

Appendix

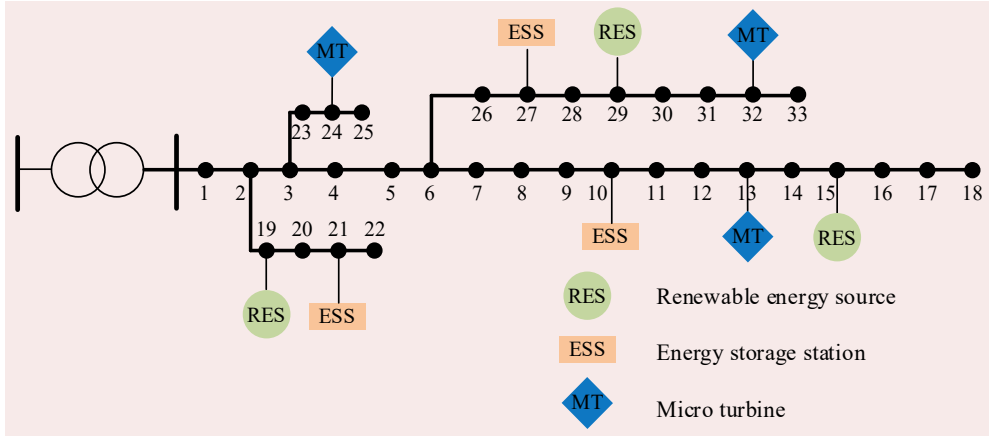


Fig. A1 Modified IEEE-33 bus ADN

The studied distribution system is a modified IEEE-33 bus case with 3 MTs, 3 RESs, and 3 ESSs, as shown in Fig. A1. The power dispatch of ADN studied in this paper consists of 24 time periods per day, which means making real-time decisions every hour. To encourage more renewable energy absorption, λ_{cur} is set as \$300/MWh. η_{ch} and η_{dis} are set to be 0.97 and 0.98 respectively. λ_{ESS} is set to be \$0.9/MWh.

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-slot	1	2	3	4	5	6
$P_i^D(t)$ (kW)	720.29	780.31	840.34	870.35	876.35	840.34
$Q_i^D(t)$ (kVAR)	360.14	390.16	420.17	435.18	438.18	420.17
Time-slot	7	8	9	10	11	12
$P_i^D(t)$ (kW)	780.31	757.50	753.90	744.30	739.50	737.10
$Q_i^D(t)$ (kVAR)	390.16	378.75	376.95	372.15	369.75	368.55
Time-slot	13	14	15	16	17	18
$P_i^D(t)$ (kW)	732.30	720.29	660.26	540.22	480.19	420.17
$Q_i^D(t)$ (kVAR)	366.15	360.14	330.13	270.11	240.10	210.08
Time-slot	19	20	21	22	23	24
$P_i^D(t)$ (kW)	450.18	510.21	570.23	600.24	660.26	690.28
$Q_i^D(t)$ (kVAR)	225.09	255.10	285.12	300.12	330.13	345.14

Table A2 Expectation of maximum output of RES

Time-slot	1	2	3	4	5	6
$P_i^{\text{RES}}(t)$ (kW)	100	150	250	300	320	350
Time-slot	7	8	9	10	11	12
$P_i^{\text{RES}}(t)$ (kW)	320	300	250	140	100	150
Time-slot	13	14	15	16	17	18
$P_i^{\text{RES}}(t)$ (kW)	150	170	150	200	220	260
Time-slot	19	20	21	22	23	24
$P_i^{\text{RES}}(t)$ (kW)	300	320	330	220	200	100