

ENERGY STATISTICS

2019 Report



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December 2019

Sustainable Energy Authority of Ireland

SEAI is Ireland's national energy authority investing in, and delivering, appropriate, effective and sustainable solutions to help Ireland's transition to a clean energy future. We work with Government, homeowners, businesses and communities to achieve this, through expertise, funding, educational programmes, policy advice, research and the development of new technologies. SEAI is funded by the Government of Ireland through the Department of Communications, Climate Action and Environment.

SEAI 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 in meeting international reporting obligations, for advising policymakers and informing investment decisions. Based in Cork, EPSSU is SEAI'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.

Acknowledgements

SEAI gratefully acknowledges the cooperation of all the organisations, agencies, energy suppliers and distributors that provided data and responded to questionnaires throughout the year.

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1 Introduction

This annual publication from the Sustainable Energy Authority of Ireland (SEAI) presents national energy statistics on energy production and consumption in Ireland over the period 2005 – 2018. Specifically, the report presents energy trends and underlying drivers as well as discussion on sectoral energy consumption and how energy trends relate to Government and EU renewable energy targets.

Timely and reliable energy statistics underpin evidence-based decision-making. To this end, this publication presents a comprehensive overview of energy supply and demand in Ireland in order to inform Government policy and the wider energy debate. As the dialogue on climate change continues to gain momentum, it is now more important than ever that rational debate is based on robust statistical evidence from all emitting sectors.

The information in the report is based on annual energy balances for the country that show the flow of energy from production and transformation through to final consumption in different sectors of the economy. The energy balance is the starting point for the construction of various indicators of energy consumption (e.g. energy intensity, per capita, etc.), of energy efficiency and also of other areas of national interest such as energy-related greenhouse gas (GHG) emissions.

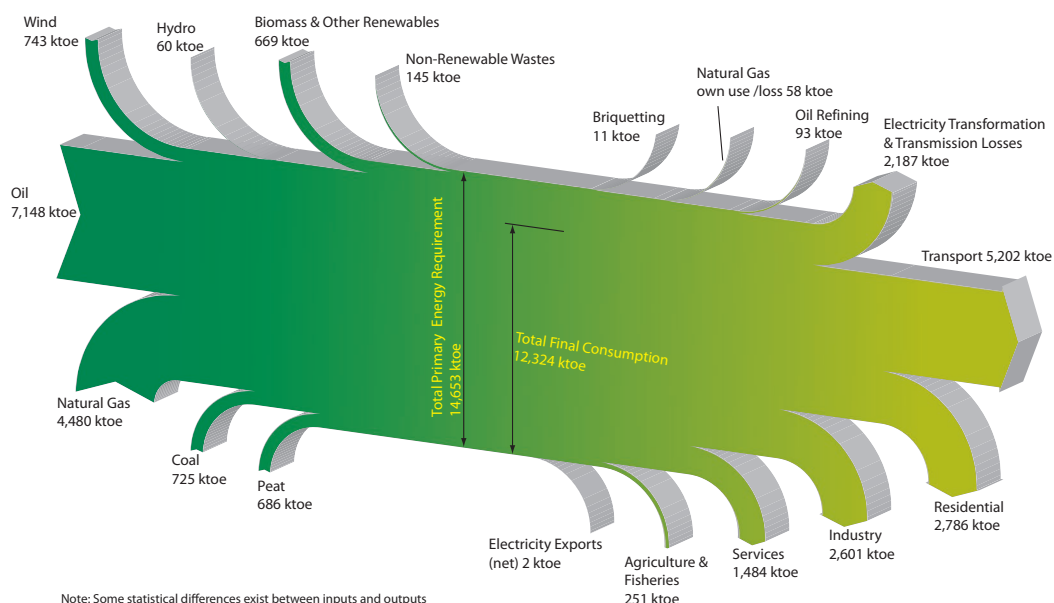
The data in the energy balance are based on monthly and annual surveys received from approximately 300 organisations including energy producers, import/export companies and energy supply companies. In addition, SEAI uses these data to fulfil Ireland’s energy statistics reporting obligations to Eurostat, under the EU Energy Statistics Regulation (EC 1099/2008), and to the International Energy Agency (IEA) through the completion of upwards of a hundred annual, quarterly, monthly and ad hoc questionnaires each year.

The energy balance develops continuously as data revisions and new methodologies become available. This ensures that the best information is available. The main changes related to the period 2005 – 2018 are presented in this report and are described later.

An energy data portal containing the background data that this report is based upon, together with energy forecast data, and an electronic version of this and other statistical reports, are available on SEAI’s website at <http://www.seai.ie/resources/energy-data/>.

Feedback and comment on this report are welcome. Contact details are available on the back cover of this report.

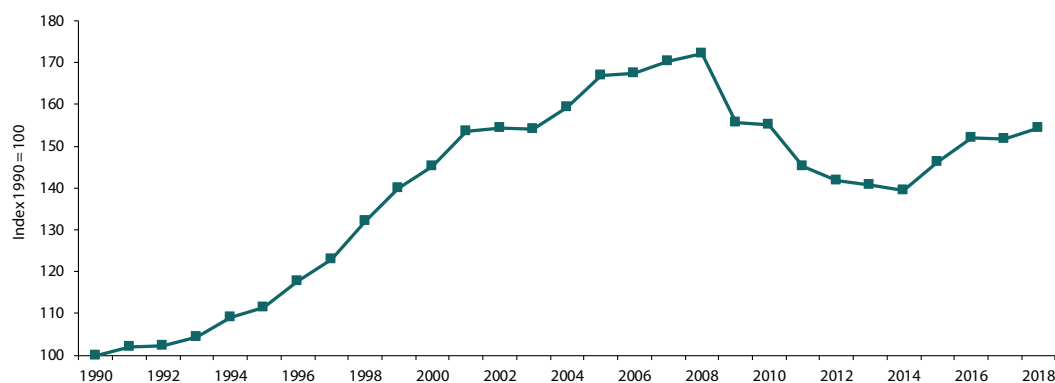
Figure 1: Energy Flow 2018



2 Energy Balance 2018

kilo tonnes of oil equivalent (ktoe)	COAL	PEAT	OIL	NATURAL GAS	RENEWABLES	NON-RENEWABLE	ELECTRICITY	TOTAL
Indigenous Production	-	816	-	2,752	1,326	145	-	5,040
Imports	845	-	9,099	1,728	150	-	139	11,962
Exports	15	7	1,717	-	9	-	142	1,891
Mar. Bunkers	-	-	162	-	-	-	-	162
Stock Change	-106	-123	160	-	4	-	-	-64
Primary Energy Supply (incl non-energy)	725	686	7,380	4,480	1,471	145	-2	14,885
Primary Energy Requirement (excl. non-energy)	725	686	7,148	4,480	1,471	145	-2	14,653
Transformation Input	489	540	3,127	2,501	214	91	54	7,016
Public Thermal Power Plants	489	467	34	2,188	205	91	-	3,473
Combined Heat and Power Plants	-	5	1	273	9	-	-	287
Pumped Storage Consumption	-	-	-	-	-	-	43	43
Briquetting Plants	-	68	-	-	-	-	-	68
Oil Refineries & other energy sector	-	-	3,092	41	-	-	11	3,144
Transformation Output	-	65	3,167	-	73	26	1,873	5,204
Public Thermal Power Plants	-	-	-	-	68	26	1,668	1,668
Combined Heat and Power Plants - Electricity	-	-	-	-	5	-	185	185
Combined Heat and Power Plants - Heat	-	-	-	-	-	-	-	-
Pumped Storage Generation	-	-	-	-	-	-	20	20
Briquetting Plants	-	65	-	-	-	-	-	65
Oil Refineries	-	-	3,167	-	-	-	-	3,167
Exchanges and transfers	22	-	-24	-	-804	-	804	-2
Electricity	-	-	-	-	-804	-	804	-
Heat	-	-	-	-	-	-	-	-
Other	22	-	-24	-	-	-	-	-2
Own Use and Distribution Losses	-	11	93	58	-	-	259	421
Available Final Energy Consumption	258	199	7,303	1,921	453	55	2,362	12,550
Non-Energy Consumption	-	-	232	-	-	-	-	232
Final non-Energy Consumption	-	-	232	-	-	-	-	232
Total Final Energy Consumption	261	197	7,065	1,948	464	55	2,334	12,324
Industry	105	1	516	790	198	55	936	2,601
Non-Energy Mining	-	-	34	13	-	-	67	114
Food, beverages and tobacco	19	1	136	111	26	-	201	494
Textiles and textile products	-	-	3	1	-	-	12	16
Wood and wood products	-	-	3	2	129	-	40	175
Pulp, paper, publishing and printing	-	-	3	4	-	-	22	29
Chemicals & man-made fibres	-	-	28	69	-	-	171	268
Rubber and plastic products	-	-	10	5	-	-	41	56
Other non-metallic mineral products	87	-	193	18	43	55	60	456
Basic metals & fabricated metal products	-	-	10	422	-	-	71	503
Machinery and equipment n.e.c.	-	-	6	6	-	-	24	35
Electrical and optical equipment	-	-	46	131	-	-	116	292
Transport equipment manufacture	-	-	5	2	-	-	20	27
Other manufacturing	-	-	40	7	-	-	91	138
Transport	-	-	5,020	23	154	-	5	5,202
Road Freight	-	-	697	-	30	-	-	727
Light Goods Vehicle (LGV)	-	-	318	0	14	-	-	332
Road Private Car	-	-	1,979	-	78	-	1	2,058
Public Passenger Services	-	-	134	-	6	-	-	139
Rail	-	-	38	-	-	-	4	42
Domestic Aviation	-	-	6	-	-	-	-	6
International Aviation	-	-	1,097	-	-	-	-	1,097
Fuel Tourism	-	-	177	-	8	-	-	184
Navigation	-	-	84	-	-	-	-	84
Unspecified	-	-	490	23	20	-	-	533
Residential	155	197	1,059	604	68	-	703	2,786
Commercial/Public Services	-	-	268	532	43	-	642	1,484
Commercial Services	-	-	177	233	35	-	460	905
Public Services	-	-	91	299	8	-	182	579
Agricultural	-	-	175	-	-	-	48	223
Fisheries	-	-	27	-	-	-	-	27
Statistical Difference	-3	2	6	-27	-11	-	27	-6

Figure 2: Primary Energy Growth 1990 – 2018 (Index)

