

	Oil	Ktoe	32622	31638	28544	31527	31938	32246	32703		Oil and petroleum products	CBS	modelling output
	Natural gas	Ktoe	35325	40059	28526	24030	22882	20031	18903			CBS	modelling output
	Nuclear	Ktoe	986	917	936	1049	1047	1047	0		Nuclear heat	CBS	modelling output
	Electricity	Ktoe	1574	239	752	1313	-96	1520	1632		Renewables, including bio-waste and biolulcs	CBS	modelling output
	Renewable energy forms	Ktoe	2259	3215	3683	7555	8972	7923	7608		Renewables, including bio-waste and biolulcs	CBS	modelling output
	Other	Ktoe	891	836	915	867	889	890	893		Non-renewable waste	CBS	modelling output
2.2. Electricity and heat													
	1 Gross electricity generation	GWhe	100769	116139	110087	99975	116139	95043	89744			CBS	modelling output
	2 By fuel												
	Nuclear energy	GWhe	3997	3959	4078	4220	4220	4209	0			CBS	modelling output
	Solids	GWhe	27957	26190	42473	27436	30031	25956	20562			CBS	modelling output
	Oil (including refinery gas)	GWhe	332	48	96	0	0	0	0			CBS	modelling output
	Gas (including derived gases)	GWhe	58208	73576	45881	30488	30139	19509	22443			CBS	modelling output
	Biomass waste	GWhe	5272	7058	4930	13120	13511	6507	6320			CBS	modelling output
	Hydro (pumping excluded)	GWhe	88	104	93	117	117	117	117			CBS	modelling output
	Wind	GWhe	2067	3993	7590	19119	29556	26647	24689			CBS	modelling output
	Solar	GWhe	34	59	1122	4975	8567	12099	15614			CBS	modelling output
	Geothermal and other renewables	GWhe	0.00	0.00	0.00							CBS	modelling output
	Other fuels (hydrogen, methanol)	GWhe	2809	3139	2864							CBS	modelling output
	3 Share of power generation from combined heat and power generation in total electricity generation (CHP electricity generation divided by the total gross electricity generation, including the generation in pumped storage power stations)	%	55%	52%	40%	34%	25%	24%	23%			CBS	modelling output
	4 Capacity electricity generation including retirements and new investments (note: split between retirements and new investments may not be straightforward to obtain with standard models. Complementary assumptions may need to be made)	GW	21.98	26.51	35.21	30.35	35.66	36.91	38.22			CBS	modelling output
	Nuclear energy	GW	0.45	0.51	0.51	0.48	0.48	0.48	0.00			CBS	modelling output
	Solids	GW	9.47	8.86	11.16	4.64	4.64	4.64	3.41		Coal plants	CBS	modelling output
	Oil (including refinery gas)	GW	10.68	14.41	14.55	12.25	11.04	9.62	9.57		Central + decentral plants	CBS	modelling output
	Biomass waste	GW	0.04	0.04	0.04	0.04	0.04	0.04	0.04			CBS	modelling output
	Hydro (pumping excluded)	GW	1.22	2.24	3.39	6.19	8.51	7.28	6.51			CBS	modelling output
	Solar	GW	0.05	0.09	1.52	6.06	10.28	14.26	18.12			CBS	modelling output
	Geothermal and other renewables	GW										CBS	modelling output
	Other fuels (hydrogen, methanol)	GW										CBS	modelling output
	5 Heat generation from thermal power generation	GWhe											
	6 Heat generation from combined heat and power plants including industrial waste heat	GWhe											
	7 Cross-border interconnection capacities for electricity (the level of electricity interconnectivity in line with Article 4(4)(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)												
	Germany	MW				4250	5000	5000	5000				Assumption
	Belgium	MW				2400	3400	3400	3400				Assumption
	Denmark	MW				700	700	700	700				Assumption
	UK	MW				1000	1000	1000	1000				Assumption
	Norway	MW				700	700	700	700				Assumption
2.3. Transformation sector													
	1 Fuel inputs to Thermal Power Generation	Ktoe	19779	21915	19771	9934	9746	7317	6731		Total for the years 2005, 2010 and 2015 includes renewable energy	Eurostat	modelling output
	Solids	Ktoe	4998	4669	7942	5013	5493	4746	3668			Eurostat	modelling output
	Oil	Ktoe	545	386	354	203	202	212	212			Eurostat	modelling output
	Gas	Ktoe	12115	14182	8720	4719	4051	2359	2851			Eurostat	modelling output
	2 Fuel input to other conversion processes	Ktoe	65292	63965	65359	82146	59830	59314	57802			Eurostat	modelling output
2.4. Energy consumption													
	1 Primary energy consumption	Ktoe	81836	84508	74556	74893	74569	71763	69415		Includes non-energetic energy consumption	CBS	modelling output
