

Input B_H_REFv1.10_Market_economic_simulation.txt

The EnergyPLAN model 16.1



Electricity demand (TWh/year): Flexible demand0,00 Fixed demand 7,95 Fixed imp/exp. 0,00 Electric heating + HP 2,93 Transportation 0,06 Electric cooling 0,22 Total 11,16						Capacities Efficiencies Group 2: MW-e MJ/s elec. Ther COP CHP 0 1500 0,40 0,50 Heat Pump 0 0 3,00 Boiler 0 0,90 Group 3: CHP 443 82 0,21 0,47 Heat Pump 0 0 3,00 Boiler 0 0,90 Condensing 1058 0,29				Regulation Strategy:Market regulation NEW CEEP regulation 000000000 Minimum Stabilisation share 0,98 Stabilisation share of CHP 0,00 Minimum CHP gr 3 load 0 MW Minimum PP 0 MW Heat Pump maximum share 1,00 Maximum import/export 2100 MW				Fuel Price level: Basic Capacities Storage Efficiencies Elec. Storage MW-e GWh Elec. Ther. Charge 1: 0 0 0,80 Discharge 1: 0 0,90 Charge 2: 420 3 0,80 Discharge 2: 420 0,90 Electrolysers: 0 0 0,80 0,00 Rockbed Storage: 0 0 1,00 CAES fuel ratio: 0,000			
District heating (TWh/year) Gr.1 Gr.2 Gr.3 Sum District heating demand 1,13 0,00 0,50 1,63 Solar Thermal 0,00 0,00 0,00 0,00 Industrial CHP (CSHP) 0,00 0,00 0,00 0,00 Demand after solar and CSHP 1,13 0,00 0,50 1,63						Heatstorage: gr.2: 0 GWh gr.30 GWh Fixed Boiler: gr.2:0,0 Per cent gr.0,0 Per cent				Distr. lavex_market_price_2020.txt Addition factor 0,00 EUR/MWh Multiplication factor 1,00 Dependency factor 0,00 EUR/MWh pr. MW Average Market Price 39 EUR/MWh Gas Storage 0 GWh Syngas capacity 0 MW Biogas max to grid 0 MW				(TWh/year) Coal Oil Ngas Biomass Transport 0,00 13,43 0,01 0,00 Household 1,15 0,41 0,71 13,47 Industry 2,47 1,32 0,89 0,20 Various 5,83 1,87 1,07 0,39			
Wind 87 MW 0,16 TWh/year 0,00 Grid Photo Voltaic 35 MW 0,08 TWh/year 0,00 stabili- River Hydro 172 MW 0,44 TWh/year 0,00 sation River Hydro 0 MW 0 TWh/year 0,00 share Hydro Power 1685 MW 4,28 TWh/year Geothermal/Nuclear 0 MW 0 TWh/year						Electricity prod. from CSHP Waste (TWh/year) Gr.1: 0,00 0,00 Gr.2: 0,00 0,00 Gr.3: 0,00 0,00											

