Input AlternativeWithElectrolyserForCHPplants — The EnergyPLAN model 7.20

Electricity demand (TWh/year):		Flexible demand	0.00
Fixed demand	49.00	Fixed imp/exp.	0.00
Electric heating	0.00	Transportation	0.00
Electric cooling	0.00	Total	49.00

District heating (TWh/year)	Gr.1	Gr.2	Gr.3	Sum
District heating demand	2.26	14.29	22.63	39.18
Solar Thermal	0.02	0.00	0.00	0.02
Industrial CHP (CSHP)	0.00	0.00	1.73	1.73
Demand after solar and CSHP	2.24	14.29	20.90	37.43

Wind	6414	MW	21.80	TWh/year	0.00	Grid
Offshore Wind	0	MW	0	TWh/year	0.00	stabili-
Photo Voltaic	0	MW	0	TWh/year	0.00	sation
Wave Power	0	MW	0	TWh/year	0.00	share
Hydro Power	0	MW	0	TWh/year		
Geothermal	0	MW	0	TWh/year		

	Capacities MW-e	MJ/s	Efficiencies elec.	Ther	COP
Group 2:					
CHP	1350	1647	0.41	0.50	
Heat Pump	7	40			5.75
Boiler		7500		0.86	
Group 3:					
CHP	2000	2440	0.41	0.50	
Heat Pump	0	0			3.50
Boiler		11300		0.86	
Condensing	8000		0.52		

Heatstorage:	gr.2:	40	GWh	gr.3:	10	GWh
Fixed Boiler:	gr.2:	2.5	Per cent	gr.3:	1.0	Per cent

Electricity prod. from	CSHP	Waste (TWh/year)
Gr.1:	0.00	0.00
Gr.2:	0.00	0.00
Gr.3:	2.41	0.00

Regulation Strategy:	Technical regulation no. 3		
KEOL regulation	23700		
Minimum Stabilisation share	0.30		
Stabilisation share of CHP	0.00		
Minimum CHP gr 3 load	450	MW	
Heat Pump maximum share	0.50		
Maximum import/export	0	MW	

Distr. Name :	Price_DKV_2005.txt	
Addition factor	60.00	DKK/MWh
Multiplication factor	1.04	
Dependency factor	0.02	DKK/MWh pr. MW
Average Market Price	349	DKK/MWh

Fuel Price level:

	Capacities MW-e	Storage GWh	Efficiencies elec.	Ther.
Hydro Pump:	0	0	0.40	
Hydro Turbine:	0		0.40	
Electrol. Gr.2:	200	150	0.72	0.10
Electrol. Gr.3:	250	150	0.72	0.10
Electrol. trans.:	0	0	0.80	
Ely. MicroCHP:	0	0	0.80	
CAES fuel ratio:		0.000		

(TWh/year)	Coal	Oil	Ngas	Biomass
Transport	0.00	69.20	0.00	0.00
Household	0.01	6.72	9.05	7.29
Industry	3.37	26.92	18.19	5.18
Various	0.00	3.01	19.73	0.00

