

TABLE I  
RESPECTIVE WIND POWER SCENARIOS

Hour	Respective wind power scenario (MW)									
	1	2	3	4	5	6	7	8	9	10
1	132.5	140.2	134.6	133.6	139.6	140.5	133.3	137.4	142.4	138.4
2	125.2	119.7	118.9	122.4	129.1	128.9	130.7	130.3	119.3	121.3
3	123.6	111.6	115.2	114.8	121.5	116.2	113.4	117.4	121.4	123.7
4	137.8	135.2	134.3	129.9	142.2	134.4	134.6	137.8	141.2	141.9
5	118.6	112.9	113.7	111.7	116.0	123.2	113.3	121.7	120.2	115.6
6	102.3	98.9	95.9	97.0	102.2	95.3	101.5	102.9	100.3	98.8
7	94.6	95.1	86.9	90.9	91.3	89.4	92.2	87.7	95.5	91.4
8	81.9	87.5	89.3	81.0	83.1	82.7	88.8	83.3	80.4	82.8
9	106.1	106.4	101.3	104.4	105.3	110.2	108.9	105.7	107.2	103.3
10	102.3	103.9	105.4	112.1	106.3	102.7	104.9	102.1	109	103.5
11	123.1	117.6	115.5	126.6	122.5	116.2	123.9	126.8	127.4	124.5
12	136.9	136.6	140.5	135.5	146.5	133.7	135.2	137.3	143.9	138.2
13	199.2	200.8	197.5	197.4	197.2	189.6	204.9	192.1	206.4	195.9
14	182.6	188.1	182.8	181.9	181.8	183.1	179.1	187.5	188.7	190.8
15	178.4	191.3	188.6	189.2	176.1	183.1	182.6	189.4	178.3	191.8
16	178.7	183.6	176.5	175.4	180.7	182.4	172.6	174.6	174.2	171.2
17	180.3	181.8	167.7	172.7	180.5	177.0	165.9	178.8	182.6	178.1
18	160.4	162.4	164.2	173.6	164.4	171.9	169.2	171.9	172.8	163.6
19	57.5	60.4	58.1	59.6	59.4	63.3	60.9	62.1	58.6	58.8
20	83.7	84.9	80.1	83.4	82.9	78.4	82.5	78.8	78.7	85.6
21	103.5	105.4	104.4	110.4	108.6	107.6	102.4	110.1	105.2	109.5
22	114.3	117.7	116.6	113.6	108.2	116.2	109.7	116.6	118.2	112.9
23	126.7	137.4	129.3	135.5	137.1	133.6	136.8	137.5	126.8	131.5
24	135.6	134.4	145.7	145.1	145.3	140.1	144.3	140.4	141.9	133.8

TABLE II  
TRANSMISSION LINE CHARACTERISTICS

Line No.	Initial bus	Terminal bus	Impedance (p.u.)	Power flow limit (MW)
1	1	2	0.17	250
2	1	5	0.258	180
3	2	3	0.15	175
4	2	4	0.197	185
5	2	5	0.14	225
6	3	4	0.018	320
7	4	5	0.037	175
8	4	7	0.037	195
9	4	9	0.15	200
10	5	6	0.187	225
11	6	11	0.197	450
12	6	12	0.197	150
13	6	13	0.15	180
14	7	8	0.14	380
15	7	9	0.019	260
16	9	10	0.039	325
17	9	14	0.037	255
18	10	11	0.152	250
19	12	13	0.183	150
20	13	14	0.192	260

TABLE III  
ATMOSPHERE STRATIFICATION CLASS

Wind velocity (m/s)	Solar radiation		Cloudy/night	Cloudy night		
	S	M		W	Thin clouds	Cloudage $\leq$ 4/10
<2	A	A~B	B	D		
2~3	A~B	B	C	D	E	F
3~5	B	B~C	C	D	D	E
5~6	C	C~D	D	D	D	D
>6	C	D	D	D	D	D