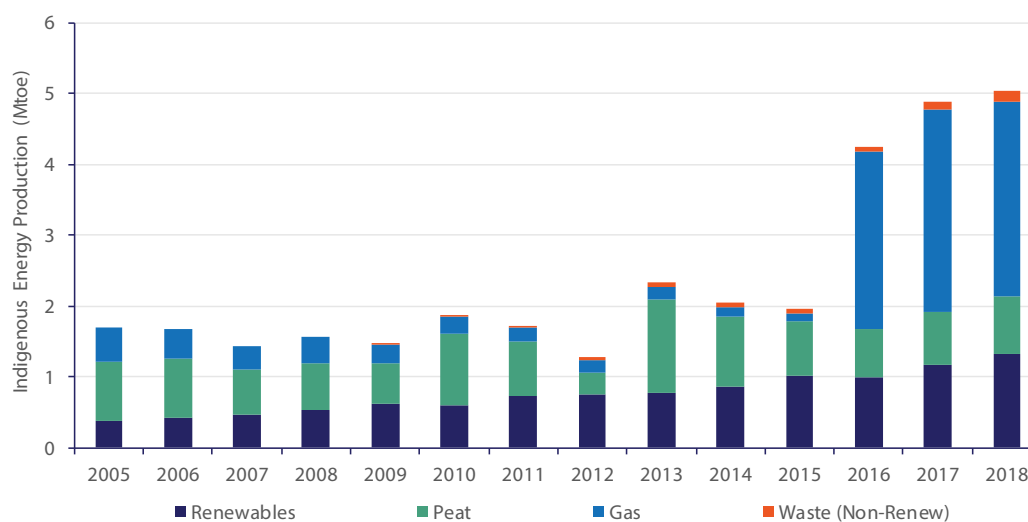


3 Energy Production

3.1 Primary Energy Production

Primary Production kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Indigenous Production	2,161	1,702	1,855	1,292	2,327	2,053	1,962	4,241	4,884	5,040
Coal	0	0	0	0	0	0	0	0	0	0
Peat	965	845	1,011	321	1,327	982	769	679	744	816
Natural Gas	960	488	237	181	164	132	113	2,493	2,854	2,752
Renewables	235	370	597	745	775	873	1,011	1,003	1,173	1,326
Hydro	73	54	52	69	52	61	69	59	59	60
Wind	21	96	242	345	391	442	565	529	640	743
Biomass	113	180	197	222	232	262	258	290	340	387
Landfill Gas	24	25	44	43	38	39	42	40	39	34
Biogas	4	9	14	13	11	13	14	16	16	17
Liquid Biofuel	0	1	26	24	22	23	24	24	25	27
Solar	0	0	8	9	10	11	12	13	14	15
Geothermal	0	4	16	19	20	23	27	32	39	44
Non-Renewable (Wastes)	0	0	9	46	61	66	69	67	113	145

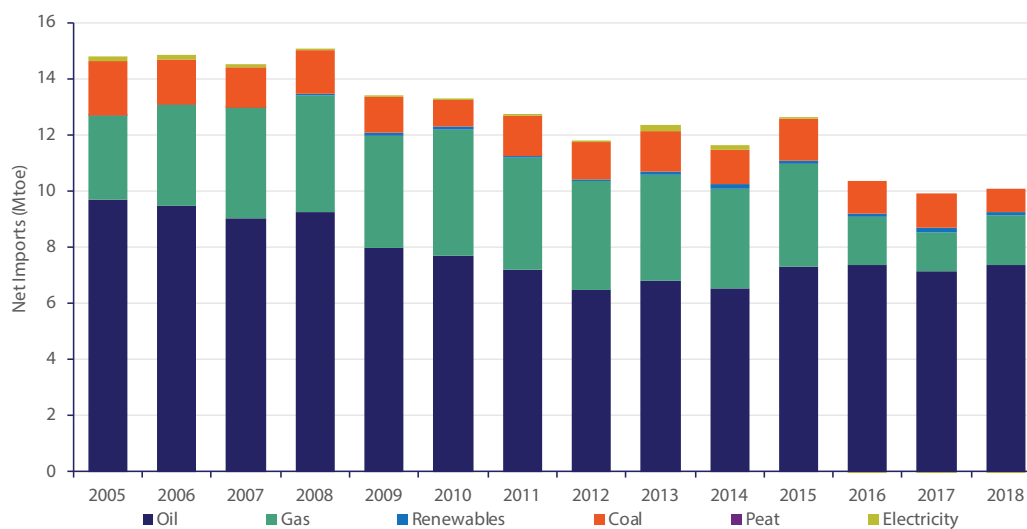
Figure 3: Indigenous Production by Fuel 2005 – 2018



3.2 Net Energy Imports

Net Energy Imports kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Net Imports	12,371	14,759	13,269	11,776	12,319	11,615	12,602	10,292	9,849	10,071
Coal	1,691	1,897	958	1,330	1,473	1,205	1,469	1,146	1,220	830
Bituminous Coal	1,641	1,839	923	1,286	1,395	1,147	1,419	1,084	1,183	795
Anthracite + Manufactured Ovoids	32	33	25	33	57	46	38	54	31	28
Lignite	18	25	10	12	21	13	12	8	6	7
Peat Briquettes	-8	-10	-10	-9	-9	-2	-7	-5	-6	-7
Oil	8,198	9,680	7,712	6,494	6,830	6,504	7,329	7,369	7,125	7,382
Crude	3,010	3,342	3,019	3,005	2,997	2,759	3,725	3,270	2,981	3,053
Refinery Gas	0	0	0	0	0	0	0	0	0	0
Gasoline	1,059	1,085	1,061	646	659	615	433	424	411	200
Kerosene	357	390	508	527	489	379	427	508	379	348
Jet Kerosene	724	1,177	1,068	763	886	947	1,131	1,122	1,300	1,387
Fuel Oil	426	116	-592	-766	-719	-786	-1,029	-979	-976	-928
LPG	121	111	92	67	71	76	104	120	119	122
Gasoil / Diesel/ DERV	2,111	2,686	2,151	1,866	2,072	2,171	2,207	2,567	2,627	2,839
Petroleum Coke	220	318	99	125	112	159	148	149	147	164
Naphta	-111	-7	-23	-9	-25	-17	-26	-76	-103	-36
Bitumen	167	362	299	238	256	167	173	230	202	196
White Spirit	2	2	1	1	1	2	1	2	1	1
Lubricants	114	97	27	30	31	32	33	33	36	36
Natural Gas	2,483	3,016	4,487	3,846	3,717	3,590	3,629	1,704	1,409	1,728
Electricity	8	176	40	36	193	185	58	-61	-58	-2
Renewables	0	0	82	80	114	133	124	139	159	141
Biomass	0	0	11	15	36	42	27	46	27	23

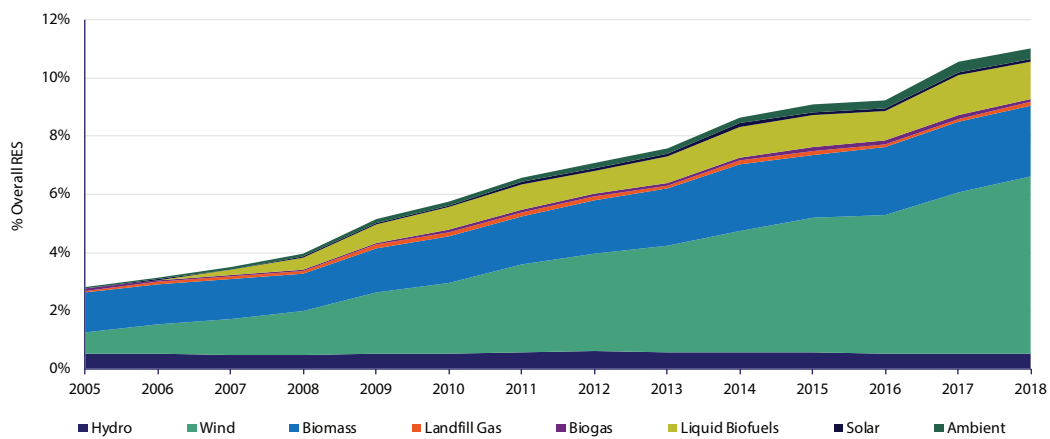
Figure 4: Net Imported Energy by Fuel 2005 – 2018



3.3 Renewable Production

Renewable Production kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Total Renewable Production	235	370	597	745	775	873	1,011	1,003	1,173	1,326
Hydro	73	54	52	69	52	61	69	59	59	60
Wind	21	96	242	345	391	442	565	529	640	743
Biomass	113	180	197	222	232	262	258	290	340	387
Landfill Gas	24	25	44	43	38	39	42	40	39	34
Biogas	4	9	14	13	11	13	14	16	16	17
Liquid Biofuel	0	1	26	24	22	23	24	24	25	27
Solar	0	0	8	9	10	11	12	13	14	15
Geothermal	0	4	16	19	20	23	27	32	39	44

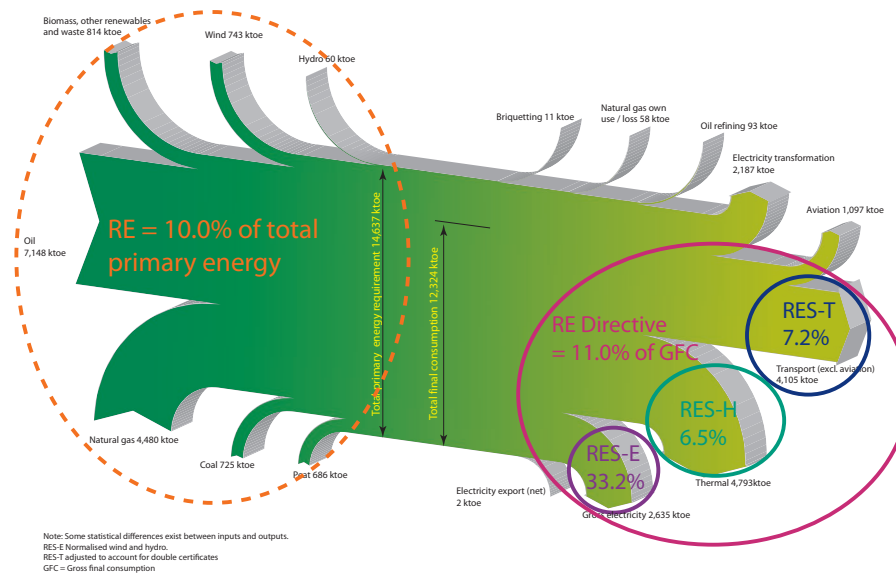
Figure 5: Renewable Energy Contribution to Final Consumption (Directive 2009/28/EC)



