Reporting of used parameters and variables included in Annex 1, part 2, of the Energy Union Governance

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 highligted in orange correspond to indicators to be computed on the basis of parameters and variables already available elsewhere in the excel file

		Unit	2005	2010	2015	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035	2040	Comments MS
1. General parameters and variables																			
1	**Population**	**million**	5,37	5,39	5,42	5,41					5,38					5,31	5,21	5,10	
2	**GDP**	**EUR million**	54803,78	68875,54	76493,23	89048,49					101969,39					116666,53	127454,02	134498,64	
3	**Sectorial gross value added**	**EUR million**																	
	Agriculture	**EUR million**			1900,34	2073,93					2227,39					2433,57	2535,68	2556,36	
	Construction	**EUR million**																	
	Services	**EUR million**			44552,84	52458,27					60627,89					69920,81	76829,21	81852,65	
	Energy Sector	**EUR million**																	
	Industry	**EUR million**			13353,18	15038,52					16690,03					18651,90	20059,78	20803,97	
4	**Number of households**	**million**																	
5	**Households size**	**inhabitants/household**																	
6	**Disposable income of households (yearly)**	**EUR**																	
7	**Number of passenger-kilometers**	**million pkm**	**39912,34**	**36864,84**	**38563,83**	**45441,77**					**51724,22**					**58314,49**	**63138,06**	**66189,09**	
	Public road transport	million pkm	8465,31	5379,32	5789,57	6523,49					7304,70					8107,06	8540,14	8972,34	
	Private cars	million pkm	26315,00	26873,67	27776,39	33107,62					37702,97					42338,44	45875,44	47968,28	
	Motorcycles	million pkm	595,68	585,23	655,82	726,45					826,33					925,47	989,87	1053,97	
	Rail	million pkm	2346,77	2483,36	2679,21	2988,72					3282,90					3599,21	3800,85	3879,11	
	Aviation	million pkm	2189,59	1543,27	1662,84	2095,49					2607,33					3344,30	3931,75	4315,40	
	Inland navigation	million pkm	0,00	0,00	0,00	0,00					0,00					0,00	0,00	0,00	
8	**Freight transport tonnes-kilometres**	**million tkm**	**20510,43**	**20698,25**	**21856,58**	**24985,28**					**27812,22**					**30702,73**	**32902,15**	**34283,15**	
	Trucks	million tkm	10204,02	11410,97	12495,47	14012,10					15201,74					16443,04	17462,92	18107,28	
	Rail	million tkm	10180,25	9080,05	9144,20	10719,76					12306,05					13904,30	15042,68	15746,38	
	Inland navigation	million tkm	126,16	207,22	216,91	253,43					304,43					355,39	396,56	429,50	
9	**International Fuel prices**	**EUR/toe**																	
	Oil	EUR/toe			349,3652	543,9351					617,4367					680,1224	709,43	751,298	**Compact PRIMES model for SVK by E3M Lab**
	Gas (NCV)	EUR/toe			281,3297	342,6198					373,323					408,7945	439,7303	454,5004	**Compact PRIMES model for SVK by E3M Lab**
	Coal	EUR/toe			83,1545	103,7396					123,9758					148,7477	157,4702	164,0993	**Compact PRIMES model for SVK by E3M Lab**
10	**Carbon price ETS sectors**	**EUR/ ton CO2**			7,50	15,00					22,50					33,50	74,00	117,00	**PRIMES model - E3M Lab assumption**
11	**Exchange rate to EUR and to US dollar**	**EUR/currency**			1,00	1,00					1,00					1,00	1,00	1,00	
12	**Heating degree days**		3543,14	3491,74	3055,59	3143,86					3093,58					3043,29	2993,01	2942,72	**based on historical data**
13	**Cooling degree days**		20,13	45,36	119,10	55,96					62,33					68,70	75,06	81,43	**based on historical data**
14	**Technology cost assumptions (see specific excel file circulated with technology cost assumptions as used in EU Reference Scenario 2016 for suggestions on what could be relevant to report**																		
2. energy balances and indicators																			
2.1 energy supply																			
1	**Production (incl.recovery of products)**	**ktoe**			**6109**	**7944**					**7696**					**8356**	**8647**	**8722**	
	Solids	ktoe			536,89	415,76					36,02					25,56	24,52	23,85	
	Oil	ktoe			208,44	127,85					0,00					0,00	0,00	0,00	
	Natural gas	ktoe			80,50	92,25					95,16					83,75	71,24	62,85	
	Nuclear	ktoe			3744,61	5431,60					5431,60					5431,60	5431,60	5431,60	
	Renewable energy sources	ktoe			1538,35	1876,78					2133,19					2814,70	3119,52	3204,13	
