Dataset of 'Stochastic-Distributionally Robust Frequency-Constrained Dispatchable Resources Configuration for an Isolated Microgrid'

I. Parameters

TABLE I PARAMETERS IN THE SIMULATION

Symbol	Value	Symbol	Value
a^G	246 L/MWh	b^G	84.15 L/MWh
c^C	30 \$/t(CO_2)	c_E^I	258000 \$/MW
c_G^I	210000 \$/MW	c_F^I	243000 \$/MW
c_H^I	400000 \$/MW	c_G^O	0.05 \$/h
c_B^I	342000 \$/MW	c_F^O	10 \$/MWh
c_E^O	10 \$/MWh	c_B^O	10 \$/MWh
c_H^O	10 \$/MWh	c_B^R	\$18.53/MW/h
c_W^R	\$5.8/MW/h	c_G^R	\$21/MW/h
c_F^R	\$18.53/MW/h	c^U	0.43 \$/L
r	0.07	B^C	0.38 t(CO_2)/MWh
H^B	1.25 s	H^G	5 s
H^F	1.75 s	H^W	4 s
L	20 years	$RoCoF^{\max}$	0.5 Hz/s
T_{DB}	0.5 s	T_B	2 s
T_F	3 s	T_W	4 s
T_G	7 s	γ^B	0.04
γ^G	0.0028 t(CO_2)/L	ε^W	0.05
λ^W	0.05	η^{B+}	0.95
η^{B-}	0.95	η^F	0.7
η^E	0.6	κ^H	40 MWh/t(H_2)
υ^B	0.4	$\Delta f^{\max}$	0.5 Hz

II. Configurations of the 15-node microgrid

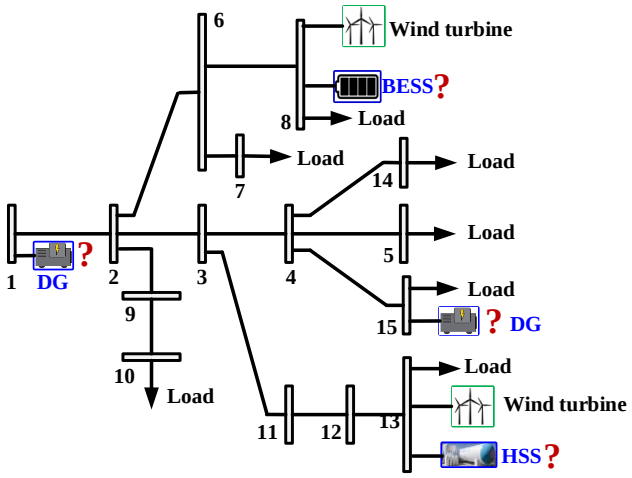

Fig. 1 Topology of the 15-node microgrid

TABLE II CAPACITY OF INSTALLED WIND FARMS IN THE 15-NODE MICROGRID

Bus No.	Capacity (MW)
8	4
13	4

TABLE III BUS DATA OF THE 15-NODE MICROGRID

Bus No.	Active power (MW)	Reactive power (MVar)
1	0	0
2	0.441	0.1125
3	0.700	0.1785
4	1.400	0.3570
5	0.441	0.1125
6	1.400	0.3570
7	1.400	0.3570
8	0.700	0.1785
9	0.700	0.1785
10	0.441	0.1125
11	1.400	0.3570
12	0.700	0.1785
13	0.441	0.1125
14	0.700	0.1785
15	1.400	0.3570

Bus No.	Active power (MW)	Reactive power (MVar)
Total	12.264	3.1275

TABLE IV BRANCH DATA OF THE 15-NODE MICROGRID

Branch No.	From bus	To bus	Resistance (p.u.)	Reactance (p.u.)
1	1	2	0.7766	0.7596
2	2	3	0.6716	0.6569
3	3	4	0.4827	0.4722
4	4	5	0.8744	0.5898
5	2	9	1.1554	0.7793
6	9	10	0.9680	0.6529
7	2	6	1.4677	0.9900
8	6	7	0.6245	0.4213
9	6	8	0.7182	0.4844
10	3	11	1.0305	0.6951
11	11	12	1.4052	0.9478
12	12	13	1.1554	0.7793
13	4	14	1.2803	0.8636
14	4	15	0.6870	0.4634

