

# Input NgasMicroCHPWind50percentWithCHP

# The EnergyPLAN model 7.20



Electricity demand (TWh/year):	Flexible demand	0.00				Capacities		Efficiencies		Regulation Strategy: Technical regulation no. 2				Fuel Price level:					
Fixed demand	49.00	Fixed imp/exp.	0.00			Group 2:	MW-e	MJ/s	elec.	Ther	COP		KEOL regulation		00000		Capacities Storage Efficiencies		
Electric heating	0.00	Transportation	0.00			CHP	1350	1647	0.41	0.50	Heat Pump		Minimum Stabilisation share		0.00		MW-e GWh elec. Ther.		
Electric cooling	0.00	Total	49.00			Heat Pump	0	0	3.50		Boiler		Stabilisation share of CHP		0.00		Hydro Pump: 0 1 0.68		
District heating (TWh/year)	Gr.1	Gr.2	Gr.3	Sum	Group 3:	7500		0.90		CHP		Minimum CHP gr 3 load		450 MW		Hydro Turbine: 0 2.44			
District heating demand	2.26	14.29	22.63	39.18	CHP	2000	2440	0.41	0.50	Heat Pump		Heat Pump maximum share		0.50		Electrol. Gr.2: 0 360 0.80 0.15			
Solar Thermal	0.02	0.00	0.00	0.02	Heat Pump	0	0	3.50		Boiler		Maximum import/export		0 MW		Electrol. Gr.3: 0 0 0.40 0.50			
Industrial CHP (CSHP)	0.00	0.00	1.73	1.73	Boiler	11300		0.90		Distr. Name :		Price_DKV_2005.txt				Electrol. trans.: 0 0 0.80			
Demand after solar and CSHP	2.24	14.29	20.90	37.43	Condensing	8000	0.52		Heatsstorage: gr.2: 40 GWh gr.3: 10 GWh		Addition factor		0.00 DKK/MWh		CAES fuel ratio: 1.156		(TWh/year) Coal Oil Ngas Biomass		
Wind	3100 MW	7.26	TWh/year	0.00	Grid	Fixed Boiler: gr.2: 2.5 Per cent gr.3: 1.0 Per cent		Electricity prod. from CSHP Waste (TWh/year)		Dependency factor		0.00 DKK/MWh pr. MW		Average Market Price		277 DKK/MWh		Transport 0.00 69.20 0.00 0.00	
Offshore Wind	4500 MW	17.23	TWh/year	0.00	stabilisation	Gr.1: 0.00 0.00		Gr.2: 0.00 0.00		Gr.3: 2.41 0.00								Household 0.01 6.72 4.05 7.29	
Photo Voltaic	0 MW	0	TWh/year	0.00	share													Industry 3.37 26.92 18.19 5.18	
Wave Power	0 MW	0	TWh/year	0.00														Various 0.00 3.01 19.73 0.00	
Hydro Power	0 MW	0	TWh/year																
Geothermal	0 MW	0	TWh/year																

# Output

District Heating										Electricity														Exchange					
Demand		Production								Consumption						Production						Balance				Payment			
Distr. heating	MW	Solar	CSHP	DHP	CHP	HP	ELT	Boiler	EH	Ba-lance	Elec. demand	Flexi-ble	Elec-trolyser	EH	Hydro Pump	Tur-bine	RES	Hy-dro	Geo-thermal	Waste+ CSHP	CHP	PP	Stab-Load %	Imp	Exp	CEEP	EPP	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	MW	Million DKK	Million DKK
January	7177	1	197	413	2273	0	0	4293	0	0	6305	0	0	0	0	0	3662	0	0	274	2265	308	100	0	204	204	0	0	0
February	7343	2	197	422	3160	0	0	3563	0	0	6237	0	0	0	0	0	2424	0	0	274	2992	639	100	0	92	92	0	0	0
March	6256	2	197	359	2761	0	0	2938	0	-1	6004	0	0	0	0	0	2722	0	0	274	2632	537	100	0	161	161	0	0	0
April	5013	3	197	286	2082	0	0	2444	0	2	5291	0	0	0	0	0	3161	0	0	274	2000	165	100	0	310	310	0	0	0
May	3933	3	197	223	2744	0	0	756	0	9	5162	0	0	0	0	0	2068	0	0	274	2467	495	100	0	143	143	0	0	0
June	1782	3	197	100	1403	0	0	107	0	-27	5017	0	0	0	0	0	2461	0	0	274	1222	1286	100	0	226	226	0	0	0
July	1782	4	197	99	1402	0	0	68	0	13	4574	0	0	0	0	0	1890	0	0	274	1211	1328	100	0	129	129	0	0	0
August	1782	3	197	100	1430	0	0	74	0	-21	5263	0	0	0	0	0	2461	0	0	274	1237	1454	100	0	163	163	0	0	0
September	2736	3	197	155	2122	0	0	260	0	-1	5401	0	0	0	0	0	2397	0	0	274	1866	1040	100	0	177	177	0	0	0
October	4076	2	197	234	2278	0	0	1340	0	25	5602	0	0	0	0	0	3270	0	0	274	2093	396	100	0	432	432	0	0	0
November	5347	1	197	307	2212	0	0	2629	0	1	6054	0	0	0	0	0	3704	0	0	274	2128	358	100	0	411	411	0	0	0
December	6385	1	197	368	2495	0	0	3322	0	3	6056	0	0	0	0	0	3229	0	0	274	2412	485	100	0	345	345	0	0	0
Average	4460	2	197	255	2194	0	0	1812	0	0	5578	0	0	0	0	0	2788	0	0	274	2041	708	100	0	233	233	0	0	Average price (DKK/MWh)
Maximum	12535	28	197	723	4088	0	0	9297	0	3097	8603	0	0	0	0	0	7564	0	0	274	3768	5164	100	0	4487	4487	0	0	385
Minimum	1561	0	197	76	549	0	0	66	0	-2383	2795	0	0	0	0	0	2	0	0	274	450	0	100	0	0	0	0	0	0
Total for the whole year																								Million DKK					
TWh/year	39.18	0.02	1.73	2.24	19.27	0.00	0.00	15.91	0.00	0.00	49.00	0.00	0.00	0.00	0.00	0.00	24.49	0.00	0.00	2.41	17.93	6.22	0.00	2.05	2.05	0.00	0	0	

