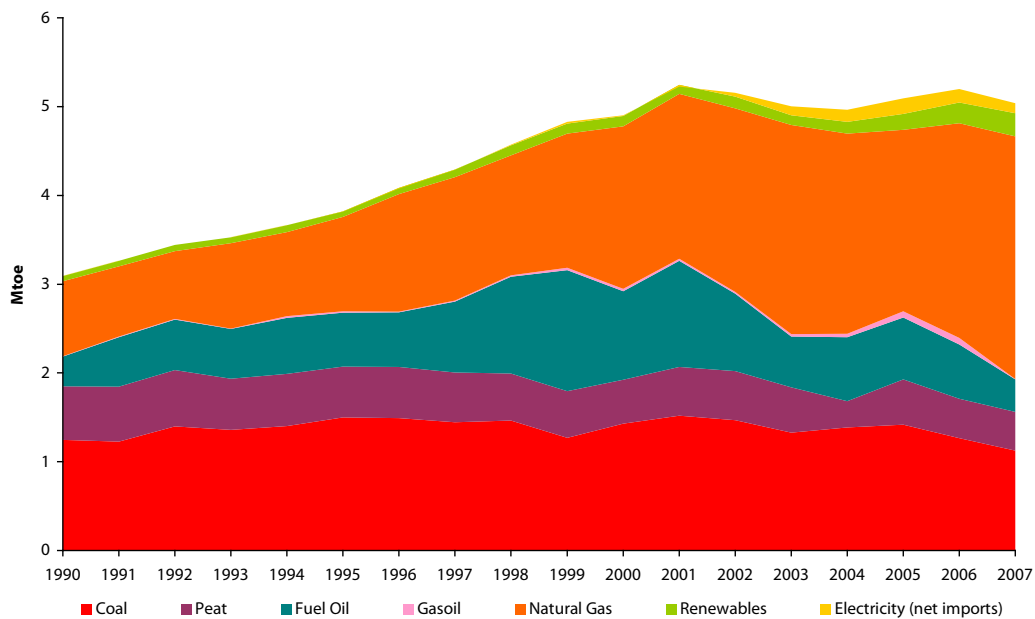


### 3.5 Fuels used in Electricity Production

#### Electricity Inputs

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Coal</b>	<b>1,245</b>	<b>1,499</b>	<b>1,430</b>	<b>1,517</b>	<b>1,468</b>	<b>1,327</b>	<b>1,387</b>	<b>1,416</b>	<b>1,265</b>	<b>1,124</b>
Bituminous Coal	1,245	1,499	1,430	1,517	1,468	1,327	1,387	1,416	1,265	1,124
<b>Peat</b>	<b>604</b>	<b>574</b>	<b>491</b>	<b>549</b>	<b>554</b>	<b>511</b>	<b>296</b>	<b>511</b>	<b>444</b>	<b>438</b>
Milled Peat	572	567	491	549	554	511	296	511	444	438
Sod Peat	32	8	0	0	0	0	0	0	0	0
<b>Oil</b>	<b>341</b>	<b>625</b>	<b>1,039</b>	<b>1,232</b>	<b>898</b>	<b>607</b>	<b>769</b>	<b>774</b>	<b>693</b>	<b>376</b>
Refinery Gas	0	5	12	12	8	8	8	8	7	8
Fuel Oil	334	605	998	1,195	870	571	721	697	611	364
Gasoil	7	16	29	26	20	28	39	68	75	4
<b>Natural Gas</b>	<b>843</b>	<b>1,063</b>	<b>1,828</b>	<b>1,855</b>	<b>2,069</b>	<b>2,356</b>	<b>2,251</b>	<b>2,044</b>	<b>2,417</b>	<b>2,737</b>
<b>Renewables</b>	<b>60</b>	<b>63</b>	<b>117</b>	<b>104</b>	<b>131</b>	<b>109</b>	<b>135</b>	<b>180</b>	<b>232</b>	<b>259</b>
Hydro	60	61	73	51	78	51	54	54	62	57
Wind	0	1	21	29	33	39	56	96	139	168
Biomass	0	0	0	0	0	0	2	2	3	3
Landfill Gas	0	0	24	24	19	16	20	25	25	24
Biogas	0	0	0	0	0	2	2	2	2	6
<b>Electricity (net imports)</b>	<b>0</b>	<b>-1</b>	<b>8</b>	<b>-22</b>	<b>43</b>	<b>100</b>	<b>135</b>	<b>176</b>	<b>153</b>	<b>114</b>
<b>Total</b>	<b>3,093</b>	<b>3,822</b>	<b>4,914</b>	<b>5,237</b>	<b>5,163</b>	<b>5,010</b>	<b>4,973</b>	<b>5,101</b>	<b>5,205</b>	<b>5,048</b>

Figure 7 Primary Fuel Mix for Electricity Generation 1990 – 2007



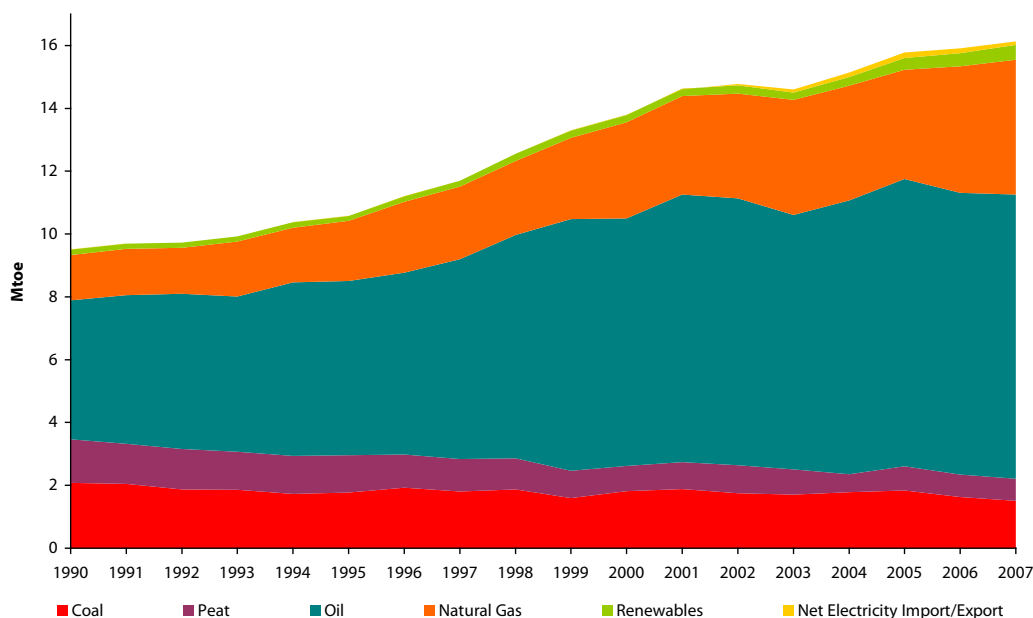
## 4. Consumption

### 4.1 Gross Energy Consumption

#### Gross Energy Consumption

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Primary Energy Supply (incl. non-energy)</b>	<b>10,120</b>	<b>11,115</b>	<b>14,337</b>	<b>15,237</b>	<b>15,355</b>	<b>14,840</b>	<b>15,406</b>	<b>16,064</b>	<b>16,200</b>	<b>16,422</b>
<b>Primary Energy Requirement (excl. non-energy)</b>	<b>9,503</b>	<b>10,577</b>	<b>13,797</b>	<b>14,603</b>	<b>14,776</b>	<b>14,604</b>	<b>15,136</b>	<b>15,774</b>	<b>15,910</b>	<b>16,132</b>
Coal	2,085	1,777	1,815	1,879	1,751	1,700	1,778	1,832	1,631	1,508
Peat	1,377	1,184	803	863	887	805	574	776	707	701
Oil	4,614	5,662	8,033	8,692	8,727	8,340	8,983	9,436	9,268	9,337
Natural Gas	1,877	2,339	3,443	3,591	3,686	3,659	3,653	3,477	4,019	4,293
Renewables	168	155	235	234	261	235	282	367	422	468
Electricity Imports	0	-1	8	-22	43	100	135	176	153	114
<b>Transformation Input</b>	<b>5,105</b>	<b>6,234</b>	<b>8,339</b>	<b>8,796</b>	<b>8,446</b>	<b>8,304</b>	<b>7,874</b>	<b>8,317</b>	<b>8,227</b>	<b>8,326</b>
Coal	1,245	1,499	1,430	1,517	1,468	1,327	1,387	1,416	1,265	1,124
Peat	788	730	618	679	679	645	387	610	552	532
Oil	2,186	2,905	4,391	4,669	4,150	3,894	3,761	4,158	3,900	3,838
Natural Gas	843	1,063	1,828	1,855	2,069	2,356	2,251	2,044	2,417	2,737
Renewables	0	0	24	24	19	19	25	30	31	33
Electricity Pumped Storage	44	39	48	51	61	64	64	60	62	63
<b>Exchanges &amp; Transfers</b>	<b>0</b>	<b>0</b>	<b>-1</b>	<b>-1</b>	<b>-0</b>	<b>-0</b>	<b>-4</b>	<b>1</b>	<b>-11</b>	<b>9</b>
<b>Own Use &amp; Transmission Loss</b>	<b>289</b>	<b>346</b>	<b>410</b>	<b>443</b>	<b>463</b>	<b>471</b>	<b>474</b>	<b>498</b>	<b>510</b>	<b>425</b>
<b>Non Energy Use</b>	<b>617</b>	<b>538</b>	<b>540</b>	<b>634</b>	<b>579</b>	<b>236</b>	<b>269</b>	<b>290</b>	<b>290</b>	<b>290</b>
<b>Total Final Consumption (Observed)</b>	<b>7,265</b>	<b>8,007</b>	<b>10,830</b>	<b>11,280</b>	<b>11,329</b>	<b>11,603</b>	<b>11,970</b>	<b>12,646</b>	<b>13,012</b>	<b>13,265</b>
Coal	843	317	398	393	374	394	405	435	378	374
Peat	757	612	303	292	293	271	267	274	284	272
Oil	3,967	4,912	7,064	7,421	7,461	7,551	7,708	8,194	8,368	8,604
Natural Gas	570	797	1,203	1,237	1,199	1,280	1,461	1,464	1,567	1,584
Renewables	108	92	117	130	130	126	146	184	189	207
Electricity	1,021	1,277	1,745	1,808	1,872	1,981	1,983	2,094	2,225	2,224

