



Supplementary Materials

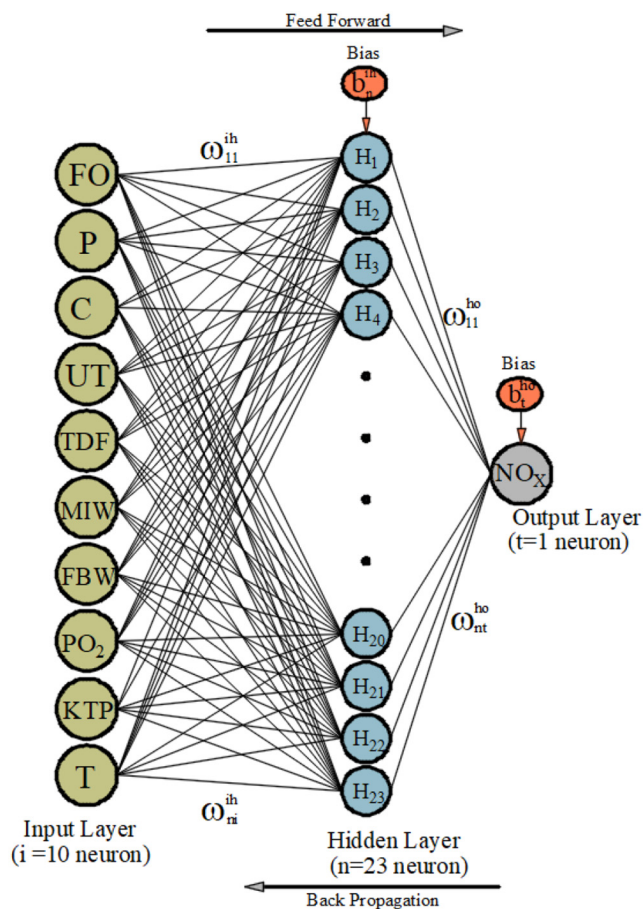


Fig. S1. Schematic diagram of the network.

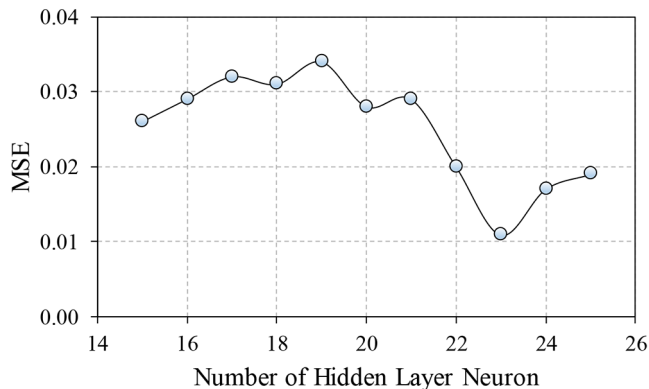


Fig. S2. Performance of network with different number of hidden layer neurons.

