Input HeatPumpIndividualWind50percentNONCHP

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	39.18	0.00	0.00	39.18
Solar Thermal	0.02	0.00	0.00	0.02
Industrial CHP (CSHP)	1.73	0.00	0.00	1.73
Demand after solar and CSHP	37.43	0.00	0.00	37.43

Wind	3100	MW	7.26	TWh/year	0.00	Grid
Offshore Wind	4500	MW	17.23	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		Efficiencies		
Group 2:	MW-e	MJ/s	elec.	Ther	COP
CHP	1350	1647	0.41	0.50	
Heat Pump	0	0			3.50
Boiler		7500		0.90	
Group 3:					
CHP	2000	2440	0.41	0.50	
Heat Pump	0	0			3.50
Boiler		11300		0.90	
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:	2.41	0.00	
Gr.2:	0.00	0.00	
Gr.3:	0.00	0.00	

Regulation Strategy:	Technical regulation no. 2		
KEOL regulation	00000		
Minimum Stabilisation share	0.00		
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	0.00	DKK/MWh
Multiplication factor	1.00	
Dependency factor	0.00	DKK/MWh pr. MW
Average Market Price	277	DKK/MWh

Fuel Price level:

	Capacities	Storage	Efficiencies	
	MW-e	GWh	elec.	Ther.
Hydro Pump:	0	1	0.68	
Hydro Turbine:	0		2.44	
Electrol. Gr.2:	0	360	0.80	0.15
Electrol. Gr.3:	0	0	0.40	0.50
Electrol. trans.:	0	0	0.80	
Ely. MicroCHP:	0	0	0.80	
CAES fuel ratio:		1.156		

(TWh/year)	Coal	Oil	Ngas	Biomass
Transport	0.00	69.20	0.00	0.00
Household	0.01	6.72	4.05	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								Ba-	Consumption						Production							Balance					Payment
	Distr. heating	Solar	Waste+ CSHP	DHP	CHP	HP	ELT	Boiler	EH	lance	Elec. demand	Flexi- ble	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 DKK	
January	7177	1	197	6980	549	0	0	0	0	-549	6305	0	282	0	0	0	0	3662	0	0	274	450	2244	100	1	44	44	0	0	0
February	7343	2	197	7144	549	0	0	0	0	-549	6237	0	289	0	0	0	0	2424	0	0	274	450	3414	100	0	35	35	0	0	0
March	6256	2	197	6057	549	0	0	0	0	-549	6004	0	242	0	0	0	0	2722	0	0	274	450	2851	100	0	52	52	0	0	0
April	5013	3	197	4813	549	0	0	0	0	-549	5291	0	188	0	0	0	0	3161	0	0	274	450	1734	100	0	141	141	0	0	0
May	3933	3	197	3733	549	0	0	0	0	-549	5162	0	132	0	0	0	0	2068	0	0	274	450	2579	100	0	77	77	0	0	0
June	1782	3	197	1582	549	0	0	0	0	-549	5017	0	44	0	0	0	0	2461	0	0	274	450	2061	100	0	185	185	0	0	0
July	1782	4	197	1582	549	0	0	0	0	-549	4574	0	37	0	0	0	0	1890	0	0	274	450	2102	100	0	105	105	0	0	0
August	1782	3	197	1582	549	0	0	0	0	-549	5263	0	40	0	0	0	0	2461	0	0	274	450	2256	100	0	138	138	0	0	0
September	2736	3	197	2537	549	0	0	0	0	-549	5401	0	82	0	0	0	0	2397	0	0	274	450	2475	100	0	114	114	0	0	0
October	4076	2	197	3877	549	0	0	0	0	-549	5602	0	143	0	0	0	0	3270	0	0	274	450	2050	100	0	299	299	0	0	0
November	5347	1	197	5149	549	0	0	0	0	-549	6054	0	202	0	0	0	0	3704	0	0	274	450	2052	100	0	225	225	0	0	0
December	6385	1	197	6187	549	0	0	0	0	-549	6056	0	245	0	0	0	0	3229	0	0	274	450	2513	100	0	166	166	0	0	0
Average	4460	2	197	4261	549	0	0	0	0	-549	5578	0	160	0	0	0	0	2788	0	0	274	450	2358	100	0	132	132	0	Average price	
Maximum	12535	28	197	12338	549	0	0	0	0	-549	8603	0	522	0	0	0	0	7564	0	0	274	450	7550	100	177	3649	3649	0	(DKK/MWh)	
Minimum	1561	0	197	1364	549	0	0	0	0	-549	2795	0	0	0	0	0	0	2	0	0	274	450	0	100	0	0	0	0	182	0
Total for the whole year																													Million DKK	
TWh/year	39.18	0.02	1.73	37.43	4.82	0.00	0.00	0.00	0.00	-4.82	49.00	0.00	1.41	0.00	0.00	0.00	0.00	24.49	0.00	0.00	2.41	3.95	20.71		0.00	1.16	1.16	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	1.00	-	-	-	-	14.72	-	-	-	-	-	-	-	-	-	-	-	0.01	3.37	-	19.11	-0.82	18.28	6.53	6.25
Oil	21.94	-	-	-	-	1.11	-	-	-	-	-	-	-	-	-	-	69.20	6.72	26.92	3.01	128.90	-0.06	128.84	34.34	34.32
N.Gas	17.58	-	-	-	-	23.70	-	-	-	-	-	-	-	-	-	-	-	4.05	18.19	19.73	83.25	-1.32	81.93	16.99	16.72
Biomass	1.06	-	9.65	-	-	0.20	-	-	-	-	-	-	-	-	-	-	-	7.29	5.18	-	23.38	-0.02	23.37	0.00	0.00
Renewable	-	-	-	-	-	-	-	-	-	-	-	7.26	17.23	-	-	0.02	-	-	-	-	24.51	0.00	24.51	0.00	0.00
H2 etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00
Geothermal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00
Total	41.59	-	9.65	-	-	39.73	-	-	-	-	-	7.26	17.23	-	-	0.02	69.20	18.07	53.66	22.74	279.15	-2.22	276.92	57.87	57.30