III. Configurations of the 33-node microgrid

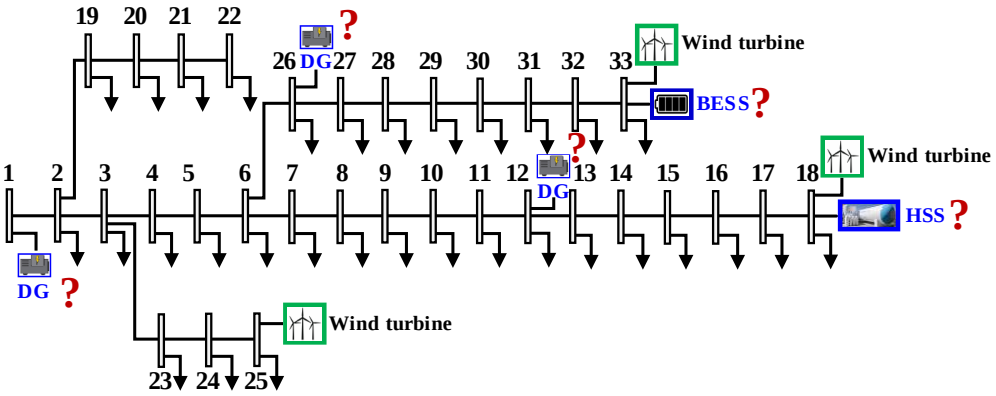

Fig. 2 Topology of the 33-node microgrid

TABLE V CAPACITY OF INSTALLED WIND FARMS IN THE 33-NODE MICROGRID

Bus No.	Capacity (MW)
18	5.5
25	3.5
33	3.5

TABLE VI BUS DATA OF THE 33-NODE MICROGRID

Bus No.	Active power (MW)	Reactive power (MVar)
1	0	0
2	0.6667	0.3000
3	0.6000	0.2000
4	0.8000	0.4000
5	0.4000	0.1500
6	0.4000	0.1000
7	1.3333	0.5000
8	1.3333	0.5000
9	0.4000	0.1000
10	0.4000	0.1000
11	0.3000	0.1500
12	0.4000	0.1750
13	0.4000	0.1750
14	0.8000	0.4000
15	0.4000	0.0500

Bus No.	Active power (MW)	Reactive power (MVar)
16	0.4000	0.1000
17	0.4000	0.1000
18	0.6000	0.2000
19	0.6000	0.2000
20	0.6000	0.2000
21	0.6000	0.2000
22	0.6000	0.2000
23	0.6000	0.2500
24	2.8000	1.0000
25	2.8000	1.0000
26	0.4000	0.1250
27	0.4000	0.1250
28	0.4000	0.1000
29	0.8000	0.3500
30	1.3333	3.0000
31	1.0000	0.3500
32	1.4000	0.5000
33	0.4000	0.2000
Total	24.7666	11.5000

TABLE VII BRANCH DATA OF THE 33-NODE MICROGRID

Branch No.	From bus	To bus	Resistance (p.u.)	Reactance (p.u.)
1	1	2	0.0922	0.0470
2	2	3	0.4930	0.2511
3	3	4	0.3660	0.1864
4	4	5	0.3811	0.1941
5	5	6	0.8190	0.7070
6	6	7	0.1872	0.6188
7	7	8	1.7114	1.2351
8	8	9	1.0300	0.7400
9	9	10	1.0440	0.7400
10	10	11	0.1966	0.0650
11	11	12	0.3744	0.1238

Branch No.	From bus	To bus	Resistance (p.u.)	Reactance (p.u.)
12	12	13	1.4680	1.1550
13	13	14	0.5416	0.7129
14	14	15	0.5910	0.5260
15	15	16	0.7463	0.5450
16	16	17	1.2890	1.7210
17	17	18	0.7320	0.5740
18	2	19	0.1640	0.1565
19	19	20	1.5042	1.3554
20	20	21	0.4095	0.4784
21	21	22	0.7089	0.9373
22	3	23	0.4512	0.3083
23	23	24	0.8980	0.7091
24	24	25	0.8960	0.7011
25	6	26	0.2030	0.1034
26	26	27	0.2842	0.1447
27	27	28	1.0590	0.9337
28	28	29	0.8042	0.7006
29	29	30	0.5075	0.2585
30	30	31	0.9744	0.9630
31	31	32	0.3105	0.3619
32	32	33	0.3410	0.5302
33	21	8	2.0000	2.0000
34	9	15	2.0000	2.0000
35	12	22	2.0000	2.0000
36	18	33	0.5000	0.5000
37	25	29	0.5000	0.5000