Table S1. ANN Modeling Parameters

No.	FO (%)	P (%)	C (%)	UT (%)	TDF (%)	MIW (%)	FBW (%)	PO ₂ (%)	KIP(MW)	T (t/h)	NO _x (mg/Nm ³)
1	0.00	100.00	0.00	0.00	0.00	0.00	0.00	3.38	83.62	160.4	568.9
2	0.00	100.00	0.00	0.00	0.00	0.00	0.00	3.34	92.60	160.6	584.0
3	0.00	100.00	0.00	0.00	0.00	0.00	0.00	3.13	95.10	159.1	584.0
4	0.00	100.00	0.00	0.00	0.00	0.00	0.00	2.96	90.26	157.5	528.0
5	0.00	100.00	0.00	0.00	0.00	0.00	0.00	3.10	89.60	158.0	624.4
6	0.00	100.00	0.00	0.00	0.00	0.00	0.00	3.46	92.82	159.1	751.6
7	0.00	100.00	0.00	0.00	0.00	0.00	0.00	3.40	90.51	158.0	652.0
8	0.00	100.00	0.00	0.00	0.00	0.00	0.00	3.51	100.82	159.3	731.8
9	0.00	100.00	0.00	0.00	0.00	0.00	0.00	3.71	94.72	159.2	600.3
10	0.00	96.30	0.00	3.70	0.00	0.00	0.00	3.15	98.18	157.7	476.3
11	0.00	90.07	0.00	9.93	0.00	0.00	0.00	2.90	87.86	158.8	528.6
12	0.00	90.57	0.00	9.43	0.00	0.00	0.00	2.90	92.45	156.8	380.7
13	0.00	90.67	0.00	9.33	0.00	0.00	0.00	2.77	93.52	157.1	586.4
14	0.00	90.39	0.00	9.61	0.00	0.00	0.00	2.71	90.81	159.9	542.9
15	0.00	93.37	0.00	6.63	0.00	0.00	0.00	2.85	91.41	160.9	511.2
16	0.00	93.43	0.00	6.57	0.00	0.00	0.00	2.81	92.89	159.5	356.7
17	0.00	97.55	0.00	2.45	0.00	0.00	0.00	2.57	101.93	157.7	406.4
18	0.00	93.83	0.00	6.17	0.00	0.00	0.00	2.31	83.26	157.1	435.7
19	0.00	93.70	0.00	6.30	0.00	0.00	0.00	2.63	89.79	160.6	436.8
20	0.00	91.27	0.00	6.50	0.00	2.23	0.00	2.66	86.94	158.2	448.7
21	0.00	94.95	0.00	2.66	0.00	2.38	0.00	2.72	88.67	160.0	520.7
22	0.00	99.08	0.00	0.00	0.00	0.00	0.92	2.42	78.64	163.3	609.5
23	0.00	97.82	0.00	0.00	0.00	0.00	2.18	2.52	66.84	161.1	503.8
24	0.00	92.20	0.00	0.00	0.00	0.00	7.80	2.48	43.50	159.1	562.1
25	0.00	96.96	0.00	0.00	0.00	1.11	1.94	3.11	87.61	159.5	516.0
26	0.00	86.27	0.00	2.88	0.00	0.00	6.33	2.67	88.00	155.3	374.1
27	0.00	95.32	0.00	0.00	0.00	1.65	3.03	2.70	88.00	155.7	602.2
28	0.00	98.37	0.00	0.00	0.00	1.63	0.00	2.62	89.00	157.1	484.4
29	0.00	97.03	0.00	2.67	0.00	0.31	0.00	2.62	90.00	159.5	421.6
30	0.00	85.76	0.00	2.96	0.00	4.57	6.06	2.52	90.20	163.5	466.5
31	0.00	88.36	0.00	2.97	0.00	1.91	6.06	2.49	89.63	159.2	437.6
32	0.00	90.65	0.00	7.45	0.00	0.00	1.90	2.57	89.45	159.8	595.9
33	0.00	92.92	0.00	0.00	0.00	0.00	7.08	2.64	85.51	159.1	550.8
34	0.00	94.37	0.00	0.00	0.00	0.00	5.63	2.51	86.08	159.3	496.9
35	0.00	97.46	0.00	0.00	0.00	0.00	2.54	2.63	85.92	160.6	573.1
36	0.00	100.00	0.00	0.00	0.00	0.00	0.00	3.14	90.06	159.7	644.1
37	0.00	93.86	0.00	6.14	0.00	0.00	0.00	3.07	86.86	159.4	636.6
38	0.00	88.43	0.00	10.24	0.00	0.00	1.33	2.60	91.11	158.8	572.1
39	0.00	87.88	0.00	10.26	0.00	0.00	1.86	2.67	90.94	159.4	679.5
40	0.00	88.56	0.00	10.12	0.00	0.00	1.31	2.50	92.15	158.5	563.5
41	0.00	83.51	0.00	10.32	0.00	0.00	6.17	2.40	90.36	162.3	517.8
42	0.00	84.76	0.00	10.21	0.00	0.00	5.04	2.33	91.41	159.8	431.4
43	0.00	86.74	0.00	8.75	0.00	0.00	4.51	2.30	91.33	155.6	446.9
44	0.00	85.76	0.00	2.96	0.00	4.57	6.72	2.42	90.19	157.8	465.0
45	0.00	88.36	0.00	2.97	0.00	1.91	6.76	2.44	89.63	156.2	409.6
46	0.00	87.24	0.00	7.39	0.00	0.00	5.37	2.33	90.19	156.8	437.1
47	0.00	86.76	0.95	9.64	0.00	0.00	2.65	2.39	91.28	158.5	463.4
48	0.00	83.59	1.85	9.18	0.00	0.00	5.38	2.38	90.02	156.6	453.7

Table S1. ANN Modeling Parameters (cont.)

