Input B_H_REFv1.11_Technical_simulation.txt — The EnergyPLAN model 16.1

Electricity demand (TWh/year):		Flexible demand	0,00
Fixed demand	7,95	Fixed imp/exp.	0,00
Electric heating + HP	2,93	Transportation	0,06
Electric cooling	0,22	Total	11,16

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

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		

	Capacities MW-e	Capacities MJ/s	Efficiencies elec.	Efficiencies Ther	COP
Group 2:					
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		

Heatstorage:	gr.2: 0	GWh	gr.30	GWh
Fixed Boiler:	gr.2:0,0	Per cent	gr.0,0	Per cent

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	

Regulation Strate	Technical regulation no. 1	
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

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

Fuel Price level: Basic

Elec. Storage	Capacities MW-e	Storage GWh	Efficiencies 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		

(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

Output

	District Heating										Electricity																Exchange	
	Demand	Production									Consumption						Production								Balance					Payment	
	Distr. heating	Solar	Waste CSHP	DHP	CHP	HP	ELT	Boiler	EH	Balance	Elec. demand	Flex.& Transp	HP	Elec-trolyser	EH	Hydro Pump	Tur-bine	RES	Hy-dro	Geo-thermal	Waste CSHP	CHP	PP	Stab-Load	Imp	Exp	CEEP	EEP	Imp	Exp
	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	%	MW	MW	MW	MW	Million EUR	
January	391	0	0	271	81	0	0	0	0	39	795	7	4	0	701	0	0	100	488	0	0	435	484	140	0	0	0	0	0	0
February	307	0	0	213	75	0	0	0	0	18	822	7	3	0	550	0	0	84	487	0	0	407	404	144	0	0	0	0	0	0
March	283	0	0	197	72	0	0	0	0	14	761	7	3	0	508	0	0	108	482	0	0	389	297	146	2	0	0	0	0	0
April	190	0	0	132	53	0	0	0	0	5	806	7	2	0	341	0	0	61	486	0	0	288	321	155	0	0	0	0	0	0
May	114	0	0	79	35	0	0	0	0	0	874	7	1	0	204	0	0	50	487	0	0	187	360	159	1	0	0	0	0	0
June	70	0	0	49	21	0	0	0	0	0	1010	7	1	0	126	0	0	59	488	0	0	116	481	156	0	0	0	0	0	0
July	48	0	0	33	15	0	0	0	0	0	1121	7	1	0	86	0	0	62	488	0	0	79	585	152	1	0	0	0	0	0
August	41	0	0	28	12	0	0	0	0	0	1079	7	0	0	73	0	0	58	488	0	0	67	547	155	0	0	0	0	0	0
September	62	0	0	43	19	0	0	0	0	0	1058	7	1	0	111	0	0	67	488	0	0	102	520	153	0	0	0	0	0	0
October	147	0	0	102	45	0	0	0	0	0	984	7	2	0	263	0	0	81	488	0	0	241	447	149	0	0	0	0	0	0
November	256	0	0	178	67	0	0	0	0	11	917	7	3	0	459	0	0	85	487	0	0	361	452	145	0	0	0	0	0	0
December	315	0	0	219	76	0	0	0	0	20	924	7	4	0	565	0	0	109	487	0	0	412	491	140	0	0	0	0	0	0
Average	185	0	0	129	48	0	0	0	0	9	930	7	2	0	332	0	0	77	487	0	0	257	449	150	0	0	0	0	Average price	
Maximum	610	0	0	424	82	0	0	0	0	104	1577	13	7	0	1094	0	0	233	488	0	0	443	982	210	345	0	0	0	(EUR/MWh)	
Minimum	9	0	0	6	3	0	0	0	0	0	65	0	0	0	17	0	0	0	307	0	0	15	0	124	0	0	0	0	0	44
TWh/year	1,63	0,00	0,00	1,13	0,42	0,00	0,00	0,00	0,00	0,08	8,17	0,06	0,02	0,00	2,91	0,00	0,00	0,68	4,28	0,00	0,00	2,25	3,95		0,00	0,00	0,00	0,00	0	0

FUEL BALANCE (TWh/year):	DHP	CHP2	CHP3	Boiler2	Boiler3	PP	Geo/Nu.	Hydro	Waste/ HTL	CAES Elc.ly.	BioCon-version	Electro-Fuel	Wind	PV and Wind off CSP	Wave	Hydro	Solar.Th	Transp.	household	Industry Various	Total	Imp/Exp Corrected Imp/Exp	Net	CO2 emission (Mt): Total	Net
Coal	0,65	-	0,88	-	-	13,50	-	-	-	-	-	-	-	-	-	-	-	-	1,15	8,29	24,48	0,01	24,49	10,14	10,14
Oil	0,02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,43	0,41	3,18	17,04	0,00	17,04	4,45	4,45
N.Gas	0,47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,82	0,71	1,99	3,99	0,00	3,99	0,93	1,11
Biomass	0,36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,47	0,59	14,43	0,00	14,43	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	0,00
Biofuel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00	0,00	0,00	0,00	0,00
Nuclear/CCS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00	0,00	0,00	0,00	0,00
Total	1,51	-	0,88	-	-	13,50	-	4,28	-	-	-	-	0,16	0,08	-	4,71	-	14,25	15,74	14,06	64,89	0,01	64,90	15,52	15,71