3.4 Renewable Energy Progress to Targets

% of each target	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018	2020
RES-E (normalised)	4.8	7.2	15.6	19.8	21.3	23.5	25.5	26.8	30.1	33.2	40
RES-T	0.0	0.0	2.5	4.0	4.9	5.2	5.9	5.2	7.4	7.2	10
RES-H	2.4	3.4	4.3	4.8	5.2	6.3	6.2	6.3	6.7	6.5	12
Directive (2009/29/EC)	1.9	2.8	5.7	7.1	7.6	8.6	9.1	9.2	10.5	11.0	16

Figure 6: Progress to Targets 2018

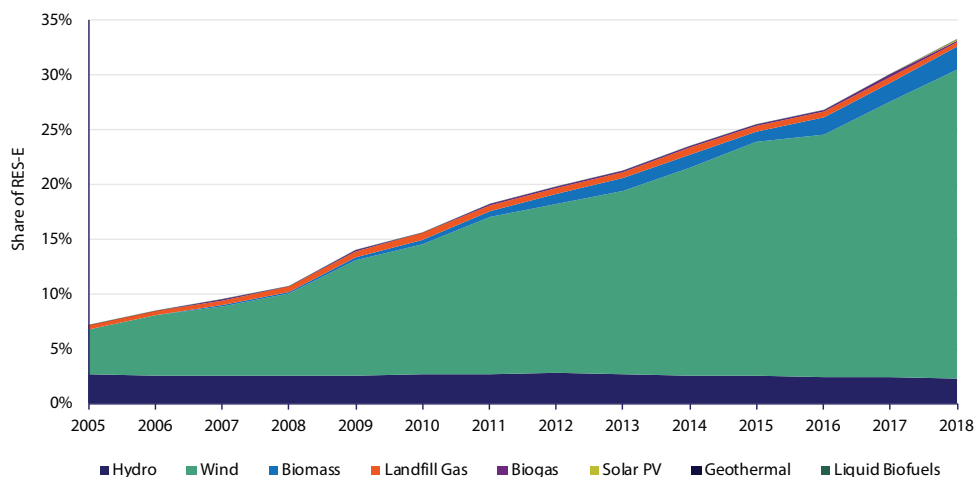


Note: Some statistical differences exist between inputs and outputs.
 RES-E Normalised wind and hydro.
 RES-T adjusted to account for double certificates
 GFC = Gross final consumption

3.5 Renewable Electricity as percentage of Gross Electricity Consumption

	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Renewables % of Gross Electricity	4.8	7.2	15.6	19.8	21.3	23.5	25.5	26.8	30.1	33.2
Hydro (normalised)	3.4	2.7	2.6	2.8	2.7	2.6	2.5	2.5	2.4	2.3
Wind (normalised)	1.0	4.0	11.9	15.5	16.9	19.0	21.3	22.0	25.2	28.1
Biomass	0.0	0.0	0.4	0.9	1.1	1.2	1.0	1.6	1.8	2.1
Landfill Gas	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
Biogas	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Solar	0.0	0.0	0.0	0.0	0.0	0.01	0.01	0.02	0.04	0.05

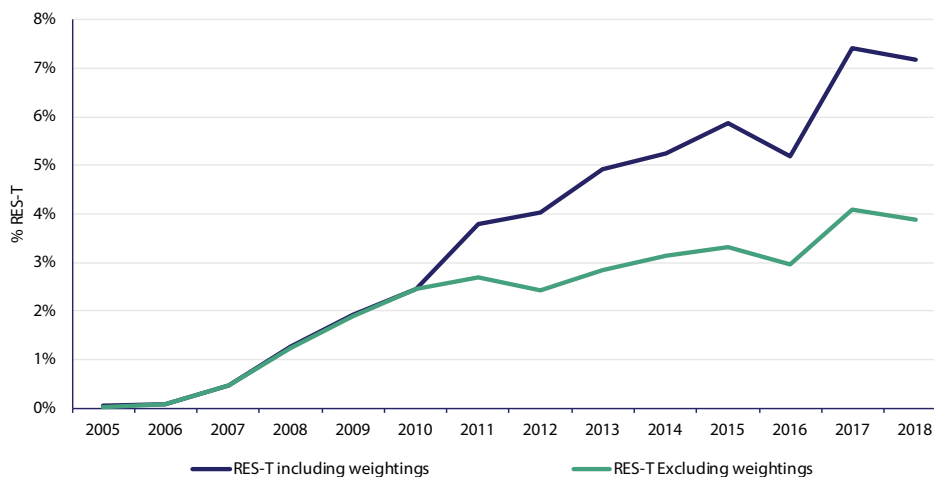
Figure 7: Renewable Energy Contribution to Gross Electricity Consumption (normalised) 2005 – 2018



3.6 Renewable Energy as percentage of (Petrol & Diesel) Transport

	2005	2010	2012	2013	2014	2015	2016	2017	2018
Liquid Biofuels (ktoe)	1.1	93	85	102	116	128	118	161	154
Weighted Biofuels (ktoe)	1.1	93	140	176	193	226	206	292	284
Renewable Electricity (ktoe)	0.3	0.4	0.6	0.7	0.7	0.8	1.0	1.1	1.4
Weighted Electricity (ktoe)	0.7	1.1	1.5	1.7	1.8	2.1	2.7	3.2	4.2
Transport Renewable RES-T	0%	2.5%	4.0%	4.9%	5.2%	5.9%	5.2%	7.4%	7.2%
Liquid Biofuels (%)	0.0%	2.4%	2.4%	2.8%	3.1%	3.3%	2.9%	4.0%	3.8%
Weighted Biofuel (%)	0.0%	2.4%	4.0%	4.9%	5.2%	5.8%	5.1%	7.3%	7.1%
Renewable Electricity (%)	0.02%	0.03%	0.04%	0.05%	0.05%	0.05%	0.07%	0.08%	0.10%

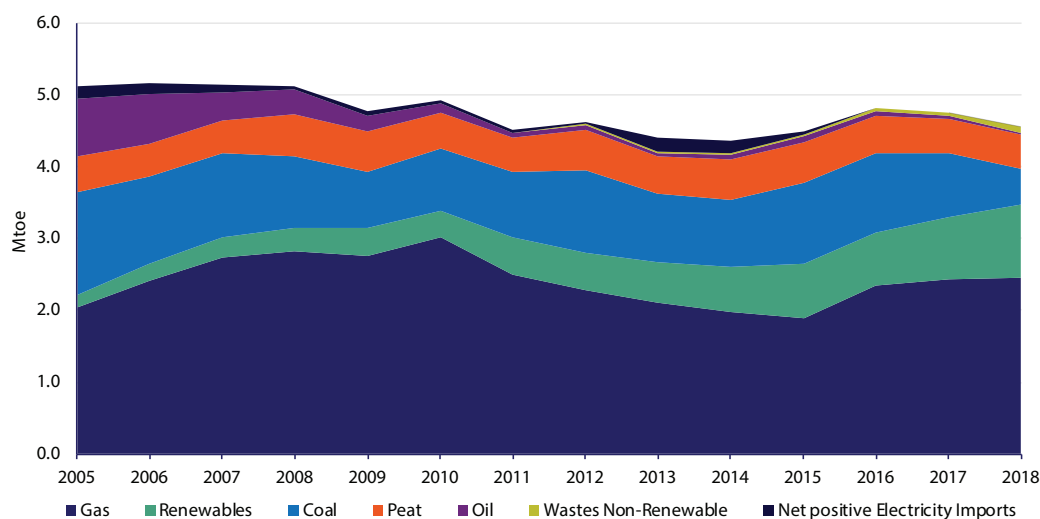
Figure 8: Renewable Energy as percentage of (Petrol & Diesel) Transport



3.7 Fuels used in Electricity Production

Electricity Inputs kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Coal	1,430	1,422	868	1,160	970	942	1,127	1,101	868	489
Bituminous Coal	1,430	1,422	868	1,160	970	942	1,127	1,101	868	489
Peat	491	499	492	557	507	550	554	522	488	472
Milled Peat	491	499	492	557	507	550	554	522	488	472
Sod Peat	0	0	0	0	0	0	0	0	0	0
Oil	1,039	794	137	56	43	60	86	68	34	35
Refinery Gas	12	8	7	9	5	5	9	5	0	0
Fuel Oil	998	718	104	39	33	47	58	52	26	26
Gasoil	29	68	26	7	4	8	19	11	7	8
Natural Gas	1,828	2,044	3,025	2,270	2,098	1,973	1,899	2,342	2,423	2,461
Renewables	117	180	368	526	561	631	750	748	885	1,019
Hydro	73	54	52	69	52	61	69	59	59	60
Wind	21	96	242	345	391	442	565	529	640	743
Biomass	0	2	24	65	77	84	69	114	138	174
Landfill Gas	24	25	44	43	38	39	42	40	39	34
Biogas	0	2	6	4	4	5	5	7	7	7
Wastes non-Renewable	0	0	0	18	23	25	25	25	56	91
Electricity (net imports)	8	176	40	36	193	185	58	-	-	-
Total	4,906	4,936	4,889	4,588	4,203	4,180	4,442	4,806	4,754	4,565