	1 Final energy consumption	Ktoe	48684	50182	43026	42668	41755	40550	39062			CBS	modelling output
	2 by sector												
	Industry	Ktoe	15391	14085	12873	13017	12854	12329	11246			CBS	modelling output
	Residential	Ktoe	10746	12461	9556	8786	8450	8175	7842			CBS	modelling output
	Tertiary	Ktoe	6936	7753	6671	6072	5730	5561	5493		Commercial and public services	CBS	modelling output
	Transport	Ktoe	11379	11658	10385	10555	10528	10445	10638		Agriculture & forestry	CBS	modelling output
	Agriculture	Ktoe	3657	3891	3475	3877	3808	3623	3431		Mainly fishery	CBS	modelling output
	Other	Ktoe	375	334	285	361	386	398	413			CBS	modelling output
	<i>By transport activity, when available</i>												
	Passenger transport	Ktoe											
	Freight transport	Ktoe											
	3 by fuel												
	Solids	Ktoe	506	516	482	100	103	103	92			CBS	modelling output
	Oil	Ktoe	14684	15235	13883	13413	13557	13480	13877		Oil and petroleum products	CBS	modelling output
	Gas	Ktoe	16577	19337	15054	14931	14694	14044	12307		The years 2005, 2010 and 2015 excludes gas consumption for unit	CBS	modelling output
	Electricity	Ktoe	6978	9265	8921	8717	8697	8673	8607			CBS	modelling output
	Heat	Ktoe	5271	5178	4046	2249	1658	1402	1401		The years 2005, 2010 and 2015 includes unsold heat from CHP	CBS	modelling output
	Renewable energy forms	Ktoe	521	561	735	248	266	247	259		Renewables, including bio-waste and biolulcs	CBS	modelling output

4	Final non energy consumption	ktoe	148	88	103	576	483	381	379		CBS	modelling output		
5	Primary energy intensity of the economy	ktoe/million euro	15140	16283	13507	13453	13819	14106	14408	Primary energy consumption divided by GDP	CBS	modelling output	calculation	
6	Final energy intensity by sector	ktoe/million euro of value added	0.15	0.13	0.11	0.10	0.09	0.08	0.07				calculation	
	Industry		0.22	0.20	0.18	0.14	0.13	0.12	0.10				calculation	
	Road/air													
	Road/air													
	Freight transport	ton/million km												
2.5. Prices														
1 Electricity prices by type of using sector (residential, industry, tertiary)														
	residential	eur/MWh	178	174	184	170	195	199	212	222 Euro's 2015, total price including taxes		modelling output	modelling output	
	industry	eur/MWh	95	92	78	73	91	91	101	111 Euro's 2015, total price including taxes. Average of 13 industrial sites		modelling output	modelling output	
	tertiary	eur/ktoe	1679954	1714843	1626165	1638958	1074755	1904412	2023039	2136140 Euro's 2015, total price including taxes. Average of commercial/retail		modelling output	modelling output	
2 National retail fuel prices (including taxes, per source and sector)														
	Diesel oil	eur/ktoe												
	Industry	eur/ktoe												
	Households	eur/ktoe												
	Transport private	eur/ktoe												
	Transport public	eur/ktoe												
	Gasoline	eur/ktoe												
	Transport private	eur/ktoe												
	Transport public	eur/ktoe												
	Natural gas	eur/ktoe												
	Industry	eur/ktoe	394085	380256	416024	332060	496341	601568	628381	654075 Euro's 2015, total price including taxes. Average of 13 industrial sites		modelling output	Assumption	
	Households	eur/ktoe	803892	755211	808522	913556	1058904	1207227	1244531	1277735 Euro's 2015, total price including taxes		modelling output	Assumption	
2.6. Investments														
	Energy-related investment costs for overall economy	% of GDP	1.0%	1.5%	2.0%									
	Energy-related investment costs for industry	% of value added												
2.7. Renewables														
Gross final consumption of energy from renewable sources and share of renewable energy in gross final energy consumption and by sector (electricity, heating and cooling, transport) and by technology														
	RES in Gross Final Energy Consumption	%	2.5%	3.9%	5.8%	12%	15%	15%	15%	Share of RES technology in gross final energy consumption of RES	SHARES	modelling output	modelling output	In line with RED recast
	RES H&C share	%	2.4%	3.1%	5.5%	9%	10%	10%	10%	Share of RES technology in gross final energy consumption of RES	SHARES	modelling output	modelling output	In line with RED recast
