

表 A1 竞价机组中长期交易相关参数

机组 编号	$E^{trade}$ /(MW·h)	$E_{x-l}^o$ /(MW·h)	$E_x^{max}$ /(MW·h)	$E_x^{min}$ /(MW·h)	$l_{x-l}^o$ /%	机组 编号	$E^{trade}$ /(MW·h)	$E_{x-l}^o$ /(MW·h)	$E_x^{max}$ /(MW·h)	$E_x^{min}$ /(MW·h)	$l_{x-l}^o$ /%
14	57200	34387	2400	100	60.12	37	57200	35552	2400	0	62.15
16	57200	33663	2400	800	58.85	40	114400	70417	4800	0	61.55
19	57200	34097	2400	400	59.61	43	171600	95204	7200	7200	55.48
21	143000	85655	6000	600	59.90	45	171600	101023	7200	2500	58.87
22	57200	32311	2400	2000	56.49	47	57200	35351	2400	0	61.80
24	114400	68051	4800	900	59.49	48	57200	34771	2400	0	60.79
27	240240	147745	10080	0	61.50	50	28600	17162	1200	100	60.01
28	240240	151351	8000	0	63.00	51	57200	34820	2400	0	60.87
30	45760	27908	1920	0	60.99	54	28600	17806	1200	0	62.26
35	57200	35454	2400	0	61.98						
合约完成进度方差										3.5278	

表A2 机组CO<sub>2</sub> 排放系数

机组	a	b	c	机组	a	b	c
1	70.0288	10.1083	0.0105	28	244.0042	11.4073	0.00264
2	140.0576	9.1083	0.0053	29	200.3179	10.0031	0.00343
3	112.3179	10.8416	0.00876	30	323.5475	8.8616	0.00199
4	189.6272	9.3016	0.00267	31	70.0288	13.1083	0.01059
5	130.0021	8.6121	0.00505	32	140.0576	13.1083	0.0053
6	260.0042	9.6121	0.00253	33	112.3179	10.8416	0.00876
7	34.3891	10.542	0.02533	34	189.6272	9.3016	0.00267
8	68.7782	9.542	0.01266	35	70.0288	13.1083	0.01059
9	61.298	14.3272	0.01359	36	140.0576	13.1083	0.0053
10	134.1259	13.5073	0.00962	37	112.3179	10.8416	0.00876
11	70.0288	13.1083	0.01059	38	189.6272	9.3016	0.00267
12	140.0576	13.10830	0.0053	39	70.0288	13.1083	0.01059
13	112.3179	10.8416	0.00876	40	140.0576	13.1083	0.0053
14	189.6272	9.3016	0.00267	41	112.3179	10.8416	0.00876
15	130.0021	10.6121	0.00505	42	189.6272	9.3016	0.00267
16	260.0042	10.6121	0.00253	43	58.131	14.4921	0.01736
17	190.176	9.8416	0.00278	44	116.262	14.4921	0.00866
18	406.9102	7.5121	0.00143	45	72.6481	12.5752	0.01328
19	58.131	14.4921	0.01736	46	129.7552	11.28	0.00588
20	116.262	14.4921	0.00866	47	58.131	14.4921	0.01736
21	72.6481	12.5752	0.01328	48	116.262	14.4921	0.00866
22	129.75520	11.0800	0.00588	49	72.6481	12.5752	0.01328
23	55.5959	13.7154	0.01288	50	129.7552	11.28	0.00588

24	111.1918	13.7154	0.00644	51	122.0021	11.4073	0.00528
25	98.6485	11.9637	0.00823	52	244.0042	11.4073	0.00264
26	184.3879	10.7367	0.00473	53	200.3179	10.0031	0.00343
27	122.0021	11.4073	0.00528	54	323.5475	8.8616	0.00199

