

Distribution network information:**Feeder information:**

From bus	To bus	Resistance (p.u.)	Reactance (p.u.)	Capacity (MW)	Availability
Main Grid	1	9.37E-05	4.40E-05	14.54923	0.999997
Main Grid	38	0.000211565	9.93E-05	14.54923	0.999987
1	47	8.50E-05	3.99E-05	14.54923	0.999995
2	36	0.000110833	3.24E-05	10.73872	0.999996
2	37	0.000129099	3.78E-05	10.73872	0.999995
2	48	0.000104858	3.07E-05	10.73872	0.999996
3	49	0.00012955	3.79E-05	10.73872	0.999995
4	5	0.000213098	6.24E-05	10.73872	0.999992
6	25	0.000158865	4.65E-05	10.73872	0.999994
6	26	0.000239707	7.02E-05	10.73872	0.999991
52	7	0.000108127	3.16E-05	10.73872	0.999996
7	53	1.88E-05	5.51E-06	10.73872	0.999999
30	8	0.000167321	4.90E-05	10.73872	0.999994
9	20	7.69E-05	2.25E-05	10.73872	0.999997
10	55	0.00012831	3.76E-05	10.73872	0.999995
60	11	6.07E-05	1.78E-05	10.73872	0.999998
13	21	3.65E-05	1.71E-05	14.54923	0.999998
14	19	4.11E-05	1.93E-05	14.54923	0.999997
14	45	0.000195283	5.72E-05	10.73872	0.999993
15	33	0.000128535	3.76E-05	10.73872	0.999995
15	57	5.49E-05	1.61E-05	10.73872	0.999998
16	43	4.71E-05	2.21E-05	14.54923	0.999997
51	17	9.40E-05	2.75E-05	10.73872	0.999997
18	22	4.65E-05	2.18E-05	14.54923	0.999997
19	42	6.75E-05	3.17E-05	14.54923	0.999996
20	32	7.96E-05	2.33E-05	10.73872	0.999997
21	9	0.000120192	3.52E-05	10.73872	0.999996
21	60	0.000140938	4.13E-05	10.73872	0.999995
22	2	6.24E-05	2.93E-05	14.54923	0.999996
24	6	0.00015785	4.62E-05	10.73872	0.999994
25	46	0.000245795	7.19E-05	10.73872	0.999991
27	29	0.000123574	3.62E-05	10.73872	0.999995
27	56	0.000107789	3.15E-05	10.73872	0.999996
28	59	0.000104745	3.07E-05	10.73872	0.999996
31	35	0.000347947	0.000101838	10.73872	0.999987
32	27	0.000108466	3.17E-05	10.73872	0.999996
36	3	0.000258761	7.57E-05	10.73872	0.999991
37	24	0.000227981	6.67E-05	10.73872	0.999992
38	16	0.000103097	4.84E-05	14.54923	0.999994
40	39	6.31E-05	1.85E-05	10.73872	0.999998
40	41	0.000131805	3.86E-05	10.73872	0.999995
42	61	6.88E-05	3.23E-05	14.54923	0.999996
43	14	0.000100608	4.72E-05	14.54923	0.999994
44	13	3.55E-05	1.67E-05	14.54923	0.999998
44	15	0.000184121	5.39E-05	10.73872	0.999993
47	34	8.72E-05	2.55E-05	10.73872	0.999997
47	51	2.62E-05	1.23E-05	14.54923	0.999998
48	52	0.000112412	3.29E-05	10.73872	0.999996
49	50	9.53E-05	2.79E-05	10.73872	0.999997
50	28	9.62E-05	2.81E-05	10.73872	0.999996
51	18	3.04E-05	1.43E-05	14.54923	0.999998
52	23	0.000134511	3.94E-05	10.73872	0.999995
52	30	0.000159654	4.67E-05	10.73872	0.999994
54	31	0.000153002	4.48E-05	10.73872	0.999994
56	10	9.47E-05	2.77E-05	10.73872	0.999997
57	40	0.000147026	4.30E-05	10.73872	0.999995
11	58	8.35E-05	2.45E-05	10.73872	0.999997
58	12	0.000114892	3.36E-05	10.73872	0.999996
59	4	0.000106323	3.11E-05	10.73872	0.999996
60	54	7.87E-05	2.30E-05	10.73872	0.999997
61	44	5.76E-05	2.71E-05	14.54923	0.999996
8	54	9.46E-05	2.77E-05	10.73872	0.999997