2	**Net Imports (ktoe)**	**ktoe**			**9717**	**9453**					**9968**					**9322**	**9036**	**8635**	
	Solids	ktoe			2699,05	2546,26					2264,49					1749,53	1774,29	1772,31	
	Oil	ktoe			2946,34	3041,66					3253,60					3189,80	3002,16	2529,35	
	Natural gas	ktoe			3815,50	4062,78					4634,38					4558,93	4393,23	4466,80	
	Electricity	ktoe			256,49	-197,76					-184,88					-176,27	-133,29	-133,27	
3	**Import Dependency**	**%**			61,40	54,34					56,43					52,73	51,10	49,75	
4	**Main import sources for energy carriers**																		
	Main country (please specify here) of origin of Electricity Purchases	**% of total imports**																	
	1st main country (please specify here) of origin of Gas Purchases	**% of total imports**																	
	2nd main country (please specify here) of origin of Gas Purchases	**% of total imports**																	
	3rd main country (please specify here) of origin of Gas Purchases	**% of total imports**																	
5	**Gross Inland Consumption**	**ktoe**			**15826**	**17397**					**17664**					**17678**	**17683**	**17358**	
	Solids	ktoe			3099,35	2909,51					2238,81					1701,01	1571,79	1319,30	
	Oil	ktoe			3154,78	3169,51					3253,60					3189,80	3002,16	2529,35	
	Natural gas	ktoe			3896,00	4155,03					4729,54					4642,68	4464,47	4529,65	
	Nuclear	ktoe			3744,61	5431,60					5431,60					5431,60	5431,60	5431,60	
	Electricity	ktoe			256,49	-197,76					-184,88					-176,27	-133,29	-133,27	
	Renewable energy forms	ktoe			1674,98	1929,32					2194,84					2888,74	3346,52	3681,00	
	Other	ktoe			0,00	0,00					0,00					0,00	0,00	0,00	
2.2. Electricity and heat																			
1	**Gross electricity generation**	**GWhe**			**27215,36**	**34165,66**					**36597,85**					**38265,51**	**39563,83**	**41598,53**	
2	**By fuel**																		
	Nuclear energy	GWhe			15410,95	22362,95					22362,95					22362,95	22362,95	22362,95	
	Solids	GWhe			4119,62	4138,46					1880,60					1133,66	1124,46	1203,73	
	Oil (including refinery gas)	GWhe			1527,30	992,87					844,28					582,48	438,78	55,69	
	Gas (including derived gases)	GWhe			1429,14	1101,95					4921,87					5304,99	4658,92	6677,68	
	Biomass-waste	GWhe			323,69	498,17					1243,44					3316,10	4829,14	4724,18	
	Hydro (pumping excluded)	GWhe			3893,25	4526,21					4638,40					4663,13	4768,19	4794,83	
	Wind	GWhe			5,61	39,24					188,52					377,60	505,77	531,49	
	Solar	GWhe			505,80	505,80					505,80					505,80	834,76	1173,60	
	Geothermal and other renewables	GWhe			0,00	0,00					11,99					18,80	40,86	74,39	
	Other fuels (hydrogen, methanol)	GWhe			0,00	0,00					0,00					0,00	0,00	0,00	

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**	**%**																		
	Share of heat generation from combined heat and power generation in total heat generation (CHP heat generation divided by the total heat for district heating)	**%**																		
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**																		
	Nuclear energy	**GW**																		
	Solids	**GW**																		
	Oil (including refinery gas)	**GW**																		
	Gas (including derived gases)	**GW**																		
	Biomass-waste	**GW**																		
	Hydro (pumping excluded)	**GW**																		
	Wind	**GW**																		
	Solar	**GW**																		
	Geothermal and other renewables	**GW**																		
	Other fuels (hydrogen, methanol)	**GW**																		
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(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**	**ktoe**			**316,20**	**342,58**					**206,63**					**170,52**	**157,51**	**132,56**		
	Solids	ktoe			79,69	78,54					25,94					52,15	21,29	8,45		
	Oil	ktoe			0,00	0,00					0,00					0,00	0,00	0,00		
	Gas	ktoe			230,12	249,40					160,27					80,16	87,39	80,16		
2	**Fuel Input to other conversion processes**	**ktoe**			6,40	14,65					20,42					38,20	48,83	43,95		
2.4.	**Energy consumption**																			
1	**Primary energy consumption**	**ktoe**			14806,38	16225,33					16337,58					16159,01	16038,74	15656,01		