Figure 8 Primary Energy Requirement by Fuel 1990 – 2007

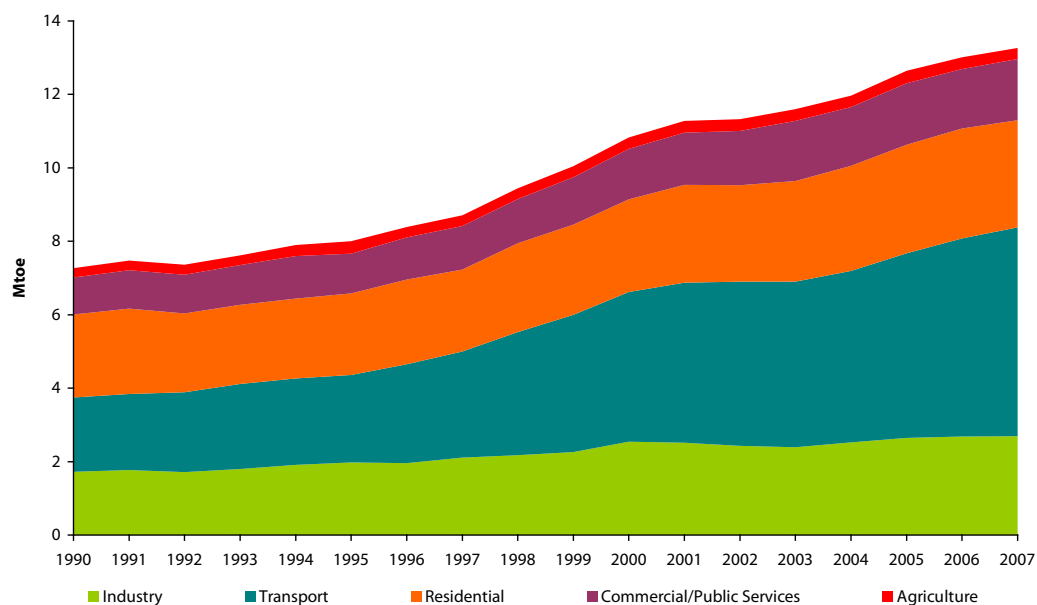


## 4.2 Total Final Consumption

### Total Final Consumption

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Total Final Energy Consumption</b>	<b>7,265</b>	<b>8,007</b>	<b>10,830</b>	<b>11,280</b>	<b>11,329</b>	<b>11,603</b>	<b>11,970</b>	<b>12,646</b>	<b>13,012</b>	<b>13,265</b>
<b>Industry</b>	<b>1,723</b>	<b>1,977</b>	<b>2,542</b>	<b>2,516</b>	<b>2,431</b>	<b>2,391</b>	<b>2,523</b>	<b>2,641</b>	<b>2,688</b>	<b>2,691</b>
Non-Energy Mining	37	144	180	195	170	150	134	141	143	136
Food, beverages and tobacco	426	495	640	634	562	544	532	553	548	543
Textiles and textile products	51	52	64	63	49	37	26	28	27	26
Wood and wood products	74	89	134	146	148	104	127	155	155	140
Pulp, paper, publishing and printing	18	54	67	66	63	59	61	63	65	62
Chemicals & man-made fibres	184	225	285	293	277	260	277	282	280	274
Rubber and plastic products	34	42	51	45	45	44	45	48	51	48
Other non-metallic mineral prods	305	188	264	243	315	408	526	553	513	565
Basic metals & fab. metal prods	316	410	502	451	451	465	496	496	567	575
Machinery and equipment n.e.c.	25	58	89	122	89	63	38	40	40	39
Electrical and optical equipment	63	169	203	196	199	195	198	216	228	215
Transport equipment manufacture	14	19	24	25	23	21	20	21	21	20
Other manufacturing	178	30	39	38	40	42	43	46	48	47
<b>Transport</b>	<b>2,022</b>	<b>2,384</b>	<b>4,080</b>	<b>4,355</b>	<b>4,468</b>	<b>4,509</b>	<b>4,673</b>	<b>5,031</b>	<b>5,390</b>	<b>5,685</b>
Road Freight	334	371	813	825	963	1,075	1,128	1,218	1,186	1,186
Road Private Car	926	1,176	1,559	1,698	1,708	1,792	1,863	1,910	2,024	2,183
Public Passenger Services	52	65	86	97	105	121	120	160	162	180
Rail	45	38	42	46	40	44	49	45	45	47
Domestic Aviation	21	23	38	41	37	36	37	44	51	54
International Aviation	354	378	592	716	766	750	707	814	938	991
Fuel Tourism	0	12	757	766	697	665	709	822	806	633
Unspecified	290	320	194	166	151	26	60	18	177	410
<b>Residential</b>	<b>2,261</b>	<b>2,216</b>	<b>2,524</b>	<b>2,664</b>	<b>2,633</b>	<b>2,738</b>	<b>2,862</b>	<b>2,955</b>	<b>2,990</b>	<b>2,918</b>
<b>Commercial/Public Services</b>	<b>1,007</b>	<b>1,090</b>	<b>1,368</b>	<b>1,423</b>	<b>1,473</b>	<b>1,640</b>	<b>1,597</b>	<b>1,683</b>	<b>1,622</b>	<b>1,670</b>
Commercial Services	554	657	854	888	932	1,059	1,031	1,085	1,046	1,076
Public Services	452	433	514	535	541	581	566	598	577	595
<b>Agricultural</b>	<b>252</b>	<b>340</b>	<b>317</b>	<b>323</b>	<b>324</b>	<b>325</b>	<b>314</b>	<b>336</b>	<b>322</b>	<b>301</b>

Figure 9 Total Final Consumption by Sector 1990 – 2007

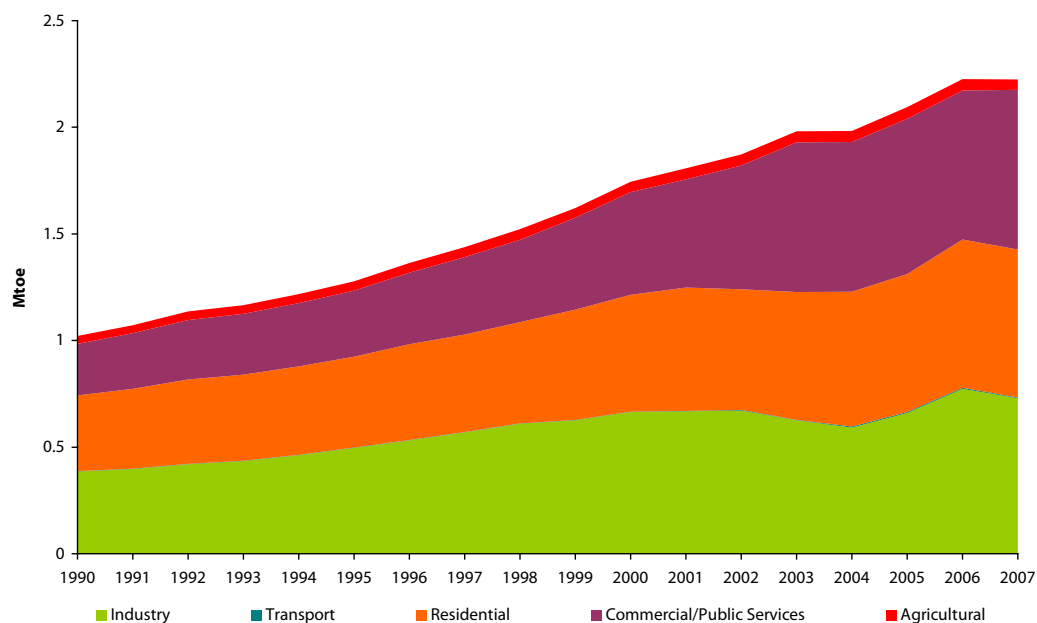


### 4.3 Final Electricity Consumption

#### Final Electricity Consumption

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Total Final Energy Consumption</b>	<b>1,021</b>	<b>1,277</b>	<b>1,745</b>	<b>1,808</b>	<b>1,872</b>	<b>1,981</b>	<b>1,983</b>	<b>2,094</b>	<b>2,225</b>	<b>2,224</b>
<b>Industry</b>	<b>386</b>	<b>496</b>	<b>665</b>	<b>667</b>	<b>672</b>	<b>626</b>	<b>592</b>	<b>660</b>	<b>773</b>	<b>729</b>
Non-Energy Mining	8	30	40	40	45	47	49	54	64	57
Food, beverages and tobacco	105	117	156	161	163	153	145	162	189	171
Textiles and textile products	19	13	18	16	13	10	7	8	9	8
Wood and wood products	10	22	29	29	29	27	25	28	33	30
Pulp, paper, publishing and printing	9	20	27	27	29	28	27	30	35	32
Chemicals & man-made fibres	36	86	115	119	112	98	87	97	113	102
Rubber and plastic products	13	25	33	30	31	29	27	30	36	32
Other non-metallic mineral products	31	38	50	50	51	48	46	52	61	55
Basic metals and fab. metal prods	56	34	46	39	40	38	37	41	48	75
Machinery and equipment n.e.c.	10	13	18	17	17	16	15	16	19	17
Electrical and optical equipment	31	75	101	106	108	101	97	108	127	114
Transport equipment manufacture	4	8	10	10	10	9	8	9	10	9
Other manufacturing	53	17	22	23	24	23	22	25	29	26
<b>Transport</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>4</b>
Road Freight	0	0	0	0	0	0	0	0	0	0
Road Private Car	0	0	0	0	0	0	0	0	0	0
Public Passenger Services	0	0	0	0	0	0	0	0	0	0
Rail	1	2	2	2	2	2	4	5	5	4
Domestic Aviation	0	0	0	0	0	0	0	0	0	0
International Aviation	0	0	0	0	0	0	0	0	0	0
Fuel Tourism	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0
<b>Residential</b>	<b>356</b>	<b>427</b>	<b>548</b>	<b>579</b>	<b>566</b>	<b>599</b>	<b>632</b>	<b>646</b>	<b>695</b>	<b>693</b>
<b>Commercial/Public Services</b>	<b>240</b>	<b>310</b>	<b>481</b>	<b>508</b>	<b>580</b>	<b>702</b>	<b>702</b>	<b>728</b>	<b>699</b>	<b>749</b>
Commercial Services	172	222	345	364	416	503	504	522	501	537
Public Services	68	88	136	144	164	199	199	206	198	212
<b>Agricultural</b>	<b>37</b>	<b>43</b>	<b>49</b>	<b>52</b>	<b>52</b>	<b>52</b>	<b>52</b>	<b>55</b>	<b>53</b>	<b>48</b>

Figure 10 Final Electricity Consumption by Sector 1990 – 2007



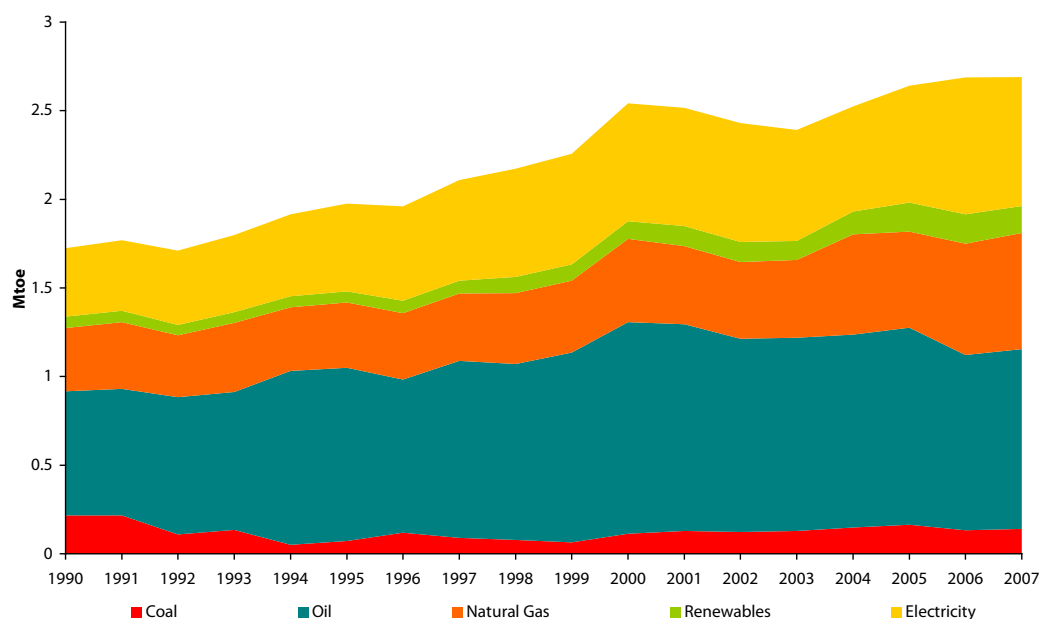
## 5. Sectoral Consumption of Fuels

### 5.1 Industry

#### Industry

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Coal</b>	<b>216</b>	<b>71</b>	<b>113</b>	<b>129</b>	<b>122</b>	<b>129</b>	<b>148</b>	<b>163</b>	<b>133</b>	<b>140</b>
Bituminous Coal	216	71	113	129	122	129	148	163	133	140
Anthracite + Manufactured Ovoids	0	0	0	0	0	0	0	0	0	0
Coke	0	0	0	0	0	0	0	0	0	0
Lignite	0	0	0	0	0	0	0	0	0	0
<b>Peat</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Milled Peat	0	0	0	0	0	0	0	0	0	0
Sod Peat	0	0	0	0	0	0	0	0	0	0
Briquettes	0	0	0	0	0	0	0	0	0	0
<b>Oil</b>	<b>700</b>	<b>979</b>	<b>1,193</b>	<b>1,165</b>	<b>1,091</b>	<b>1,090</b>	<b>1,088</b>	<b>1,112</b>	<b>988</b>	<b>1,015</b>
Crude	0	0	0	0	0	0	0	0	0	0
Refinery Gas	0	0	0	0	0	0	0	0	0	0
Gasoline	0	0	0	0	0	0	0	0	0	0
Kerosene	17	42	90	101	105	121	120	124	124	124
Jet Kerosene	0	0	0	0	0	0	0	0	0	0
Fuel Oil	422	582	673	571	516	480	483	472	372	359
LPG	62	61	66	68	64	64	63	73	71	70
Gasoil / Diesel/ DERV	148	210	190	191	193	197	186	199	190	178
Petroleum Coke	51	82	173	233	212	227	234	243	230	282
Naphta	1	1	1	1	1	1	1	1	1	1
Bitumen	0	0	0	0	0	0	0	0	0	0
White Spirit	0	0	0	0	0	0	0	0	0	0
Lubricants	0	0	0	0	0	0	0	0	0	0
<b>Natural Gas</b>	<b>358</b>	<b>369</b>	<b>471</b>	<b>441</b>	<b>432</b>	<b>437</b>	<b>566</b>	<b>543</b>	<b>629</b>	<b>655</b>
<b>Renewables</b>	<b>63</b>	<b>62</b>	<b>100</b>	<b>113</b>	<b>113</b>	<b>108</b>	<b>129</b>	<b>163</b>	<b>164</b>	<b>152</b>
Hydro	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0
Biomass	61	59	96	109	109	104	124	159	162	151
Landfill Gas	0	0	0	0	0	0	0	0	0	0
Biogas	2	3	4	4	4	4	5	4	2	1
Wastes	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0
<b>Electricity</b>	<b>386</b>	<b>496</b>	<b>665</b>	<b>667</b>	<b>672</b>	<b>626</b>	<b>592</b>	<b>660</b>	<b>773</b>	<b>729</b>
<b>Total</b>	<b>1,723</b>	<b>1,977</b>	<b>2,542</b>	<b>2,516</b>	<b>2,431</b>	<b>2,391</b>	<b>2,523</b>	<b>2,641</b>	<b>2,688</b>	<b>2,691</b>