Figure 9: Primary Fuel Mix for Electricity Generation 2005 – 2018

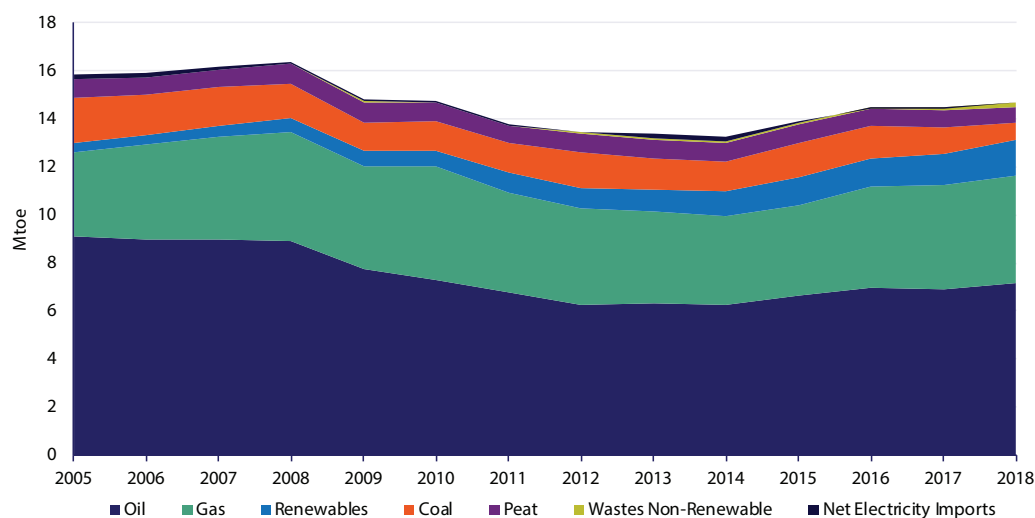


4 Consumption

4.1 Primary Energy Consumption

Primary Energy Consumption										
kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Primary Energy Supply (incl. non-energy)	14,444	16,313	15,059	13,735	13,648	13,445	14,083	14,703	14,660	14,885
Primary Energy Requirement (excl. non-energy)	13,778	15,852	14,731	13,466	13,360	13,244	13,876	14,439	14,420	14,653
Coal	1,813	1,882	1,233	1,485	1,310	1,233	1,426	1,370	1,099	725
Peat	803	791	765	790	742	777	767	734	695	686
Oil	7,859	9,130	7,294	6,246	6,303	6,249	6,651	6,946	6,921	7,148
Natural Gas	3,059	3,503	4,712	4,041	3,863	3,731	3,769	4,251	4,315	4,480
Renewables	235	370	678	822	888	1,004	1,136	1,133	1,335	1,471
Non-Renewable (Wastes)	0	0	9	46	61	66	69	67	113	145
Electricity Imports	8	176	40	36	193	185	58	-61	-58	-2
Transformation Input	8,339	8,332	7,741	7,492	6,875	6,676	7,365	7,660	7,418	6,925
Coal	1,430	1,422	868	1,160	970	942	1,127	1,101	868	489
Peat	618	599	602	649	619	646	623	607	567	540
Oil	4,391	4,177	3,108	3,193	2,946	2,874	3,501	3,341	3,286	3,127
Natural Gas	1,828	2,044	3,045	2,329	2,154	2,028	1,943	2,396	2,469	2,501
Renewables	24	30	74	112	119	128	115	160	184	214
Electricity Pumped Storage	48	60	43	49	68	58	56	56	44	54
Exchanges & Transfers	-1	1	6	-1	-2	-2	-3	-3	-0	-2
Own Use & Transmission Loss	410	527	454	376	400	401	426	405	408	421
Non Energy Use	666	461	328	269	288	201	207	264	240	232
Total Final Consumption (Observed)	10,814	12,606	11,886	10,671	10,860	10,806	11,308	11,650	11,791	12,324
Coal	398	484	378	339	355	326	312	285	251	261
Peat	303	274	254	215	218	201	201	198	189	197
Oil	7,047	8,196	7,159	6,088	6,203	6,164	6,480	6,732	6,775	7,065
Natural Gas	1,203	1,369	1,590	1,624	1,631	1,619	1,715	1,794	1,824	1,948
Renewables	118	188	311	299	331	380	400	401	459	464
Non-Renewable (Wastes)	0	0	9	27	39	42	44	42	57	55
Electricity	1,745	2,094	2,186	2,078	2,082	2,076	2,156	2,199	2,236	2,334

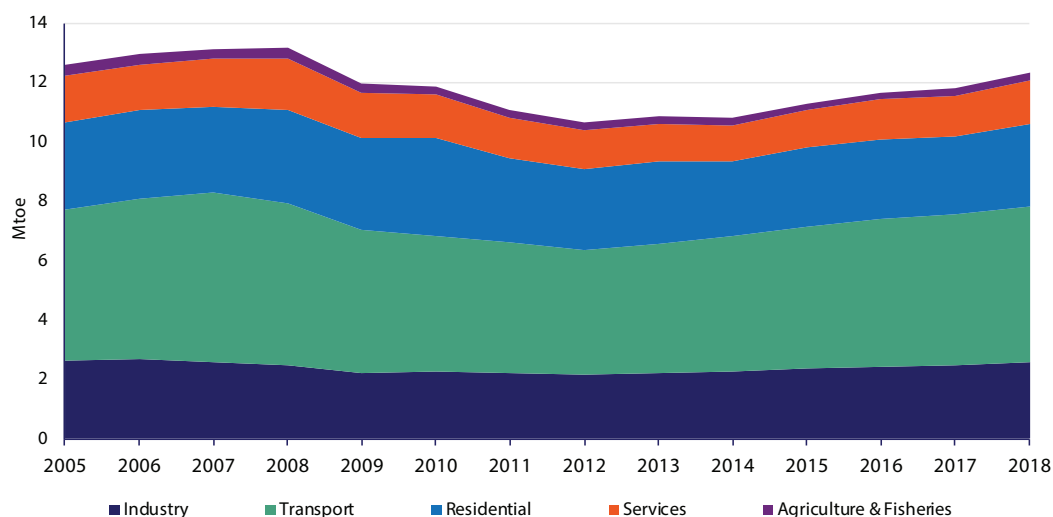
Figure 10: Primary Energy Consumption by Fuel 2005 – 2018



4.2 Total Final Consumption

Total Final Consumption										
kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Total Final Energy Consumption	10,814	12,606	11,886	10,671	10,860	10,806	11,308	11,650	11,791	12,324
Industry	2,549	2,633	2,263	2,181	2,221	2,286	2,364	2,435	2,484	2,601
Non-Energy Mining	178	151	109	104	101	98	101	105	107	114
Food, beverages and tobacco	640	587	491	410	433	439	452	463	467	494
Textiles and textile products	68	31	15	13	14	14	14	15	15	16
Wood and wood products	134	146	139	134	139	147	156	155	169	175
Pulp, paper, publishing and printing	67	42	26	24	25	24	25	27	27	29
Chemicals & man-made fibres	286	279	233	222	229	228	237	249	253	268
Rubber and plastic products	52	52	48	47	48	48	50	52	53	56
Other non-metallic mineral prods	263	587	328	336	331	381	400	421	434	456
Basic metals & fab. metal prods	504	406	464	486	481	492	500	493	496	503
Machinery and equipment n.e.c.	88	38	30	30	31	30	31	33	33	35
Electrical and optical equipment	206	261	227	235	245	243	250	269	274	292
Transport equipment manufacture	25	20	23	22	23	23	24	25	25	27
Other manufacturing	39	34	131	116	122	118	124	128	130	138
Transport	4,103	5,084	4,599	4,176	4,351	4,525	4,786	4,969	5,068	5,202
Road Freight	809	1,112	688	629	581	621	626	735	746	727
Light Goods Vehicle (LGV)	0	0	347	310	322	328	327	320	339	332
Road Private Car	1,562	1,893	2,014	2,057	2,104	2,157	2,157	2,108	2,079	2,058
Public Passenger Services	86	157	164	149	142	136	134	135	133	139
Rail	42	45	44	42	42	38	39	40	42	42
Domestic Aviation	25	22	16	5	5	5	5	6	6	6
International Aviation	606	837	772	581	671	744	842	864	1,016	1,097
Fuel Tourism	718	387	228	228	210	294	473	384	162	184
Navigation	24	50	65	59	58	72	71	86	76	84
Unspecified	231	582	262	116	217	128	110	292	470	533
Residential	2,504	2,937	3,260	2,714	2,749	2,525	2,656	2,685	2,608	2,786
Commercial/Public Services	1,304	1,569	1,469	1,326	1,290	1,242	1,282	1,336	1,395	1,484
Commercial Services	812	1,014	907	821	799	770	787	823	855	905
Public Services	492	556	562	505	491	472	494	513	540	579
Agricultural	317	336	270	251	224	205	200	207	213	223
Fisheries	37	47	25	23	25	24	21	19	23	27

Figure 11: Total Final Consumption by Sector 2005 – 2018

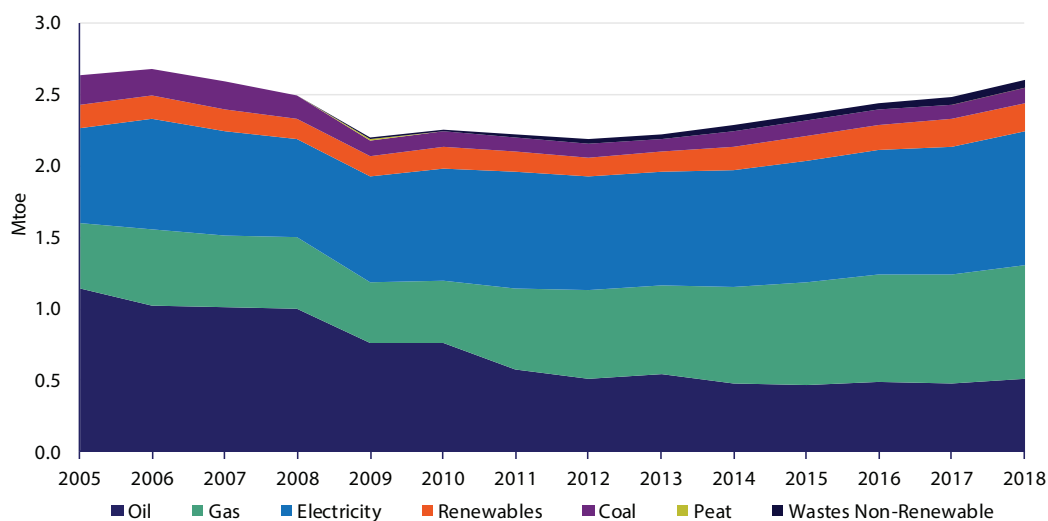


5 Sectoral Consumption of Fuels

5.1 Industry

Industry kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Coal	113	212	124	97	82	107	106	106	102	105
Bituminous Coal	113	212	124	97	82	107	106	106	102	105
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
Peat	0	0	0	1	1	1	1	1	1	1
Milled Peat	0	0	0	1	0	1	1	1	1	1
Sod Peat	0	0	0	0	0	0	0	0	0	0
Briquettes	0	0	0	0	0	0	0	0	0	0
Oil	1,201	1,136	757	514	545	478	464	484	480	516
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	90	124	112	76	78	74	86	91	86	95
Jet Kerosene	0	0	0	0	0	0	0	0	0	0
Fuel Oil	673	472	311	109	138	75	41	35	30	29
LPG	86	103	103	96	116	104	106	113	116	126
Gasoil / Diesel/ DERV	190	199	157	143	124	111	107	113	117	124
Petroleum Coke	161	237	73	91	88	113	124	133	132	141
Naphta	1	1	1	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
Natural Gas	471	462	437	619	615	679	724	755	764	790
Renewables	100	163	152	135	141	171	179	174	192	198
Hydro	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0
Biomass	96	159	148	130	138	168	175	172	190	196
Landfill Gas	0	0	0	0	0	0	0	0	0	0
Liquid Biofuels	4	4	5	5	3	3	3	2	2	2
Biogas	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
Non-Renewable (Wastes)	0	0	9	27	39	42	44	42	57	55
Electricity	665	660	783	788	799	808	847	872	889	936
Total	2,549	2,633	2,263	2,181	2,221	2,286	2,364	2,435	2,484	2,601

