

	Wind	MW			699	699	709	719	729	739	749	788	828	868	908	948	948	1811	2723	4500
	Solar	MW			1029	1042	1191	1339	1488	1636	1785	2071	2357	2643	2930	3216	3216	3216	3277	4555
	Geothermal and other renewables	MW			0	0					0					0	0	0	0	67
	Other fuels (hydrogen, methanol)	MW																		
5	Heat generation from thermal and nuclear power generation *3, *4	GWth			11014	10323	10493	10662	10831	11001	11170	11032	10894	10755	10617	10479	9482	8891	8735	8534
6	Heat generation from combined heat and power plants, including industrial waste heat	GWth			13388	12912	13010	13108	13207	13305	13404	13223	13042	12860	12679	12498	11423	10718	10473	10238
7	Cross-border interconnection capacities for electricity [the level of electricity interconnectivity in line with Article 4(d)(1) and the relevant annex of the Energy Union Governance regulation] and their projected usage rates [note that such information may not be available in standard energy system models; complementary tools or assumptions might be needed]																			
2.3. Transformation sector																				
1	Fuel Inputs to Thermal Power Generation (heat and power)	ktoe	6688	7551	7008	7015	6978	6941	6904	6866	6829	6624	6418	6213	6007	5802	3812	1627	1417	2485
	Solids	ktoe	5817	6610	6165	5918	5906	5893	5880	5867	5855	5565	5274	4984	4694	4404	2310	545	423	380
	Other	ktoe	174	221	224	454	435	416	397	378	359	369	378	388	398	408	370	394	447	465
	Gas	ktoe	697	720	618	643	637	632	627	621	616	691	765	840	915	990	1132	688	548	1640
2	Fuel Input to other conversion processes	ktoe	6420	6041	6667	6667	6606	6544	6482	6421	6359	6319	6278	6238	6197	6157	5977	5811	5601	5402
2.4. Energy consumption																				
1	Primary energy consumption	ktoe	18905	17352	17981	18518	18506	18493	18480	18467	18455	18257	18059	17861	17664	17466	17001	16708	16526	14506
1	Final energy consumption	ktoe	10184	8843	9502	9985	10045	10104	10163	10223	10282	10289	10296	10304	10311	10318	10171	10123	10086	10140
2	by sector																			
	Industry	ktoe	4037	2561	2715	2841	2856	2871	2886	2901	2916	2925	2935	2944	2954	2964	2933	2940	2933	2942
	Residential	ktoe	2117	2246	2195	2312	2319	2326	2332	2339	2346	2350	2355	2360	2365	2369	2377	2436	2460	2478
	Tertiary (Service)	ktoe	1128	1174	1197	1207	1220	1233	1246	1259	1272	1267	1262	1258	1253	1249	1248	1253	1261	1259
	Transport	ktoe	2903	2862	3394	3626	3651	3675	3700	3724	3749	3747	3744	3741	3739	3736	3612	3493	3432	3462
	Other	ktoe					0	0	0	0		0	0	0	0					
	By transport activity, when available																			
	Passenger transport	ktoe			2467	2565	2554	2543	2532	2521	2510	2485	2460	2434	2409	2383	2243	2195	2142	2130
	Freight transport	ktoe			779	930	969	1007	1046	1084	1123	1142	1161	1180	1199	1218	1248	1197	1186	1185
3	by fuel																			
	Solids	ktoe	978	414	332	360	345	329	314	298	283	264	245	225	206	187	147	67	33	24

