Appendix

In order to express the diversity of load profile, the system is connected with three different typical loads, e.g., residential load, industrial load, and commercial load. Expectation of load profile at each time is listed in Table A1. Expectation of RES is listed in Table A2. The forecasting errors of demand load, the error between actual RES output and its expectation value is assumed to follow the normal distribution $N(0,0.03^2)$ and $N(0,0.1^2)$, respectively.

Table A1 Expectation of demand load

Time interval	1	2	3	4	5	6	7	8
P(residential)	0.170236	0.168423	0.207593	0.184721	0.151753	0.153095	0.178605	0.187298
P(industrial)	0.041523	0.023708	0.030862	0.005203	0.036022	0.028284	0.025702	0.033657
P(commercial)	0.0096	0.019587	0.02978	0.038142	0.038159	0.039467	0.049705	0.049264
Time interval	9	10	11	12	13	14	15	16
P(residential)	0.186704	0.157857	0.155334	0.162476	0.181865	0.172656	0.179402	0.202556
P(industrial)	0.016934	0.010299	0.03017	0.018555	0.002928	0.027313	0.023611	0.027926
P(commercial)	0.049242	0.047686	0.049533	0.049329	0.067128	0.088392	0.106426	0.11466
Time interval	17	18	19	20	21	22	23	24
P(residential)	0.268647	0.244151	0.243471	0.237235	0.296181	0.292386	0.292787	0.319905
P(industrial)	0.046245	0.009225	0.027818	0.032892	0.041931	0.043838	0.010161	0.013413
P(commercial)	0.127634	0.137204	0.145916	0.147355	0.157839	0.168456	0.174323	0.184458
Time interval	25	26	27	28	29	30	31	32
P(residential)	0.179253	0.192893	0.189442	0.194688	0.161847	0.161887	0.199237	0.166347
P(industrial)	0.380455	0.369026	0.369845	0.397353	0.911364	0.918467	0.939976	0.916196
P(commercial)	0.189566	0.187394	0.182109	0.18624	0.197907	0.192685	0.196949	0.195766
Time interval	33	34	35	36	37	38	39	40
P(residential)	0.201609	0.22233	0.192406	0.201131	0.220578	0.187718	0.208585	0.18237
P(industrial)	0.961526	0.977116	0.960201	1	0.881614	0.887629	0.914003	0.886707
P(commercial)	0.241416	0.29755	0.345161	0.394233	0.490337	0.582412	0.671146	0.798899
Time interval	41	42	43	44	45	46	47	48
P(residential)	0.22588	0.18239	0.183886	0.18868	0.197724	0.201914	0.20377	0.188098
P(industrial)	0.872006	0.885927	0.893611	0.903742	0.584127	0.603889	0.592105	0.585107
P(commercial)	0.825637	0.840081	0.830031	0.908368	0.936211	0.910031	0.908082	0.928596
Time interval	49	50	51	52	53	54	55	56
P(residential)	0.215963	0.212673	0.205945	0.212891	0.184189	0.184847	0.211484	0.195193
P(industrial)	0.853063	0.84174	0.859954	0.845331	0.932449	0.934837	0.919402	0.905213
P(commercial)	0.927645	0.906604	0.912822	0.933953	0.942619	0.932536	0.929032	0.9321
Time interval	57	58	59	60	61	62	63	64
P(residential)	0.206909	0.18131	0.19747	0.246837	0.296205	0.315952	0.459117	0.602283
P(industrial)	0.806161	0.804782	0.794923	0.789149	0.769328	0.742209	0.736045	0.767501
P(commercial)	0.925399	0.938027	0.947104	0.928812	0.913704	0.91901	0.94277	0.925885
Time interval	65	66	67	68	69	70	71	72
P(residential)	0.745448	0.888614	0.987349	0.967669	0.98528	0.982416	0.89894	0.915849
P(industrial)	0.625737	0.61558	0.650909	0.637098	0.309265	0.29393	0.308639	0.309649
P(commercial)	0.93479	0.90961	0.921333	0.921343	0.943368	0.910068	0.931493	0.943485
Time interval	73	74	75	76	77	78	79	80
P(residential)	0.914023	0.871804	0.79246	0.781299	0.756144	0.794947	0.592036	0.570399
P(industrial)	0.020673	0.040217	0.041204	0.020775	0.025253	0.014905	0.011908	0.015896
P(commercial)	0.946132	0.9251	0.920119	0.942527	0.941346	0.94861	0.906366	0.914152
Time interval	81	82	83	84	85	86	87	88
P(residential)	0.574256	0.569346	0.428671	0.436826	0.4494	0.430487	0.268107	0.251398