Figure 11 Industry Final Energy Use by Fuel

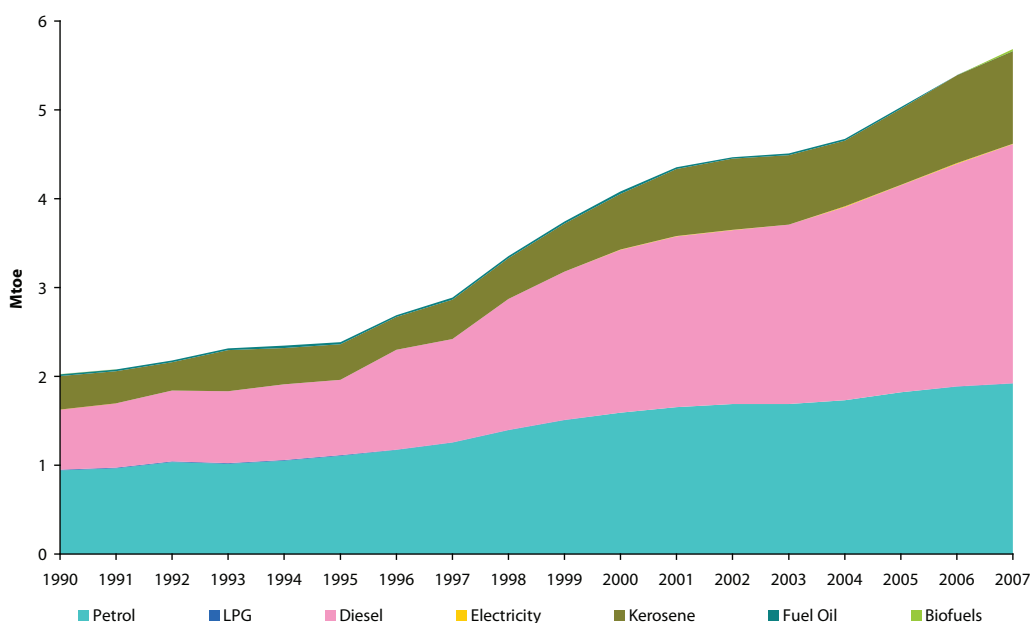


## 5.2 Transport

### Transport

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Coal</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Bituminous Coal	0	0	0	0	0	0	0	0	0	0
Anthracite + Manufactured Ovoids	0	0	0	0	0	0	0	0	0	0
Coke	0	0	0	0	0	0	0	0	0	0
Lignite	0	0	0	0	0	0	0	0	0	0
<b>Peat</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Milled Peat	0	0	0	0	0	0	0	0	0	0
Sod Peat	0	0	0	0	0	0	0	0	0	0
Briquettes	0	0	0	0	0	0	0	0	0	0
<b>Oil</b>	<b>2,021</b>	<b>2,383</b>	<b>4,078</b>	<b>4,352</b>	<b>4,466</b>	<b>4,507</b>	<b>4,669</b>	<b>5,025</b>	<b>5,383</b>	<b>5,659</b>
Crude	0	0	0	0	0	0	0	0	0	0
Refinery Gas	0	0	0	0	0	0	0	0	0	0
Gasoline	944	1,105	1,591	1,653	1,689	1,687	1,732	1,820	1,884	1,920
Kerosene	0	0	0	0	0	0	0	0	0	0
Jet Kerosene	374	400	629	755	802	784	743	857	988	1,043
Fuel Oil	20	22	25	20	18	17	18	18	0	0
LPG	7	6	2	2	1	1	1	1	1	1
Gasoil / Diesel/ DERV	677	849	1,831	1,923	1,956	2,018	2,176	2,329	2,509	2,695
Petroleum Coke	0	0	0	0	0	0	0	0	0	0
Naphta	0	0	0	0	0	0	0	0	0	0
Bitumen	0	0	0	0	0	0	0	0	0	0
White Spirit	0	0	0	0	0	0	0	0	0	0
Lubricants	0	0	0	0	0	0	0	0	0	0
<b>Natural Gas</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Renewables</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>21</b>
Hydro	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0
Landfill Gas	0	0	0	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0	0	0	0
Liquid Biofuels	0	0	0	0	0	0	0	1	3	21
Solar	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0
<b>Electricity</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>4</b>
<b>Total</b>	<b>2,022</b>	<b>2,384</b>	<b>4,080</b>	<b>4,355</b>	<b>4,468</b>	<b>4,509</b>	<b>4,673</b>	<b>5,031</b>	<b>5,390</b>	<b>5,685</b>

Figure 12 Transport Final Energy Use by Fuel

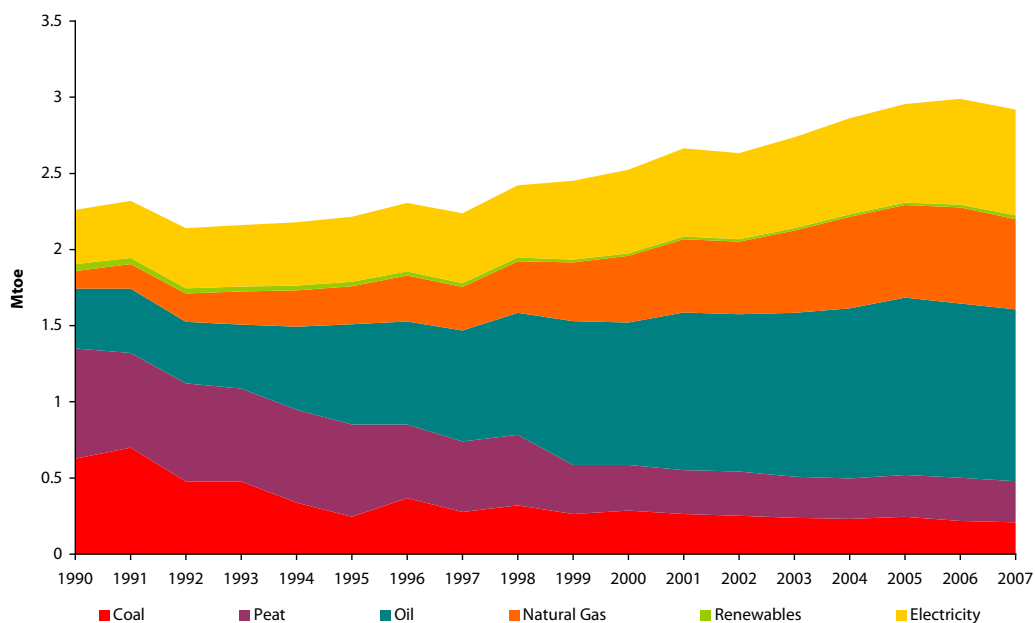


### 5.3 Residential

#### Residential

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Coal</b>	<b>626</b>	<b>246</b>	<b>286</b>	<b>264</b>	<b>252</b>	<b>239</b>	<b>231</b>	<b>246</b>	<b>219</b>	<b>208</b>
Bituminous Coal	608	178	210	181	170	167	158	163	159	142
Anthracite + Manufactured Ovoids	0	47	59	62	56	53	59	59	57	60
Coke	0	0	0	0	0	0	0	0	0	0
Lignite	18	21	17	21	26	18	15	24	4	6
<b>Peat</b>	<b>725</b>	<b>606</b>	<b>299</b>	<b>288</b>	<b>290</b>	<b>270</b>	<b>266</b>	<b>273</b>	<b>284</b>	<b>271</b>
Milled Peat	0	0	0	0	0	0	0	0	0	0
Sod Peat	570	486	179	179	178	177	177	183	196	186
Briquettes	155	120	120	109	113	93	89	90	88	85
<b>Oil</b>	<b>392</b>	<b>656</b>	<b>935</b>	<b>1,035</b>	<b>1,033</b>	<b>1,076</b>	<b>1,117</b>	<b>1,166</b>	<b>1,142</b>	<b>1,127</b>
Crude	0	0	0	0	0	0	0	0	0	0
Refinery Gas	0	0	0	0	0	0	0	0	0	0
Gasoline	0	0	0	0	0	0	0	0	0	0
Kerosene	105	283	570	645	663	710	775	795	792	789
Jet Kerosene	0	0	0	0	0	0	0	0	0	0
Fuel Oil	0	0	0	0	0	0	0	0	0	0
LPG	70	68	73	77	72	71	73	80	78	77
Gasoil / Diesel/ DERV	197	270	244	247	248	248	239	256	245	230
Petroleum Coke	21	36	47	67	50	47	30	35	27	31
Naphta	0	0	0	0	0	0	0	0	0	0
Bitumen	0	0	0	0	0	0	0	0	0	0
White Spirit	0	0	0	0	0	0	0	0	0	0
Lubricants	0	0	0	0	0	0	0	0	0	0
<b>Natural Gas</b>	<b>117</b>	<b>252</b>	<b>439</b>	<b>482</b>	<b>476</b>	<b>539</b>	<b>601</b>	<b>607</b>	<b>632</b>	<b>593</b>
<b>Renewables</b>	<b>45</b>	<b>30</b>	<b>17</b>	<b>16</b>	<b>16</b>	<b>15</b>	<b>15</b>	<b>17</b>	<b>18</b>	<b>25</b>
Hydro	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0
Biomass	45	30	17	16	16	15	15	16	17	23
Landfill Gas	0	0	0	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0	0	0	0
Wastes	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	1	1
Geothermal	0	0	0	0	0	0	0	0	0	1
<b>Electricity</b>	<b>356</b>	<b>427</b>	<b>548</b>	<b>579</b>	<b>566</b>	<b>599</b>	<b>632</b>	<b>646</b>	<b>695</b>	<b>693</b>
<b>Total</b>	<b>2,261</b>	<b>2,216</b>	<b>2,524</b>	<b>2,664</b>	<b>2,633</b>	<b>2,738</b>	<b>2,862</b>	<b>2,955</b>	<b>2,990</b>	<b>2,918</b>

