

Appendix

Table 1 Planning schemes of DS with different cases in the 33-node system

Planning year	Case	Capacity of substation (MW)	Type of lines									
			line-1	line-2	line-3	line-4	line-5	line-6	line-7	line-8	line-9	line-10
1	Case-1	5.22	4	3	2	2	2	1	1	1	1	1
	Case-2	4.68	3	3	2	2	2	1	1	2	2	2
2	Case-1	5.59	-	4	3	-	-	-	-	-	-	-
	Case-2	5.01	4	-	-	-	-	-	-	-	-	-
3	Case-1	5.98	5	-	-	3	3	-	-	-	-	-
	Case-2	5.35	-	-	-	-	-	-	-	-	-	-
4	Case-1	6.40	-	-	-	-	-	-	-	-	-	-
	Case-2	5.63	-	4	3	3	-	-	-	-	-	-
5	Case-1	6.84	6	5	-	-	-	2	-	-	-	-
	Case-2	5.82	5	-	-	-	-	-	-	-	-	-
Planning year	Case	line-11	line-12	line-13	line-14	line-15	line-16	line-17	line-18	line-19	line-20	line-21
1	Case-1	1	1	1	1	1	1	1	1	1	1	1
	Case-2	2	2	2	2	2	2	1	1	1	1	1
2	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
3	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
4	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
5	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
Planning year	Case	line-22	line-23	line-24	line-25	line-26	line-27	line-28	line-29	line-30	line-31	line-32
1	Case-1	1	1	1	1	1	1	1	1	1	1	1
	Case-2	1	1	1	1	1	1	1	1	1	1	1
2	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
3	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
4	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
5	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-

*The symbol “-” means that the line is not invested.

Table 2 Planning schemes of DS with different cases in the 99-node system

Planning year	Case	Capacity of substation (MW)	Type of lines									
			line-1	line-2	line-3	line-4	line-5	line-6	line-7	line-8	line-9	line-10
1	Case-1	8.39	3	1	1	1	1	1	1	1	1	1
	Case-2	8.01	3	1	1	1	1	1	1	1	1	1
2	Case-1	9.03	4	-	-	-	-	-	-	-	-	-
	Case-2	8.57	-	-	-	-	-	-	-	-	-	-
3	Case-1	9.62	-	-	-	-	-	-	-	-	-	-
	Case-2	9.17	4	-	-	-	-	-	-	-	-	-
4	Case-1	10.32	5	-	-	-	-	-	-	-	-	-
	Case-2	9.73	-	-	-	-	-	-	-	-	-	-
5	Case-1	11.03	-	-	-	-	-	-	-	-	-	-
	Case-2	10.72	5	-	-	-	-	-	-	-	-	-
Planning year	Case	line-11	line-12	line-13	line-14	line-15	line-16	line-17	line-18	line-19	line-20	line-21
1	Case-1	3	1	3	1	3	1	1	1	1	1	1
	Case-2	3	1	3	1	3	1	1	1	1	1	1
2	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
3	Case-1	4	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
4	Case-1	-	-	4	-	4	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
5	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	4	-	4	-	4	-	-	-	-	-	-
Planning year	Case	line-22	line-23	line-24	line-25	line-26	line-27	line-28	line-29	line-30	line-31	line-32
1	Case-1	1	1	2	1	1	1	1	2	1	1	1

2	Case-2	1	1	2	1	1	1	1	2	1	1	1
	Case-1	-	-	-	-	-	-	-	-	-	-	-
3	Case-2	-	-	-	-	-	-	-	-	-	-	-
	Case-1	-	-	-	-	-	-	-	-	-	-	-
4	Case-2	-	-	-	-	-	-	-	-	-	-	-
	Case-1	-	-	-	-	-	-	-	-	-	-	-
5	Case-2	-	-	3	-	-	-	-	3	-	-	-
	Case-1	-	-	-	-	-	-	-	-	-	-	-
Planning year	Case	line-33	line-34	line-35	line-36	line-37	line-38	line-39	line-40	line-41	line-42	line-43
1	Case-1	1	1	1	1	1	1	1	1	1	1	1
	Case-2	1	1	1	1	1	1	1	1	1	1	1
2	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
3	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
4	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
5	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
Planning year	Case	line-44	line-45	line-46	line-47	line-48	line-49	line-50	line-51	line-52	line-53	line-54
1	Case-1	1	1	1	1	1	1	1	1	1	3	3
	Case-2	1	1	1	1	1	1	1	1	1	3	2
2	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	3
3	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
4	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
5	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
Planning year	Case	line-55	line-56	line-57	line-58	line-59	line-60	line-61	line-62	line-63	line-64	line-65
1	Case-1	1	2	2	1	2	1	1	2	1	2	1
	Case-2	1	2	2	1	2	1	1	2	1	2	1
2	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
3	Case-1	-	3	3	-	3	-	-	-	-	-	-
	Case-2	-	3	3	-	3	-	-	-	-	-	-
4	Case-1	-	-	-	-	-	-	-	3	-	-	-
	Case-2	-	-	-	-	-	-	-	3	-	-	-
5	Case-1	-	-	-	-	-	-	-	-	-	3	-
	Case-2	-	-	-	-	-	-	-	-	-	3	-
Planning year	Case	line-66	line-67	line-68	line-69	line-70	line-71	line-72	line-73	line-74	line-75	line-76
1	Case-1	2	1	1	1	1	2	1	1	1	1	1
	Case-2	2	1	1	1	1	2	1	1	1	1	1
2	Case-1	-	-	-	-	-	-	-	2	-	-	-
	Case-2	-	-	-	-	-	-	-	2	-	-	-
3	Case-1	-	-	-	-	-	-	-	-	-	2	-
	Case-2	-	-	-	-	-	-	-	-	-	2	-
4	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
5	Case-1	3	-	-	-	-	-	-	-	-	-	-
	Case-2	3	-	-	-	-	-	-	-	-	-	-
Planning year	Case	line-77	line-78	line-79	line-80	line-81	line-82	line-83	line-84	line-85	line-86	line-87
1	Case-1	1	1	1	1	1	1	1	1	1	1	1
	Case-2	1	1	1	1	1	1	1	1	1	1	1
2	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
3	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
4	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
5	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
Planning year	Case	line-88	line-89	line-90	line-91	line-92	line-93	line-94	line-95	line-96	line-97	line-98
1	Case-1	1	1	1	1	1	1	1	1	1	1	1

[illegible]

Table 3 Planning schemes of DS with different uncertainty methods in the 33-node system

[illegible]**Table 4 Planning schemes of DS with different uncertainty methods in the 99-node system**[illegible]

Table 5 Planning schemes of DS with different decentralized solution methods in the 33-node system

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Table 6 Planning schemes of DS with different decentralized solution methods in the 99-node system

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