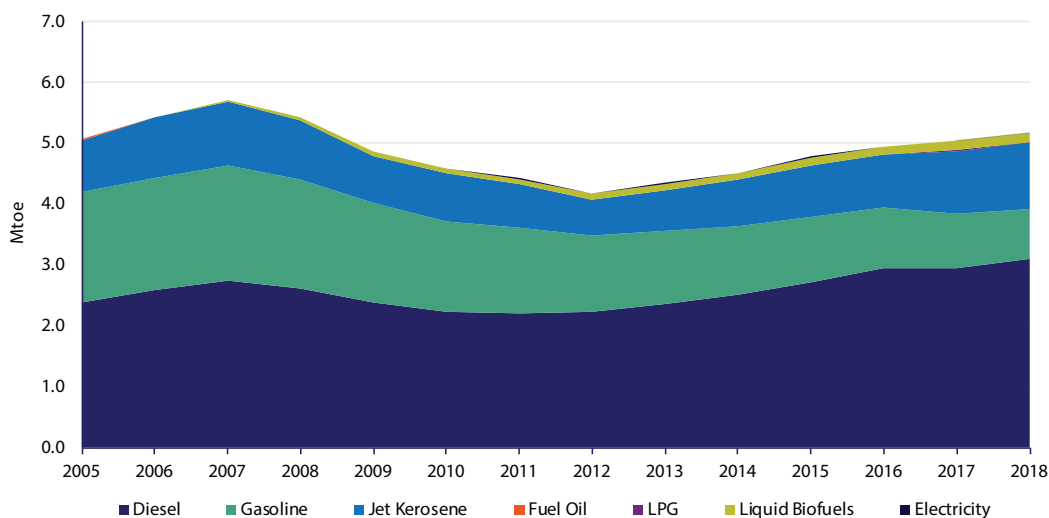
Figure 12: Industry Final Energy Use by Fuel 2005 – 2018



5.2 Transport

Transport kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Coal	0	0	0	0	0	0	0	0	0	0
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
Peat	0	0	0	0	0	0	0	0	0	0
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
Oil	4,101	5,076	4,501	4,084	4,242	4,402	4,651	4,825	4,883	5,020
Crude	0	0	0	0	0	0	0	0	0	0
Refinery Gas	0	0	0	0	0	0	0	0	0	0
Gasoline	1,590	1,822	1,478	1,272	1,197	1,134	1,075	1,003	904	821
Kerosene	0	0	0	0	0	0	0	0	0	0
Jet Kerosene	629	857	787	586	675	748	846	868	1,021	1,102
Fuel Oil	25	18	0	0	0	0	0	0	0	0
LPG	2	1	1	1	1	2	3	3	2	2
Gasoil / Diesel/ DERV	1,855	2,378	2,236	2,224	2,368	2,519	2,727	2,951	2,955	3,095
Petroleum Coke	0	0	0	0	0	0	0	0	0	0
Naphtha	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
Natural Gas	0	2	2	4	3	3	4	21	20	23
Renewables	0	1	93	85	102	116	128	118	161	154
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	1	93	85	102	116	128	118	161	154
Solar	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0
Non-Renewable (Wastes)	0	0	0	0	0	0	0	0	0	0
Electricity	2	5	4	4	4	3	4	4	4	5
Total	4,103	5,084	4,599	4,176	4,351	4,525	4,786	4,969	5,068	5,202

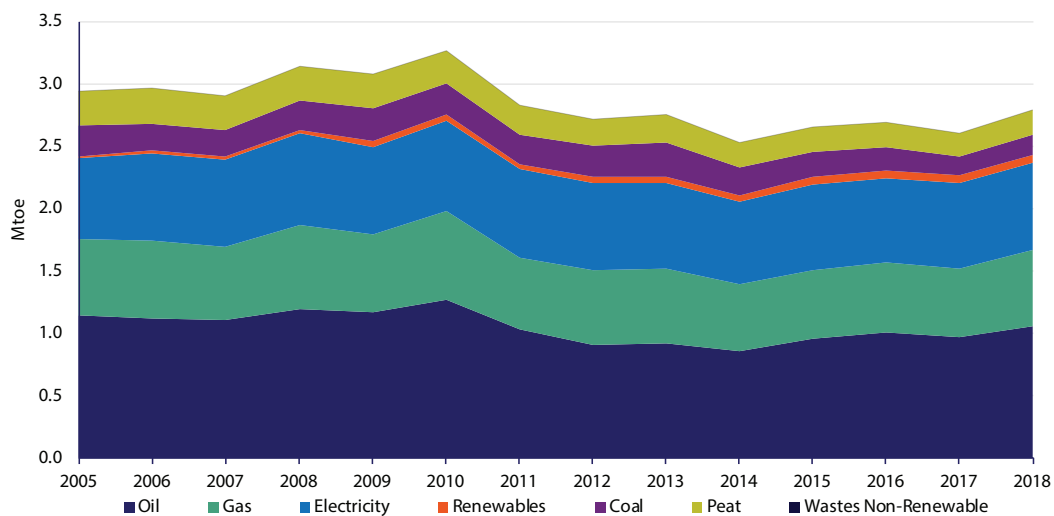
Figure 13: Transport Final Energy Use by Fuel 2005 – 2018



5.3 Residential

Residential kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Coal	286	246	254	242	273	219	206	179	149	155
Bituminous Coal	210	163	177	165	173	133	126	101	74	78
Anthracite + Manufactured Ovoids	59	59	67	65	83	73	68	69	66	70
Coke	0	0	0	0	0	0	0	0	0	0
Lignite	17	24	10	12	17	13	13	9	9	8
Peat	299	273	254	215	218	200	201	197	188	197
Milled Peat	0	0	0	0	0	0	0	0	0	0
Sod Peat	179	183	165	128	128	128	128	128	128	128
Briquettes	120	90	88	87	90	72	73	69	61	69
Oil	915	1,145	1,263	910	917	857	956	1,005	967	1,059
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	570	795	1,010	683	706	669	775	815	773	852
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	57	53	37	33	40	36	37	39	40	44
Gasoil / Diesel/ DERV	244	256	202	185	160	143	138	145	150	160
Petroleum Coke	44	41	13	10	11	8	7	6	4	4
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
Natural Gas	439	607	710	600	606	536	555	563	555	604
Renewables	17	20	44	49	51	51	60	64	63	68
Hydro	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0
Biomass	17	16	27	28	28	26	32	32	27	28
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	7	9	10	11	11	12	12	13
Geothermal	0	3	10	12	13	14	17	20	24	27
Non-Renewable (Wastes)	0	0	0	0	0	0	0	0	0	0
Electricity	548	646	735	698	684	663	678	677	685	703
Total	2,504	2,937	3,260	2,714	2,749	2,525	2,656	2,685	2,608	2,786

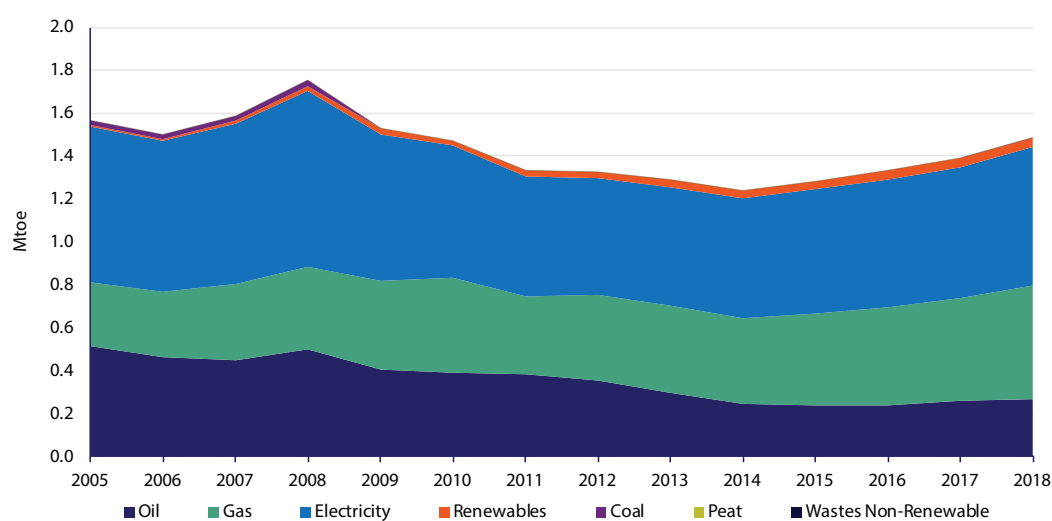
Figure 14: Residential Final Energy Use by Fuel 2005 – 2018



5.4 Commercial & Public Services

Commercial/Public Services kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Coal	0	27	0	0	0	0	0	0	0	0
Bituminous Coal	0	24	0	0	0	0	0	0	0	0
Anthracite + Manufactured Ovoids	0	2	0	0	0	0	0	0	0	0
Coke	0	0	0	0	0	0	0	0	0	0
Lignite	0	1	0	0	0	0	0	0	0	0
Peat	4	0	0	0	0	0	0	0	0	0
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	4	0	0	0	0	0	0	0	0	0
Oil	526	511	391	355	298	245	237	239	257	268
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	17	10	7	5	4	3	3	1	1	1
LPG	8	9	8	7	9	8	8	8	9	9
Gasoil / Diesel/ DERV	501	493	376	343	286	234	226	229	247	257
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
Natural Gas	293	299	440	401	407	401	432	455	484	532
Renewables	0	4	21	30	37	42	32	44	44	43
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	12	19	25	28	17	25	21	18
Landfill Gas	0	0	0	0	0	0	0	0	0	0
Biogas	0	3	4	4	4	5	5	7	8	8
Wastes	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0
Geothermal	0	1	5	7	7	8	10	12	15	17
Non-Renewable (Wastes)	0	0	0	0	0	0	0	0	0	0
Electricity	481	728	616	540	547	554	580	598	609	642
Total	1,304	1,569	1,469	1,326	1,290	1,242	1,282	1,336	1,395	1,484