表 A3 机组SO<sub>2</sub> 排放系数

机组	a	b	c	机组	a	b	c
1	0	0	0	28	12.832	1.66783	0.002118088
2	0	0	0	29	1.356	2.5775	0.002175
3	0	0	0	30	14.866	3.094155	0.009184549
4	0	0	0	31	6.334	5.2487640	0.01393258
5	0	0	0	32	4.7505	3.936573	0.01044944
6	0	0	0	33	2.6925	5.654519	0.004245283
7	0	0	0	34	1.5225	2.673	0.00192
8	0	0	0	35	1.5225	2.673	0.00192
9	11.0845	9.185337	0.02438202	36	1.0170	1.9331250	0.001631250
10	11.0845	9.185337	0.02438202	37	0	0	0
11	2.373	4.510625	0.00380625	38	0	0	0
12	11.536	3.766	0.00105	39	0	0	0
13	0	0	0	40	0	0	0
14	0	0	0	41	0	0	0
15	9.501	7.873146	0.02089888	42	0	0	0
16	3.045	5.346	0.00384	43	0	0	0
17	9.501	7.873146	0.02089888	44	0	0	0
18	9.501	7.873146	0.02089888	45	0	0	0
19	0	0	0	46	0	0	0
20	0	0	0	47	0	0	0
21	7	3.082474	0.000600343	48	0	0	0
22	2.5375	4.455	0.0032	49	0	0	0
23	2.5375	4.455	0.0032	50	0	0	0
24	9.75	3.3225	0.0011	51	0	0	0
25	0	0	0	52	0	0	0
26	0	0	0	53	0	0	0
27	0	0	0	54	0	0	0

表 A4 机组NO<sub>x</sub> 排放系数

机组	a	b	c	机组	a	b	c
1	0	0	0	28	5.1328	0.667131	0.000847
2	0	0	0	29	0.542	1.03	0.00087
3	0	0	0	30	5.9464	1.2376	0.00367
4	0	0	0	31	2.5336	2.0995	0.00557
5	0	0	0	32	1.9002	1.57462900000000	0.004179

6	0	0	0	33	1.077	2.2618	0.001698
7	0	0	0	34	0.609	1.069	0.000768
8	0	0	0	35	0.609	1.0692	0.000768
9	4.4338	3.674135	0.009752809	36	0.4068	0.77325	0.000652
10	4.4338	3.674135	0.009752809	37	0	0	0
11	0.9492	1.80425	0.0015225	38	0	0	0
12	4.61440	1.5064	0.00042	39	0	0	0
13	0	0	0	40	0	0	0
14	0	0	0	41	0	0	0
15	3.8004	3.149258	0.00835955	42	0	0	0
16	1.218	2.1384	0.001536	43	0	0	0
17	3.8004	3.149258	0.00835955	44	0	0	0
18	3.8004	3.149258	0.00835955	45	0	0	0
19	0	0	0	46	0	0	0
20	0	0	0	47	0	0	0
21	2.80	1.23299	0.00024	48	0	0	0
22	1.015	1.7820	0.00128	49	0	0	0
23	1.015	1.782	0.00128	50	0	0	0
24	3.90	1.329	0.00044	51	0	0	0
25	0	0	0	52	0	0	0
26	0	0	0	53	0	0	0
27	0	0	0	54	0	0	0

表 A5 启动和停机过程中的成本与污染气体排放量

机组	成本/\$		污染气体排放量/lbs		机组	成本/\$		污染气体排放量/lbs	
	启动	停机	启动	停机		启动	停机	启动	停机
1	736.5971	368.2986	736.5971	368.2986	28	2810.849	1405.425	2810.849	1405.425
2	750.7142	375.3571	750.7142	375.3571	29	1404.28	702.14	1404.28	702.14
3	656.13	328.065	656.13	328.065	30	863.5083	431.7542	863.5083	431.7542
4	7939.77	3969.885	7939.77	3969.885	31	1192.883	596.4417	1192.883	596.4417
5	1640.081	820.0404	1640.081	820.0404	32	1192.883	596.4417	1192.883	596.4417
6	672.8696	336.4348	672.8696	336.4348	33	1174.325	587.1627	1174.325	587.1627
7	676.2979	338.149	676.2979	338.149	34	933.15	466.575	933.15	466.575
8	565.9632	282.9816	565.9632	282.9816	35	933.15	466.575	933.15	466.575
9	1192.883	596.4417	1192.883	596.4417	36	7782.68	3891.34	7782.68	3891.34
10	1404.28	702.14	1404.28	702.14	37	933.15	466.575	933.15	466.575
11	1138.96	569.48	1138.96	569.48	38	1192.883	596.4417	1192.883	596.4417
12	1192.883	596.4417	1192.883	596.4417	39	5348.16	2674.08	5348.16	2674.08
13	1192.883	596.4417	1192.883	596.4417	40	6901.78	3450.89	6901.78	3450.89
14	933.15	466.575	933.15	466.575	41	1174.325	587.1627	1174.325	587.1627
15	1192.883	596.4417	1192.883	596.4417	42	1111.005	555.5024	1111.005	555.5024
16	933.15	466.575	933.15	466.575	43	1404.28	702.14	1404.28	702.14