Substation bus information:

Bus number	Active peak load (MW)	Reactive peak load (MVar)	VOLL (€/MWh)
1	2.589	2.45955	23300
2	2.853	2.71035	16100
3	0.927	0.88065	29900
4	0.828	0.7866	24500
5	0.945	0.89775	27900
6	2.058	1.9551	24800
7	1.2	1.14	25100
8	2.973	2.82435	28300
9	0.669	0.63555	26300
10	1.497	1.42215	29900
11	1.032	0.9804	29900
12	2.982	2.8329	24500
13	1.611	1.53045	15100
14	1.14	1.083	29900
15	1.509	1.43355	29900
16	0.354	0.3363	29900
17	3.06	2.907	24500
18	1.158	1.1001	60000
19	2.142	2.0349	26700
20	1.506	1.4307	24100
21	1.908	1.8126	27800
22	0.0219	0.020805	24500
23	0.963	0.91485	14000
24	0.0993	0.094335	28500
25	0.72	0.684	33100
26	2.49	2.3655	12800
27	0.732	0.6954	15800
28	1.497	1.42215	24500
29	1.119	1.06305	24500
30	0.213	0.20235	29900
31	2.574	2.4453	29900
32	0.462	0.4389	24500
33	3.72	3.534	10200
34	0.306	0.2907	19200
35	1.758	1.6701	17900
36	1.692	1.6074	33800
37	1.668	1.5846	19200
38	0.726	0.6897	10400
39	1.662	1.5789	29900
40	1.179	1.12005	29900
41	2.634	2.5023	24500
42	1.755	1.66725	24500
43	0.342	0.3249	24500
44	0.2208	0.20976	24500
45	0.1821	0.172995	24500
46	4.29	4.0755	24500
47	2.67	2.5365	24500
48	0.96	0.912	17900
49	0.681	0.64695	33800
50	0.1833	0.174135	10400
51	2.442	2.3199	15900
52	2.346	2.2287	29900
53	1.155	1.09725	24500
54	1.305	1.23975	15300
55	0.711	0.67545	7860
56	3.6	3.42	16000
57	0.891	0.84645	18100
58	0.954	0.9063	31100
59	1.059	1.00605	29900
60	1.266	1.2027	29900
61	1.047	0.99465	24500

Disaggregated load data (per unit):

Spring weekday

Hour	Heating & Ventilation	Freezer	Refrigerator	Clothes washer	Clothes dryer	Dish washer	Other
1	0.2983	0.002600	0	0.01020	0.0006000	0.007500	0.2845
2	0.2060	0.008900	0	0.02840	0.003100	0	0.1953
3	0.1593	0.01300	0.002900	0.02080	0.002700	0	0.1470
4	0.1461	0.01130	0.01800	0.02030	0.002900	0	0.1309
5	0.1436	0.01120	0.01440	0.02020	0.0009000	0	0.1476
6	0.1512	0.01940	0.01840	0.01540	0.002400	0	0.1398
7	0.1719	0.02120	0.02080	0.009100	0.004000	0	0.1524
8	0.1253	0.01340	0.03530	0.001200	0.005000	0	0.1732
9	0.1144	0.01400	0.02740	0	0.003900	0.002400	0.1549
10	0.1064	0.01100	0.02590	0.001100	0.003500	0.008300	0.1432
11	0.1009	0.01380	0.02070	0.006900	0.002800	0.005500	0.1452
12	0.09870	0.01070	0.01860	0.007200	0.003400	0.006000	0.1457
13	0.09400	0.01260	0.02030	0.01010	0.003100	0.008100	0.1183
14	0.08970	0.01520	0.02210	0.009500	0.003500	0.003900	0.1228
15	0.08710	0.01530	0.02270	0.01470	0.004200	0.002600	0.1247
16	0.08660	0.01600	0.01620	0.01380	0.001900	0.005900	0.1417
17	0.08460	0.01520	0.02080	0.02270	0.002700	0.006600	0.1559
18	0.08550	0.01500	0.03540	0.01840	0.003700	0.01130	0.1496
19	0.08200	0.01610	0.01820	0.02690	0.002400	0.01580	0.1926
20	0.08930	0.01330	0.003200	0.02510	0.0001000	0.01640	0.2070
21	0.09700	0.02020	0.0009000	0	0.003200	0.02050	0.2576
22	0.1047	0.02190	0.02680	0	0.003700	0.01600	0.1936
23	0.2295	0	0	0	0	0.02880	0.2733
24	0.4100	0.01460	0	0	0	0.02630	0.3090

