Input B_H_REFv1.10_Technic	cal_simulation.txt	The EnergyP	PLAN 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 COF CHP 0 1500 0,40 0,50 Heat Pump 0 0 3,00	Regulation Strate(Technical regulation no. 1 CEEP regulation 000000000 Minimum Stabilisation share 0,98 Stabilisation share of CHP 0,00	Fuel Price level: Basic Capacities Storage Efficiencies Elec. Storage MW-e GWh Elec. Ther. Charge 1: 0 0 0.80
District heating (TWh/year) Gr.1 Gr.2 Gr.3 Sun 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	CHP 443 82 0,21 0,47 Heat Pump 0 0 3,00 Boiler 0 0,90	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	Charge 1: 0 0,80 Discharge 1: 0 0,90 Charge 2: 420 3,0,80 Discharge 2: 420 0,90 Electrolysers: 0 0,80 0,00 Rockbed Storage: 0 0 1,00
Wind 87 MW 0,16 TWh/year 0,00 Grid Photo Voltaic 35 MW 0,08 TWh/year 0,00 stabili-	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	Addition factor 0,00 EUR/MWh Multiplication factor 1,00 Dependency factor 0,00 EUR/MWh pr. MW	CAES fuel ratio: 0,000 (TWh/year) Coal Oil Ngas Biomass
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	Average Market Price 39 EUR/MWh Gas Storage 0 GWh Syngas capacity 0 MW Biogas max to grid 0 MW	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			

Outp	ut
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_				Dis	trict He	ating														Electr	icity								Exc	hange
	Demand	and Production										Cons	umption					F	Producti	on				В	Balance)				
	Distr. heating MW	Solar MW	Waste CSHP MW		CHP MW	HP MW	ELT MW	Boiler MW	EH MW	Ba- lance MW		Flex.& dTransp MW	HP MW	Elec- trolyser MW	EH MW	Hydro Pump MW		RES MW	Hy- dro t MW	Geo- hermal MW		e P CHP MW	PP MW	Stab- Load %	Imp MW	Exp MW	CEEP MW	EEP MW	Payn Imp Millio	nent Exp n EUR
January February	391 307	0	0 0	271 213	81 75	0	0	0	0	39 18	795 822	7	4	0 0	701 550	0	0	100 84	488 487	0	0	435 407	484 404	140 144	0	0	0 0	0	0	
March	283	0	0	197	73 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	
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	
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	
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	
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	
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	
Septemb	er 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	
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	
Novembe	er 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	
Decembe	er 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	
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	Avera	ge pric
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		R/MW
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	4
TWh/yea	r 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	
FUEL B	ALANCE	(TWh/y	ear):							Wa	ste/ CA	ES Bio	Con-E	lectro-		PV ar	d Wind	off					Indus	try	Imp	/Exp C	Corrected	d CO	2 emiss	sion (N
	DHP	CHP	2 CHI	⊃3 Bo	oiler2 B	oiler3	PP	Geo/Nu	ı.Hydro	o HTI	_ Eld	.ly. ver	sion F	uel	Vind	CSP	Wave	е Нус	dro S	olar.Tr 1	Transp.	.housel	า.Varioเ	us Tota	al _I İr	mp/Exp	Net	Т	otal N	et
Coal	0,54	-	0,8	4	-	- 1	3,55	-	-	_				-	-	-	-	_		-	-	1,15	8,29	24,37	7 C),01	24,38	10	.09 10	.09
Oil	0,01	_	-		_		0,00	-	_	_				_	_	_	_	_		- 13		0,41	3,18	17,04	- 1	*	17,04			,45
N.Gas	0,40	_	-		-	-	0,00	-	-	-				-	-	-	-	-		- 0		0,71	1,99	3,92		,00	3,92			,10
Biomass	0,31	-	0,0	4	-	-	0,00	-	-	-				-	-	-	-	-		-	- 1	3,47	0,59	14,4	1 0	,00	14,41	0	,00 0	,00
Renewa	ble -	-	-		-	-	-	-	4,28	-				-	0,16	0,08	-	4,7	1	-	-	-	-	4,9	5 0	0,00	4,95	0	,00 0	,00
H2 etc.	-	-	-		-	-	-	-	-	-				-	-	-	-	-		-	-	-	-	0,00	0 0),00	0,00	0	,00 0	,00
Biofuel	-	-	0,0	0	-	-	-	-	-	-				-	-	-	-	-		-	-	-	-	0,00	- 1	0,00	0,00			,00
Nuclear/	CCS -					-	-	-							-						-	-	-	0,00		0,00	0,00	0	,00 0	,00
Total	1,25	_	0,8	 8	_	- 1	3,55	_	4,28	-				_	0,16	0,08	_	4,7	1	- 14	,25 1	5,74	14,06	64,69	9 0),01	64,70	15	,46 15	.64