1	**Final energy consumption**	**ktoe**			**10203,56**	**10716,12**					**11011,06**					**10783,21**	**10633,39**	**10261,94**		
2	***by sector***																			
	Industry	ktoe			4338,01	4365,45					4424,79					4228,54	4136,19	3915,77		
	Residential	ktoe			1987,49	2046,44					2128,77					2063,37	2050,10	1971,99		
	Tertiary	ktoe			1663,25	1726,37					1814,74					1801,64	1877,72	1878,25		
	Transport	ktoe			2214,82	2577,86					2642,77					2689,66	2569,38	2495,93		
	Other	ktoe			0,00	0,00					0,00					0,00	0,00	0,00		
	By transport activity, when available																			
	Passenger transport	ktoe																		
	Freight transport	ktoe																		
3	***by fuel***																			
	Solids	ktoe			1321,82	1248,41					1234,85					1000,14	921,57	767,32		
	Oil	ktoe			2078,95	2102,27					2161,34					2161,47	1953,93	1477,15		
	Gas	ktoe			2764,34	3186,66					3142,09					2968,50	2910,02	2788,36		
	Electricity	ktoe			2279,57	2374,82					2613,90					2740,95	2867,37	2975,13		
	Heat	ktoe			1216,00	1260,40					1257,02					1217,76	1168,52	1109,94		
	Renewable energy forms	ktoe			542,87	543,55					601,87					694,39	811,97	1144,04		
	Other	ktoe			0,00	0,00					0,00					0,00	0,00	0,00		
4	**Final non energy consumption**	**ktoe**			**1019,81**	**1171,89**					**1325,97**					**1518,56**	**1644,50**	**1701,66**		
5	**Primary energy intensity of the economy**	**toe/euro**			0,00019	0,00018					0,00016					0,00014	0,00013	0,00012		
6	**Final energy intensity by sector**																			
	Industry	toe/euro of value added																		
	Residential	toe/euro of value added																		
	Tertiary	toe/euro of value added																		
	Passenger transport	toe/million pkm																		
	Freight transport	toe/million tkm																		
2.5.	**Prices**																			
1	**Electricity prices by type of using sector (residential, industry, tertiary)**																			
	residential	euro/MWh			142,48	160,07					161,22					172,90	180,69	169,47	**End user price**	
	industry	euro/MWh			79,63	73,94					88,98					102,77	102,97	107,26	**End user price**	
	tertiary	euro/toe			1684,21	1841,90					1880,30					2004,41	2109,73	1963,70	**End user price**	
2	**National retail fuel prices (including taxes, per source and sector)**																			
	Diesel oil	**euro/toe**																		
	Industry	euro/toe			973,58	1359,25					1465,01					1566,55	1619,88	1691,10	**End user price**	
	Households	euro/toe			1168,29	1631,10					1758,01					1879,86	1943,86	2029,32	**End user price**	
	Transport private	euro/toe			1210,56	1717,65					1854,66					1972,47	2033,92	2123,00	**End user price**	
	Transport public	euro/toe			1008,80	1431,37					1545,55					1643,73	1694,93	1769,17	**End user price**	
	Gasoline	**euro/toe**																		
	Transport private	euro/toe			1465,85	1844,75					1946,75					2028,77	2060,69	2114,10	**End user price**	
	Transport public	euro/toe			1221,54	1537,29					1622,29					1690,64	1717,24	1761,75	**End user price**	
	Natural gas	**euro/toe**																		
	Industry	euro/toe			483,36	542,50					571,66					610,43	643,19	660,55	**End user price**	
	Households	euro/toe			642,16	660,44					709,03					765,36	812,98	838,19	**End user price**	
2.6.	**Investments**																			
	Energy-related investment costs for overall economy	% of GDP			0,37	1,18					0,17					0,37	0,18	0,26		
	Energy related investmentts costs for Industry	% of value added			0,56	0,49					0,44					0,40	0,37	0,36		
2.7.	**Renewables**																			
1	**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	**%**			14,03	14,49					15,25					18,91	21,29	25,50		
	RES-H&C share	%			14,16	13,25					14,96					20,65	23,21	26,19		
	RES-E share	%			19,43	23,38					22,62					24,81	25,74	26,67		
	RES-T share	%			8,26	10,05					10,31					11,74	25,04	58,62		
	(final consumption of renewable energy in transport as contribution to overall target	%																		
	Contribution of biofuels and biogas produced from feedstock listed in part A of Annex IX and consumed in transport	%																		
	Contribution of biofuels and biogas produced from feedstock listed in part B of Annex IX and consumed in transport	%																		