TABLE IV  
HOURLY FORECASTED WIND POWER AND LOAD DISTRIBUTION

Hour	$P_w$ (MW)	Load (MW)								Hour	$P_w$ (MW)	Load (MW)							
		Bus 4	Bus 5	Bus 7	Bus 9	Bus 10	Bus 11	Bus 12	Bus 13			Bus 4	Bus 5	Bus 7	Bus 9	Bus 10	Bus 11	Bus 12	Bus 13
1	142.6	190.1	113.0	83.6	98.3	93.7	177.0	107.1	54.9	13	207.4	262.9	148.2	124.4	126.3	139.6	235.5	154.0	72.6
2	131.0	204.2	121.4	89.8	105.6	100.7	190.1	115.0	59.0	14	198.7	260.7	136.9	123.5	135.2	138.5	234.1	158.1	74.7
3	123.8	203.6	121.0	89.5	105.3	100.4	189.5	114.6	58.8	15	193.0	263.5	128.5	124.7	136.6	139.9	236.0	154.3	66.3
4	142.6	205.4	122.1	90.3	106.2	101.3	191.2	115.6	59.3	16	185.7	249.6	118.4	109.8	129.1	123.1	223.1	140.6	72.1
5	123.8	207.4	123.3	91.2	107.2	102.3	193.0	116.8	59.9	17	184.3	225.5	114.1	99.2	116.6	111.3	219.9	127.0	65.1
6	105.1	212.1	126.1	93.3	109.7	104.6	197.4	119.4	61.2	18	174.2	214.1	127.2	94.2	110.7	105.6	199.2	120.5	61.8
7	96.5	237.2	141.0	104.3	122.6	117.0	220.8	133.6	68.5	19	63.5	246.1	136.3	108.3	127.3	121.4	229.1	165.8	85.0
8	89.3	251.9	149.7	110.8	130.3	124.3	215.9	141.9	72.8	20	86.5	205.9	122.4	90.6	106.5	101.6	191.7	116.0	59.5
9	110.9	236.0	146.2	108.2	127.2	121.3	225.2	138.5	71.0	21	110.9	211.2	125.5	92.8	109.1	104.1	196.5	118.9	61.0
10	112.3	233.9	135.0	99.9	117.4	111.3	227.8	137.4	70.4	22	119.5	245.6	146.0	108.0	127.0	121.2	228.6	138.3	70.9
11	128.2	267.7	145.0	122.1	133.6	137.0	221.3	156.3	73.8	23	138.2	197.4	117.3	86.8	102.1	97.3	183.7	111.1	57.0
12	148.3	254.6	149.2	125.2	137.2	140.4	247.0	160.3	69.4	24	146.9	191.7	113.9	84.3	99.1	94.6	178.4	108.0	55.4

TABLE V  
PARAMETERS OF ENERGY STORAGE

Storage no.	$\bar{P}_s^{\text{dis}}$ (MW)	$P_s^{\text{dis}}$ (MW)	$\bar{P}_s^{\text{ch}}$ (MW)	$P_s^{\text{ch}}$ (MW)	Capacity (MWh)	$E_{s0}$ (%)	$\bar{E}_s$ (%)	$E_s$ (%)	$\Delta E_s$ (%)	$\eta_s^{\text{ch}}$	$\eta_s^{\text{dis}}$	Bus
1	120	5	120	5	400	40	95	20	18	0.95	0.95	7

TABLE VI  
PREDICTED WEATHER CONDITIONS NEAR COAL-FIRED POWER PLANTS

Hour	Unit 1			Unit 7			Unit 3			Unit 2			Unit 5			Unit 6		
	rate (km/h)	vector (°)	$\zeta$	rate (km/h)	vector (°)	$\zeta$	rate (km/h)	vector (°)	$\zeta$	rate (km/h)	vector (°)	$\zeta$	rate (km/h)	vector (°)	$\zeta$	rate (km/h)	vector (°)	$\zeta$
1	7.6	292	D	8.6	337	F	3.2	310	E	15.2	290	E	13.1	290	D	13.2	20	E
2	8.3	285	D	8.4	343	F	4.3	333	E	15.4	295	E	13.4	284	D	14.2	18	E
3	7.8	281	D	8.5	349	F	4.3	323	E	15.0	301	E	12.9	280	D	13.5	15	E
4	6.9	275	D	7.9	356	F	4.6	320	E	14.2	304	E	12.4	283	D	13.7	7	E
5	6.4	276	D	7.5	348	F	4.2	317	E	14.9	310	E	12.1	286	D	13.0	9	E
6	6.2	271	D	6.5	355	F	5.3	304	E	14.0	312	E	11.5	291	D	12.2	4	E
7	5.3	270	F	5.5	357	D	5.6	302	D	14.1	318	F	10.5	283	F	11.0	354	F