P(industrial)	0.010593	0.022328	0.038655	0.014078	0.035416	0.042972	0.010661	0.041985
P(commercial)	0.889774	0.847028	0.775156	0.740371	0.667322	0.632476	0.574253	0.528264
Time interval	89	90	91	92	93	94	95	96
P(residential)	0.246352	0.24619	0.220578	0.187718	0.208585	0.18237	0.22588	0.19747
P(industrial)	0.035044	0.038249	0.045246	0.024189	0.028069	0.018974	0.031629	0.031936
P(commercial)	0.497623	0.44957	0.386511	0.334455	0.289552	0.239971	0.191993	0.144537

Table A2 Expectation of maximum output of RES

Time interval	1	2	3	4	5	6	7	8
$\overline{P}^{\mathrm{WPP}}$	0.403772	0.404608	0.394528	0.399271	0.40277	0.395391	0.410802	0.405815
$\overline{P}^{\mathrm{PVP}}$	0	0	0	0	0	0	0	0
Time interval	9	10	11	12	13	14	15	16
$\overline{P}^{\mathrm{WPP}}$	0.404581	0.437513	0.479767	0.537139	0.590032	0.57551	0.59581	0.581418
$\overline{P}^{\mathrm{PVP}}$	0	0	0	0	0	0	0	0
Time interval	17	18	19	20	21	22	23	24
$\overline{P}^{\mathrm{WPP}}$	0.580055	0.570492	0.553407	0.56507	0.562214	0.556351	0.545796	0.541448
$\overline{P}^{\mathrm{PVP}}$	0	0	0	0	0	0	0	0
Time interval	25	26	27	28	29	30	31	32
$\overline{P}^{\mathrm{WPP}}$	0.555709	0.524411	0.451511	0.36294	0.27333	0.20159	0.223693	0.247722
$\overline{P}^{\mathrm{PVP}}$	0	0	0	0	0	0	0	0
Time interval	33	34	35	36	37	38	39	40
$\overline{P}^{\mathrm{WPP}}$	0.269248	0.29255	0.323239	0.345026	0.370117	0.387143	0.417243	0.443458
$\overline{P}^{\mathrm{PVP}}$	0	0	0.023018	0.046398	0.070104	0.091643	0.138189	0.186841
Time interval	41	42	43	44	45	46	47	48
$\overline{P}^{\mathrm{WPP}}$	0.466103	0.477779	0.499161	0.495789	0.499189	0.509582	0.502421	0.497809
$\overline{P}^{\mathrm{PVP}}$	0.232254	0.273058	0.304453	0.339271	0.35815	0.381372	0.410406	0.429402
Time interval	49	50	51	52	53	54	55	56
$\overline{P}^{\mathrm{WPP}}$	0.506029	0.510316	0.527718	0.516486	0.521234	0.540116	0.554402	0.568147
$\overline{P}^{\mathrm{PVP}}$	0.470317	0.49681	0.523761	0.588205	0.632964	0.708568	0.721872	0.681313
Time interval	57	58	59	60	61	62	63	64
$\overline{P}^{\mathrm{WPP}}$	0.574503	0.593114	0.626339	0.717574	0.818106	0.910099	0.995482	0.977228
$\overline{P}^{\mathrm{PVP}}$	0.652765	0.62413	0.569647	0.57103	0.54184	0.51488	0.487338	0.474644
Time interval	65	66	67	68	69	70	71	72
$\overline{P}^{\mathrm{WPP}}$	0.994441	0.983928	1	0.898404	0.826315	0.726222	0.62725	0.590592
$\overline{P}^{\mathrm{PVP}}$	0.432946	0.411525	0.391728	0.350448	0.298382	0.250713	0.200696	0.161955
Time interval	73	74	75	76	77	78	79	80
$\overline{P}^{\mathrm{WPP}}$	0.578259	0.568517	0.561195	0.536484	0.534075	0.509432	0.495324	0.47893
$\overline{P}^{\mathrm{PVP}}$	0.109067	0.063645	0.016784	0	0	0	0	0
Time interval	81	82	83	84	85	86	87	88
$\overline{P}^{\mathrm{WPP}}$	0.464023	0.434948	0.408266	0.404775	0.394436	0.394455	0.379053	0.380269
$\overline{P}^{\mathrm{PVP}}$	0	0	0	0	0	0	0	0
Time interval	89	90	91	92	93	94	95	96
$\overline{P}^{\mathrm{WPP}}$	0.380313	0.381346	0.382465	0.367379	0.366688	0.373498	0.366996	0.365885
$\overline{P}^{\mathrm{PVP}}$	0	0	0	0	0	0	0	0