Figure 13 Residential Final Energy Use by Fuel

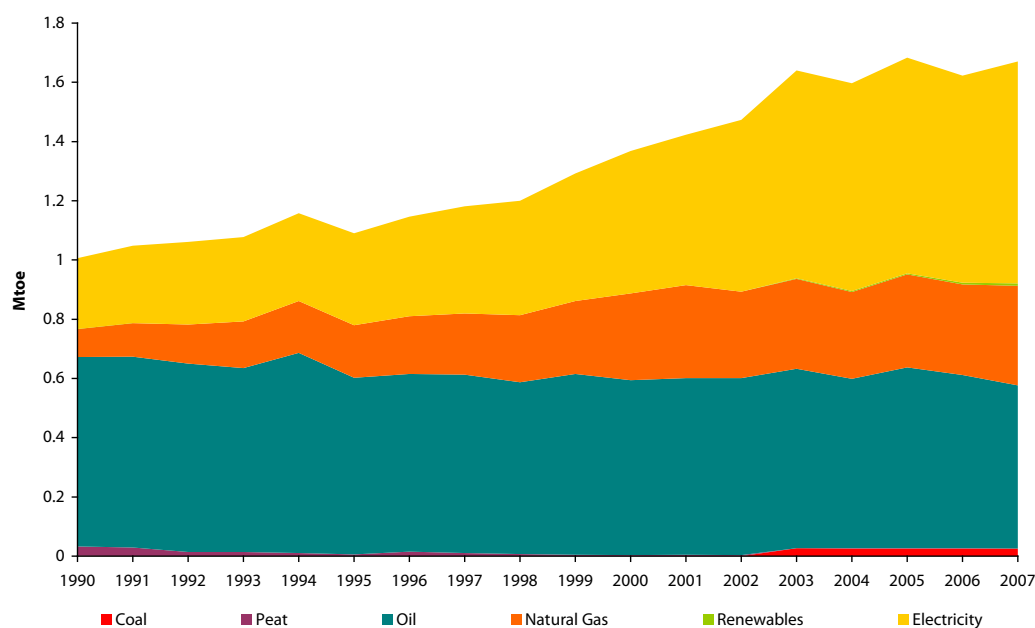


## 5.4 Commercial &amp; Public Services

## Commercial/Public Services

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Coal</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>	<b>26</b>	<b>26</b>	<b>26</b>
Bituminous Coal	1	0	0	0	0	25	25	24	24	24
Anthracite + Manufactured Ovoids	0	0	0	0	0	1	1	1	1	1
Coke	0	0	0	0	0	0	0	0	0	0
Lignite	0	0	0	0	0	1	0	1	1	1
<b>Peat</b>	<b>32</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Milled Peat	0	0	0	0	0	0	0	0	0	0
Sod Peat	16	0	0	0	0	0	0	0	0	0
Briquettes	16	6	4	4	3	1	0	0	0	0
<b>Oil</b>	<b>640</b>	<b>597</b>	<b>590</b>	<b>597</b>	<b>598</b>	<b>605</b>	<b>573</b>	<b>611</b>	<b>586</b>	<b>551</b>
Crude	0	0	0	0	0	0	0	0	0	0
Refinery Gas	0	0	0	0	0	0	0	0	0	0
Gasoline	0	0	0	0	0	0	0	0	0	0
Kerosene	0	0	0	0	0	0	0	0	0	0
Jet Kerosene	0	0	0	0	0	0	0	0	0	0
Fuel Oil	148	68	17	15	14	13	11	10	10	10
LPG	9	11	11	11	11	10	11	12	12	11
Gasoil / Diesel/ DERV	483	518	562	570	573	573	550	589	564	530
Petroleum Coke	0	0	0	0	0	9	0	0	0	0
Naphta	0	0	0	0	0	0	0	0	0	0
Bitumen	0	0	0	0	0	0	0	0	0	0
White Spirit	0	0	0	0	0	0	0	0	0	0
Lubricants	0	0	0	0	0	0	0	0	0	0
<b>Natural Gas</b>	<b>94</b>	<b>177</b>	<b>293</b>	<b>314</b>	<b>291</b>	<b>303</b>	<b>293</b>	<b>314</b>	<b>306</b>	<b>336</b>
<b>Renewables</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>8</b>
Hydro	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	1	5
Landfill Gas	0	0	0	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	2	2	3	3	2
Wastes	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	1	1
<b>Electricity</b>	<b>240</b>	<b>310</b>	<b>481</b>	<b>508</b>	<b>580</b>	<b>702</b>	<b>702</b>	<b>728</b>	<b>699</b>	<b>749</b>
<b>Total</b>	<b>1,007</b>	<b>1,090</b>	<b>1,368</b>	<b>1,423</b>	<b>1,473</b>	<b>1,640</b>	<b>1,597</b>	<b>1,683</b>	<b>1,622</b>	<b>1,670</b>

Figure 14 Commercial/Public Services Final Energy Use by Fuel

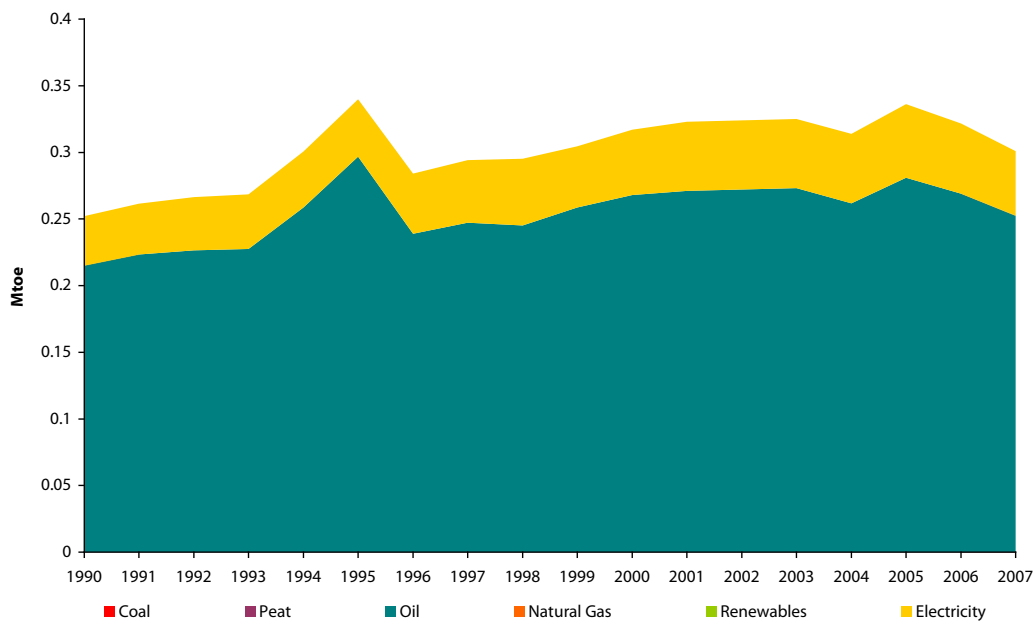


## 5.5 Agriculture

### Agriculture

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Coal</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Bituminous Coal	0	0	0	0	0	0	0	0	0	0
Anthracite + Manufactured Ovoids	0	0	0	0	0	0	0	0	0	0
Coke	0	0	0	0	0	0	0	0	0	0
Lignite	0	0	0	0	0	0	0	0	0	0
<b>Peat</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Milled Peat	0	0	0	0	0	0	0	0	0	0
Sod Peat	0	0	0	0	0	0	0	0	0	0
Briquettes	0	0	0	0	0	0	0	0	0	0
<b>Oil</b>	<b>215</b>	<b>297</b>	<b>268</b>	<b>271</b>	<b>272</b>	<b>273</b>	<b>262</b>	<b>281</b>	<b>269</b>	<b>252</b>
Crude	0	0	0	0	0	0	0	0	0	0
Refinery Gas	0	0	0	0	0	0	0	0	0	0
Gasoline	0	0	0	0	0	0	0	0	0	0
Kerosene	0	0	0	0	0	0	0	0	0	0
Jet Kerosene	0	0	0	0	0	0	0	0	0	0
Fuel Oil	0	0	0	0	0	0	0	0	0	0
LPG	0	0	0	0	0	0	0	0	0	0
Gasoil / Diesel/ DERV	215	297	268	271	272	273	262	281	269	252
Petroleum Coke	0	0	0	0	0	0	0	0	0	0
Naphta	0	0	0	0	0	0	0	0	0	0
Bitumen	0	0	0	0	0	0	0	0	0	0
White Spirit	0	0	0	0	0	0	0	0	0	0
Lubricants	0	0	0	0	0	0	0	0	0	0
<b>Natural Gas</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Renewables</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Hydro	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0
Landfill Gas	0	0	0	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0	0	0	0
Wastes	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0
<b>Electricity</b>	<b>37</b>	<b>43</b>	<b>49</b>	<b>52</b>	<b>52</b>	<b>52</b>	<b>52</b>	<b>55</b>	<b>53</b>	<b>48</b>
<b>Total</b>	<b>252</b>	<b>340</b>	<b>317</b>	<b>323</b>	<b>324</b>	<b>325</b>	<b>314</b>	<b>336</b>	<b>322</b>	<b>301</b>