	Contribution from biofuels, bioliquids and biomass fuels consumed in transport, produced from food or feed crops	%																		
	Contribution of other biofuels and consumed in transport	%																		
	Gross final consumption of RES for heating and cooling	ktoe																		
	Gross final consumption of electricity from RES	ktoe																		
	Gross final consumption of energy from RES in transport	ktoe																		
	Total Gross final consumption of RES	ktoe			1431,06	1553,03					1678,75					2039,28	2263,37	2616,47		
	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	%																		
	Gross final consumption of RES from district heating and cooling	ktoe																		
	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	%																		
2	**(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**	**45,225.52**	**39,920.63**	**35 869,65**	**35 070,42**	**35 138,57**	**35 233,62**	**35 357,95**	**35 469,50**	**35 581,85**	**35 694,90**	**35 812,10**	**35 899,16**	**36 052,93**	**36 213,89**	**36 258,04**	**36 331,79**	Emission projections reported 15.3.2017 under MMR an 31.12.2017 under 7NC & 3BR	
	ETS sector emissions (in ETS scope since 2013)	tCO2eq	25,231.77	21,698.63	**21 193,31**	**20 182,99**	**20 178,63**	**20 201,54**	**20 242,14**	**20 284,03**	**20 326,66**	**20 381,07**	**20 436,91**	**20 448,61**	**20 514,47**	**20 587,10**	**20 801,16**	**20 948,59**	Emission projections reported 15.3.2017 under MMR an 31.12.2017 under 7NC & 3BR	
	Effort Sharing sector GHG emissions (in scope since 2013)	tCO2eq	25,917.50	24,561.34	**19 905,88**	**20 152,69**	**20 130,67**	**20 108,27**	**20 097,48**	**20 072,61**	**20 047,80**	**20 054,00**	**20 062,93**	**20 085,86**	**20 121,33**	**20 157,24**	**20 138,88**	**20 065,20**	Emission projections reported 15.3.2017 under MMR an 31.12.2017 under 7NC & 3BR	
	LULUCF (accounted according to EU legislation requirements)	tCO2eq	**-5,923.75**	**-6,339.33**	**- 5 229,54**	**- 5 265,26**	**- 5 170,73**	**- 5 076,20**	**- 4 981,67**	**- 4 887,13**	**- 4 792,60**	**- 4 740,17**	**- 4 687,74**	**- 4 635,31**	**- 4 582,88**	**- 4 530,45**	**- 4 682,00**	**- 4 682,00**	Emission projections reported 15.3.2017 under MMR an 31.12.2017 under 7NC & 3BR	
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**																		
4	**CO2 emission related indicators**																			
a	**GHG intensity of domestic power and heat generation**	**tCO2eq/MWh**																		
b	**GHG intensity of final energy consumption by sector**	**tCO2eq/toe**																		
	Industry	tCO2eq/toe																		
	Residential	tCO2eq/toe																		
	Tertiary	tCO2eq/toe																		
	Passenger tranport	tCO2eq/toe																		
	Freight transport	tCO2eq/toe																		
5	**Non-CO2 GHG emission related parameters**																			
a	**Livestock**																			
	dairy cattle	1000 heads			327	339					313					306	294	290	Information reported 15.3.2017 under MMR an 31.12.2017 under 7NC & 3BR	
	non-dairy cattle	1000 heads			130	135					125					122	117	116		
	pigs	1000 heads			382	409					408					402	404	404		
	sheep	1000 heads			633	888					963					950	1007	1096		
	poultry	1000 heads			12836	14994					13235					13235	13235	13235		
b	**Nitrogen input from application of synthetic fertilizers**	**kt nitrogen**	78	87	115	117					95					100	100	100		
c	**Nitrogen input from application of manure**	**kt nitrogen**	22	23	20															
d	**Nitrogen fixed by N-fixing crops**	**kt nitrogen**	25	32	40															
e	**Nitrogen in crop residues returned to soils**	**kt nitrogen**																		
f	**Area of cultivated organic soils**	**hectares**	0,00	0,00	0,00															
g	**Municipal solid waste (MSW) generation**	**t**			1888456	2234660					2373567					2502880	2622268	2622268	Information reported 15.3.2017 under MMR an 31.12.2017 under 7NC & 3BR	
h	**Municipal solid waste (MSW) going to landfills**	**t**			1303845	1436489					1412782					1370595	1311134	1311134		
i	**Share of CH4 recovery in total CH4 generation from landfills**	**%**			7	10					13					18	23	23		