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 I MW	Total er MW
January	7177	1	197	6980	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	743	2918	0	0	3662
February	7343	2	197	7144	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	1095	1328	0	0	2424
March	6256	2	197	6057	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	867	1855	0	0	2722
April	5013	3	197	4813	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	710	2451	0	0	3161
May	3933	3	197	3733	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	720	1348	0	0	2068
June	1782	3	197	1582	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	752	1709	0	0	2461
July	1782	4	197	1582	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	505	1384	0	0	1890
August	1782	3	197	1582	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	721	1739	0	0	2461
September	2736	3	197	2537	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	707	1690	0	0	2397
October	4076	2	197	3877	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	1192	2078	0	0	3270
November	5347	1	197	5149	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	1146	2558	0	0	3704
December	6385	1	197	6187	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	773	2457	0	0	3229
Average	4460	2	197	4261	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	826	1962	0	0	2788
Maximum	12535	28	197	12338	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	3100	4500	0	0	7564
Minimum	1561	0	197	1364	0	0	0	0	0	0	0	0	0	0	0	0	0	549	0	0	0	0	0	-549	0	0	0	0	2
Total for the whole year																													
TWh/year	39.18	0.02	1.73	37.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	4.82	0.00	0.00	0.00	0.00		-4.82	7.26	17.23	0.00	0.00	24.49

ANNUAL COSTS (Million DKK)

Total Fuel =		63607
Coal =	1072	
FuelOil =	11800	
Gasoil/Diesel=	13572	
Petrol/JP =	17399	
Ngas =	15558	
Biomas =	4206	
Waste =	0	
Maginal operation costs =		427
Total Electricity exchange =		0
Import =	0	
Export =	0	
Bottleneck =	0	
Fixed imp/ex=	0	
Total CO2 emission costs =		8680
Total variable costs =		72714
Fixed operation costs =		3126
Annual Investment costs =		9263
TOTAL ANNUAL COSTS =		85103