No.	FO (%)	P (%)	C (%)	UT (%)	TDF (%)	MIW (%)	FBW (%)	PO ₂ (%)	KIP (MW)	T (t/h)	NOx (mg/Nm ³)
49	0.00	85.44	1.77	8.79	0.00	0.00	4.00	2.63	90.92	158.2	471.8
50	0.00	87.85	1.88	8.69	0.00	0.00	1.58	2.64	92.02	157.7	348.7
51	0.00	86.36	1.84	8.85	0.00	0.00	2.95	2.43	90.33	157.9	361.1
52	0.00	87.21	0.82	8.22	0.00	0.00	3.74	2.34	90.74	156.8	297.7
53	0.00	85.75	1.37	8.86	0.00	0.00	4.03	2.26	90.26	157.5	317.9
54	0.00	87.62	0.99	8.74	0.00	0.00	2.65	2.27	91.47	157.5	350.7
55	2.19	87.62	0.95	8.77	0.00	0.00	2.66	2.24	91.14	155.3	491.0
56	0.00	85.04	0.90	8.76	0.00	0.00	5.31	2.60	91.28	157.2	468.0
57	0.00	87.11	1.07	9.07	0.00	0.00	2.75	2.23	88.11	158.2	416.4
58	0.00	83.30	1.14	10.61	0.00	0.00	4.96	2.94	87.95	153.3	497.6
59	0.00	86.01	0.90	9.19	0.00	0.00	3.90	2.92	87.04	150.2	328.0
60	0.00	86.90	0.00	13.10	0.00	0.00	0.00	3.01	60.06	158.1	306.2
61	0.00	91.89	0.00	8.11	0.00	0.00	0.00	3.31	73.91	157.4	258.4
62	0.00	91.03	0.00	8.97	0.00	0.00	0.00	3.85	68.59	159.9	499.2
63	0.00	87.28	0.00	12.72	0.00	0.00	0.00	3.48	57.85	157.6	518.2
64	0.00	85.70	0.00	14.30	0.00	0.00	0.00	2.46	59.31	157.0	500.2
65	0.00	84.40	0.00	15.60	0.00	0.00	0.00	2.16	54.36	157.1	458.9
66	0.00	84.38	0.00	15.62	0.00	0.00	0.00	1.96	54.29	159.5	418.4
67	0.00	85.27	0.00	14.73	0.00	0.00	0.00	1.92	57.57	153.5	454.8
68	0.00	84.78	0.00	15.22	0.00	0.00	0.00	1.93	55.73	157.1	426.1
69	0.00	78.29	0.00	11.16	0.00	10.55	0.00	1.76	65.16	151.1	216.7
70	0.00	85.40	0.00	14.60	0.00	0.00	0.00	1.57	58.09	150.5	235.9
71	0.00	85.26	0.00	14.74	0.00	0.00	0.00	1.96	49.31	149.2	232.6
72	0.00	95.30	0.00	4.70	0.00	0.00	0.00	2.20	51.58	151.7	246.3
73	0.00	84.86	0.00	15.14	0.00	0.00	0.00	2.56	56.00	158.6	426.9
74	0.00	84.02	0.00	15.98	0.00	0.00	0.00	2.49	53.09	162.5	526.2
75	0.00	90.98	0.00	9.02	0.00	0.00	0.00	2.46	53.74	165.6	418.4
76	0.00	92.61	0.00	7.39	0.00	0.00	0.00	2.41	49.16	164.9	311.1
77	0.00	85.52	0.00	14.48	0.00	0.00	0.00	2.29	46.01	161.6	170.1
78	0.00	85.78	0.00	14.22	0.00	0.00	0.00	2.08	41.40	166.0	532.9
79	0.00	84.84	0.00	15.16	0.00	0.00	0.00	2.20	43.90	165.2	414.5
80	0.00	77.19	0.00	17.86	0.00	4.95	0.00	2.33	47.85	165.3	415.9
81	0.00	76.47	0.00	17.18	0.00	6.35	0.00	2.20	55.96	164.6	283.6
82	0.00	80.31	0.00	15.57	0.00	4.12	0.00	1.77	57.60	160.8	204.0
83	0.00	76.91	0.00	22.15	0.00	0.94	0.00	1.81	50.30	164.9	253.7
84	0.00	87.84	0.00	8.85	0.00	3.31	0.00	2.02	50.20	166.3	317.2
85	0.00	87.75	0.00	10.42	0.00	1.83	0.00	1.96	51.80	162.4	217.7
86	0.00	87.20	0.00	12.80	0.00	0.00	0.00	1.82	47.91	161.9	283.4
87	0.00	77.40	0.00	17.05	0.00	5.55	0.00	1.84	55.50	166.3	146.1
88	0.00	88.27	0.00	9.54	0.00	2.19	0.00	1.91	52.08	163.2	136.5
89	0.00	98.61	0.00	1.39	0.00	0.00	0.00	2.19	51.31	164.0	241.2
90	8.09	76.77	0.00	11.85	3.29	0.00	0.00	2.62	36.81	154.4	564.7
91	0.00	60.56	0.00	29.44	10.00	0.00	0.00	2.56	44.85	158.5	604.2
92	0.00	72.78	0.00	18.71	8.51	0.00	0.00	2.49	42.73	160.2	591.1
93	2.30	71.30	0.00	16.29	10.11	0.00	0.00	2.32	43.14	158.2	535.7
94	0.00	69.14	0.00	18.74	12.12	0.00	0.00	2.39	43.97	162.8	615.0
95	0.00	66.78	0.00	20.15	13.07	0.00	0.00	2.41	44.49	165.8	540.6
96	0.00	64.80	0.00	24.37	10.83	0.00	0.00	2.15	44.74	164.1	466.9