Figure 15 Agriculture Final Energy Use by Fuel



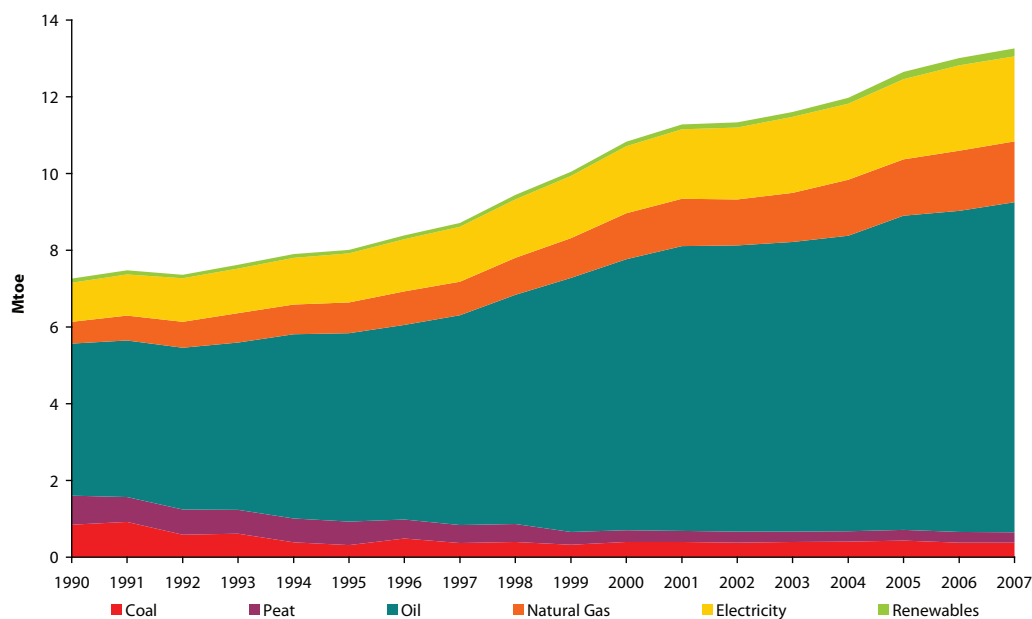
## 6. Fuels

### 6.1 Final Consumption of Fuels

#### Total Final Consumption

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Coal</b>	<b>843</b>	<b>317</b>	<b>398</b>	<b>393</b>	<b>374</b>	<b>394</b>	<b>405</b>	<b>435</b>	<b>378</b>	<b>374</b>
Bituminous Coal	825	249	323	311	292	321	330	351	316	307
Anthracite + Manufactured Ovoids	0	47	59	62	56	54	59	60	57	61
Coke	0	0	0	0	0	0	0	0	0	0
Lignite	18	21	17	21	26	19	15	24	4	7
<b>Peat</b>	<b>757</b>	<b>612</b>	<b>303</b>	<b>292</b>	<b>293</b>	<b>271</b>	<b>267</b>	<b>274</b>	<b>284</b>	<b>272</b>
Milled Peat	0	0	0	0	0	0	0	0	0	0
Sod Peat	586	486	179	179	178	177	177	183	196	186
Briquettes	171	126	124	113	116	94	90	91	88	85
<b>Oil</b>	<b>3,967</b>	<b>4,912</b>	<b>7,064</b>	<b>7,421</b>	<b>7,461</b>	<b>7,551</b>	<b>7,708</b>	<b>8,194</b>	<b>8,368</b>	<b>8,604</b>
Crude	0	0	0	0	0	0	0	0	0	0
Refinery Gas	0	0	0	0	0	0	0	0	0	0
Gasoline	944	1,105	1,591	1,653	1,689	1,687	1,732	1,820	1,884	1,920
Kerosene	121	325	660	746	767	832	895	919	916	913
Jet Kerosene	374	400	629	755	802	784	743	857	988	1,043
Fuel Oil	589	672	714	606	548	509	512	500	381	369
LPG	148	146	153	157	149	146	149	166	162	159
Gasoil / Diesel/ DERV	1,719	2,144	3,095	3,203	3,243	3,309	3,413	3,653	3,778	3,885
Petroleum Coke	72	118	221	300	262	283	264	278	257	313
Naphta	1	1	1	1	1	1	1	1	1	1
Bitumen	0	0	0	0	0	0	0	0	0	0
White Spirit	0	0	0	0	0	0	0	0	0	0
Lubricants	0	0	0	0	0	0	0	0	0	0
<b>Natural Gas</b>	<b>570</b>	<b>797</b>	<b>1,203</b>	<b>1,237</b>	<b>1,199</b>	<b>1,280</b>	<b>1,461</b>	<b>1,464</b>	<b>1,567</b>	<b>1,584</b>
<b>Renewables</b>	<b>108</b>	<b>92</b>	<b>118</b>	<b>130</b>	<b>130</b>	<b>126</b>	<b>147</b>	<b>184</b>	<b>189</b>	<b>207</b>
Hydro	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0
Biomass	105	89	113	125	125	119	139	176	181	179
Landfill Gas	0	0	0	0	0	0	0	0	0	0
Biogas	2	3	4	4	4	7	7	7	4	4
Liquid Biofuels	0	0	0	0	0	0	0	1	3	21
Solar	0	0	0	0	0	0	0	0	1	1
Geothermal	0	0	0	0	0	0	0	0	1	2
<b>Electricity</b>	<b>1,021</b>	<b>1,277</b>	<b>1,745</b>	<b>1,808</b>	<b>1,872</b>	<b>1,981</b>	<b>1,983</b>	<b>2,094</b>	<b>2,225</b>	<b>2,224</b>
<b>Total</b>	<b>7,265</b>	<b>8,007</b>	<b>10,830</b>	<b>11,280</b>	<b>11,330</b>	<b>11,604</b>	<b>11,970</b>	<b>12,646</b>	<b>13,012</b>	<b>13,265</b>

Figure 16 Total Final Energy Use by Fuel

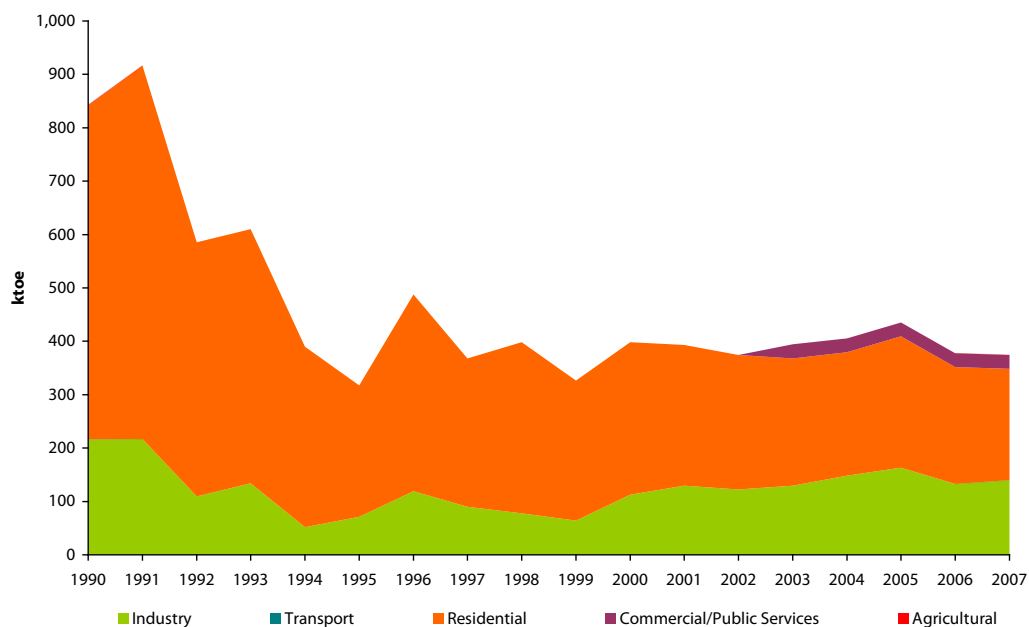


## 6.2 Coal

### Coal

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Total Final Energy Consumption</b>	<b>843</b>	<b>317</b>	<b>398</b>	<b>393</b>	<b>374</b>	<b>394</b>	<b>405</b>	<b>435</b>	<b>378</b>	<b>374</b>
<b>Industry</b>	<b>216</b>	<b>71</b>	<b>113</b>	<b>129</b>	<b>122</b>	<b>129</b>	<b>148</b>	<b>163</b>	<b>133</b>	<b>140</b>
Non-Energy Mining	0	0	0	0	0	0	0	0	0	0
Food, beverages and tobacco	70	18	29	19	16	15	15	16	13	14
Textiles and textile products	3	6	10	8	7	7	7	8	6	6
Wood and wood products	0	0	0	0	0	0	0	0	0	0
Pulp, paper, publishing and printing	0	0	0	0	0	0	0	0	0	0
Chemicals & man-made fibres	18	0	0	0	0	0	0	0	0	0
Rubber and plastic products	0	0	0	0	0	0	0	0	0	0
Other non-metallic mineral products	124	44	70	95	94	105	127	139	113	120
Basic metals and fabricated metal prods	1	0	0	0	0	0	0	0	0	0
Machinery and equipment n.e.c.	0	0	0	0	0	0	0	0	0	0
Electrical and optical equipment	0	3	4	7	5	2	0	0	0	0
Transport equipment manufacture	0	0	0	0	0	0	0	0	0	0
Other manufacturing	0	0	0	0	0	0	0	0	0	0
<b>Transport</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Road Freight	0	0	0	0	0	0	0	0	0	0
Road Private Car	0	0	0	0	0	0	0	0	0	0
Public Passenger Services	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	0	0	0
Domestic Aviation	0	0	0	0	0	0	0	0	0	0
International Aviation	0	0	0	0	0	0	0	0	0	0
Fuel Tourism	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0
<b>Residential</b>	<b>626</b>	<b>246</b>	<b>286</b>	<b>264</b>	<b>252</b>	<b>239</b>	<b>231</b>	<b>246</b>	<b>219</b>	<b>208</b>
<b>Commercial/Public Services</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>	<b>26</b>	<b>26</b>	<b>26</b>
Commercial Services	1	0	0	0	0	26	26	26	26	26
Public Services	0	0	0	0	0	0	0	0	0	0
<b>Agricultural</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Figure 17 Coal Use by Sector 1990 – 2007

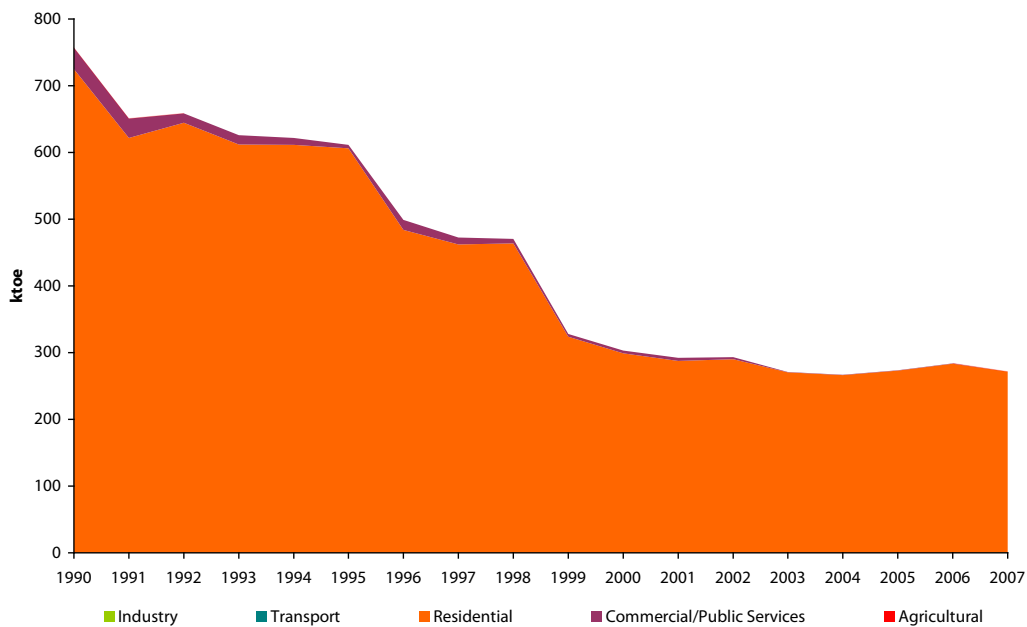


## 6.3 Peat

## Peat

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Total Final Energy Consumption</b>	<b>757</b>	<b>612</b>	<b>303</b>	<b>292</b>	<b>293</b>	<b>271</b>	<b>267</b>	<b>274</b>	<b>284</b>	<b>272</b>
<b>Industry</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Non-Energy Mining	0	0	0	0	0	0	0	0	0	0
Food, beverages and tobacco	0	0	0	0	0	0	0	0	0	0
Textiles and textile products	0	0	0	0	0	0	0	0	0	0
Wood and wood products	0	0	0	0	0	0	0	0	0	0
Pulp, paper, publishing and printing	0	0	0	0	0	0	0	0	0	0
Chemicals & man-made fibres	0	0	0	0	0	0	0	0	0	0
Rubber and plastic products	0	0	0	0	0	0	0	0	0	0
Other non-metallic mineral products	0	0	0	0	0	0	0	0	0	0
Basic metals and fab. metal prods	0	0	0	0	0	0	0	0	0	0
Machinery and equipment n.e.c.	0	0	0	0	0	0	0	0	0	0
Electrical and optical equipment	0	0	0	0	0	0	0	0	0	0
Transport equipment manufacture	0	0	0	0	0	0	0	0	0	0
Other manufacturing	0	0	0	0	0	0	0	0	0	0
<b>Transport</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Road Freight	0	0	0	0	0	0	0	0	0	0
Road Private Car	0	0	0	0	0	0	0	0	0	0
Public Passenger Services	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	0	0	0
Domestic Aviation	0	0	0	0	0	0	0	0	0	0
International Aviation	0	0	0	0	0	0	0	0	0	0
Fuel Tourism	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0
<b>Residential</b>	<b>725</b>	<b>606</b>	<b>299</b>	<b>288</b>	<b>290</b>	<b>270</b>	<b>266</b>	<b>273</b>	<b>284</b>	<b>271</b>
<b>Commercial/Public Services</b>	<b>32</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Commercial Services	0	0	0	0	0	0	0	0	0	0
Public Services	32	6	4	4	3	1	0	0	0	0
<b>Agricultural</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Figure 18 Peat Use by Sector 1990 – 2007