Output

	District Heating										Electricity															Exchange	
	Demand	Production									Consumption						Production							Balance				
	Distr. heating MW	Solar MW	Waste+ CSHP MW	DHP MW	CHP MW	HP MW	ELT MW	Boiler MW	EH MW	Balance MW	Elec. demand MW	Flexible MW	HP MW	Electrolyser MW	EH MW	Hydro Pump MW	Turbine MW	RES MW	Hydro MW	Geothermal MW	Waste+ CSHP MW	CHP MW	PP MW	Stab-Load %	Imp MW	Exp MW	CEEP MW	EEP MW	Payment Imp Million DKK	Payment Exp Million DKK
January	7177	1	197	413	3018	40	17	3491	0	0	6305	0	7	169	0	0	0	2358	0	0	274	2473	1375	150	0	0	0	0	0	0
February	7343	2	197	422	2491	40	25	4167	0	0	6237	0	7	246	0	0	0	2948	0	0	274	2041	1226	132	0	0	0	0	0	0
March	6256	2	197	359	2690	40	22	2947	0	0	6004	0	7	216	0	0	0	2668	0	0	274	2204	1080	134	0	0	0	0	0	0
April	5013	3	197	286	2457	40	22	2017	0	-10	5291	0	7	223	0	0	0	2428	0	0	274	2014	804	128	0	0	0	0	0	0
May	3933	3	197	223	2443	40	21	989	0	16	5162	0	7	212	0	0	0	2232	0	0	274	2002	872	131	0	0	0	0	0	0
June	1782	3	197	100	1351	40	14	116	0	-39	5017	0	7	200	0	0	0	2460	0	0	274	1107	1383	128	0	0	0	0	0	0
July	1782	4	197	99	1325	40	11	58	0	49	4574	0	7	133	0	0	0	1675	0	0	274	1086	1679	163	0	0	0	0	0	0
August	1782	3	197	100	1376	40	14	99	0	-47	5263	0	7	185	0	0	0	2223	0	0	274	1127	1830	150	0	0	0	0	0	0
September	2736	3	197	155	2049	40	16	252	0	24	5401	0	7	190	0	0	0	2283	0	0	274	1679	1362	138	0	0	0	0	0	0
October	4076	2	197	234	1898	40	29	1670	0	7	5602	0	7	302	0	0	0	3136	0	0	274	1555	945	113	0	0	0	0	0	0
November	5347	1	197	307	2254	40	27	2521	0	0	6054	0	7	268	0	0	0	3066	0	0	274	1847	1141	124	0	0	0	0	0	0
December	6385	1	197	368	2948	40	16	2813	0	2	6056	0	7	163	0	0	0	2345	0	0	274	2416	1191	143	0	0	0	0	0	0
Average	4460	2	197	255	2192	40	19	1755	0	0	5578	0	7	208	0	0	0	2482	0	0	274	1796	1241	136	0	0	0	0	Average price (DKK/MWh)	
Maximum	12535	28	197	723	4088	40	45	9201	0	2335	8603	0	7	450	0	0	0	5940	0	0	274	3350	5102	289	0	0	0	0		
Minimum	1561	0	197	76	549	40	0	26	0	-1975	2795	0	7	0	0	0	0	0	0	0	274	450	0	100	0	0	0	0	42	0
Total for the whole year																													Million DKK	
TWh/year	39.18	0.02	1.73	2.24	19.25	0.35	0.17	15.41	0.00	0.00	49.00	0.00	0.06	1.83	0.00	0.00	0.00	21.80	0.00	0.00	2.41	15.78	10.90		0.00	0.00	0.00	0.00	0	0

FUEL BALANCE (TWh/year):

	DHP	CHP2	CHP3	Boiler2	Boiler3	PP	Geo-th.	Hydro	Elc.ly.s	Waste	CAES	Wind	Offsh.	PV	Wave	Solar.Th	Transp.	househ.	Industry	Various	Total	Imp/Exp Corrected Imp/Exp	Imp/Exp Corrected Netto	CO2 emission (Mt): Total	CO2 emission (Mt): Netto
Coal	0.04	1.10	2.12	0.15	0.19	7.71	-	-	-	-	-	-	-	-	-	-	-	0.01	3.37	-	14.69	0.00	14.69	5.02	5.02
Oil	0.83	0.25	0.47	3.22	4.15	0.58	-	-	-	-	-	-	-	-	-	-	69.20	6.72	26.92	3.01	115.35	0.00	115.35	30.73	30.73
N.Gas	0.67	5.11	9.81	2.58	3.32	12.42	-	-	-	-	-	-	-	-	-	-	-	9.05	18.19	19.73	80.89	0.00	80.89	16.51	16.51
Biomass	1.06	7.35	11.37	1.65	2.26	0.20	-	-	-	-	-	-	-	-	-	-	-	7.29	5.18	-	36.36	0.00	36.36	0.00	0.00
Renewable	-	-	-	-	-	-	-	-	-	-	-	21.80	-	-	-	0.02	-	-	-	-	21.82	0.00	21.82	0.00	0.00
H2 etc.	-	0.17	0.76	0.39	0.00	-	-	-	-1.32	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00
Geothermal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00
Total	2.60	13.98	24.54	7.98	9.92	20.91	-	-	-1.32	-	-	21.80	-	-	-	0.02	69.20	23.07	53.66	22.74	269.11	0.00	269.11	52.26	52.26

