Dataset of "A Frequency-Secured Planning Method for Integrated Electricity-Heat Microgrids with Virtual Inertia Suppliers"

I. Configurations of Test System

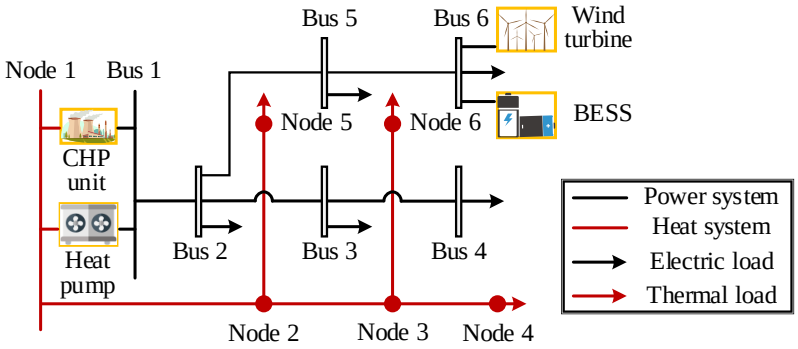

Fig. 1 Topology of Test System

TABLE I BUS DATA OF THE 6-BUS POWER GRID

Bus No.	Active power (MW)	Reactive power (MVar)
1	0	0
2	0.4410	0.1125
3	0.7000	0.1785
4	1.4000	0.3570
5	0.4410	0.1125
6	1.4000	0.3570
Total	4.3820	1.1175

TABLE II BRANCH DATA OF THE 6-BUS POWER GRID

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	2	5	0.8744	0.5898
5	5	6	1.1554	0.7793

TABLE III NODE DATA OF THE 6-NODE THERMAL NETWORK

Bus No.	Heat power (MW)
1	0
2	0
3	0
4	1.0000
5	1.0000
6	1.0000
Total	3.0000

TABLE IV PIPELINE DATA OF THE 6-NODE THERMAL NETWORK

Branch No.	From bus	To bus	Length (m)	Diameter (m)	Conductivity (W/(m°C))	Mass flow rate (kg/s)
1	1	2	2500.00	0.25	0.25	35.00
2	2	3	1200.00	0.20	0.25	20.00
3	3	4	500.00	0.15	0.25	10.00
4	2	5	850.00	0.17	0.25	15.00
5	3	6	700.00	0.15	0.25	10.00

II. Parameters

TABLE IX PARAMETERS IN SIMULATION

Symbol	Value	Symbol	Value
a_1, a_2, a_3, a_4, a_5	-0.1120, 0.1015, 5.0906, -41.2200, 2.6340	b_1, b_2, b_3, b_4	0.0106, 1.9099e-5, 5.0611e-4, 2.8648e-5
B^{C}	0.234 t(CO_2)/MWh	c^{C}	30 \$/t(CO_2)
c_G^{I}	1000000 \$/MW	c_H^{I}	450000 \$/MW
c_W^{I}	1000000 \$/MW	c_B^{I}	342000 \$/MW
c_B^{O}	10 \$/MWh	$c_H^{O,fix}$, c_H^{O}	0, 10\$/MWh
c_B^{R}	25 \$/(MW/h)	c_W^{R}	5.8 \$/(MW/h)
c_G^{R}	21 \$/(MW/h)	c_H^{R}	20 \$/(MW/h)
f_0	50 Hz	I^{G}	5 s
I^{B}	1.5 s	L	20 years
N_s, N_t	6, 24	r	0.07
RU^{G}, RD^{G}	0.9, 0.9	$RoCoF^{max}$	0.5 Hz/s
$\tan\beta_1^{G}$, $\tan\beta_2^{G}$, β_3^{G}	0.46, 0.12, 0.4	t_G^{DB}, t_W^{DB}, t_H^{DB}, t_B^{DB}	0.5 s, 0, 0, 0
T_G, T_W, T_H, T_B	7 s, 4 s, 15 s, 2s	α_1^{H}, α_2^{H}	14.6141e-6, -0.2297e-6
α_1^{W}, α_2^{W}	4.2662, 0.0597	$\alpha_{G,1}^{O}$, $\alpha_{G,2}^{O}$, $\alpha_{G,3}^{O}$	15 \$/h, 45 \$/MW, 20 \$/MW
γ^{B}	0.04	η^{B+}, η^{B-}	0.95, 0.95
ε^{W}	0.05	υ^{B}	0.4
χ^{E}, χ^{H}	0.32 t(CO_2)/MWh, 0.51 t(CO_2)/MWh	ψ^{W}	0.05
Δf^{max}	0.8 Hz	Δt	1 h
Φ^{on}, Φ^{off}	2h, 1h		