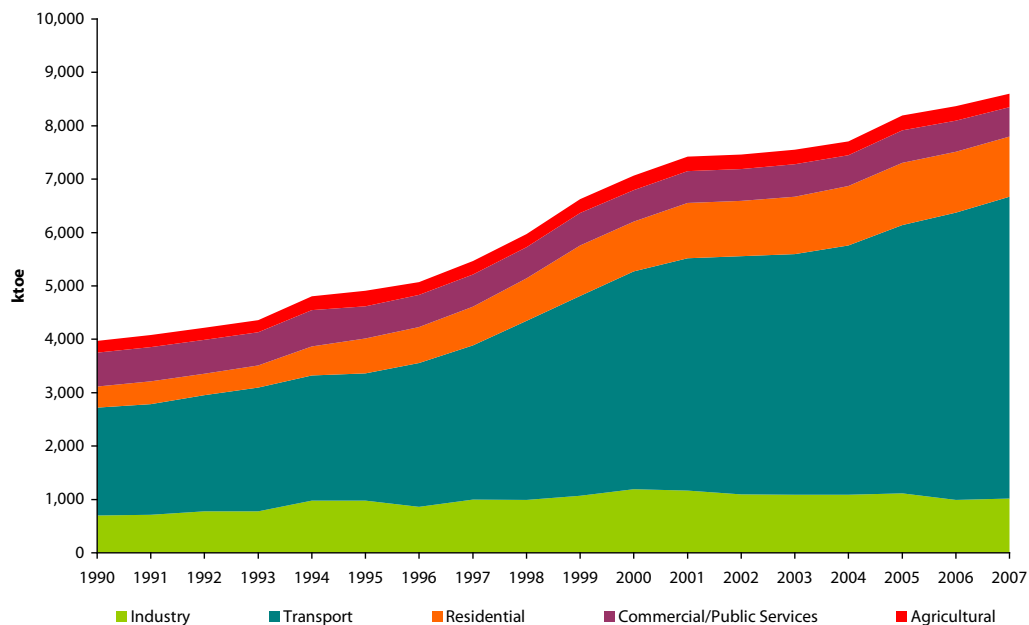


## 6.4 Oil

### Oil

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Total Final Energy Consumption</b>	<b>3,967</b>	<b>4,912</b>	<b>7,064</b>	<b>7,421</b>	<b>7,461</b>	<b>7,551</b>	<b>7,708</b>	<b>8,194</b>	<b>8,368</b>	<b>8,604</b>
<b>Industry</b>	<b>700</b>	<b>979</b>	<b>1,193</b>	<b>1,165</b>	<b>1,091</b>	<b>1,090</b>	<b>1,088</b>	<b>1,112</b>	<b>988</b>	<b>1,015</b>
Non-Energy Mining	25	79	95	122	93	71	44	46	44	42
Food, beverages and tobacco	138	233	293	303	232	181	126	129	114	125
Textiles and textile products	28	31	34	37	27	19	10	11	10	10
Wood and wood products	4	7	8	7	9	11	13	13	12	13
Pulp, paper, publishing and printing	9	10	10	9	8	8	8	8	7	8
Chemicals & man-made fibres	42	62	71	67	59	54	49	50	44	48
Rubber and plastic products	16	14	14	10	9	8	6	7	6	6
Other non-metallic mineral products	93	69	96	52	123	207	290	301	285	336
Basic metals and fab. metal prods	242	367	444	407	403	417	444	440	367	324
Machinery and equipment n.e.c.	15	35	58	92	59	35	8	9	8	8
Electrical and optical equipment	32	61	59	50	57	63	68	76	73	73
Transport equipment manufacture	10	5	5	4	3	3	3	3	3	3
Other manufacturing	46	6	7	5	10	14	18	19	17	18
<b>Transport</b>	<b>2,021</b>	<b>2,383</b>	<b>4,078</b>	<b>4,352</b>	<b>4,466</b>	<b>4,507</b>	<b>4,669</b>	<b>5,025</b>	<b>5,383</b>	<b>5,659</b>
Road Freight	334	371	813	825	963	1,075	1,128	1,218	1,186	1,186
Road Private Car	926	1,176	1,559	1,698	1,708	1,792	1,863	1,909	2,022	2,162
Public Passenger Services	52	65	86	97	105	121	120	160	162	180
Rail	43	36	40	44	38	42	45	40	40	43
Domestic Aviation	21	23	38	41	37	36	37	44	51	54
International Aviation	354	378	592	716	766	750	707	814	938	991
Fuel Tourism	0	12	757	766	697	665	709	822	806	633
Unspecified	290	320	194	166	151	26	60	18	177	410
<b>Residential</b>	<b>392</b>	<b>656</b>	<b>935</b>	<b>1,035</b>	<b>1,033</b>	<b>1,076</b>	<b>1,117</b>	<b>1,166</b>	<b>1,142</b>	<b>1,127</b>
<b>Commercial/Public Services</b>	<b>640</b>	<b>597</b>	<b>590</b>	<b>597</b>	<b>598</b>	<b>605</b>	<b>573</b>	<b>611</b>	<b>586</b>	<b>551</b>
Commercial Services	340	357	381	386	388	397	373	399	382	359
Public Services	300	240	209	210	210	208	200	212	203	191
<b>Agricultural</b>	<b>215</b>	<b>297</b>	<b>268</b>	<b>271</b>	<b>272</b>	<b>273</b>	<b>262</b>	<b>281</b>	<b>269</b>	<b>252</b>

Figure 19 Oil Use by Sector 1990 – 2007

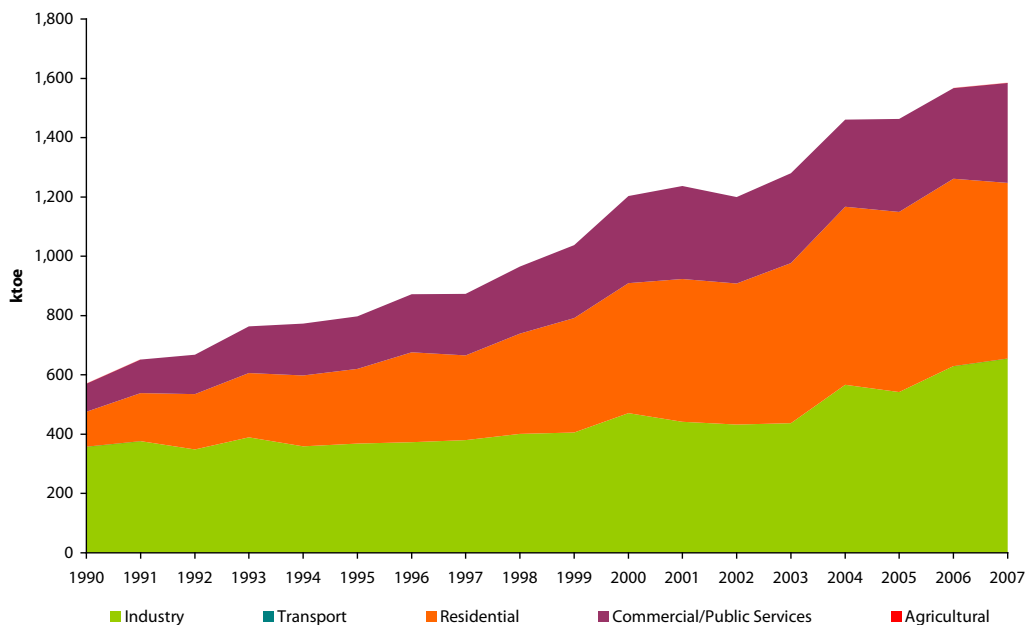


## 6.5 Natural Gas

### Natural Gas

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Total Final Energy Consumption</b>	<b>570</b>	<b>797</b>	<b>1,203</b>	<b>1,237</b>	<b>1,199</b>	<b>1,280</b>	<b>1,461</b>	<b>1,464</b>	<b>1,567</b>	<b>1,584</b>
<b>Industry</b>	<b>358</b>	<b>369</b>	<b>471</b>	<b>441</b>	<b>432</b>	<b>437</b>	<b>566</b>	<b>543</b>	<b>629</b>	<b>655</b>
Non-Energy Mining	4	36	46	33	32	32	42	40	36	36
Food, beverages and tobacco	110	124	158	146	146	152	201	193	174	174
Textiles and textile products	0	2	2	2	2	2	2	2	1	1
Wood and wood products	0	0	0	0	1	2	5	4	4	4
Pulp, paper, publishing and printing	0	24	30	29	26	23	26	25	22	23
Chemicals & man-made fibres	88	77	99	107	106	108	142	136	123	123
Rubber and plastic products	4	4	5	5	6	7	11	11	10	10
Other non-metallic mineral products	57	38	48	47	47	48	63	60	55	55
Basic metals and fabricated metal prods	17	9	11	5	7	9	15	15	152	177
Machinery and equipment n.e.c.	0	10	13	14	13	12	15	15	13	13
Electrical and optical equipment	0	31	39	33	30	27	32	31	28	28
Transport equipment manufacture	0	7	9	11	10	9	10	9	8	8
Other manufacturing	79	8	10	9	7	5	3	3	2	2
<b>Transport</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Road Freight	0	0	0	0	0	0	0	0	0	0
Road Private Car	0	0	0	0	0	0	0	0	0	0
Public Passenger Services	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	0	0	0
Domestic Aviation	0	0	0	0	0	0	0	0	0	0
International Aviation	0	0	0	0	0	0	0	0	0	0
Fuel Tourism	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0
<b>Residential</b>	<b>117</b>	<b>252</b>	<b>439</b>	<b>482</b>	<b>476</b>	<b>539</b>	<b>601</b>	<b>607</b>	<b>632</b>	<b>593</b>
<b>Commercial/Public Services</b>	<b>94</b>	<b>177</b>	<b>293</b>	<b>314</b>	<b>291</b>	<b>303</b>	<b>293</b>	<b>314</b>	<b>306</b>	<b>336</b>
Commercial Services	41	78	129	137	128	133	129	138	134	147
Public Services	53	99	165	176	164	170	165	177	172	189
<b>Agricultural</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Figure 20 Natural Gas Use by Sector 1990 – 2007

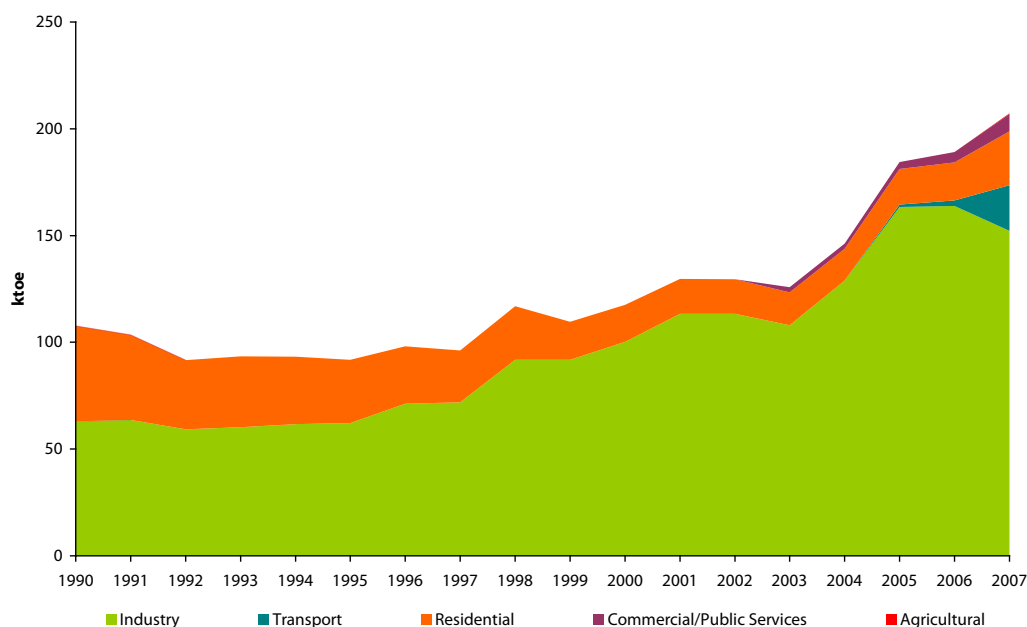


## 6.6 Renewables

### Renewables

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Total Final Energy Consumption</b>	<b>108</b>	<b>92</b>	<b>117</b>	<b>130</b>	<b>130</b>	<b>126</b>	<b>146</b>	<b>184</b>	<b>189</b>	<b>207</b>
<b>Industry</b>	<b>63</b>	<b>62</b>	<b>100</b>	<b>113</b>	<b>113</b>	<b>108</b>	<b>129</b>	<b>163</b>	<b>164</b>	<b>152</b>
Non-Energy Mining	0	0	0	0	0	0	0	0	0	0
Food, beverages and tobacco	2	3	4	4	4	44	45	54	58	59
Textiles and textile products	0	0	0	0	0	0	0	0	0	0
Wood and wood products	61	59	96	109	109	64	84	109	106	93
Pulp, paper, publishing and printing	0	0	0	0	0	0	0	0	0	0
Chemicals & man-made fibres	0	0	0	0	0	0	0	0	0	0
Rubber and plastic products	0	0	0	0	0	0	0	0	0	0
Other non-metallic mineral products	0	0	0	0	0	0	0	0	0	0
Basic metals and fab. metal products	0	0	0	0	0	0	0	0	0	0
Machinery and equipment n.e.c.	0	0	0	0	0	0	0	0	0	0
Electrical and optical equipment	0	0	0	0	0	0	0	0	0	0
Transport equipment manufacture	0	0	0	0	0	0	0	0	0	0
Other manufacturing	0	0	0	0	0	0	0	0	0	0
<b>Transport</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>21</b>
Road Freight	0	0	0	0	0	0	0	0	0	0
Road Private Car	0	0	0	0	0	0	0	1	3	21
Public Passenger Services	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	0	0	0
Domestic Aviation	0	0	0	0	0	0	0	0	0	0
International Aviation	0	0	0	0	0	0	0	0	0	0
Fuel Tourism	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0
<b>Residential</b>	<b>45</b>	<b>30</b>	<b>17</b>	<b>16</b>	<b>16</b>	<b>15</b>	<b>15</b>	<b>17</b>	<b>18</b>	<b>25</b>
<b>Commercial/Public Services</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>8</b>
Commercial Services	0	0	0	0	0	0	0	0	2	6
Public Services	0	0	0	0	0	2	2	3	3	2
<b>Agricultural</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Figure 21 Renewables Use by Sector 1990 – 2007