FUEL BALANCE (TWh/year):																				Imp/Exp Corrected			CO2 emission (Mt):		
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	Netto	Total	Netto
Coal	0.04	1.26	2.13	0.15	0.19	4.37	-	-	-	-	-	-	-	-	-	-	-	0.01	3.37	-	11.51	-1.45	10.06	3.94	3.44
Oil	0.77	0.28	0.48	3.27	4.18	0.33	-	-	-	-	-	-	-	-	-	-	69.20	6.72	26.92	3.01	115.16	-0.11	115.06	30.68	30.65
N.Gas	0.62	5.84	9.86	2.62	3.35	7.03	-	-	-	-	-	-	-	-	-	-	-	11.42	18.19	19.73	78.67	-2.34	76.33	16.06	15.58
Biomass	1.06	7.35	11.37	1.65	2.26	0.20	-	-	-	-	-	-	-	-	-	-	-	7.29	5.18	-	36.36	-0.03	36.33	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	0.00	0.00	0.00	0.00
Geothermal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00
Total	2.49	14.73	23.83	7.70	9.99	11.93	-	-	-	-	7.26	17.23	-	-	0.02	69.20	25.44	53.66	22.74	266.21	-3.93	262.29	50.67	49.67	



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	Bal-ance	District heating	Solar	CSHP	CHP	HP	ELT	Boiler	EH	Storage	Bal-ance	RES1 Wind	RES2 Offsho	RES3 Photo	RES4 Wave	Total er
	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	MW	MW
January	414	1	0	413	2618	0	0	803	0	0	1815	0	24880	0	4146	0	197	1471	0	0	2478	0	6103	0	743	2918	0	0	3662
February	424	2	0	422	2678	0	0	1215	0	0	1463	0	24882	0	4241	0	197	1945	0	0	2100	0	6082	0	1095	1328	0	0	2424
March	361	2	0	359	2282	0	0	1029	0	0	1253	0	24849	0	3614	0	197	1732	0	0	1686	0	6138	-1	867	1855	0	0	2722
April	289	3	0	286	1829	0	0	715	0	0	1112	0	24092	1	2896	0	197	1366	0	0	1332	0	5066	1	710	2451	0	0	3161
May	227	3	0	223	1435	0	0	1071	0	0	351	0	20860	13	2272	0	197	1674	0	0	405	0	4820	-4	720	1348	0	0	2068
June	103	3	0	100	650	0	0	611	0	0	68	0	15179	-29	1030	0	197	792	0	0	39	0	5249	1	752	1709	0	0	2461
July	103	4	0	99	650	0	0	598	0	0	41	0	26604	11	1030	0	197	803	0	0	28	0	5435	2	505	1384	0	0	1890
August	103	3	0	100	650	0	0	624	0	0	43	0	26248	-17	1030	0	197	806	0	0	31	0	6196	-5	721	1739	0	0	2461
September	158	3	0	155	998	0	0	891	0	0	108	0	26675	-1	1581	0	197	1232	0	0	152	0	5655	0	707	1690	0	0	2397
October	235	2	0	234	1486	0	0	839	0	0	630	0	23693	18	2354	0	197	1439	0	0	711	0	6273	8	1192	2078	0	0	3270
November	308	1	0	307	1950	0	0	772	0	0	1177	0	24796	1	3089	0	197	1440	0	0	1452	0	2096	-1	1146	2558	0	0	3704
December	368	1	0	368	2329	0	0	906	0	0	1422	0	25160	1	3688	0	197	1589	0	0	1900	0	3450	2	773	2457	0	0	3229
Average	257	2	0	255	1627	0	0	838	0	0	788	0	24003	0	2576	0	197	1356	0	0	1023	0	5217	0	826	1962	0	0	2788
Maximum	723	28	0	723	4572	0	0	1647	0	0	3888	0	40000	1472	7240	0	197	2440	0	0	5409	0	10000	1624	3100	4500	0	0	7564
Minimum	90	0	0	76	569	0	0	0	0	0	41	0	0	-1102	902	0	197	549	0	0	26	0	0	-1346	0	0	0	0	2
Total for the whole year																													
TWh/year	2.26	0.02	0.00	2.24	14.29	0.00	0.00	7.36	0.00	0.00	6.93	0.00	0.00	0.00	22.63	0.00	1.73	11.91	0.00	0.00	8.99	0.00	0.00	0.00	7.26	17.23	0.00	0.00	24.49

ANNUAL COSTS (Million DKK)

Total Fuel =	60758
Coal =	642
FuelOil =	8523
Gasoil/Diesel=	13572
Petrol/JP =	17399
Ngas =	14964
Biomass =	5659
Waste =	0
Maginal operation costs =	430
Total Electricity exchange =	0
Import =	0
Export =	0
Bottleneck =	0
Fixed imp/ex=	0
Total CO2 emission costs =	7601
Total variable costs =	68789
Fixed operation costs =	3828
Annual Investment costs =	10049
TOTAL ANNUAL COSTS =	82666