Spring weekend

Hour	Heating & Ventilation	Freezer	Refrigerator	Clothes washer	Clothes dryer	Dish washer	Other
1	0.3000	0.01220	0	0	0	0.01610	0.2842
2	0.2120	0.01430	0	0.004100	0.003000	0	0.2052
3	0.1614	0.02050	0.006600	0.01670	0.003600	0	0.1601
4	0.1448	0.01020	0.01900	0.01650	0.003600	0	0.1259
5	0.1408	0.01590	0.01670	0.01160	0.002600	0	0.1274
6	0.1428	0.01300	0.01860	0.01240	0.003000	0	0.1313
7	0.1511	0.02000	0.02100	0.003200	0.005400	0	0.1445
8	0.1219	0.02480	0.03280	0.001900	0.005700	0	0.1500
9	0.1162	0.02290	0.02470	0.005000	0.004900	0.002300	0.1588
10	0.1136	0.01540	0.03380	0.01090	0.003300	0.01150	0.1516
11	0.1096	0.01650	0.03310	0.02380	0.002400	0.009600	0.1403
12	0.1042	0.008100	0.02880	0.02620	0.002000	0.008300	0.1306
13	0.09940	0.009600	0.02680	0.01940	0.002300	0.008700	0.1068
14	0.09360	0.01810	0.03200	0.01210	0.002700	0.009800	0.1269
15	0.09090	0.01630	0.02900	0.01520	0.002600	0.009300	0.1295
16	0.08430	0.02390	0.01770	0.01740	0.0008000	0.01130	0.1259
17	0.08170	0.02900	0.02970	0.03820	0.003100	0.01100	0.1349
18	0.08130	0.02520	0.03830	0.04560	0.001200	0.01270	0.1475
19	0.08230	0.01740	0.009500	0.02190	0.0005000	0.02140	0.2093
20	0.08430	0.01900	0	0.02040	0	0.01980	0.2628
21	0.09080	0.004800	0.01690	0.01820	0.003400	0.009400	0.2189
22	0.09730	0.02770	0.02470	0.003400	0.003100	0.01030	0.1869
23	0.1976	0.001900	0	0	0.001300	0.03270	0.2498
24	0.3851	0.02380	0	0.01480	0	0.01940	0.2942

Summer weekday

Hour	Heating & Ventilation	Freezer	Refrigerator	Clothes washer	Clothes dryer	Dish washer	Other
1	0.1986	0.01800	0	0.01700	0	0.02520	0.1936
2	0.1157	0.02160	0	0.01810	0	0.009900	0.1138
3	0.08210	0.02030	0	0.02030	0	0.0009000	0.09070
4	0.07080	0.01610	0	0.01620	0	0.002100	0.08900
5	0.06820	0.01860	0.001600	0.01520	0	0.002400	0.08800
6	0.06970	0.02140	0.003800	0.002000	0.0004000	0.0001000	0.09950