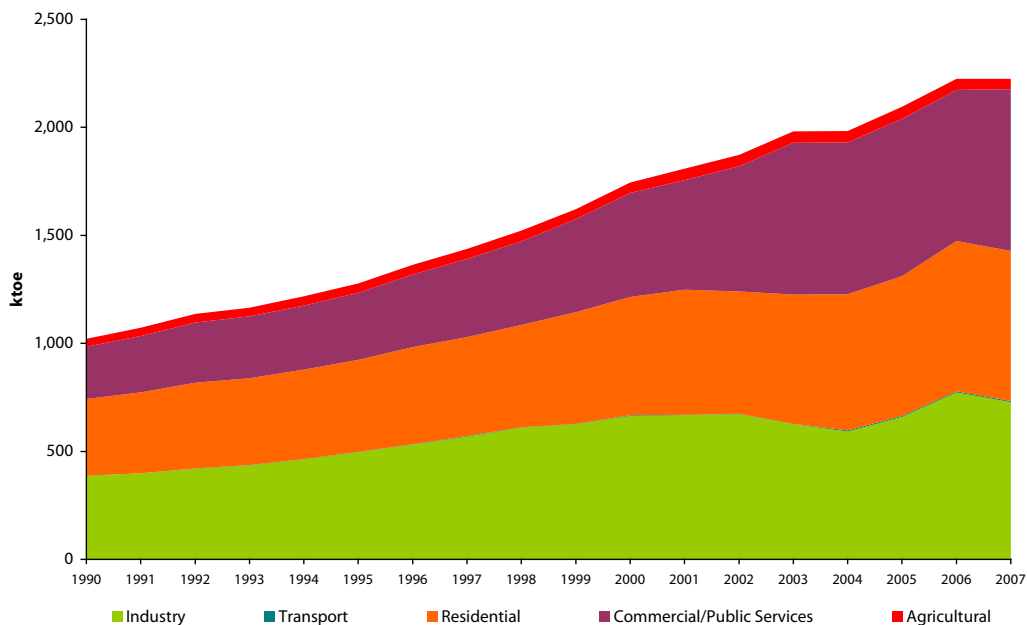


## 6.7 Electricity

### Electricity

kilo tonnes of oil equivalent (ktoe)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
<b>Total Final Energy Consumption</b>	<b>1,021</b>	<b>1,277</b>	<b>1,745</b>	<b>1,808</b>	<b>1,872</b>	<b>1,981</b>	<b>1,983</b>	<b>2,094</b>	<b>2,225</b>	<b>2,224</b>
<b>Industry</b>	<b>386</b>	<b>496</b>	<b>665</b>	<b>667</b>	<b>672</b>	<b>626</b>	<b>592</b>	<b>660</b>	<b>773</b>	<b>729</b>
Non-Energy Mining	8	30	40	40	45	47	49	54	64	57
Food, beverages and tobacco	105	117	156	161	163	153	145	162	189	171
Textiles and textile products	19	13	18	16	13	10	7	8	9	8
Wood and wood products	10	22	29	29	29	27	25	28	33	30
Pulp, paper, publishing and printing	9	20	27	27	29	28	27	30	35	32
Chemicals & man-made fibres	36	86	115	119	112	98	87	97	113	102
Rubber and plastic products	13	25	33	30	31	29	27	30	36	32
Other non-metallic mineral products	31	38	50	50	51	48	46	52	61	55
Basic metals and fab. metal prods	56	34	46	39	40	38	37	41	48	75
Machinery and equipment n.e.c.	10	13	18	17	17	16	15	16	19	17
Electrical and optical equipment	31	75	101	106	108	101	97	108	127	114
Transport equipment manufacture	4	8	10	10	10	9	8	9	10	9
Other manufacturing	53	17	22	23	24	23	22	25	29	26
<b>Transport</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>4</b>
Road Freight	0	0	0	0	0	0	0	0	0	0
Road Private Car	0	0	0	0	0	0	0	0	0	0
Public Passenger Services	0	0	0	0	0	0	0	0	0	0
Rail	1	2	2	2	2	2	4	5	5	4
Domestic Aviation	0	0	0	0	0	0	0	0	0	0
International Aviation	0	0	0	0	0	0	0	0	0	0
Fuel Tourism	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0
<b>Residential</b>	<b>356</b>	<b>427</b>	<b>548</b>	<b>579</b>	<b>566</b>	<b>599</b>	<b>632</b>	<b>646</b>	<b>695</b>	<b>693</b>
<b>Commercial/Public Services</b>	<b>240</b>	<b>310</b>	<b>481</b>	<b>508</b>	<b>580</b>	<b>702</b>	<b>702</b>	<b>728</b>	<b>699</b>	<b>749</b>
Commercial Services	172	222	345	364	416	503	504	522	501	537
Public Services	68	88	136	144	164	199	199	206	198	212
<b>Agricultural</b>	<b>37</b>	<b>43</b>	<b>49</b>	<b>52</b>	<b>52</b>	<b>52</b>	<b>52</b>	<b>55</b>	<b>53</b>	<b>48</b>

Figure 22 Electricity Use by Sector 1990 – 2007



## Glossary of Terms

### Product Definitions

#### **Bituminous Coal and Anthracite:**

Other bituminous coal is used for steam raising and space heating purposes and includes all anthracite coals and bituminous coals not included under coking coal. Its gross calorific value is greater than 23 865 kJ/kg, but usually lower than that of coking coal.

#### **Manufactured Ovoids:**

A composition fuel manufactured from hard coal fines by shaping with the addition of a binding agent. Note that the amount of patent fuel produced can be slightly higher than the amount of coal consumed in the transformation process because of the addition of a binding agent.

#### **Coke:**

The solid product obtained from carbonization of coal, principally coking coal, at high temperature, it is low in moisture and volatile matter. Coke oven coke is used mainly in the iron and steel industry acting as energy source and chemical agent.

#### **Lignite:**

Lignite/brown coal is a non-agglomerating coal with a gross calorific value of less than 17 435 kJ/kg, and greater than 31% volatile matter on a dry mineral matter free basis.

#### **Peat:**

Combustible soft, porous or compressed, fossil sedimentary deposit of plant origin with high water content (up to 90% in the raw state), easily cut, of light to dark brown colour. Peat used for non-energy purposes is not included.

#### **Milled Peat:**

Milled peat is the term used to describe air dried peat in powder or crumb form. This description is derived from the cutting operation which results in the loose crumb-like structure.

#### **Sod Peat:**

Traditional use of peat as a fuel in Ireland. It is a rectangular shaped hand cut sod dried in the open air. Can be machine cut also.

#### **Peat Briquettes:**

Small blocks of highly compressed dry peat.

#### **Crude Oil:**

Crude oil is a mineral oil of natural origin comprising a mixture of hydrocarbons and associated impurities, such as sulphur. It exists in the liquid phase under normal surface temperature and pressure and its physical characteristics (density, viscosity, etc.) are highly variable. This category includes field or lease condensate recovered from associated and non-associated gas where it is commingled with the commercial crude oil stream.

#### **Refinery Gas:**

Refinery gas includes a mixture of non-condensable gases mainly consisting of hydrogen, methane, ethane and olefins obtained during distillation of crude oil or treatment of oil products (e.g. cracking) in refineries. This also includes gases which are returned from the petrochemical industry.

#### **Motor Gasoline:**

Motor gasoline consists of a mixture of light hydrocarbons distilling between 35°C and 215°C. It is used as a fuel for land based spark ignition engines. Motor gasoline may include additives, oxygenates and octane enhancers, including lead compounds such as TEL (Tetraethyl lead) and TML (tetramethyl lead). Unleaded Motor Gasoline: motor gasoline where lead compounds have not been added to enhance octane rating. It may contain traces of organic lead. Leaded Motor Gasoline: motor gasoline with TEL (tetraethyl lead) and/or TML (tetramethyl lead) added to enhance octane rating. This category includes motor gasoline blending components (excluding additives/oxygenates), e.g. alkylates, isomate, reformate, cracked gasoline destined for use as finished motor gasoline.

#### **Aviation Gasoline:**

This is motor spirit prepared especially for aviation piston engines, with an octane number suited to the engine,

a freezing point of -60°C and a distillation range usually within the limits of 30°C and 180°C.

**Kerosene:**

Kerosene comprises refined petroleum distillate and is used in sectors other than aircraft transport. It distils between 150°C and 300°C.

**Kerosene Type Jet Fuel:**

This is a distillate used for aviation turbine power units. It has the same distillation characteristics between 150°C and 300°C (generally not above 250°C) and flash point as kerosene. In addition, it has particular specifications (such as freezing point) which are established by the International Air Transport Association (IATA). This category includes kerosene blending components.

**Fuel Oil:**

This covers all residual (heavy) fuel oils (including those obtained by blending). Kinematic viscosity is above 10 cSt at 80°C. The flash point is always above 50°C and density is always more than 0.90 kg/l. **Low sulphur content:** heavy fuel oil with sulphur content lower than 1%. **High sulphur content:** heavy fuel oil with sulphur content of 1% or higher.

**Liquefied Petroleum Gases (LPG):**

LPG is light paraffinic hydrocarbons derived from the refinery processes, crude oil stabilisation and natural gas processing plants. They consist mainly of propane (C<sub>3</sub>H<sub>8</sub>) and butane (C<sub>4</sub>H<sub>10</sub>) or a combination of the two. They could also include propylene, butylene, isobutene and isobutylene. LPG is normally liquefied under pressure for transportation and storage.

**Gas/Diesel Oil/ DERV (Distillate Fuel Oil):**

Gas/diesel oil is primarily a medium distillate distilling between 180°C and 380°C. Several grades are available depending on uses: **Transport Diesel (DERV):** • on road diesel oil for diesel compression ignition (cars, trucks etc.), usually of low sulphur content; **Heating and other Gasoil:** • light heating oil for industrial and commercial uses; • marine diesel and diesel used in rail traffic; • other gas oil including heavy gas oils which distil between 380°C and 540°C and which are used as petrochemical feedstocks. This category includes blending components.

**Petroleum Coke:**

Petroleum coke is a black solid by-product, obtained mainly by cracking and carbonising petroleum derived feedstock, vacuum bottoms, tar and pitches in processes such as delayed coking or fluid coking. It consists mainly of carbon (90 to 95%) and has a low ash content. It is used as a feedstock in coke ovens for the steel industry, for heating purposes, for electrode manufacture and for production of chemicals. The two most important qualities are "green coke" and "calcinated coke". This category also includes "catalyst coke" deposited on the catalyst during refining processes; this coke is not recoverable and is usually burned as refinery fuel.

**Naphtha:**

Naphtha is a feedstock destined for either the petrochemical industry (e.g. ethylene manufacture or aromatics production). Naphtha comprises material in the 30°C and 210°C distillation range or part of this range.

**Bitumen:**

Bitumen is a solid, semi-solid or viscous hydrocarbon with a colloidal structure, being brown to black in colour, obtained as a residue in the distillation of crude oil, by vacuum distillation of oil residues from atmospheric distillation. Bitumen is often referred to as asphalt and is primarily used for construction of roads and for roofing material. This category includes fluidized and cut back bitumen.

**White Spirit and SBP:**

White Spirit and SBP are defined as refined distillate intermediates with a distillation in the naphtha/kerosene range.

**Lubricants:**

Lubricants are hydrocarbons produced from distillate by product; they are mainly used to reduce friction between bearing surfaces. This category includes all finished grades of lubricating oil, from spindle oil to cylinder oil, and those used in greases, including motor oils and all grades of lubricating oil base stocks.