District Heating Production

	Gr.1				Gr.2										Gr.3										RES specification				
	District heating MW	Solar MW	CSHP MW	DHP MW	District heating MW	Solar MW	CSHP MW	CHP MW	HP MW	ELT MW	Boiler MW	EH MW	Storage MW	Balance MW	District heating MW	Solar MW	CSHP MW	CHP MW	HP MW	ELT MW	Boiler MW	EH MW	Storage MW	Balance MW	RES1 Wind MW	RES2 Photo MW	RES3 River MW	RES 4-7 MW	Total MW
January	271	0	0	271	0	0	0	0	0	0	0	0	0	0	119	0	0	81	0	0	0	0	0	39	18	7	75	0	100
February	213	0	0	213	0	0	0	0	0	0	0	0	0	0	94	0	0	75	0	0	0	0	0	18	23	8	54	0	84
March	197	0	0	197	0	0	0	0	0	0	0	0	0	0	86	0	0	72	0	0	0	0	0	14	29	8	71	0	108
April	132	0	0	132	0	0	0	0	0	0	0	0	0	0	58	0	0	53	0	0	0	0	0	5	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	67	0	0	0	0	0	11	17	7	61	0	85
December	219	0	0	219	0	0	0	0	0	0	0	0	0	0	96	0	0	76	0	0	0	0	0	20	27	3	79	0	109
Average	129	0	0	129	0	0	0	0	0	0	0	0	0	0	56	0	0	48	0	0	0	0	0	9	18	9	50	0	77
Maximum	424	0	0	424	0	0	0	0	0	0	0	0	0	0	186	0	0	82	0	0	0	0	0	104	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	0,50	0,00	0,00	0,42	0,00	0,00	0,00	0,00		0,08	0,16	0,08	0,44	0,00	0,68

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

ANNUAL COSTS (Million EUR)

Total Fuel ex Ngas exchange =	1943
Uranium =	0
Coal =	249
FuelOil =	121
Gasoil/Diesel=	891
Petrol/JP =	157
Gas handling =	30
Biomass =	494
Food income =	0
Waste =	0
Total Ngas Exchange costs =	64
Marginal operation costs =	349
Total Electricity exchange =	0
Import =	0
Export =	0
Bottleneck =	0
Fixed imp/ex=	0
Total CO2 emission costs =	0
Total variable costs =	2357
Fixed operation costs =	1843
Annual Investment costs =	3113
TOTAL ANNUAL COSTS =	7313

NATURAL GAS EXCHANGE

	DHP & Boilers MW	CHP2 CHP3 MW	PP CAES MW	Individual MW	Transport MW	Indu. Var. MW	Demand Sum MW	Biogas MW	Syngas MW	CO2Hygas MW	SynHygas MW	SynHygas MW	Storage MW	Sum MW	Import MW	Export MW
January	113	0	0	171	1	239	525	0	0	0	0	0	0	525	525	0
February	89	0	0	134	1	259	484	0	0	0	0	0	0	484	484	0
March	82	0	0	124	1	242	450	0	0	0	0	0	0	450	450	0
April	55	0	0	83	1	193	333	0	0	0	0	0	0	333	333	0
May	33	0	0	50	1	172	257	0	0	0	0	0	0	257	257	0
June	20	0	0	31	1	140	192	0	0	0	0	0	0	192	192	0
July	14	0	0	21	1	159	195	0	0	0	0	0	0	195	195	0
August	12	0	0	18	1	112	143	0	0	0	0	0	0	143	143	0
September	18	0	0	27	1	156	203	0	0	0	0	0	0	203	203	0
October	43	0	0	64	1	384	492	0	0	0	0	0	0	492	492	0
November	74	0	0	112	1	267	455	0	0	0	0	0	0	455	455	0
December	91	0	0	138	1	391	622	0	0	0	0	0	0	622	622	0
Average	54	0	0	81	1	226	363	0	0	0	0	0	0	363	363	0
Maximum	177	0	0	268	1	739	881	0	0	0	0	0	0	881	881	0
Minimum	3	0	0	4	1	0	9	0	0	0	0	0	0	9	9	0
Total for the whole year TWh/year	0,47	0,00	0,00	0,71	0,01	1,99	3,18	0,00	0,00	0,00	0,00	0,00	0,00	3,18	3,18	0,00

RES Share: 29,9 Percent of Primary Energy 45,3 Percent of Electricity 5,0 TWh electricity from RES