Table I Unit technical parameters

Unit	G1	G2	G3	G4	G5	G6	G7	G8	G9
P_{max} (MW)	150	150	150	150	150	150	150	150	150
P_{min} (MW)	10	10	10	10	10	10	10	10	10
Up ramp speed (MW/h)	100	50	50	100	50	50	100	50	50
Down ramp speed (MW/h)	100	50	50	100	50	50	100	50	50

Table II Parameters of power transmission branch

Branch	From Bus	To Bus	X (p.u.)	Flow Limit (MW)
Line 1	1	2	0.17	200
Line 2	1	4	0.258	200
Line 3	2	3	0.197	200
Line 4	2	4	0.14	200
Line 5	3	6	0.037	200
Line 6	4	5	0.037	200
Line 7	5	6	0.018	200
Line 8	1	16	0.018	200
Line 9	3	7	0.018	200
Line 10	7	8	0.17	200
Line 11	7	10	0.258	200
Line 12	8	9	0.197	200
Line 13	8	10	0.14	200
Line 14	9	12	0.037	200
Line 15	10	11	0.037	200
Line 16	11	12	0.018	200
Line 17	9	18	0.018	200
Line 18	13	14	0.17	200
Line 19	13	16	0.258	200
Line 20	14	15	0.197	200
Line 21	14	16	0.14	200
Line 22	15	18	0.037	200
Line 23	16	17	0.037	200
Line 24	17	18	0.018	200

Table III Parameters of natural Gas Supplier

Supplier No.	Node No.	Min Output (kcf/h)	Max Output (kcf/h)	Up ramp speed (kcf/h)	Down ramp speed (kcf/h)
1	4	100	1500	700	700
2	6	100	1200	700	700
3	10	100	1050	500	500
4	12	100	1400	500	500
5	16	100	1050	500	500
6	18	100	1400	500	500

Table IV Parameters of gas pipeline

Index	From Node	To Node	C (kcf/Psig)
Pipe 1	1	2	25.3
Pipe 2	2	4	25.05
Pipe 3	2	5	18.75
Pipe 4	3	5	21.75
Pipe 5	5	6	22.65
Pipe 6	4	14	20
Pipe 7	6	10	20
Pipe 8	7	8	25.3
Pipe 9	8	10	25.05
Pipe 10	8	11	18.75
Pipe 11	9	11	21.75
Pipe 12	11	12	22.65
Pipe 13	12	16	20
Pipe 15	13	14	25.3
Pipe 16	14	16	25.05
Pipe 17	14	17	18.75
Pipe 18	15	17	21.75
Pipe 19	17	18	22.65

Table IV Parameters of Nodes in Gas Transmission system

Node No.	Min-Pressure (Psig)	Max-Pressure (Psig)
1	52.5	60
2	60	67.5
3	62.5	70
4	67.5	77.5
5	70	77.5
6	77.5	87.5
7	52.5	60
8	60	67.5
9	62.5	70
10	67.5	77.5

11	70	77.5
12	77.5	87.5
13	52.5	60
14	60	67.5
15	62.5	70
16	67.5	77.5
17	70	77.5
18	77.5	87.5

Table V Parameters of wind farm

	W1	W2	W3
Rate Capacity (MW)	100	100	100

Table VI Other parameters

ϕ_j (kcf/MW)	N_{sa}	$gf_{4,14}^{max}$ (kcf)	$gf_{6,10}^{max}$ (kcf)	$gf_{12,16}^{max}$ (kcf)
6	10000	1000	1000	1000
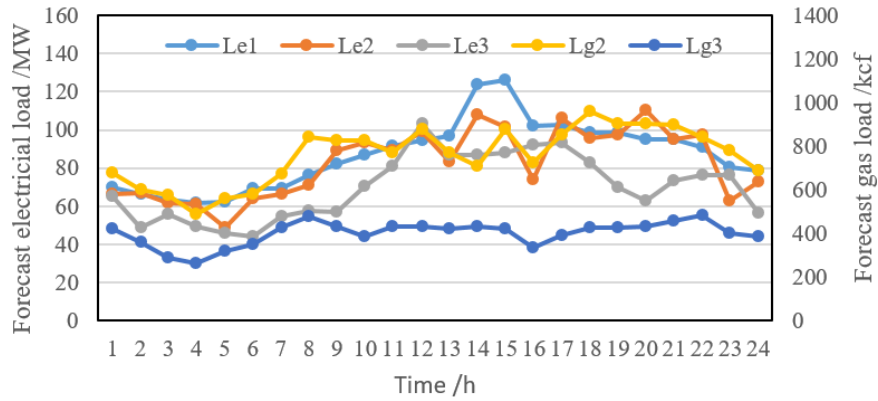
Fig .1 Forecast value of node load of electricity and natural gas system in area A
(Forecast value of node load of electricity and natural gas system of the other areas are same to area A)
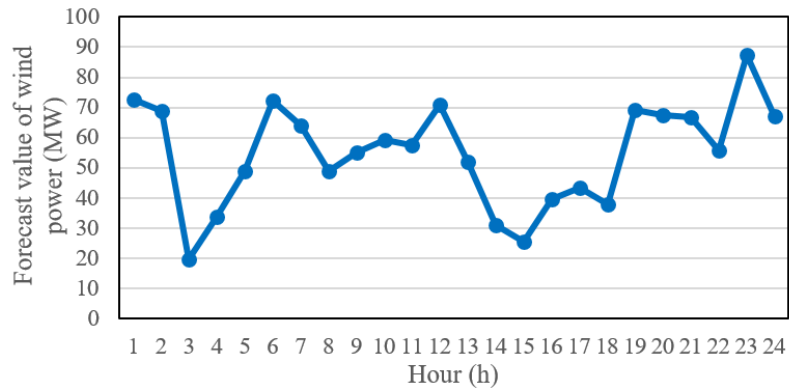

Fig .2 Forecast value of wind power in area A
(Forecast value of wind power of the other areas are same to area A)