8	5.0	270	F	5.3	355	D	4.9	305	D	14.1	317	F	10.4	276	F	11.0	350	F
9	5.1	274	F	5	355	D	6.3	311	D	14.3	316	F	10.2	273	F	11.2	359	F
10	5.2	277	F	5.1	5	D	5.3	313	D	14.5	315	F	10.7	269	F	11.3	2	F
11	5.4	275	F	5.3	4	D	4.3	315	D	14.6	315	F	10.3	268	F	11.1	8	F
12	5.0	269	F	5.4	358	D	5.1	305	D	14.3	320	F	10.2	271	F	11.5	355	F
13	5.3	268	F	5.9	3	F	6.3	298	F	14.2	310	E	10.2	270	C	11.6	357	E
14	5.3	270	F	5.7	356	F	6.4	295	F	14.2	319	E	10.3	275	C	10.8	354	E
15	4.9	274	F	5.1	2	F	7.3	290	F	14.5	316	E	10.4	276	C	10.9	7	E
16	5.1	275	F	5.2	3	F	6.3	285	F	14.3	315	E	10.1	273	C	10.8	3	E
17	5.0	272	F	5	355	F	5.3	294	F	14.3	315	E	10.1	275	C	11.1	355	E
18	5.5	274	F	5.2	360	D	4.2	303	E	14.1	319	D	10.2	276	C	11.0	355	D
19	5.5	279	D	5.6	355	D	6.3	300	E	15.5	310	D	12.4	273	C	11.8	358	D
20	6.1	281	D	6.3	352	D	5.9	322	E	15.9	308	D	12.6	276	C	11.9	360	D
21	6.4	284	D	6.5	356	D	5.5	318	E	16.5	304	D	11.9	284	C	12.5	360	D
22	7.4	295	D	7.0	354	D	5.9	323	E	17.5	310	D	11.0	297	C	13.4	345	D
23	7.9	292	D	7.5	331	D	6.0	325	E	17.9	296	D	12.6	292	C	14.5	339	D
24	8.0	296	D	7.2	345	D	6.3	316	E	16.5	292	D	12.9	302	C	14.6	331	D

TABLE VII  
PREDEFINED VALUES OF  $\rho_{mt}$  IN DIFFERENT URBAN REGIONS

Region	Predefined values for hourly $\rho_{mt}$																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A1	0.75	0.75	0.7	0.7	0.7	0.75	0.85	0.85	1.2	1	1	1.2	1.2	1	1	1	1	1.2	1.2	1.2	1.2	0.85	0.75	0.75
B1	0.75	0.7	0.7	0.7	0.7	0.7	0.75	0.75	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	1	0.85	0.85	0.75	0.75
B2	0.75	0.75	0.7	0.75	0.75	0.75	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	1	1	0.85	0.85	0.75	0.75	
B3	0.75	0.75	0.7	0.7	0.7	0.7	0.75	0.75	0.85	1	0.85	0.85	0.85	0.75	0.75	0.75	0.75	0.85	0.85	1	1	0.85	0.75	0.75
B4	0.75	0.75	0.7	0.7	0.7	0.7	0.85	0.85	0.85	1	1	0.85	0.85	0.85	0.85	0.85	1	1	1	0.85	0.85	0.75	0.75	0.75

TABLE VIII  
PREDICTED AIR POLLUTION LEVELS IN DIFFERENT URBAN REGIONS

Region	Hourly day-ahead pollution levels*																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A1	MH	MH	H	H	H	MH	M	M	U	US	US	U	U	US	US	US	US	U	U	U	U	M	MH	MH
B1	MH	H	H	H	H	H	MH	MH	M	M	M	M	M	M	M	M	M	M	M	US	M	M	MH	MH
B2	MH	MH	H	MH	MH	MH	M	M	M	M	M	M	M	M	M	M	M	M	US	US	M	M	MH	MH
B3	MH	MH	H	H	H	H	MH	MH	M	US	M	M	M	MH	MH	MH	MH	M	M	US	US	M	MH	MH
B4	MH	MH	H	H	H	H	M	M	M	US	US	M	M	M	M	M	US	US	US	M	M	MH	MH	MH

\*From the worst to the best air condition: unhealthy (U), unhealthy for sensitive people (US), moderate (M), moderately healthy (MH) and healthy (H)