Appendix

Parameters of EH

Table I
Internal parameters of EHs

$c_{\mathrm{ES,CH}}$	0.01 \$/kWh	$c_{\mathrm{ES,DC}}$	0.01 \$/kWh	$c_{\mathrm{CS,CH}}$	0.01 \$/kWh
$c_{\mathrm{CS,DC}}$	0.01 \$/kWh	$c_{\mathrm{HS,CH}}$	0.01 \$/kWh	$c_{\mathrm{HS,DC}}$	0.01 \$/kWh
$\xi_{\mathrm{G}}(t)$	0.1892 \$/kWh	c_{PV}	0.001 \$/kWh	c_{air}	0.185 \$/kWh
R_T	0.13℃/kW	$\theta_{\mathrm{in,min}}$	21℃	$\theta_{\mathrm{in,max}}$	26℃
$P_{\mathrm{UG,min}}$	-2000kW	$P_{\mathrm{UG,max}}$	2000kW	$P_{\mathrm{BIC,max}}$	2000kW
η_{BIC}	0.95	η_{CHPe}	0.3	η_{CHPh}	0.4
η_{GAS}	0.9	η_{IAC}	4	η_{AC}	1.2
$\eta_{\mathrm{ES,DC}}$	0.9	$\eta_{\mathrm{ES,CH}}$	0.9	$\eta_{\mathrm{CS,DC}}$	0.9
$\eta_{\mathrm{CS,CH}}$	0.9	$\eta_{\mathrm{HS,DC}}$	0.9	$\eta_{\mathrm{HS,CH}}$	0.9
η_{ES}	1	η_{CS}	0.98	η_{HS}	0.98
$P_{\mathrm{ES,DC,max}}$	500kW	$P_{\mathrm{ES,CH,max}}$	500 kW	$y_{\mathrm{ESL,min}}$	50 kWh
$y_{\mathrm{ESL,max}}$	500 kWh	$E_{\mathrm{CS,DC,max}}$	500 kW	$E_{\mathrm{CS,CH,max}}$	500 kW
$y_{\mathrm{CSL,min}}$	50 kWh	$y_{\mathrm{CSL,max}}$	500 kWh	$E_{\mathrm{HS,DC,max}}$	500kW
$E_{\mathrm{HS,CH,max}}$	500kW	$y_{\mathrm{HSL,min}}$	50 kWh	$y_{\mathrm{HSL,max}}$	500kW
v_{max}	10000kW	$v_{\mathrm{inj,max}}$	5000kW	$v_{\mathrm{ex,max}}$	5000kW

Table II
Load data for EH 1

Time (h)	DC load(kW)	AC load (kW)	Heating load (kW)	Cooling load (kW)

1	140.330	210.495	0	0
2	113.373	170.059	0	0
3	103.349	155.023	0	0
4	126.768	190.153	93.936	0
5	160.213	240.320	200.054	0
6	221.344	332.016	292.856	0
7	303.132	454.698	300	0
8	305.870	458.805	81.878	0
9	267.426	401.140	0	0
10	235.240	352.860	0	0
11	222.631	333.947	0	0
12	214.385	321.577	0	0
13	202.887	304.331	0	0
14	193.850	290.776	0	0
15	188.943	283.415	0	0
16	198.411	297.617	0	0
17	238.311	357.466	0	0
18	316.214	474.322	0	0
19	378.396	567.594	0	0
20	400	600	0	300
21	378.354	567.531	0	212.787
22	338.067	507.101	0	36.761
23	271.419	407.128	0	0
24	206.972	310.458	0	0

Table III
Load data for EH 2

Time (h)	DC load(kW)	AC load (kW)	Heating load (kW)	Cooling load (kW)
1	136.533	204.800	0	0

2	110.334	165.501	0	0
3	100.621	150.932	0	0
4	99.043	148.564	0	0
5	123.086	184.629	0	0
6	179.217	268.826	0	0
7	400	600	0	0
8	313.779	470.669	0	0
9	259.466	389.199	0	0
10	228.207	342.311	0	0
11	216.126	324.189	0	0
12	208.246	312.370	0	0
13	197.128	295.693	0	0
14	188.385	282.578	0	0
15	183.593	275.389	0	0
16	192.724	289.086	0	0
17	232.060	348.090	0	31.186
18	307.194	460.791	0	0
19	373.222	559.833	0	265.440
20	388.576	582.864	300	300
21	364.665	546.998	212.787	66.994
22	327.943	491.915	36.761	0
23	264.016	396.024	0	0
24	201.431	302.147	0	0

Table IV
Load data for EH 3

Time (h)	DC load(kW)	AC load (kW)	Heating load (kW)	Cooling load (kW)
1	100.548	150.822	0	0

2	95.679	143.519	18.001	0
3	122.071	183.106	60.030	0
4	142.292	213.438	86.787	0
5	181.609	272.414	131.246	0
6	223.973	335.960	151.543	0
7	400	600	300	0
8	324.394	486.592	151.200	0
9	246.169	369.254	68.254	0
10	168.614	252.921	0	0
11	159.602	239.403	0	0
12	153.673	230.510	0	0
13	145.421	218.132	0	0
14	138.936	208.404	0	0
15	135.322	202.983	0	0
16	142.061	213.092	0	0
17	171.259	256.889	0	22.402
18	226.319	339.478	0	0
19	279.792	419.688	0	276.119
20	291.354	437.031	0	300
21	275.249	412.873	0	238.333
22	241.560	362.340	0	0
23	194.450	291.675	0	0
24	148.277	222.415	0	0