	RES E share	%	6.3%	9.6%	11.1%	29%	44%	38%	39%	Share of RES technology in gross final energy consumption of RES	SHARES	modelling output	modelling output	In line with RED recast
	RES T share	%	0.4%	3.3%	5.3%	8%	18%	19%	18%	Share of RES technology in gross final energy consumption of RES	SHARES	modelling output	modelling output	In line with RED recast (as per Art 25 (1))
	Wind offshore	%	0.0%	3.0%	3.1%	0%	1%	1%	1%	Share of RES technology in gross final energy consumption of RES		modelling output	modelling output	
	Wind onshore	%	12.7%	14.5%	17.8%	15%	15%	15%	12%	Share of RES technology in gross final energy consumption of RES		modelling output	modelling output	
	Solar photovoltaic systems	%	0.2%	0.2%	3.4%	7%	10%	15%	20%	Share of RES technology in gross final energy consumption of RES		modelling output	modelling output	
	Solar heat systems	%	1.2%	1.1%	1.0%	1%	1%	1%	1%	Share of RES technology in gross final energy consumption of RES		modelling output	modelling output	
	Biomass	%	84.0%	77.5%	67.7%	60%	45%	37%	33%	Share of RES technology in gross final energy consumption of RES		modelling output	modelling output	
	Geothermal systems	%	0.0%	0.3%	2.1%	4%	3%	4%	4%	Share of RES technology in gross final energy consumption of RES		modelling output	modelling output	
	Heat pumps	%	1.2%	2.9%	4.7%	5%	6%	9%	12%	Share of RES technology in gross final energy consumption of RES		modelling output	modelling output	
	Hydro + biomass	%	0.6%	0.4%	0.3%	0%	0%	0%	0%	Share of RES technology in gross final energy consumption of RES		modelling output	modelling output	In line with RED recast (as per Art 7 (4))
(final consumption of renewable energy in transport as contribution to overall target)														
Contribution of biomass and biogas produced from feedstock listed in part B of Annex IX and consumed in transport														
	Contribution of biomass and biogas produced from feedstock listed in part B of Annex IX and consumed in transport	%												
Contribution of biomass and biogas produced from feedstock listed in part A of Annex IX and consumed in transport														
	Contribution of biomass and biogas produced from feedstock listed in part A of Annex IX and consumed in transport	%												
Contribution from biomass, biogas and biogas produced from feedstock listed in part B of Annex IX from food or feed crops														
	Contribution of other biomass and consumed in transport	%												
	Gross final consumption of RES for heating and cooling	ktoe	733	972	1419	2198	2436	2308	2339		SHARES	modelling output	modelling output	In line with RED recast
	Gross final consumption of electricity from RES	ktoe	620	982	1094	2039	4355	3887	3810		SHARES	modelling output	modelling output	In line with RED recast
	Gross final consumption of energy from RES in transport	ktoe	20	294	334	894	737	721	733		SHARES	modelling output	modelling output	In line with RED recast
	Total Gross final consumption of RES	ktoe	1373	2208	2847	5931	7528	6716	6883		SHARES	modelling output	modelling output	In line with RED recast
	Gross final consumption of waste heat and cold for heating and cooling	ktoe												
	Waste heat and cold share in gross final consumption for heating and cooling	%												
	RES share from district heating and cooling in gross final consumption for heating and cooling	%												
	Gross final consumption of waste heat and cold from district heating and cooling	ktoe												
	Waste heat and cold share from district heating and cooling in gross final consumption for heating and cooling	%												
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)														
2 solar photovoltaic systems - produced														
	solar photovoltaic systems - produced	ktoe	3	6	86	307	546	849	1152			modelling output	modelling output	Add additional rows if necessary
2 solar thermal systems - produced														
	solar thermal systems - produced	ktoe	20	27	27	56	50	57	50			modelling output	modelling output	
2 biomass - produced														
	biomass - produced	ktoe	379	403	439	448	448	448	448			modelling output	modelling output	
	heat pumps - produced	ktoe	21	68	140	305	462	611	893			modelling output	modelling output	
	geothermal systems - produced	ktoe	0	2	52	210	254	254	254			modelling output	modelling output	

