

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	10.09	8	7	5	5	5	2	2	2	2	2
	Case-2	8.65	4	4	3	3	2	1	1	1	1	1
	Case-3	8.53	4	4	3	3	2	1	1	1	1	1
2	Case-1	1.01	9	-	6	6	6	3	-	-	-	-
	Case-2	0.84	5	-	-	-	3	-	-	-	-	-
	Case-3	0.85	5	-	-	-	3	-	-	-	-	-
3	Case-1	1.11	-	9	7	-	-	-	3	-	-	-
	Case-2	0.95	6	5	-	-	-	2	-	-	-	-
	Case-3	0.94	6	5	-	-	-	2	-	-	-	-
4	Case-1	1.22	-	-	-	7	7	-	-	3	-	-
	Case-2	1.04	-	6	4	-	-	-	-	-	-	-
	Case-3	1.03	-	6	4	-	-	-	-	-	-	-
5	Case-1	1.34	-	-	-	-	-	4	-	-	3	-
	Case-2	1.15	7	-	-	4	4	-	2	-	-	-
	Case-3	1.14	7	-	-	4	4	-	2	-	-	-
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	1	1	1	1	1	1	1	1	1	1	1
	Case-3	1	1	1	1	1	1	1	1	1	1	1
2	Case-1	2	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
	Case-3	-	-	-	-	-	-	-	-	-	-	-
3	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
	Case-3	-	-	-	-	-	-	-	-	-	-	-
4	Case-1	-	2	-	-	-	-	-	2	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
	Case-3	-	-	-	-	-	-	-	-	-	-	-
5	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
	Case-3	-	-	-	-	-	-	-	-	-	-	-
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	2	2	1	1	1	1	1	1
	Case-2	1	1	1	1	1	1	1	1	1	1	1
	Case-3	1	1	1	1	1	1	1	1	1	1	1
2	Case-1	-	-	-	-	-	2	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
	Case-3	-	-	-	-	-	-	-	-	-	-	-
3	Case-1	2	-	-	-	-	-	2	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
	Case-3	-	-	-	-	-	-	-	-	-	-	-
4	Case-1	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-
	Case-3	-	-	-	-	-	-	-	-	-	-	-
5	Case-1	-	-	-	3	-	-	-	-	-	-	-

Case-2	2	-	-	2	-	-	-	-	-	-	-
Case-3	2	-	-	2	-	-	-	-	-	-	-

Table 2 Planning schemes of ES with different cases in the 33-node systemTable 3 Planning schemes of DS with different cases in the 99-node system[illegible]

[illegible]

[illegible]

5	Case-2	-	-	-	-	-	-	-	-	-	-	-	-	-
	Case-3	-	-	-	-	-	-	-	-	-	-	-	-	-
	Case-1	-	-	-	-	-	-	-	-	-	-	-	-	-
	Case-2	-	-	-	-	-	-	-	-	-	-	-	-	-
	Case-3	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 4 Planning schemes of ES with different cases in the 99-node system

Planning year		1			2			3			4			5		
Case		Case-1	Case-2	Case-3	Case-1	Case-2	Case-3	Case-1	Case-2	Case-3	Case-1	Case-2	Case-3	Case-1	Case-2	Case-3
Capacity (MW)	EC	\	6.14	8.15	\	0.61	2.83	\	0.67	0.90	\	0.75	0.99	\	0.81	1.08
	CST	\	40.25	39.52	\	4.03	3.22	\	4.44	4.35	\	4.89	4.78	\	5.14	5.26

Table 5 Planning schemes of DS with different confidence levels in the 33-node system

Confidence level	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
90%	10.09	8	7	5	5	5	2	2	2	2	2
80%	9.91	8	7	5	5	5	2	2	2	2	2
70%	9.83	8	7	5	5	5	2	2	2	2	2
60%	9.78	8	7	5	5	5	2	2	2	2	1
50%	9.74	7	7	5	5	5	2	2	2	2	1
Confidence level	line-11	line-12	line-13	line-14	line-15	line-16	line-17	line-18	line-19	line-20	line-21
90%	1	1	1	1	1	1	1	1	1	1	1
80%	1	1	1	1	1	1	1	1	1	1	1
70%	1	1	1	1	1	1	1	1	1	1	1
60%	1	1	1	1	1	1	1	1	1	1	1
50%	1	1	1	1	1	1	1	1	1	1	1
Confidence level	line-22	line-23	line-24	line-25	line-26	line-27	line-28	line-29	line-30	line-31	line-32
90%	1	1	1	2	2	1	1	1	1	1	1
80%	1	1	1	2	2	1	1	1	1	1	1
70%	1	1	1	2	2	1	1	1	1	1	1
60%	1	1	1	2	2	1	1	1	1	1	1
50%	1	1	1	2	1	1	1	1	1	1	1

Table 6 Planning schemes of DS with different confidence levels in the 99-node system

Confidence level	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
90%	17.23	9	1	1	1	1	1	1	1	1	1
80%	16.93	9	1	1	1	1	1	1	1	1	1
70%	16.79	9	1	1	1	1	1	1	1	1	1
60%	16.70	9	1	1	1	1	1	1	1	1	1
50%	16.64	9	1	1	1	1	1	1	1	1	1
Confidence level	line-11	line-12	line-13	line-14	line-15	line-16	line-17	line-18	line-19	line-20	line-21
90%	9	1	9	1	8	2	1	1	1	1	1
80%	9	1	9	1	8	2	1	1	1	1	1
70%	9	1	8	1	8	2	1	1	1	1	1
60%	9	1	8	1	8	2	1	1	1	1	1
50%	9	1	8	1	8	2	1	1	1	1	1
Confidence level	line-22	line-23	line-24	line-25	line-26	line-27	line-28	line-29	line-30	line-31	line-32
90%	1	1	6	1	1	1	1	5	1	1	1