Output

	District Heating										Electricity																Exchange			
	Demand		Production							Ba- lance MW	Consumption						Production						Balance				Payment Imp Exp Million EUR			
	Distr. heating MW	Solar MW	CSHP MW	DHP MW	CHP MW	HP MW	ELT MW	Boiler MW	EH MW		Elec. demand MW	Flex.& Transp MW	HP MW	Elec- troyser MW	EH MW	Pump MW	Tur- bine MW	RES MW	Hy- dro MW	Geo- thermal MW	CSHP MW	CHP MW	PP MW	Stab- Load %	Imp MW	Exp MW			CEEP MW	EEP MW
January	391	0	0	271	119	0	0	0	0	0	795	7	4	0	701	80	58	100	1153	0	0	53	1587	127	89	1454	0	1454	2	63
February	307	0	0	213	94	0	0	0	0	0	822	7	3	0	550	76	55	84	440	0	0	42	1266	144	224	653	0	653	5	22
March	283	0	0	197	86	0	0	0	0	0	761	7	3	0	508	96	69	108	106	0	0	39	952	151	299	199	0	199	6	7
April	190	0	0	132	58	0	0	0	0	0	806	7	2	0	341	106	76	61	35	0	0	26	866	161	279	81	0	81	4	2
May	114	0	0	79	35	0	0	0	0	0	874	7	1	0	204	112	77	50	27	0	0	16	867	163	244	83	0	83	4	3
June	70	0	0	49	21	0	0	0	0	0	1010	7	1	0	126	78	56	59	40	0	0	10	923	162	267	134	0	134	5	4
July	48	0	0	33	15	0	0	0	0	0	1121	7	1	0	86	53	42	62	258	0	0	7	1139	154	214	453	0	453	5	16
August	41	0	0	28	12	0	0	0	0	0	1079	7	0	0	73	79	54	58	319	0	0	6	1135	153	201	534	0	534	5	20
September	62	0	0	43	19	0	0	0	0	0	1058	7	1	0	111	85	64	67	844	0	0	8	1279	140	129	1130	0	1130	3	45
October	147	0	0	102	45	0	0	0	0	0	984	7	2	0	263	97	71	81	548	0	0	20	1226	145	194	787	0	787	4	29
November	256	0	0	178	78	0	0	0	0	0	917	7	3	0	459	95	68	85	957	0	0	35	1462	134	124	1250	0	1250	3	51
December	315	0	0	219	96	0	0	0	0	0	924	7	4	0	565	102	74	109	1109	0	0	43	1531	129	118	1384	0	1384	3	69
Average	185	0	0	129	56	0	0	0	0	0	930	7	2	0	332	88	64	77	487	0	0	25	1186	147	198	679	0	679	Average price	
Maximum	610	0	0	424	186	0	0	0	0	0	1577	13	7	0	1094	420	420	233	1685	0	0	83	1889	179	1009	2100	0	2100	(EUR/MWh)	
Minimum	9	0	0	6	3	0	0	0	0	0	65	0	0	0	17	0	0	0	0	0	0	1	832	112	0	0	0	0	28	56
TWh/year	1,63	0,00	0,00	1,13	0,50	0,00	0,00	0,00	0,00	0,00	8,17	0,06	0,02	0,00	2,91	0,78	0,56	0,68	4,28	0,00	0,00	0,22	10,42		1,74	5,96	0,00	5,96	49	331

FUEL BALANCE (TWh/year):										Waste/ CAES BioCon-Electro-					PV and Wind off					Industry			Imp/Exp Corrected		CO2 emission (Mt):	
DHP	CHP2	CHP3	Boiler2	Boiler3	PP	Geo/Nu.Hydro	HTL	Elc.ly.	version	Fuel	Wind	CSP	Wave	Hydro	Solar.Tr	Transp.househ.	Various	Total	Imp/Exp	Net	Total	Net				
Coal	0,54	-	0,96	-	-	36,74	-	-	-	-	-	-	-	-	-	-	1,15	8,29	47,67	-14,44	33,23	19,74	13,76			
Oil	0,01	-	0,01	-	-	1,70	-	-	-	-	-	-	-	-	-	13,43	0,41	3,18	18,75	0,00	18,75	4,90	4,90			
N.Gas	0,40	-	0,01	-	-	1,63	-	-	-	-	-	-	-	-	-	0,82	0,71	2,00	5,57	0,00	5,57	1,29	1,47			
Biomass	0,31	-	0,06	-	-	1,58	-	-	-	-	-	-	-	-	-	-	13,47	0,59	16,01	0,00	16,01	0,00	0,00			
Renewable	-	-	-	-	-	-	4,28	-	-	-	0,16	0,08	-	4,71	-	-	-	-	4,95	0,00	4,95	0,00	0,00			
H2 etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00	0,00	0,00	0,00				
Biofuel	-	-	0,00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00	0,00	0,00	0,00				
Nuclear/CCS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00	0,00	0,00	0,00				
Total	1,25	-	1,05	-	-	41,65	-	4,28	-	-	0,16	0,08	-	4,71	-	14,25	15,74	14,07	92,97	-14,44	78,53	25,93	20,13			