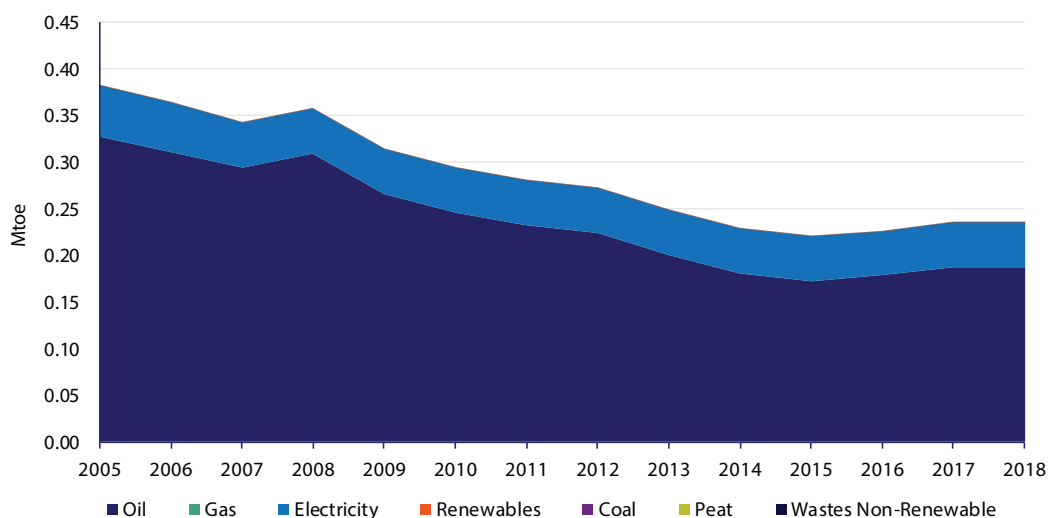
Figure 15: Commercial/Public Services Final Energy Use by Fuel 2005 – 2018



5.5 Agriculture

Agriculture kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Coal	0	0	0	0	0	0	0	0	0	0
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
Peat	0	0	0	0	0	0	0	0	0	0
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
Oil	268	281	222	203	176	157	152	159	165	175
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	268	281	222	203	176	157	152	159	165	175
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
Natural Gas	0	0	0	0	0	0	0	0	0	0
Renewables	0	0	0	0	0	0	0	0	0	0
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
Non-Renewable (Wastes)	0	0	0	0	0	0	0	0	0	0
Electricity	49	55	48	48	48	48	48	48	48	48
Total	317	336	270	251	224	205	200	207	213	223

Figure 16: Agriculture & Fisheries Final Energy Use by Fuel 2005 – 2018

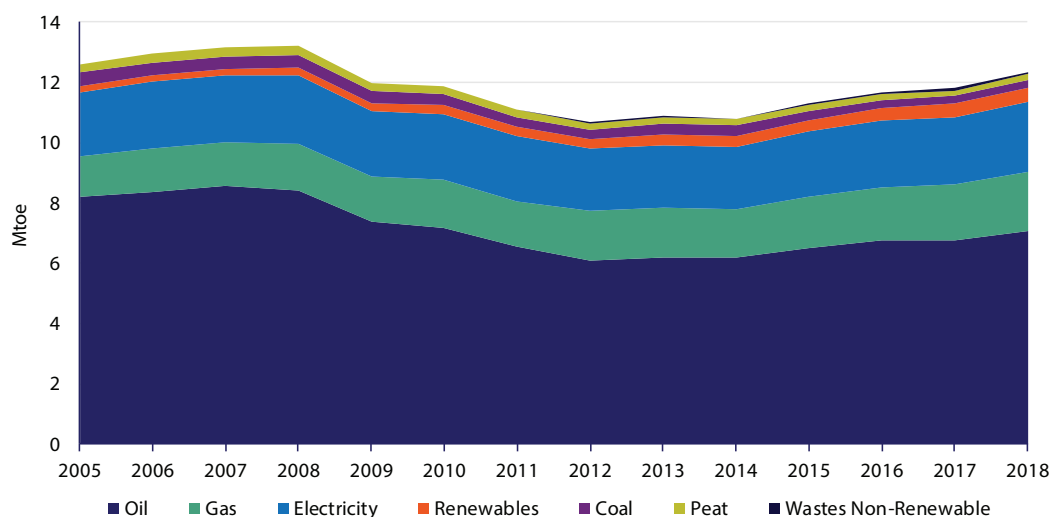


6 Fuels

6.1 Final Consumption of Fuels

Total Final Consumption										
kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Coal	398	484	378	339	355	326	312	285	251	261
Bituminous Coal	323	399	301	262	255	240	232	207	176	183
Anthracite + Manufactured Ovoids	59	61	67	65	83	73	68	69	66	70
Coke	0	0	0	0	0	0	0	0	0	0
Lignite	17	24	10	12	17	13	13	9	9	8
Peat	303	274	254	215	218	201	201	198	189	197
Milled Peat	0	0	0	1	0	1	1	1	1	1
Sod Peat	179	183	165	128	128	128	128	128	128	128
Briquettes	124	91	88	87	90	72	73	69	61	69
Oil	7,011	8,150	7,134	6,065	6,178	6,140	6,459	6,712	6,752	7,038
Crude	0	0	0	0	0	0	0	0	0	0
Refinery Gas	0	0	0	0	0	0	0	0	0	0
Gasoline	1,590	1,822	1,478	1,272	1,197	1,134	1,075	1,003	904	821
Kerosene	660	919	1,123	758	785	743	861	906	859	947
Jet Kerosene	629	857	787	586	675	748	846	868	1,021	1,102
Fuel Oil	714	500	318	113	142	78	44	36	31	31
LPG	153	166	148	137	166	150	153	163	167	181
Gasoil / Diesel/ DERV	3,059	3,606	3,193	3,098	3,114	3,165	3,350	3,597	3,635	3,811
Petroleum Coke	205	278	86	101	99	122	131	139	135	145
Naphta	1	1	1	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
Natural Gas	1,203	1,369	1,590	1,624	1,631	1,619	1,715	1,794	1,824	1,948
Renewables	118	188	311	299	331	380	400	401	459	464
Hydro	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0
Biomass	113	176	187	177	191	222	224	228	237	242
Landfill Gas	0	0	0	0	0	0	0	0	0	0
Biogas	4	7	8	9	7	8	9	9	10	10
Liquid Biofuels	0	1	93	85	102	116	128	118	161	154
Solar	0	0	7	9	10	11	11	12	13	14
Geothermal	0	4	16	19	20	23	27	32	39	44
Non-Renewable (Wastes)	0	0	9	27	39	42	44	42	57	55
Electricity	1,745	2,094	2,186	2,078	2,082	2,076	2,156	2,199	2,236	2,334
Total	10,777	12,560	11,862	10,648	10,834	10,783	11,287	11,631	11,768	12,297

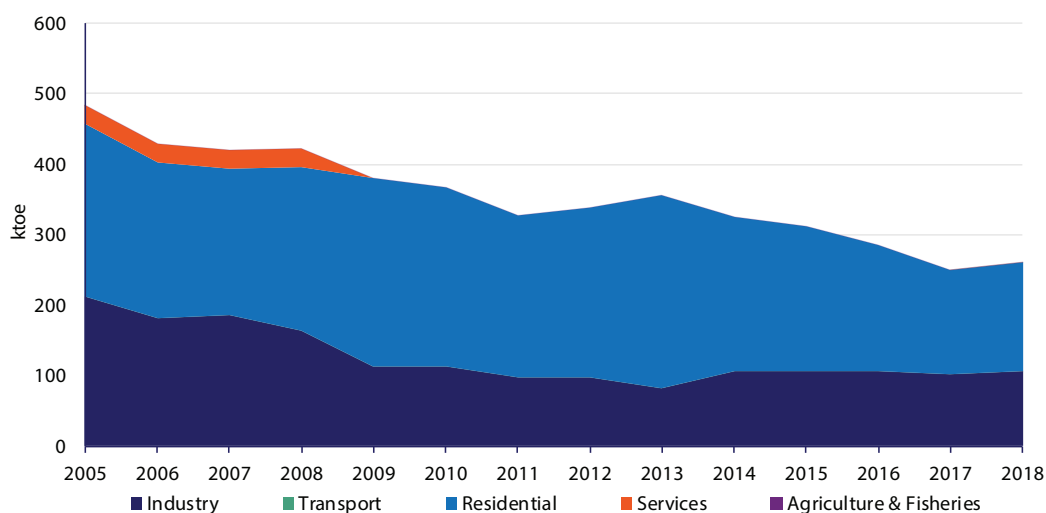
Figure 17: Total Final Energy Use by Fuel 2005 – 2018



6.2 Coal

Coal kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Total Final Energy Consumption	398	484	378	339	355	326	312	285	251	261
Industry	113	212	124	97	82	107	106	106	102	105
Non-Energy Mining	0	0	0	0	0	0	0	0	0	0
Food, beverages and tobacco	29	53	17	18	21	21	22	21	21	19
Textiles and textile products	10	8	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	1	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	2	0	0	0	0	0	0	0	0
Other non-metallic mineral products	70	148	102	77	61	86	84	86	81	87
Basic metals and fabricated metal prods	0	0	0	0	0	0	0	0	0	0
Machinery and equipment n.e.c.	0	1	0	0	0	0	0	0	0	0
Electrical and optical equipment	4	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	4	1	0	0	0	0	0	0
Transport	0	0	0	0	0	0	0	0	0	0
Road Freight	0	0	0	0	0	0	0	0	0	0
Light Goods Vehicle (LGV)	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
Navigation	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0
Residential	286	246	254	242	273	219	206	179	149	155
Commercial/Public Services	0	27	0	0	0	0	0	0	0	0
Commercial Services	0	27	0	0	0	0	0	0	0	0
Public Services	0	0	0	0	0	0	0	0	0	0
Agricultural	0	0	0	0	0	0	0	0	0	0
Fisheries	0	0	0	0	0	0	0	0	0	0