	Oil	ktoe	3712	3124	3377	3477	3493	3508	3524	3540	3555	3534	3513	3491	3470	3449	3215	3047	2938	2896
	Gas	ktoe	1565	1058	1299	1350	1336	1321	1306	1292	1277	1271	1266	1261	1256	1250	1265	1292	1279	1314
	Electricity	ktoe	2211	2330	2437	2615	2648	2682	2715	2748	2782	2814	2846	2877	2909	2941	3133	3258	3358	3374
	Heat	ktoe	939	959	818	813	820	827	834	841	848	846	845	843	841	839	824	826	821	802
	Renewable energy forms	ktoe	777	956	1237	1368	1402	1435	1469	1502	1535	1558	1581	1604	1627	1650	1585	1631	1654	1728
	Other	ktoe																		
4	Final non energy consumption	ktoe	849	422	607	631	652	673	693	714	735	743	750	758	765	773	800	838	871	901
5	Primary energy intensity of the economy	toe/euro			406.9795	354.3193	345.0692	335.8191	326.5691	317.3190	308.0689	297.7908	287.5126	277.2344	266.9563	256.6781	226.1239	206.8367	194.6417	165.0955
6	Final energy intensity by sector																			
	Industry	toe/euro of value added			0.3623	0.3243	0.3193	0.3144	0.3094	0.3044	0.2994	0.2957	0.2921	0.2884	0.2848	0.2812	0.2616	0.2465	0.2325	0.2208
	Residential	toe/euro private income			0.35	0.30	0.2890	0.2805	0.2721	0.2636	0.26	0.2482	0.2412	0.2342	0.2273	0.22	0.19	0.18	0.17	0.16
	Tertiary	toe/euro of value added			0.48647	0.40584	0.39881	0.39178	0.38475	0.37772	0.37069	0.36028	0.34987	0.33946	0.32906	0.31865	0.28607	0.26565	0.25312	0.24185
	Passenger transport	toe/million pkm			0.032	0.031	0.03043	0.03001	0.02958	0.02915	0.029	0.02819	0.02766	0.02714	0.02661	0.026	0.023	0.022	0.021	0.020
	Freight transport	toe/million tkm			0.048	0.050	0.04988	0.05012	0.05035	0.05058	0.051	0.05070	0.05059	0.05047	0.05036	0.050	0.049	0.046	0.044	0.042
2.5. Prices																				
1	Electricity prices by type of using sector (residential, industry, tertiary)																			
	residential excluding VAT	euro/toe	516	796	956	1047	1064	1076	1100	1118	1118	1171	1195	1209	1214	1218	1328	1369	1319	1498
	industry excluding VAT and other recoverable taxes and levies	euro/toe	496	675	788	844	868	880	904	922	951	969	987	1011	1047	1088	1160	1207	1249	1278
	services																			
2	National retail fuel prices (including taxes, per source and sector)																			
	Diesel oil																			
	Industry	euro/toe			561	1055	1086	1116	1146	1176	1206	1230	1253	1276	1299	1323	1403	1461	1490	1505
	Households	euro/toe			673	1267	1303	1339	1375	1411	1448	1475	1503	1531	1559	1587	1684	1754	1788	1806
	Transport private	euro/toe			1103	1273	1310	1346	1383	1419	1456	1484	1512	1540	1568	1597	1694	1764	1799	1817
	Transport public	euro/toe			919	1061	1091	1122	1152	1183	1213	1237	1260	1284	1307	1331	1411	1470	1499	1514
	Gasoline																			
	Transport private	euro/toe			1233	1412	1451	1489	1528	1566	1605	1635	1664	1694	1724	1753	1856	1930	1967	1985
	Transport public	euro/toe			1028	1177	1209	1241	1273	1305	1337	1362	1387	1412	1436	1461	1546	1609	1639	1654
	Natural gas						0	0	0	0		0	0	0	0					
	Industry	euro/toe			392	364	370	377	383	390	397	400	404	408	411	415	430	447	465	479
	Households	euro/toe			621	584	593	601	610	618	627	632	636	641	646	650	670	692	715	733
2.6. Investments																				