7	0.08380	0.02890	0	0.005000	0.002000	0	0.1231
8	0.05300	0.02270	0.01600	0.01030	0.002600	0	0.1013
9	0.04960	0.02080	0.01430	0.004300	0.002000	0.005300	0.1062
10	0.04680	0.02020	0.01420	0.004400	0.001900	0.007400	0.1057
11	0.04620	0.02100	0.009400	0.005300	0.001700	0.005900	0.1179
12	0.04720	0.01720	0.01130	0.005400	0.002200	0.005600	0.1194
13	0.04670	0.01830	0.01260	0.006800	0.002200	0.007300	0.1068
14	0.04330	0.02040	0.01190	0.006200	0.002300	0.006100	0.1015
15	0.04180	0.01990	0.01210	0.008600	0.002100	0.001700	0.1112
16	0.04160	0.01940	0.01290	0.006800	0.0009000	0.001500	0.1240
17	0.03980	0.01920	0.01610	0.01140	0.0008000	0.005600	0.1317
18	0.04590	0.02010	0.01760	0.01180	0.001400	0.008500	0.1247
19	0.03850	0.02620	0.01250	0.01500	0.003200	0.007200	0.1563
20	0.03930	0.02570	0	0.01230	0.001400	0.006000	0.2006
21	0.04770	0.03090	0	0	0.001300	0.02120	0.2303
22	0.05270	0.02360	0.01520	0	0.001300	0.01730	0.1625
23	0.1426	0.006000	0	0	0	0.02450	0.2418
24	0.3208	0.02240	0	0.01230	0	0.02510	0.2603

Summer weekend

Hour	Heating & Ventilation	Freezer	Refrigerator	Clothes washer	Clothes dryer	Dish washer	Other
1	0.1979	0.02160	0	0.003000	0	0.02180	0.1908
2	0.1233	0.02080	0	0.01340	0	0.01190	0.1101
3	0.08640	0.02290	0.01000	0.01590	0.0003000	0.002100	0.08410
4	0.07290	0.02060	0	0.02250	0.0001000	0.004800	0.08140
5	0.06870	0.01860	0.004900	0.01240	0.0001000	0.006000	0.08450
6	0.06710	0.01990	0.005100	0.004700	0.0005000	0.001000	0.09890
7	0.07190	0.02270	0.006600	0	0.001100	0	0.1096
8	0.05450	0.02880	0.01860	0.008100	0.002800	0	0.1022
9	0.05570	0.02330	0.01640	0.01560	0.002700	0	0.09860
10	0.05840	0.02610	0.01500	0.01620	0.002200	0.009000	0.1090
11	0.05870	0.02260	0.01730	0.01400	0.001400	0.006900	0.1189
12	0.05850	0.01760	0.01630	0.005600	0.0005000	0.009200	0.1411
13	0.05770	0.02200	0.01850	0.002400	0.001300	0.01250	0.1253
14	0.05600	0.02210	0.01950	0.003500	0.002600	0.006700	0.1203
15	0.05260	0.01870	0.02150	0.009100	0.003200	0.002900	0.1202
16	0.05110	0.01960	0.02400	0.006200	0.001300	0.004300	0.1198
17	0.04970	0.01560	0.01890	0.02120	0.0003000	0	0.1320
18	0.04530	0.02510	0.01710	0.02470	0.0003000	0.005200	0.1373
19	0.04550	0.01500	0.005400	0.009900	0.0007000	0.007300	0.2139
20	0.04960	0.008800	0	0	0.001800	0.01280	0.2458
21	0.05970	0.01620	0.003000	0	0.0009000	0.01190	0.2372
22	0.06250	0.02720	0.01550	0	0.0006000	0.01460	0.1845
23	0.1507	0.01410	0	0	0	0.02770	0.2035
24	0.3160	0.02470	0	0.01890	0	0.02560	0.2506

