**Parameters in the Simulation**

The simulations are implemented on Python with Gurobi solver. The other parameters in the simulation are as follows:

The main grid organizes valley filling auxiliary service during the valley price period, the compensation cost at period *t*: =0.4 yuan/kWh.

Wind power curtailment penalty at period *t*: =0.205 yuan/kWh.

The costs of charging and discharging power for MG at period *t*: =0.1 yuan/kWh, =1.25 yuan/kWh.

The penalty prices for deviation in energy market at period *t*: ==2 yuan/kWh.

The penalty prices for deviation in peak regulation market at period *t*: =0.2 yuan/kWh.

Comfort loss factor of TCLs at period *t*: =0.005 yuan/kWh.

Energy compensation factors of TCLs at period *t*: =0.25 yuan/kWh.

The transformer capacity price for ferroalloy is 28 yuan/(kW·month), so the daily capacity price: *c*trfe=28/30 yuan/(kW·day).

The transformer capacity for ferroalloy: *P*Tfe=50MVA.

The minimum daily electricity consumption ratio coefficient for the ferroalloy: *a*fe=0.95.

The electricity price discount coefficient for ferroalloy: *k*fe=0.5.

The rated power of the ferroalloy at period *t*: =50MW.

The adjustable range of the ferroalloy load at period *t*: =46MW, =55MW.

The building central air conditioning system is set to operate in cooling mode. The initial power and the adjustable range of TCLs are shown in Fig. B1.



Fig. B1. Initial power and the adjustable range of the TCLs.

The MG can provide bidirectional power. The adjustable range of MG at period *t*: [-7MW, 5MW].

In the intraday stage, the adjustable capacity range for MG to participate in wind curtailment consumption service at period *t*: [0, 8MW].

The transmission capacity of the line between the wind farm and the main grid is 100MW. The transmission capacities between the wind farm and the ferroalloy, TCLs and MG are 55MW, 10MW, and 7MW, respectively. The transmission capacities between the DN and the ferroalloy and TCLs are 50MW and 10MW, respectively.