

Appendix

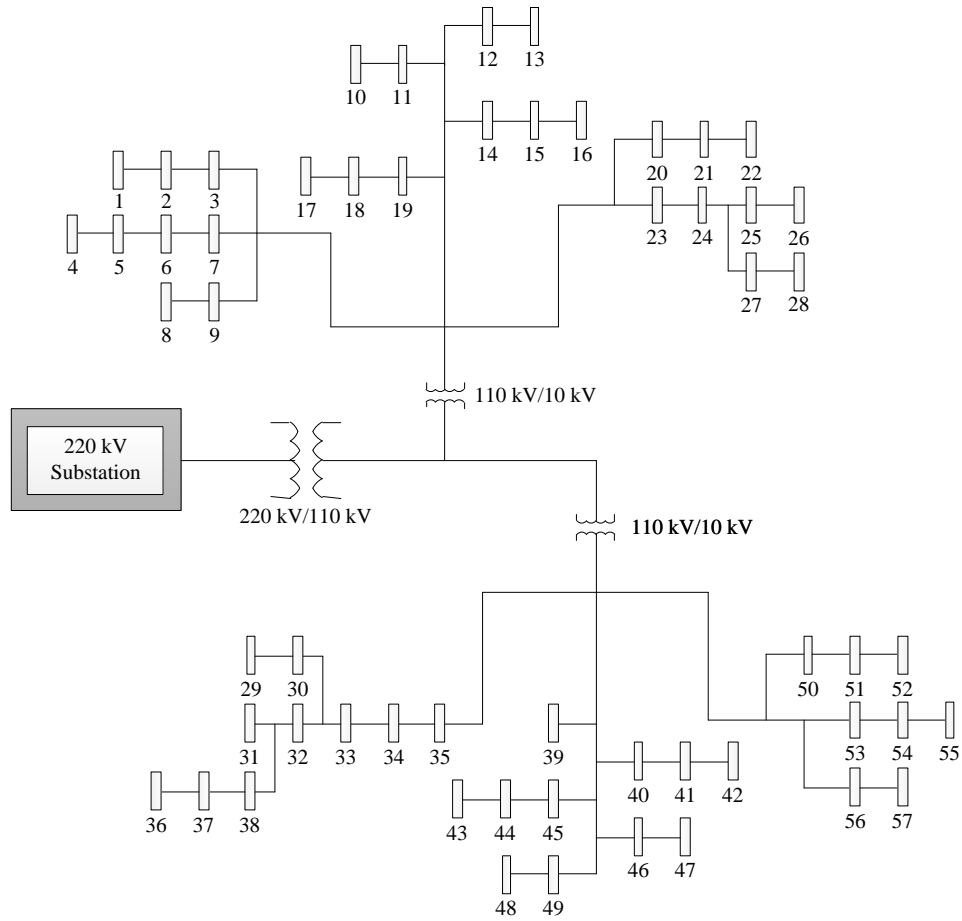


Fig. A1 Distribution network structure in planning area

Table A1 Node coordinates and load of each distribution network node

Distribution Network Node	Horizontal (km)	Vertical (km)	Load Power (MW)
1	0.313	10.670	2.15
2	1.893	10.662	1.92
3	3.756	10.684	1.63
4	4.688	8.926	1.82
5	2.801	8.056	2.16
6	1.328	8.108	1.74
7	1.406	8.074	1.67
8	5.312	6.696	1.96
9	5.938	7.702	2.34
10	5.326	10.861	2.15
11	7.188	10.947	1.65
12	9.219	11.025	1.88
13	11.094	11.213	1.72
14	5.942	9.625	1.64
15	8.281	9.637	1.95
16	9.219	8.925	2.24