23-October-2008

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	Stor-age MW	Ba-lance MW	District heating MW	Solar MW	CSHP MW	CHP MW	HP MW	ELT MW	Boiler MW	EH MW	Stor-age MW	Ba-lance MW	RES1 Wind MW	RES2 Offsho MW	RES3 Photo MW	RES4 Wave MW	Total er MW
January	414	1	0	413	2618	0	0	1103	40	7	1467	0	18284	0	4146	0	197	1915	0	10	2024	0	4294	0	2358	0	0	0	2358
February	424	2	0	422	2678	0	0	843	40	11	1785	0	18284	0	4241	0	197	1648	0	14	2382	0	4294	0	2948	0	0	0	2948
March	361	2	0	359	2282	0	0	940	40	9	1293	0	18284	0	3614	0	197	1750	0	12	1654	0	4294	0	2668	0	0	0	2668
April	289	3	0	286	1829	0	0	851	40	9	938	0	16584	-10	2896	0	197	1606	0	13	1079	0	3632	0	2428	0	0	0	2428
May	227	3	0	223	1435	0	0	893	40	9	469	0	19163	24	2272	0	197	1551	0	12	520	0	4046	-8	2232	0	0	0	2232
June	103	3	0	100	650	0	0	569	40	6	74	0	19676	-39	1030	0	197	782	0	7	43	0	6674	1	2460	0	0	0	2460
July	103	4	0	99	650	0	0	545	40	5	21	0	16535	39	1030	0	197	779	0	6	37	0	4165	10	1675	0	0	0	1675
August	103	3	0	100	650	0	0	575	40	7	64	0	13128	-36	1030	0	197	800	0	8	35	0	3859	-11	2223	0	0	0	2223
September	158	3	0	155	998	0	0	829	40	7	109	0	23348	13	1581	0	197	1220	0	9	143	0	5879	12	2283	0	0	0	2283
October	235	2	0	234	1486	0	0	588	40	12	830	0	11431	16	2354	0	197	1310	0	16	840	0	5723	-9	3136	0	0	0	3136
November	308	1	0	307	1950	0	0	731	40	12	1168	0	12729	-1	3089	0	197	1523	0	15	1353	0	7541	0	3066	0	0	0	3066
December	368	1	0	368	2329	0	0	1076	40	7	1205	0	13204	1	3688	0	197	1871	0	10	1608	0	6967	2	2345	0	0	0	2345
Average	257	2	0	255	1627	0	0	796	40	8	782	0	16697	1	2576	0	197	1396	0	11	972	0	5109	0	2482	0	0	0	2482
Maximum	723	28	0	723	4572	0	0	1647	40	20	4007	0	40000	1282	7240	0	197	2440	0	25	5194	0	10000	1599	5940	0	0	0	5940
Minimum	90	0	0	76	569	0	0	0	40	0	0	0	0	-1119	902	0	197	549	0	0	26	0	0	-1117	0	0	0	0	0
Total for the whole year																													
TWh/year	2.26	0.02	0.00	2.24	14.29	0.00	0.00	6.99	0.35	0.07	6.87	0.00		0.01	22.63	0.00	1.73	12.26	0.00	0.10	8.54	0.00		0.00	21.80	0.00	0.00	0.00	21.80

ANNUAL COSTS (Million DKK)

Total Fuel =		61256
Coal =	822	
FuelOil =	8555	
Gasoil/Diesel=	13572	
Petrol/JP =	17399	
Ngas =	15250	
Biomas =	5659	
Waste =	0	
Maginal operation costs =		497
Total Electricity exchange =		0
Import =	0	
Export =	0	
Bottleneck =	0	
Fixed imp/ex=	0	
Total CO2 emission costs =		7840
Total variable costs =		69593
Fixed operation costs =		2817
Annual Investment costs =		8433
TOTAL ANNUAL COSTS =		80843