Table S1. ANN Modeling Parameters (cont.)

No.	FO (%)	P (%)	C (%)	UT (%)	TDF (%)	MIW (%)	FBW (%)	PO ₂ (%)	KIP (MW)	T (t/h)	NOx (mg/Nm ³)
97	0.00	79.01	0.00	13.99	7.00	0.00	0.00	2.09	41.56	160.7	415.0
98	0.00	66.71	0.00	25.10	8.18	0.00	0.00	1.91	44.40	159.9	489.0
99	0.00	62.90	0.00	24.38	12.72	0.00	0.00	2.06	45.72	163.3	544.0
100	0.00	63.63	0.00	24.07	12.30	0.00	0.00	2.08	45.31	161.7	540.9
101	0.00	64.01	0.00	24.17	11.82	0.00	0.00	2.39	45.10	160.4	519.9
102	0.00	61.62	0.00	26.92	7.39	4.07	0.00	2.18	45.90	160.3	509.3
103	0.00	61.51	0.00	28.87	9.62	0.00	0.00	2.04	45.33	160.0	384.4
104	0.00	61.33	0.00	33.95	2.65	0.00	2.07	1.69	45.68	160.8	382.7
105	0.00	70.28	0.00	17.52	7.35	0.00	4.85	1.58	42.87	158.9	381.8
106	0.00	61.49	0.00	12.94	12.94	0.00	12.62	1.74	44.93	160.3	449.7
107	0.00	60.02	0.00	23.22	9.18	0.00	7.59	1.79	44.87	162.8	487.7
108	0.00	46.24	24.12	21.31	8.34	0.00	0.00	1.99	57.94	163.5	499.4
109	0.00	44.67	23.36	21.28	9.25	0.00	1.44	1.88	51.38	164.3	387.1
110	0.00	46.99	24.16	19.75	8.00	0.00	1.10	1.80	52.80	162.7	387.7
111	0.00	46.07	24.52	20.04	7.92	0.00	1.45	1.79	55.65	164.5	410.1
112	0.00	45.35	23.77	22.27	7.89	0.00	0.72	1.72	53.59	164.0	414.0
113	0.00	44.77	23.32	27.03	2.33	0.00	2.55	1.69	49.75	162.0	298.0
114	0.00	40.66	22.03	24.69	11.22	0.00	1.40	1.71	56.85	165.9	479.4
115	0.00	45.18	23.61	21.86	7.91	0.00	1.45	1.63	56.30	163.0	337.2
116	0.00	46.38	24.77	24.20	4.65	0.00	0.00	1.81	61.70	163.2	479.5
117	0.00	45.51	24.43	21.03	4.66	0.00	4.37	1.87	65.13	163.5	402.1
118	0.00	50.83	17.15	23.04	4.40	0.00	4.58	1.74	52.80	161.3	474.7
119	0.00	46.18	24.33	24.96	2.34	0.00	2.19	1.76	53.75	161.2	546.5
120	0.00	47.77	25.19	20.05	3.31	0.00	3.69	1.97	49.49	161.4	545.0

Table S2. Statistical Parameters

	R ² (%)	RMSE (mg/Nm ³)	E _f (%)
NO _x Model	67	87.8	63