2	Electricity and heat generation from renewable energy in buildings (as defined in Article 2(1) of Directive 2010/31/EU); this shall include, where available, disaggregated data on energy produced, consumed and injected into the grid by solar photovoltaic systems, solar thermal systems, biomass, heat pumps, geothermal systems, as well as all other decentralized renewables systems)																				
3	If applicable, other national trajectories, including long-term or sectorial ones (the share of food-based and advanced biofuels, the share of renewable energy in district heating, as well as the renewable energy produced by cities and energy communities as defined by Article 22 of [recast of Directive 2009/28/EC as proposed by COM(2016) 767])																				
3. GHG emissions and removals related indicators																					
1	GHG emissions by policy sector (EU ETS, Effort Sharing Regulation and LULUCF)	tCO2eq	54315	50461	54656	53495	53419.69	53343.96	53268.24	53192.52	53117	52004.02	50891.25	49778.47	48665.70	47553	38208	28959	28288	31388	
	ETS sector emissions (in ETS scope since 2013)	tCO2eq	39398	35596	37800	37287	37091.51	36896.12	36700.74	36505.36	36310	35227.36	34144.75	33062.13	31979.51	30897	22409	13674	12685	14906	
	Effort Sharing sector GHG emissions (in scope since 2013)	tCO2eq	27272	25209	25345	24850	24959.98	25070.29	25180.59	25290.90	25401	25370.81	25340.41	25310.00	25279.60	25249	24319	23719	23944	24717	
	LULUCF (accounted according to EU legislation requirements)	tCO2eq	-12355	-10344	-8489	-8641	-8631.80	-8622.45	-8613.10	-8603.75	-8594	-8594.15	-8593.91	-8593.66	-8593.42	-8593	-8519	-8434	-8341	-8235	
2	GHG emissions by IPCC sector and by gas (where relevant split into EU ETS and Effort Sharing sectors).	tCO2eq	Please use for reporting on GHG emissions by IPCC sector and gas the same excel template as used for reporting on Annex XII to Commission Implementing Regulation (EU) 749/2014 (IPArticle23_table1), next due 15/3/2019. It is provided as separate file.																		
3	Carbon intensity of the overall economy	tCO2eq/GDP			976	814	788.64	762.88	737.12	711.36	686	651.22	616.83	582.44	548.06	514	342	206	180	196	
4	CO2 emission related indicators																				
a	GHG intensity of domestic power and heat generation	tCO2eq/GWh			0.51	0.50	0.49	0.48	0.47	0.47	0.46	0.44	0.42	0.40	0.38	0.36	0.21	0.06	0.05	0.09	
b	GHG intensity of final energy consumption by sector	tCO2eq/toe					0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00						
	Industry	tCO2eq/GWh			0.09	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06
	Residential	tCO2eq/GWh			0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	
	Tertiary	tCO2eq/GWh			0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	
	Passenger transport	tCO2eq/GWh																			
	Freight transport	tCO2eq/GWh																			
5	Non-CO2 GHG emission related parameters																				
a	Livestock																				
	dairy cattle	1000 heads	358	302	286	315	317.78	320.90	324.03	327.16	330	333.42	336.54	339.67	342.80	346	362	377	393	408	
	non-dairy cattle	1000 heads	288	239	266	280	279.55	279.43	279.31	279.18	279	292.43	305.81	319.18	332.56	346	362	377	393	408	
	pigs	1000 heads	937	697	577	655	661.34	667.85	674.36	680.87	687	693.89	700.40	706.91	713.42	720	752	785	818	850	

	sheep	1000 heads	1647	1384	1334	1485	1499.34	1514.10	1528.86	1543.62	1558	1573.14	1587.90	1602.66	1617.42	1632	1706	1780	1854	1927
	poultry	1000 heads	19514	16668	15105	12998	13127.09	13256.32	13385.55	13514.77	13644	13773.23	13902.45	14031.68	14160.91	14290	14936	15582	16229	16875
b	Nitrogen input from application of synthetic fertilizers	kt nitrogen				360	362.69	365.05	367.41	369.77	372	374.54	376.96	379.37	381.78	384	396	408	420	432
c	Nitrogen input from application of manure	kt nitrogen	54	44	42	36	35.33	34.48	33.64	32.80	32	31.11	30.26	29.41	28.57	28	23	19	14	10
d	Nitrogen fixed by N-fixing crops	kt nitrogen	1.02	0.73	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
e	Nitrogen in crop residues returned to soils	kt nitrogen	132	214	210	279	290.79	302.88	314.98	327.07	339	350.99	362.82	374.65	386.48	398	456	516	574	633
f	Area of cultivated organic soils	hectares	41267	41267	41267	41267	41267.20	41267.20	41267.20	41267.20	41267	41267.20	41267.20	41267.20	41267.20	41267	41267	41267	41267	41267

RES in Heating and cooling	ktoe	741	974	1148	1264	1322	1381	1439	1497	1555	1583	1611	1639	1667	1695	1628	1670	1697	1716
RES in Heating and cooling	%	14.3	24.4	28.94	31.07	32.48	33.89	35.30	36.71	38.11	38.99	39.88	40.78	41.68	42.60	42.18	43.64	45.30	45.99

*1: older plants can use alternatively oil or gas or both together, the plants can be split by capacity type but not by fuel type. CCGT plants are excluded her

*2:these are biomass plants only; other plant types can blend biomass

*3: we include both steam and heat

Investment calculations

<i>Investments per 5 year period</i>	2016-202	2021-202	2026-203	2031-203	2036-204	2041-204	2046-2050
<i>Residential and tertiary</i>	9032	7740	8332	10126	8882	8523	10522
<i>Industry</i>	1225	1172	924	959	941	1172	1263
Transport	39220.5	23728.7	26826.4	34862.2	34766.1	37569.5	37458.3

Energy related in transport	4314.26	3677.95	5365.29	7146.75	7300.87	8077.43	8240.83
	0.11	0.155	0.2	0.205	0.21	0.215	0.22
investment expenditure power plants	490.262	1233.58	11839.5	1526.4	2023.6	1098.25	3894.85
grid expenditures	676	748	839	896	956	1020	1151
Total	15738	14572	27300	20655	20105	19891	25072
	3147.56	2914.43	5460.03	4130.93	4020.92	3978.28	5014.43