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])																			Add additional rows if necessary
3. GHG emissions and removals related indicators																			
GHG emissions by policy sector (EU ETS, Effort Sharing Regulation and LULUCF)	tCO2eq	22019750	219559426	201436363	176014394	174354005	164696743	157730758		including LULUCF and indirect emissions	NR2018	modelling output							
ETS sector emissions	tCO2eq	80351292	84735599	94095271	75514584	77235135	71504515	66724175		ETS scope as applicable in the concerning year	NR2018/NEA	modelling output							
Effort Sharing sector GHG emissions	tCO2eq	13400562	12892032	100683476	94165504	90733894	85380906	84264603		Total minus ETS and LULUCF emissions	NR2018	modelling output							
LULUCF (accounted according to EU legislation requirements)	tCO2eq	5962796	6130795	6457516	6333906	6385176	6811323	6741980											
GHG emissions by IPCC sector and by gas (where relevant split into 2 EU ETS and Effort Sharing sectors).	tCO2eq																		
3 Carbon intensity of the overall economy	tCO2eq/GDP	399	343	292	231	207	192	162											
4 CO2 emission related indicators	tCO2eq/MWh																		
a GHG intensity of domestic power and heat generation	tCO2eq/ktce																		
b GHG intensity of final energy consumption by sector	tCO2eq/ktce																		
Industry	tCO2eq/ktce																		
Residential	tCO2eq/ktce																		
Tertiary	tCO2eq/ktce																		
Passenger transport	tCO2eq/ktce																		
Freight transport	tCO2eq/ktce																		
5 Non-CO2 GHG emission related parameters																			
a Livestock																			
dairy cattle	1000 heads	2587,60	2725,35	2964,94	2876,17	2764,39	2649,38			Dairy young stock + dairy cows.		Assumption							
non-dairy cattle	1000 heads	1209,18	1249,84	1169,91	1179,22	1161,23	1143,23					Assumption							
pigs	1000 heads	11311,56	12254,97	12602,89	12359,74	12359,74	12359,74			Breeding sows (incl. piglets) + Fattening pigs		Assumption							
sheep	1000 heads	1360,51	1129,50	946,18	1033,57	1033,57	1033,57			Laying hens including broiler parents + Broilers including ducks and turkeys		Assumption							
poultry	1000 heads	95190,46	103370,96	108559,15	101320,41	98743,56	96286,71			2015 is projection		Assumption							
b Nitrogen input from application of synthetic fertilizers	kt nitrogen																		

Guidance for the template on reporting of used parameters and variables included in Annex 1, part 2, of the provisionally agreed Energy Union Governance

The aim of this excel file is to facilitate reporting of the quantitative parameters and variables under Annex I Part 2 in the indicated format

- All parameters and variables highlighted in green are already currently requested under existing legislation (MMR, RES Directive, or Energy Efficiency Directive), see e.g. http://cdr.eionet.europa.eu/help/mmr/MMR_projections_templates_2018.zip
- All energy related parameters and variables highlighted in red might require to rely on complementary tools than standard energy system models
- All variables highlighted in orange correspond to indicators to be computed on the basis of parameters and variables already available elsewhere in the excel file
- The request for historical data relates to data if and when used in modelling
- All monetary Euro values shall be expressed in constant 2016 prices.
- Elements in **red** font are meant to provide further precision to what is currently indicated in the template in the provisionally agreed Governance Regulation. They aim to provide additional guidance or specifications and should facilitate the better understanding of modelling results by the Commission. While they remain optional, their use is much encouraged.
- Please report the used values for the years 2005 to 2040 in five yearly steps, and if possible yearly for 2021 to 2030 (the latter indicated in the red font as not required in the template in the Governance regulation).
- Column T can be used for comments that MS wish to provide (e.g. explanation of different methodology, caveats or sources of projections)