Autumn weekday

Hour	Heating & Ventilation	Freezer	Refrigerator	Clothes washer	Clothes dryer	Dish washer	Other
1	0.3020	0.006300	0	0.04020	0.0009000	0	0.2774
2	0.2065	0.002100	0	0.03500	0.0006000	0	0.2114
3	0.1624	0.008500	0	0.03220	0.001600	0	0.1833
4	0.1483	0.01050	0.002400	0.03680	0.0008000	0	0.1609
5	0.1455	0.009900	0	0.03700	0.0001000	0	0.1617
6	0.1499	0.01500	0	0.02150	0.0008000	0	0.1702
7	0.1659	0.02360	0.01470	0.02670	0.003900	0	0.1650
8	0.1198	0.01760	0.03650	0.005500	0.004000	0	0.1811
9	0.1132	0.01890	0.03980	0	0.003900	0	0.1683
10	0.1078	0.01360	0.04320	0.001400	0.003100	0.0008000	0.1502
11	0.1077	0.01220	0.03840	0	0.003300	0	0.1693
12	0.1084	0.01200	0.03480	0	0.003300	0	0.1688
13	0.1062	0.01110	0.03000	0.0008000	0.003300	0.001800	0.1548
14	0.1067	0.01190	0.02860	0	0.003300	0	0.1523
15	0.1030	0.01440	0.02410	0.002300	0.003600	0	0.1662
16	0.1048	0.01530	0.02830	0.0001000	0.003200	0	0.1888
17	0.1048	0.01820	0.03430	0.01270	0.003400	0	0.1931

18	0.1058	0.01490	0.03930	0.01370	0.004100	0.005200	0.2010
19	0.1036	0.01770	0.02380	0.01970	0.006900	0.007700	0.2486
20	0.1112	0.01820	0.01740	0	0.003400	0.01040	0.3252
21	0.1123	0.02360	0.01800	0	0.004700	0.02020	0.2926
22	0.1164	0.02590	0.02720	0	0.004000	0.01200	0.2239
23	0.2211	0	0	0	0	0.01760	0.3241
24	0.4309	0.002700	0	0	0	0.01150	0.3757

Autumn weekend

Hour	Heating & Ventilation	Freezer	Refrigerator	Clothes washer	Clothes dryer	Dish washer	Other
1	0.3064	0.002700	0	0.03340	0	0	0.2611
2	0.2143	0.002800	0	0.04020	0.001100	0	0.2131
3	0.1676	0.007100	0	0.03310	0.001400	0	0.1622
4	0.1490	0.01120	0	0.03600	0.0001000	0	0.1778
5	0.1429	0.007000	0.001600	0.03320	0.0004000	0	0.1548
6	0.1422	0.01530	0.009200	0.02310	0.0008000	0	0.1457
7	0.1467	0.02760	0.01600	0.01300	0.002500	0	0.1721
8	0.1116	0.02110	0.03510	0.01100	0.006200	0	0.1663
9	0.1125	0.01970	0.04510	0.01650	0.006400	0.001400	0.1693
10	0.1103	0.01130	0.04260	0.01780	0.004300	0.01510	0.1804
11	0.1146	0.005900	0.04470	0.02080	0.005000	0.01720	0.1833
12	0.1202	0.003100	0.04540	0.01200	0.004600	0.01170	0.1776
13	0.1142	0.003400	0.04580	0.008200	0.005600	0.01150	0.1799
14	0.1116	0.01000	0.03950	0.006500	0.005500	0.01180	0.1649
15	0.1065	0.02150	0.04530	0.01420	0.005000	0.009300	0.1618
16	0.1084	0.01600	0.04490	0.009000	0.005400	0.008000	0.1918
17	0.1100	0.01620	0.05550	0.01570	0.003200	0	0.1927
18	0.1065	0.02450	0.04950	0.03360	0.003400	0.007200	0.2495
19	0.1003	0.03300	0.02690	0.02060	0.005100	0.008200	0.2992
20	0.1132	0.01550	0.02680	0.009000	0.002300	0.01890	0.3367
21	0.1201	0.01180	0.03720	0.001900	0.003000	0.02420	0.3061
22	0.1171	0.01500	0.04840	0	0	0.01570	0.2041
23	0.2254	0.002300	0	0	0	0.02740	0.2427
24	0.4020	0.004800	0	0	0	0.003400	0.3495