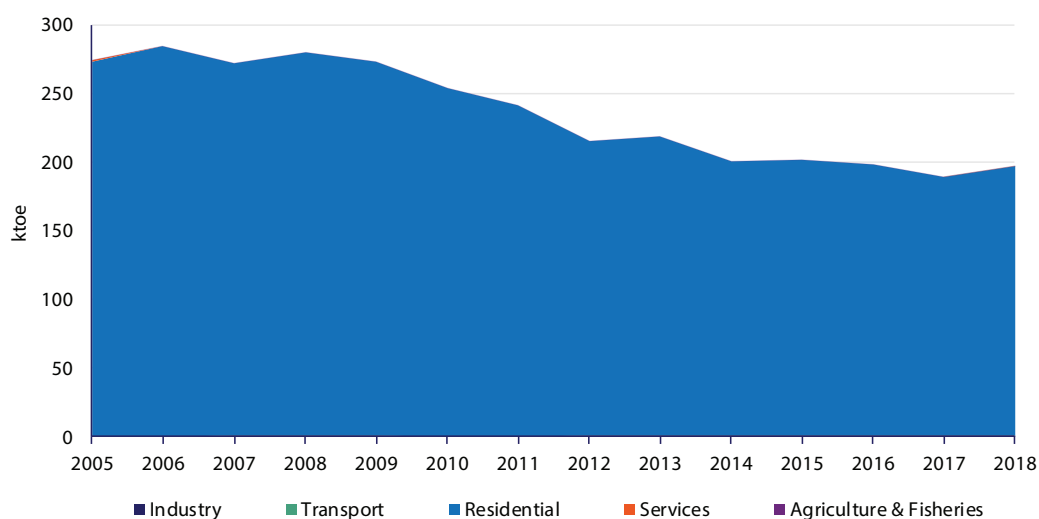
Figure 18: Coal Use by Sector 2005 – 2018



6.3 Peat

Peat kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Total Final Energy Consumption	303	274	254	215	218	201	201	198	189	197
Industry	0	0	0	1	1	1	1	1	1	1
Non-Energy Mining	0	0	0	0	0	0	0	0	0	0
Food, beverages and tobacco	0	0	0	1	0	1	1	1	1	1
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
Transport	0	0	0	0	0	0	0	0	0	0
Road Freight	0	0	0	0	0	0	0	0	0	0
Light Goods Vehicle (LGV)	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
Navigation	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0
Residential	299	273	254	215	218	200	201	197	188	197
Commercial/Public Services	4	0	0	0	0	0	0	0	0	0
Commercial Services	0	0	0	0	0	0	0	0	0	0
Public Services	4	0	0	0	0	0	0	0	0	0
Agricultural	0	0	0	0	0	0	0	0	0	0
Fisheries	0	0	0	0	0	0	0	0	0	0

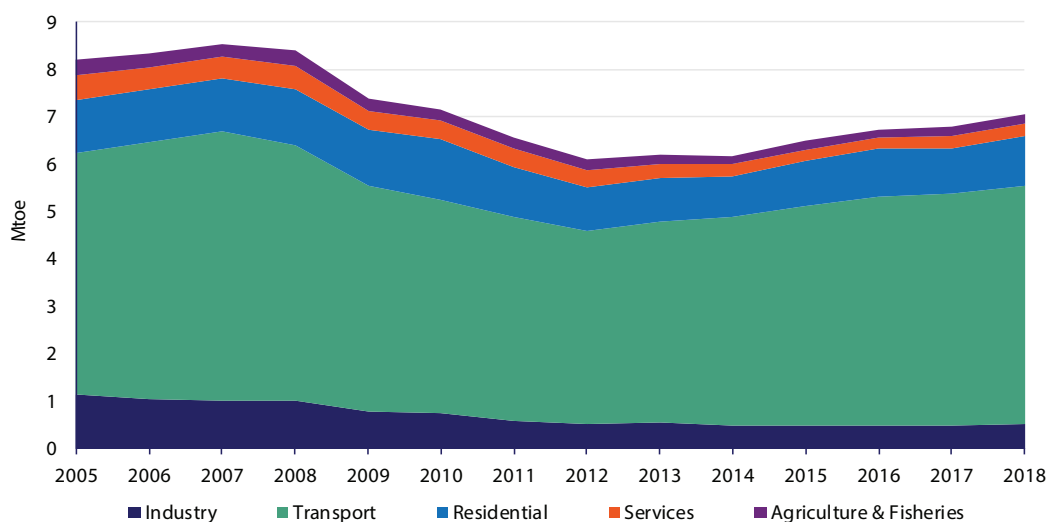
Figure 19: Peat Use by Sector 2005 – 2018



6.4 Oil

Oil kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Total Final Energy Consumption	7,047	8,196	7,159	6,088	6,203	6,164	6,480	6,732	6,775	7,065
Industry	1,201	1,136	757	514	545	478	464	484	480	516
Non-Energy Mining	93	77	44	37	34	30	30	31	32	34
Food, beverages and tobacco	292	160	187	118	137	121	127	131	127	136
Textiles and textile products	38	14	4	2	3	2	2	2	2	3
Wood and wood products	9	5	3	3	3	2	2	2	3	3
Pulp, paper, publishing and printing	10	9	4	3	3	3	3	3	3	3
Chemicals & man-made fibres	72	51	42	25	29	25	27	27	27	28
Rubber and plastic products	14	8	10	9	10	9	9	9	9	10
Other non-metallic mineral products	94	316	143	146	141	160	171	182	181	193
Basic metals and fab. metal prods	447	357	224	94	96	45	11	8	8	10
Machinery and equipment n.e.c.	57	9	6	5	6	5	5	5	5	6
Electrical and optical equipment	62	112	38	35	42	38	38	41	42	46
Transport equipment manufacture	6	5	5	4	5	4	4	5	5	5
Other manufacturing	7	13	47	33	39	34	36	37	37	40
Transport	4,101	5,076	4,501	4,084	4,242	4,402	4,651	4,825	4,883	5,020
Road Freight	809	1,112	669	613	562	599	603	713	713	697
Light Goods Vehicle (LGV)	0	0	338	302	312	316	316	310	324	318
Road Private Car	1,562	1,892	1,967	2,008	2,047	2,094	2,088	2,044	1,996	1,979
Public Passenger Services	86	157	160	145	138	132	130	131	127	133
Rail	40	40	40	38	38	35	36	36	38	38
Domestic Aviation	25	22	14	5	5	5	5	6	6	6
International Aviation	606	837	774	581	671	744	842	864	1,016	1,096
Fuel Tourism	718	387	222	222	203	284	456	372	155	177
Navigation	24	50	65	59	58	72	71	86	76	84
Unspecified	231	580	253	110	208	122	103	263	432	491
Residential	915	1,145	1,263	910	917	857	956	1,005	967	1,059
Commercial/Public Services	526	511	391	355	298	245	237	239	257	268
Commercial Services	339	333	254	232	195	160	155	157	170	177
Public Services	187	178	136	123	103	85	82	81	87	91
Agricultural	268	281	222	203	176	157	152	159	165	175
Fisheries	37	47	25	23	25	24	21	19	23	27

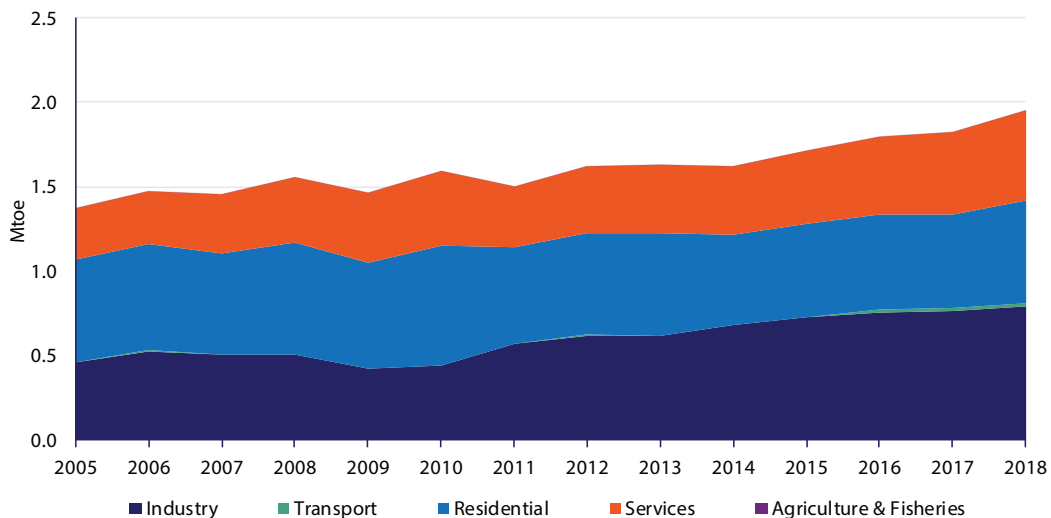
Figure 20: Oil Use by Sector 2005 – 2018



6.5 Natural Gas

Natural Gas kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Total Final Energy Consumption	1,203	1,369	1,590	1,624	1,631	1,619	1,715	1,794	1,824	1,948
Industry	471	462	437	619	615	679	724	755	764	790
Non-Energy Mining	46	24	9	10	10	10	10	12	12	13
Food, beverages and tobacco	158	178	79	88	89	90	91	102	104	111
Textiles and textile products	2	1	1	1	1	1	1	1	1	1
Wood and wood products	0	3	2	2	2	2	2	2	2	2
Pulp, paper, publishing and printing	30	9	3	3	3	3	3	3	3	4
Chemicals & man-made fibres	99	119	49	54	55	55	56	63	64	69
Rubber and plastic products	5	8	3	4	4	4	4	4	4	5
Other non-metallic mineral products	48	59	13	14	14	14	15	16	17	18
Basic metals and fabricated metal prods	11	7	177	329	321	383	422	417	419	422
Machinery and equipment n.e.c.	13	12	4	5	5	5	5	5	5	6
Electrical and optical equipment	39	33	92	103	105	105	107	120	122	131
Transport equipment manufacture	9	6	1	2	2	2	2	2	2	2
Other manufacturing	10	2	5	5	5	6	6	6	6	7
Transport	0	2	2	4	3	3	4	21	20	23
Road Freight	0	0	0	0	0	0	0	0	0	0
Light Goods Vehicle (LGV)	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
Navigation	0	0	0	0	0	0	0	0	0	0
Unspecified	0	2	2	4	3	3	4	21	20	23
Residential	439	607	710	600	606	536	555	563	555	604
Commercial/Public Services	293	299	440	401	407	401	432	455	484	532
Commercial Services	129	131	193	176	178	176	189	199	212	233
Public Services	165	168	247	225	228	225	243	256	272	299
Agricultural	0	0	0	0	0	0	0	0	0	0
Fisheries	0	0	0	0	0	0	0	0	0	0