Outp	ut s	oec	ifica	atior	าร	F	B_F	I_RI	EF	/1.1	0_T	ect	nnic	al_	simu	latio	on.t	xt		TI	he E	ne	rgyl	PLAI	N mo	del	16. [′]	1/	7
_											Dist	rict Hea	ating P	roducti	on													1 all	>
	G	r.1								Gr.2									Gr.3						RE	S speci	ification		
	District heating MW	Solar MW	CSHP MW	DHP MW	District heating MW	Solar MW	CSHF 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			RES3 I River I 4 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	197 132	0	0	0	0	0	0	0 0	0	0	0	86	0	0	72 52	0	0	0 0	0	0	14 5	29	8	71	0	108
April May	132 79	0	0	79	0	0	0	0 0	0	0	0	0	0	0	58 35	0	0 0	53 35	0	0	0	0	0	0	19 21	11 10	31 20	0	61 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
Septembe		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
Novembe		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
Decembe	r 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		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 TWh/year		,	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 f	rom inc	lustrial	CH0,00	0 TWh/ye	ar			-							<u> </u>	-		<u> </u>					·	·				
																	N	IATUR.	AL GAS	S EXCI	HANGE								
ANNUAL	COSTS	(Milli	on EUF	₹)						HP &	CHP2	PP	lı	ndi-	Trans	Indu.	Den	nand I	Bio-	Syn-	CO	2Hy S	ynHy	SynHy	Stor-	Sum	lm-	E	Ex-
Total Fuel	l ex Nga	s excha	ange =	1939	9					Boilers	CHP3			idual	port	Var.	Sui	,	gas	gas	gas		gas	gas	age		por		port
Uranium	=		0						ı	MW	MW	MV	V I	MW	MW	MW	MV	V I	MW	MW	MV	/	ИW	MW	MW	MW	MW	' !	MW
Oou.	=		247					Januar	ry	95	0	(0	171	1	239	50	7	0	0	()	0	0	0	507	507	•	0
FuelOil Gasoil/Die	=		21 191					Februa	ary	75	0	(0	134	1	259	470	0	0	0	()	0	0	0	470	470)	0
Gasoli/Die Petrol/JP			57					March		69	0	(0	124	1	242	43		0	0	()	0	0	0	437	437	•	0
Gas hand			29					April		46	0	(83	1	193	324		0	0	(•	0	0	0	324	324		0
Biomass	=	4	94					May		28	0	(50	1	172	25		0	0	(•	0	0	0	251	251		0
Food inco	me =		0					June		17	0	(-	31	1	139	189		0	0	(•	0	0	0	189	189		0
Waste	=		0					July		12 10	0	(D D	21 18	1 1	159 112	193 143	-	0	0	(•	0	0	0	193 141	193 141		0

									NATU	JRAL GA	S EXCH	ANGE						
ANNUAL COSTS (Million EU	R)		DHP &	CHP2	PP	Indi-	Trans	Indu.	Demand	d Bio-	Syn-	CO2Hy	SynHy	SynHy	Stor-	Sum	lm-	Ex-
Total Fuel ex Ngas exchange :	= 1939		Boilers	CHP3	CAES	vidual	port	Var.	Sum	gas	gas	gas	gas	gas	age		port	port
Uranium = 0			MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW
Coal = 247		January	95	0	0	171	1	239	507	0	0	0	0	0	0	507	507	0
FuelOil = 121		February	75	0	0	134	1	259	470	0	0	0	0	0	0	470	470	0
Gasoil/Diesel= 891		March	69	0	0	124	1	242	437	0	0	0	0	0	0	437	437	0
Petrol/JP = 157		April	46	0	0	83	1	193	324	0	0	0	0	0	0	324	324	o l
Gas handling = 29		May	28	0	0	50	1	172	251	0	0	0	0	0	0	251	251	0
Biomass = 494		June	17	0	0	31	1	139	189	0	0	0	0	0	0	189	189	0
Food income = 0		July	12	0	0	21	1	159	193	0	0	0	0	0	0	193	193	0
Waste = 0		August	10	0	0	18	1	112	141	0	0	0	0	0	0	141	141	o l
Total Ngas Exchange costs =	63	Septembe		0	0	27	1	156	200	0	0	0	0	0	0	200	200	o l
l		October	36	0	0	64	1	383	485	0	0	0	0	0	0	485	485	0
Marginal operation costs =	349	November	62	0	0	112	1	267	443	0	0	0	0	0	0	443	443	0
Total Electricity exchange =	0	December	77	0	0	138	1	391	608	0	0	0	0	0	0	608	608	0
Import = 0			45	0	•	0.4		000	054	0	•	0	0	0	•	054	054	
Export = 0		Average	45	0	0	81	1	226	354	0	0	0	0	0	0	354	354	0
Bottleneck = 0		Maximum Minimum	149 2	0	3 0	268 4	1	739 0	872 9	0 0	0	0 0	0 0	0 0	0 0	872 9	872 9	0
Fixed imp/ex= 0		Minimum	2	U	U	4	ı	U	9	U	U	U	U	U	U	9	9	١
Total CO2 emission costs =	0	Total for th	e whole	year														
Total CO2 etilission costs =	0	TWh/year	0,40	0,00	0,00	0,71	0,01	1,99	3,11	0,00	0,00	0,00	0,00	0,00	0,00	3,11	3,11	0,00
Total variable costs =	2351																	
Fixed operation costs =	33910																	
Annual Investment costs =	57902																	
TOTAL ANNUAL COSTS =	94163																	
RES Share: 29,9 Percent of I	Primary Energy 46,3 Percent	of Electricity		5,1 TW	n electricit	ty from R	ES									02-ap	oril-2022	[18:42]