	District Heating Production																																
	Gr.1				Gr.2										Gr.3										RES specification								
	District heating	Solar	CSHP	DHP	District heating	Solar	CSHP	CHP	HP	ELT	Boiler	EH	Storage	Balance	District heating	Solar	CSHP	CHP	HP	ELT	Boiler	EH	Storage	Balance	RES1	RES2	RES3	RES	Total				
																									Wind	Photo	River	I4-7	5				
																									MW	MW	MW	MW	MW				
January	271	0	0	271	0	0	0	0	0	0	0	0	0	0	119	0	0	119	0	0	0	0	0	0	18	7	75	0	100				
February	213	0	0	213	0	0	0	0	0	0	0	0	0	0	94	0	0	94	0	0	0	0	0	0	23	8	54	0	84				
March	197	0	0	197	0	0	0	0	0	0	0	0	0	0	86	0	0	86	0	0	0	0	0	0	29	8	71	0	108				
April	132	0	0	132	0	0	0	0	0	0	0	0	0	0	58	0	0	58	0	0	0	0	0	0	19	11	31	0	61				
May	79	0	0	79	0	0	0	0	0	0	0	0	0	0	35	0	0	35	0	0	0	0	0	0	21	10	20	0	50				
June	49	0	0	49	0	0	0	0	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	0	12	12	35	0	59				
July	33	0	0	33	0	0	0	0	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	0	10	13	38	0	62				
August	28	0	0	28	0	0	0	0	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	12	12	34	0	58				
September	43	0	0	43	0	0	0	0	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	15	10	42	0	67				
October	102	0	0	102	0	0	0	0	0	0	0	0	0	0	45	0	0	45	0	0	0	0	0	0	16	8	57	0	81				
November	178	0	0	178	0	0	0	0	0	0	0	0	0	0	78	0	0	78	0	0	0	0	0	0	17	7	61	0	85				
December	219	0	0	219	0	0	0	0	0	0	0	0	0	0	96	0	0	96	0	0	0	0	0	0	27	3	79	0	109				
Average	129	0	0	129	0	0	0	0	0	0	0	0	0	0	56	0	0	56	0	0	0	0	0	0	18	9	50	0	77				
Maximum	424	0	0	424	0	0	0	0	0	0	0	0	0	0	186	0	0	186	0	0	0	0	0	0	87	35	172	0	233				
Minimum	6	0	0	6	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0				
Total for the whole year																																	
TWh/year	1,13	0,00	0,00	1,13	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,50	0,00	0,00	0,50	0,00	0,00	0,00	0,00	0,00	0,00	0,16	0,08	0,44	0,00	0,68				

Own use of heat from industrial CH0,00 TWh/year

ANNUAL COSTS (Million EUR)			NATURAL GAS EXCHANGE															
			DHP & Boilers	CHP2 CHP3	PP CAES	Individual	Transport	Indu. Var.	Demand Sum	Bio-gas	Syn-gas	CO2Hy gas	SynHy gas	SynHy gas	Storage	Sum	Import	Export
Total Fuel ex Ngas exchange = 2270			MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW
Uranium =	0																	
Coal =	457	January	95	3	186	171	1	240	698	0	0	0	0	0	0	698	698	0
FuelOil =	187	February	75	3	187	134	1	261	662	0	0	0	0	0	0	662	662	0
Gasoil/Diesel=	891	March	69	2	193	124	1	243	634	0	0	0	0	0	0	634	634	0
Petrol/JP =	157	April	46	2	197	83	1	194	524	0	0	0	0	0	0	524	524	0
Gas handling =	57	May	28	1	198	50	1	173	451	0	0	0	0	0	0	451	451	0
Biomass =	520	June	17	1	196	31	1	140	387	0	0	0	0	0	0	387	387	0
Food income =	0	July	12	0	188	21	1	160	383	0	0	0	0	0	0	383	383	0
Waste =	0	August	10	0	181	18	1	113	323	0	0	0	0	0	0	323	323	0
Total Ngas Exchange costs =	96	September	15	1	157	27	1	157	359	0	0	0	0	0	0	359	359	0
Marginal operation costs =	412	October	36	1	177	64	1	386	666	0	0	0	0	0	0	666	666	0
Total Electricity exchange =	-282	November	62	2	181	112	1	268	628	0	0	0	0	0	0	628	628	0
Import =	49	December	77	3	184	138	1	394	797	0	0	0	0	0	0	797	797	0
Export =	-331	Average	45	2	186	81	1	228	543	0	0	0	0	0	0	543	543	0
Bottleneck =	0	Maximum	149	5	200	268	1	743	1078	0	0	0	0	0	0	1078	1078	0
Fixed imp/ex=	0	Minimum	2	0	0	4	1	0	58	0	0	0	0	0	0	58	58	0
Total CO2 emission costs =	0	Total for the whole year																
		TWh/year	0,40	0,01	1,63	0,71	0,01	2,00	4,77	0,00	0,00	0,00	0,00	0,00	0,00	4,77	4,77	0,00
Total variable costs =	2496																	
Fixed operation costs =	33910																	
Annual Investment costs =	57902																	
TOTAL ANNUAL COSTS =	94307																	