17	1192.883	596.4417	1192.883	596.4417	44	1404.28	702.14	1404.28	702.14
18	1192.883	596.4417	1192.883	596.4417	45	1555.993	777.9963	1555.993	777.9963
19	1106.087	553.0434	1106.087	553.0434	46	1174.325	587.1627	1174.325	587.1627
20	1285.003	642.5017	1285.003	642.5017	47	933.15	466.575	933.15	466.575
21	1285.003	642.5017	1285.003	642.5017	48	933.15	466.575	933.15	466.575
22	933.15	466.575	933.15	466.575	49	1174.325	587.1627	1174.325	587.1627
23	933.15	466.575	933.15	466.575	50	1111.005	555.5024	1111.005	555.5024
24	1412	706	1412	706	51	933.15	466.575	933.15	466.575
25	1412	706	1412	706	52	933.15	466.575	933.15	466.575
26	933.15	466.575	933.15	466.575	53	933.15	466.575	933.15	466.575
27	2810.849	1405.425	2810.849	1405.425	54	1111.005	555.5024	1111.005	555.5024

表 A6 机组成本参数

机组	a	b	c	机组	a	b	c
1	34.3891	16.542	0.02533	28	68.7782	17.82	0.012660
2	68.7782	16.542	0.01266	29	6.7800	12.8875	0.0108750
3	61.298	14.3272	0.01359	30	74.330	15.4707	0.045922
4	134.1259	13.5073	0.00962	31	31.67	26.2438	0.0696
5	70.0288	13.1083	0.01059	32	31.67	26.2438	0.069662
6	140.0576	13.1083	0.00530	33	17.95	37.696	0.028301
7	112.3179	10.8416	0.008760	34	10.15	17.82	0.01280
8	189.6272	9.3016	0.002670	35	10.150	17.820	0.0128
9	31.67	26.2438	0.069662	36	6.780	12.887	0.010875
10	6.780	12.8875	0.010875	37	10.150	17.82	0.0128
11	32.960	10.76	0.00300	38	31.67	26.24	0.06966
12	31.670	26.243	0.069662	39	32.90	10.760	0.00300
13	31.670	26.243	0.06966	40	6.780	12.8875	0.010875
14	10.150	17.82	0.01280	41	17.950	37.696	0.0283018
15	31.670	26.243	0.06966	42	58.810	22.94225	0.00977
16	10.150	17.820	0.01280	43	6.780	12.8870	0.010875
17	31.670	26.243	0.06966	44	6.780	12.88750	0.010875
18	31.67	26.2438	0.06966	45	6.7800	12.887	0.010875
19	10.15	17.820	0.01280	46	17.9500	37.69	0.02830188
20	28	12.3298	0.00240	47	10.1500	17.820	0.01280
21	28	12.3298	0.00240	48	10.15	17.820	0.01280
22	10.15	17.820	0.01280	49	17.95	37.6967	0.0283018
23	10.15	17.820	0.0128	50	58.810	22.9422	0.009774
24	39	13.2900	0.0044	51	10.150	17.820	0.01280
25	39	13.290	0.00440	52	10.15	17.820	0.01280
26	10.15	17.820	0.0128	53	10.150	17.820	0.01280
27	34.389	22.9422	0.0253	54	58.8100	22.9422	0.00977

表 A7 天然气网络节点气压

node	Minimum pressure/Psig	Maximum pressure /Psig
1	300	370
2	290	330
3	320	370
4	280	310
5	240	260
6	270	290
7	250	270
8	300	330
9	320	370
10	270	290