**Natural Gas:**

Natural gas comprises gases, occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane. It includes both "non-associated" gas originating from fields producing only hydrocarbons in gaseous form, and "associated" gas produced in association with crude oil as well as methane recovered from

coal mines (colliery gas).

**Hydro-power:**

Potential and kinetic energy of water converted into electricity in hydroelectric plants. Pumped storage is treated separately in the balance.

**Wind Energy:**

Kinetic energy of wind exploited for electricity generation in wind turbines.

**Solid Biomass:**

Covers organic, non-fossil material of biological origin which may be used as fuel for heat production or electricity generation. It comprises: **Charcoal:** covers the solid residue of the destructive distillation and pyrolysis of wood and other vegetal material and **Wood, wood wastes, other solid wastes:** Covers purpose-grown energy crops (poplar, willow etc.), a multitude of woody materials generated by an industrial process (wood/paper industry in particular) or provided directly by forestry and agriculture (firewood, wood chips, bark, sawdust, shavings, chips, black liquor etc.) as well as wastes such as tallow, straw, rice husks, nut shells, poultry litter, crushed grape dregs etc. Combustion is the preferred technology for these solid wastes. The quantity of fuel used is reported on a net calorific value basis.

**Landfill Gas:**

A gas composed principally of methane and carbon dioxide produced by anaerobic digestion landfill wastes.

**Biogas:**

A gas composed principally of methane and carbon dioxide produced by anaerobic digestion of biomass, comprising: **Sewage sludge gas,** produced from the anaerobic fermentation of sewage sludge and **Other biogas,** such as biogas produced from the anaerobic fermentation of animal slurries and of wastes in abattoirs, breweries and other agro-food industries.

**Liquid Biofuel:**

cover the fuels listed below: **Bioethanol:** ethanol produced from biomass and/or biodegradable fraction of waste; **Biodiesel:** a diesel quality liquid fuel produced from biomass or used fried oils; **Biomethanol:** methanol produced from biomass and/or the biodegradable fraction of waste; **Biodimethylether:** a diesel quality fuel produced from biomass and/or the biodegradable fraction of waste; **Other Liquid Biofuel:** liquid biofuels, used directly as a fuel, not included in biogasoline or biodiesels.

**Geothermal energy:**

Energy available as heat emitted from within the earth's crust, usually in the form of hot water or steam. It is exploited at suitable sites: for electricity generation using dry steam or high enthalpy brine after flashing or directly as heat for district heating, agriculture etc. Ground source geothermal energy is also included in the category.

**Solar Energy:**

Solar radiation exploited for hot water production and electricity generation, by: flat plate collectors, for domestic hot water or for the seasonal heating of swimming pools; photovoltaic cells; solar thermal-electric plants. Passive solar energy for the direct heating, cooling and lighting of dwellings or other buildings is not included.

**Electricity:**

Gross electricity production is measured at the terminals of all alternator sets in a station; it therefore includes the energy taken by station auxiliaries and losses in transformers that are considered integral parts of the station. The difference between gross and net production is amount of own use of electricity in the generation plants.

**Heat:**

In recent years, the production of heat for sale has been increasing in importance. To reflect this, heat production represents all heat production from public CHP and heat plants as well as heat sold by autoproducer CHP and heat plants to third parties. Corresponding fuels to produce quantities of heat for sale are being recorded in the transformation sector under the rows CHP plants and Heat plants. The use of fuels for heat which is not sold is recorded under the sectors in which the fuel use occurs.

## Flow Definitions

### **Production:**

Production refers to the quantities of fuels extracted or produced, calculated after any operation for removal of inert matter or impurities (e.g. sulphur from natural gas). It refers only to indigenous production of fuels in Ireland.

### **Imports and Exports:**

Imports and exports comprise amounts having crossed the national territorial boundaries of the country whether or not customs clearance has taken place. **a) Coal** Imports and exports comprise the amount of fuels obtained from or supplied to other countries, whether or not there is an economic or customs union between the relevant countries. Coal in transit should not be included. **b) Oil and Gas** Quantities of crude oil and oil products imported or exported under processing agreements (i.e. refining on account) are included. Quantities of oil in transit are excluded. Crude oil, NGL and natural gas are reported as coming from the country of origin; refinery feedstocks and oil products are reported as coming from the country of last consignment. Re-exports of oil imported for processing within bonded areas are shown as an export of product from the processing country to the final destination. **c) Electricity** Amounts are considered as imported or exported when they have crossed the national territorial boundaries

### **International Marine Bunkers:**

International marine bunkers cover those quantities delivered to sea-going ships of all flags, including warships. Consumption by ships engaged in transport in inland and coastal waters and by fishing vessels in all waters is not included.

### **Stock Changes:**

Stock changes (opening stock minus closing stock) reflect the difference between opening stock levels on the first day of the year and closing levels on the last day of the year of stocks on national territory held by producers, importers, energy transformation industries and large consumers. Oil and gas stock changes in pipelines are not taken into account. With the exception of large users mentioned above, changes in final users' stocks are not taken into account. A stock build is shown as a negative number, and a stock draw as a positive number.

### **Primary Energy Supply (including non-energy):**

Primary energy supply is defined as production + inputs from other sources + imports - exports - international marine bunkers ± stock changes. This includes any energy source that may be used for non-energy purposes such as natural gas as a feedstock for fertilizer production.

### **Primary Energy Supply (excluding non-energy):**

Total primary energy supply (TPES) is made up of production + imports - exports - international marine bunkers ± stock changes but excluding non-energy uses.

### **Statistical Differences:**

Statistical difference is defined as deliveries to final consumption + use for transformation and consumption within the energy sector + distribution losses – domestic supply – transfers. Statistical differences arise because the data for the individual components of supply are often derived from different data sources by the national administration. Furthermore, the inclusion of changes in some large consumers' stocks in the supply part of the balance introduces distortions which also contribute to the statistical differences.

### **Transformation Input:**

This section details the energy inputs into the conversion of primary forms of energy to secondary and further transformation (e.g. coking coal to coke, crude oil to petroleum products, heavy fuel oil to electricity).

### **Public Thermal Power Plants:**

Public thermal power plants refer to plants which are designed to produce electricity only from the combustion of fuels. Public supply undertakings generate electricity and/or heat for sale to third parties, as their primary activity. They may be privately or publicly owned. Note that the sale need not take place through the public grid.

### **Combined Heat & Power plants:**

Combined heat and power (CHP) plants (refers to plants which are designed to produce both heat and electricity). CHP plants may be autoproducer (generating for own use only) or third party ownership selling electricity and heat on-site as well as exporting electricity to the grid. Public supply undertakings generate electricity and/or

heat for sale to third parties, as their primary activity. They may be privately or publicly owned. Note that the sale need not take place through the public grid.

**Gross Electricity Consumption:**

Defined as total electricity generated plus net imports.

**Pumped Storage:**

Electricity consumed in, and generated from hydro-electric storage plants.

**Briquetting plants:**

This category covers the use of fuels for the manufacture of patent fuels & briquettes.

**Oil Refineries:**

Petroleum refineries (covers the use of hydrocarbons for the manufacture of finished petroleum products).

**Transformation Output:**

This section details the outputs from the conversion of primary forms of energy into secondary and further transformation (e.g. coking coal to coke, crude oil to petroleum products, heavy fuel oil to electricity).

**Exchanges & Transfers:**

Transfers comprise inter-product transfers, products transferred and recycled products. Inter-product transfers result from reclassification of products either because their specification has changed or because they are blended into another product, e.g. kerosene may be reclassified as gasoil after blending with the latter in order to meet its winter diesel specification. The net balance of inter-product transfers should be zero. Products transferred reference is intended for petroleum products imported for further processing in refineries. For example, fuel oil imported for upgrading in a refinery is transferred to the feedstock category. Recycled products are finished products which pass a second time through the marketing network, after having been once delivered to final consumers (e.g. used lubricants which are reprocessed). Exchanges are used to exchange say electricity produced from hydro to the electricity column.

**Own Use & Distribution Losses:**

Own use covers use of energy in refineries, power generation stations etc. Distribution losses include losses in gas distribution and electricity transmission. It may also include unaccounted for use of crude oil and petroleum products.

**Non-Specified Energy:**

Includes non-specified energy sector's use.

**Total Final Energy Consumption:**

The term final consumption (equal to the sum of end-use sectors' consumption) implies that energy used for transformation and for own use of the energy producing industries is excluded. Final consumption reflects for the most part deliveries to consumers (see note on stock changes).

**Industry sector:**

Consumption of the industry sector is specified in the sub-sectors (energy used for transport by industry is not included here but is reported under transport). Covers NACE categories 13 – 37 excluding energy mining and oil refining.

**Transport Sector:**

Consumption in the Transport sector covers all transport activity (in mobile engines) regardless of the economic sector to which it is contributing.

**Commercial and Public Services:**

Services sector including government and public services.

**Residential:**

All consumption by households, excluding fuels used for transport. Includes households with employed persons (ISIC Division 95) which is a small part of total residential consumption.

**Agriculture:**

Includes energy consumed by such users whether for traction (excluding agricultural highway use), power or heating (agricultural and domestic).

## Energy Conversion Factors

	To:	toe	MWh	GJ
From:	Multiply by			
toe		1	11.63	41.868
MWh		0.086	1	3.6
GJ		0.02388	0.2778	1

## Energy Units:

**joule (J):** Joule is the international (S.I.) unit of energy.

**kilowatt hour (kWh):** The conventional unit of energy that electricity is measured and charged for commercially.

**tonne of Oil Equivalent (toe):** This is a conventional standardized unit of energy and is defined on the basis of a tonne of oil having a net calorific value of 41686 kJ/kg. A related unit is the *kilogram of oil equivalent (kgoe)*, where 1 kgoe = 10<sup>-3</sup> toe.

## Decimal Prefixes

deca (da)	10 <sup>1</sup>	deci (d)	10 <sup>-1</sup>
hecto (h)	10 <sup>2</sup>	centi (c)	10 <sup>-2</sup>
kilo (k)	10 <sup>3</sup>	milli (m)	10 <sup>-3</sup>
mega (M)	10 <sup>6</sup>	micro (μ)	10 <sup>-6</sup>
giga (G)	10 <sup>9</sup>	nano (n)	10 <sup>-9</sup>
tera (T)	10 <sup>12</sup>	pico (p)	10 <sup>-12</sup>
peta (P)	10 <sup>15</sup>	femto (f)	10 <sup>-15</sup>
exa (E)	10 <sup>18</sup>	atto (a)	10 <sup>-18</sup>

## Calorific Values

Fuel	Net Calorific Value toe/t	Net Calorific Value MJ/t
Crude Oil	1.0226	42,814
Gasoline (petrol)	1.0650	44,589
Kerosene	1.0556	44,196
Jet Kerosene	1.0533	44,100
Gasoil / Diesel	1.0344	43,308
Residual Fuel Oil (heavy oil)	0.9849	41,236
Milled Peat	0.1860	7,787
Sod Peat	0.3130	13,105
Peat Briquettes	0.4430	18,548
Coal	0.6650	27,842
Liquefied Petroleum Gas (LPG)	1.1263	47,156
Petroleum Coke	0.8329	34,870
	<b>Conversion Factor</b>	<b>Conversion Factor</b>
Electricity	86 toe/GWh	3.6 TJ/GWh

## Emission Factors

	t CO <sub>2</sub> /TJ (NCV)	g CO <sub>2</sub> /kWh (NCV)
<b>Liquid Fuels</b>		
Motor Spirit (Gasoline)	70.0	251.9
Jet Kerosene	71.4	257.0
Other Kerosene	71.4	257.0
Gas/Diesel Oil	73.3	263.9
Residual Oil	76.0	273.6
LPG	63.7	229.3
Naphta	73.3	264.0
Petroleum Coke	100.8	362.9
<b>Solid Fuels and Derivatives</b>		
Coal	94.6	340.6
Milled Peat	116.7	420.0
Sod Peat	104.0	374.4
Peat Briquettes	98.9	355.9
<b>Gas</b>		
Natural Gas	57.1	205.6
<b>Electricity (2007)</b>	150.8	542.8

## Sources

Central Statistics Office

Department of Communications, Energy and Natural Resources

Department of Environment, Heritage and Local Government

Department of Transport

Eirgrid

Environmental Protection Agency

Eurostat

International Energy Agency

SGS (National Car Test)

Vehicle Registration Unit