Winter weekday

Hour	Heating & Ventilation	Freezer	Refrigerator	Clothes washer	Clothes dryer	Dish washer	Other
1	0.4359	0	0	0	0	0	0.4289
2	0.3447	0	0	0.01600	0.001000	0	0.3729
3	0.2972	0	0	0.04020	0.0009000	0	0.2992
4	0.2759	0	0.009200	0.03860	0.0005000	0	0.2451
5	0.2642	0.007600	0.02700	0.03490	0.0002000	0	0.2181
6	0.2703	0.01190	0.02840	0.02700	0.002100	0	0.2204
7	0.2826	0.01550	0.04120	0.01910	0.004300	0	0.2493
8	0.2209	0.01650	0.06560	0	0.004700	0	0.2625
9	0.2144	0.02610	0.05570	0	0.004000	0	0.2507
10	0.2078	0.02140	0.05290	0	0.003900	0.001000	0.2394
11	0.2073	0.01460	0.04970	0	0.004000	0.002100	0.2369
12	0.2052	0.01350	0.04400	0	0.004300	0.002900	0.2400
13	0.2029	0.01090	0.04610	0	0.004400	0.003500	0.2223
14	0.2013	0.01110	0.04630	0	0.004000	0.002500	0.2194
15	0.2002	0.01320	0.04890	0	0.004300	0	0.2257
16	0.2019	0.01720	0.04380	0	0.004400	0	0.2604
17	0.2007	0.01720	0.05110	0.004100	0.004700	0.003200	0.2682
18	0.2004	0.01400	0.05410	0	0.005200	0.01010	0.2742
19	0.1974	0.02280	0.04900	0.006800	0.006900	0.01160	0.3159
20	0.2047	0.02250	0.03940	0	0.004600	0.01740	0.3624
21	0.2059	0.02520	0.04440	0	0.007000	0.02180	0.3494
22	0.2117	0.01770	0.05590	0	0.006200	0.01070	0.2804
23	0.3207	0	0.02000	0	0.001400	0.01650	0.3404
24	0.5521	0	0	0	0	0.01820	0.4301

Winter weekend

Hour	Heating & Ventilation	Freezer	Refrigerator	Clothes washer	Clothes dryer	Dish washer	Other
1	0.4555	0	0	0	0	0	0.4303

2	0.3676	0	0	0.004700	0.001100	0	0.3798
3	0.3123	0	0	0.02670	0.001900	0	0.3120
4	0.2852	0	0.01140	0.03340	0.001200	0	0.2464
5	0.2697	0.006400	0.02070	0.02700	0.002600	0	0.2269
6	0.2734	0.009500	0.02510	0.02290	0.002100	0	0.2234
7	0.2702	0.01610	0.02100	0.02330	0.004000	0	0.2485
8	0.2255	0.02950	0.05880	0	0.004400	0	0.2257
9	0.2268	0.03130	0.05860	0	0.005000	0	0.2483
10	0.2282	0.02730	0.05760	0	0.005100	0.006100	0.2461
11	0.2276	0.01550	0.05920	0	0.002700	0.009100	0.2478
12	0.2261	0.01340	0.05130	0.002000	0.001900	0.008200	0.2633
13	0.2188	0.01300	0.05020	0	0.002800	0.01010	0.2568
14	0.2168	0.01620	0.05290	0	0.003700	0.008700	0.2402
15	0.2137	0.01840	0.05640	0.005000	0.006000	0.005000	0.2404
16	0.2089	0.01990	0.06110	0	0.005000	0.007900	0.2864
17	0.2098	0.03260	0.05630	0.01520	0.004200	0	0.2669
18	0.2079	0.03640	0.06730	0.02160	0.004100	0.004100	0.2975
19	0.2051	0.02960	0.04470	0.002600	0.006800	0.01170	0.4054
20	0.2092	0.02190	0.03520	0	0.003500	0.01600	0.4404
21	0.2159	0.01060	0.05090	0	0.003500	0.01930	0.3569
22	0.2167	0.01720	0.05930	0	0.002500	0.006500	0.2800
23	0.3085	0	0.007000	0	0.002400	0.01280	0.3630
24	0.5367	0.002900	0	0	0	0.007800	0.4521