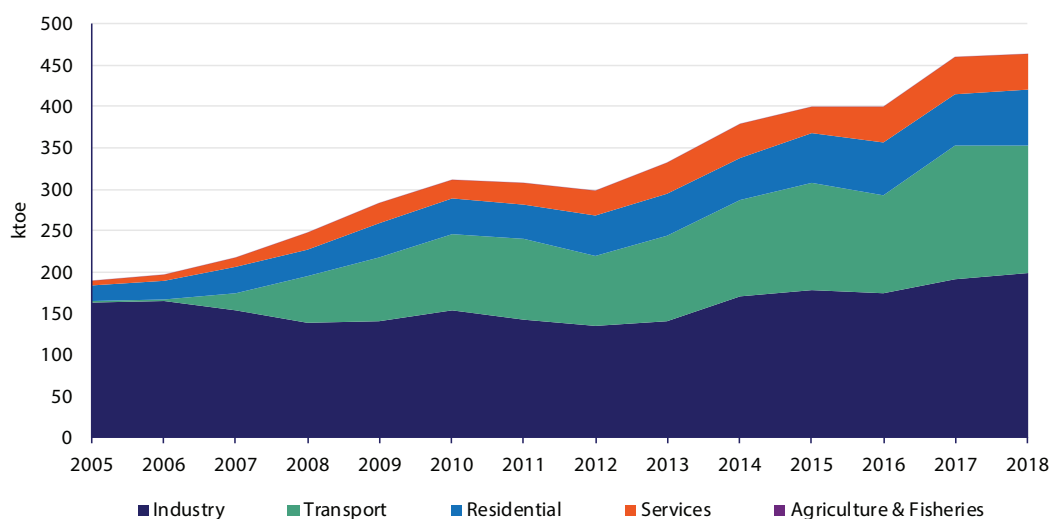
Figure 21: Natural Gas Use by Sector 2005 – 2018



6.6 Renewables

Renewables kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Total Final Energy Consumption	118	188	311	299	331	380	400	401	459	464
Industry	100	163	152	135	141	171	179	174	192	198
Non-Energy Mining	0	0	0	0	0	0	0	0	0	0
Food, beverages and tobacco	4	54	40	18	16	35	30	22	23	26
Textiles and textile products	0	0	0	0	0	0	0	0	0	0
Wood and wood products	96	109	100	95	100	108	115	113	126	129
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	12	21	25	28	33	39	42	43
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
Transport	0	1	93	85	102	116	128	118	161	154
Road Freight	0	0	19	16	18	22	23	22	33	30
Light Goods Vehicle (LGV)	0	0	10	8	10	12	12	9	15	14
Road Private Car	0	0	48	49	57	64	69	64	82	78
Public Passenger Services	0	0	4	4	4	5	5	4	6	6
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	6	6	7	10	17	11	7	8
Navigation	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	6	2	6	3	3	8	18	20
Residential	17	20	44	49	51	51	60	64	63	68
Commercial/Public Services	0	4	21	30	37	42	32	44	44	43
Commercial Services	0	1	18	26	33	36	27	37	36	35
Public Services	0	3	4	4	4	5	5	7	8	8
Agricultural	0	0	0	0	0	0	0	0	0	0
Fisheries	0	0	0	0	0	0	0	0	0	0

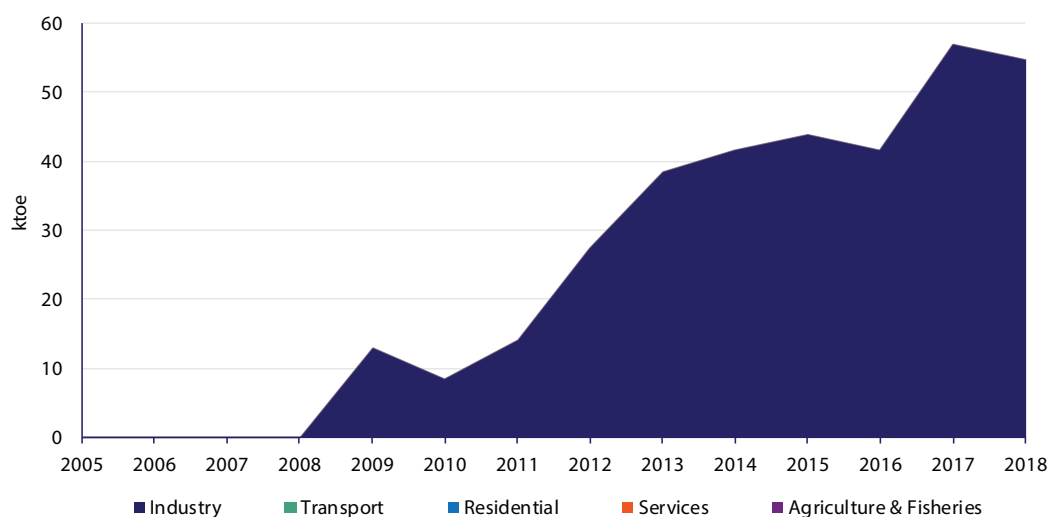
Figure 22: Renewables Use by Sector 2005 – 2018



6.7 Non-Renewable (wastes)

Electricity kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Total Final Energy Consumption	0	0	9	27	39	42	44	42	57	55
Industry	0	0	9	27	39	42	44	42	57	55
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	9	27	39	42	44	42	57	55
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
Transport	0	0	0	0	0	0	0	0	0	0
Road Freight	0	0	0	0	0	0	0	0	0	0
Light Goods Vehicle (LGV)	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
Navigation	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0
Commercial/Public Services	0	0	0	0	0	0	0	0	0	0
Commercial Services	0	0	0	0	0	0	0	0	0	0
Public Services	0	0	0	0	0	0	0	0	0	0
Agricultural	0	0	0	0	0	0	0	0	0	0
Fisheries	0	0	0	0	0	0	0	0	0	0

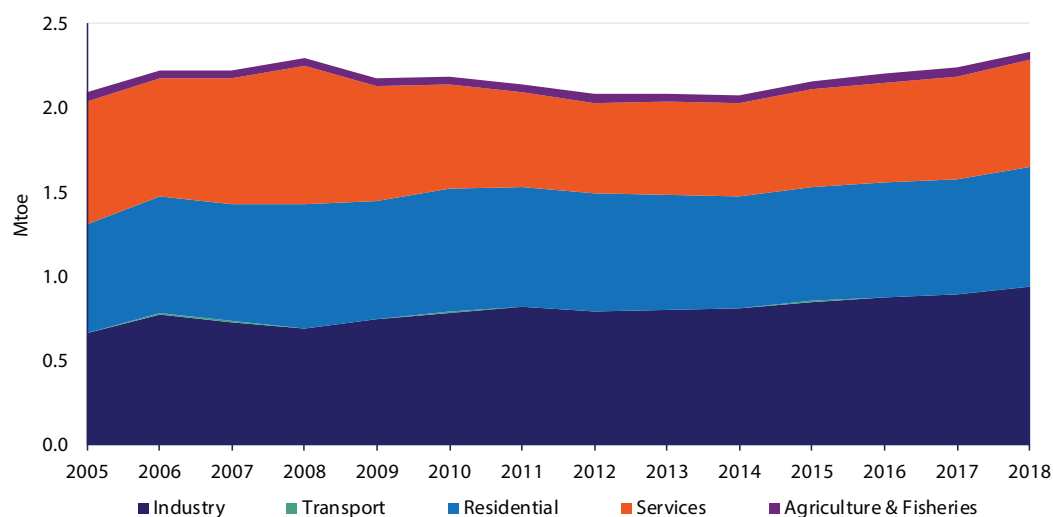
Figure 23: Non-Renewables (wastes) Use by Sector 2005 – 2018



6.8 Electricity

Electricity kilo tonnes of oil equivalent (ktoe)	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Total Final Energy Consumption	1,745	2,094	2,186	2,078	2,082	2,076	2,156	2,199	2,236	2,334
Industry	665	660	783	788	799	808	847	872	889	936
Non-Energy Mining	40	50	56	56	57	58	61	63	64	67
Food, beverages and tobacco	156	142	167	168	170	172	180	186	190	201
Textiles and textile products	18	8	10	10	10	10	11	11	11	12
Wood and wood products	29	28	34	34	34	35	36	37	38	40
Pulp, paper, publishing and printing	27	24	18	18	19	19	20	20	21	22
Chemicals & man-made fibres	115	108	142	143	145	147	154	159	162	171
Rubber and plastic products	33	33	34	35	35	35	37	38	39	41
Other non-metallic mineral products	50	64	50	50	51	51	54	56	57	60
Basic metals and fab. metal prods	46	42	63	64	64	64	67	68	69	71
Machinery and equipment n.e.c.	18	16	20	20	20	21	22	22	23	24
Electrical and optical equipment	101	117	97	97	99	100	105	108	110	116
Transport equipment manufacture	10	9	17	17	17	17	18	18	19	20
Other manufacturing	22	18	76	76	78	78	82	85	87	91
Transport	2	5	4	4	4	3	4	4	4	5
Road Freight	0	0	0	0	0	0	0	0	0	0
Light Goods Vehicles (LGV)	0	0	0	0	0	0	0	0	0	0
Road Private Car	0	0	0	0	0	0	0	0	1	1
Public Passenger Services	0	0	0	0	0	0	0	0	0	0
Rail	2	5	4	4	4	3	4	4	4	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
Navigation	0	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0
Residential	548	646	735	698	684	663	678	677	685	703
Commercial/Public Services	481	728	616	540	547	554	580	598	609	642
Commercial Services	345	522	442	387	392	397	416	429	437	460
Public Services	136	206	174	153	155	157	164	169	173	182
Agricultural	49	55	48	48	48	48	48	48	48	48
Fisheries	0	0	0	0	0	0	0	0	0	0

Figure 24: Electricity Use by Sector 2005 – 2018



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, isomerate, 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 (C₃H₈) and butane (C₄H₁₀) 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

From:	To:	toe	MWh	GJ
	<i>Multiply by</i>			
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 by and charged for commercially.

tonne of oil equivalent (toe): This is a conventional standardised 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 = 10⁻³ toe.

Decimal Prefixes

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

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	0.7663	32,084
	Conversion Factor	Conversion Factor
Electricity	86 toe/GWh	3.6 TJ/GWh

Emission Factors

	t CO ₂ /TJ (NCV)	g CO ₂ /kWh (NCV)
Liquid Fuels		
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	92.9	334.5
Solid Fuels and Derivatives		
Coal	94.6	340.6
Milled Peat	116.7	420.0
Sod Peat	104.0	374.4
Peat Briquettes	98.9	355.9
Gas		
Natural Gas	56.9	204.7
Electricity		
(2018)	104.2	375.2



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