Distribution Network Node	Horizontal (km)	Vertical (km)	Load Power (MW)
17	8.452	7.683	1.88
18	8.216	6.662	1.84
19	7.188	6.674	2.23
20	10.625	7.700	2.26
21	11.252	8.784	1.75
22	12.255	10.742	1.86
23	11.243	6.712	1.98
24	12.789	7.788	1.74
25	12.778	9.675	1.71
26	14.375	10.694	1.85
27	14.375	7.716	2.15
28	14.688	9.188	2.08
29	2.813	5.075	1.77
30	2.808	7.002	1.65
31	0.409	4.985	2.12
32	1.617	4.753	1.86
33	3.734	3.588	1.68
34	5.154	4.226	1.73
35	6.048	5.124	1.96
36	1.438	2.888	2.19
37	3.774	2.013	1.93
38	5.163	1.313	2.16
39	6.081	3.204	1.77
40	7.188	4.113	2.48
41	8.828	3.544	1.92
42	9.683	5.513	2.06
43	11.277	5.526	1.84
44	12.678	6.298	1.97
45	14.695	6.428	2.02
46	11.367	4.338	1.95
47	11.875	3.294	1.58
48	8.754	6.133	1.84
49	14.063	4.550	2.26
50	14.441	2.964	1.98
51	12.344	2.182	2.03
52	14.063	0.364	1.87
53	11.563	0.358	2.13
54	10.781	1.225	1.85
55	10.646	1.248	1.91
56	8.162	2.127	2.08
57	7.032	1.304	1.96

Table B1 Information of network nodes in the road map

Transportation Network Node	Horizontal (km)	Vertical (km)	Transportation Network Node	Horizontal (km)	Vertical (km)
1	0.781	0.788	38	7.502	0.788
2	0.781	4.550	39	7.502	1.756
3	0.781	7.525	40	7.502	2.625
4	0.781	8.575	41	7.502	4.824
5	0.781	10.150	42	7.502	6.102
6	1.250	0.788	43	7.502	7.180
7	1.563	2.363	44	7.502	8.575
8	1.878	4.025	45	7.502	10.150
9	2.193	6.125	46	7.502	11.296
10	2.193	7.175	47	8.625	11.327
11	2.193	8.575	48	8.625	10.150
12	2.193	10.150	49	8.625	8.566
13	4.609	11.288	50	8.625	7.180
14	4.609	10.150	51	8.625	6.001
15	4.609	8.575	52	8.625	4.842
16	4.609	7.175	53	10.132	0.788
17	4.615	6.125	54	10.132	1.756
18	4.622	4.292	55	10.132	2.625
19	4.068	3.003	56	10.132	6.001
20	3.438	1.231	57	10.132	7.180
21	3.281	0.788	58	10.132	8.566
22	4.375	0.788	59	10.132	10.150
23	5.012	2.625	60	10.132	11.332
24	5.558	0.788	61	11.563	11.332
25	5.552	1.756	62	11.563	10.150
26	5.552	2.625	63	11.563	8.566
27	5.552	4.813	64	11.563	7.180
28	5.552	6.118	65	11.563	6.001
29	5.552	7.180	66	11.094	2.625
30	5.546	8.575	67	11.094	0.788
31	6.563	8.575	68	12.344	2.625
32	6.563	7.180	69	13.125	1.802
33	6.563	6.110	70	14.688	4.292
34	6.563	4.824	71	13.438	6.001
35	6.563	2.625	72	13.438	7.180
36	6.563	1.756	73	13.438	8.566
37	6.563	0.788	74	13.438	10.150

Table C1 Parameter values used in planning model

Number of Candidates	Horizontal (km)	Vertical (km)	Number of neighborhood distribution network	Distance /km
S-1	3.118	10.063	2	1.364
			3	0.890
			4	1.938
S-2	3.732	6.954	5	1.443
			8	1.601
			30	0.925
S-3	3.704	2.625	33	0.963
			37	0.616
S-4	7.701	2.812	41	1.344
			56	0.826
S-5	7.899	6.213	18	0.550
			19	0.847
S-6	9.065	7.614	17	0.617
S-7	11.164	9.188	21	0.413
S-8	11.250	8.487	24	1.690
			25	1.935
S-9	11.647	2.112	47	1.204
			51	0.701
S-10	12.656	4.113	46	1.308
			48	4.394

Table D1 Parameter values used in planning model

μ_d	σ_d	μ_s	σ_s	w_{100} , kW·h/(100 km)	
3.2	0.88	17.6	3.4	15	
$c_{i,t}^{\text{SEL}}$, RMB/kW·h	$c_{i,t}^{\text{PUR}}$, RMB/kW·h	c^{PRI} , RMB	c^{COE}	r_0	τ
0.6	0.35	100000	30000	0.1	20
A_i , m ² /RMB	c_{ia}^{LIN} , RMB/km	π	c^{CMS} , RMB	η	α
2000	400000	20	20	0.7	0.88
β	λ	T	NP	p_{\min}	p_{\max}
0.88	2.25	240	50	0.1	0.8
F_{RA}	F_{BE}	p_{RRA}	p_{RBE}		
0.5	0.5	0.1	0.9		