

# Economic Optimization Operation Strategy for Industrial Park Integrated Energy System

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### Abstract

The integrated energy system (IES) integrates multiple energy systems, e.g. electricity, gas, heating, cooling and transportation and so on, to shape a green, low-carbon, efficient, low-cost and environmental-friendly energy ecosystem. The economic optimization operation strategy for industrial park integrated energy system is proposed. First of all, thermal power plant, gas boiler, energy storage system, photovoltaic, heat transmission and distribution system, power transmission and distribution system model in industrial park integrated energy system are established, and the operation constraints are set. Then, the optimization operation strategy of industrial park integrated energy system are proposed, including gas boiler operation strategy, energy storage system operation strategy and economic optimization operation strategy. Finally, the economic optimized operation model is solved and the industrial park integrated energy system operation information are output. The effectiveness and rationality of economic optimization operation strategy for industrial park integrated energy system are verified by example analysis, and the proposed models and strategy are widely applicable and practical.

### Case study

The example of the integrated energy system in the new industrial park takes the typical winter day. The simulation step length is 1 hour and the simulation period is 24 hours. The structure of the integrated energy system in the new industrial park is shown in Fig. 1. When the heat output of thermal power plant is not enough to meet the thermal load demand, the gas boiler starts operation, otherwise it is shutdown. The energy storage system is allowed to discharge at large power grid, charge at large power grid valley price, large power grid does not work at large power grid level price.

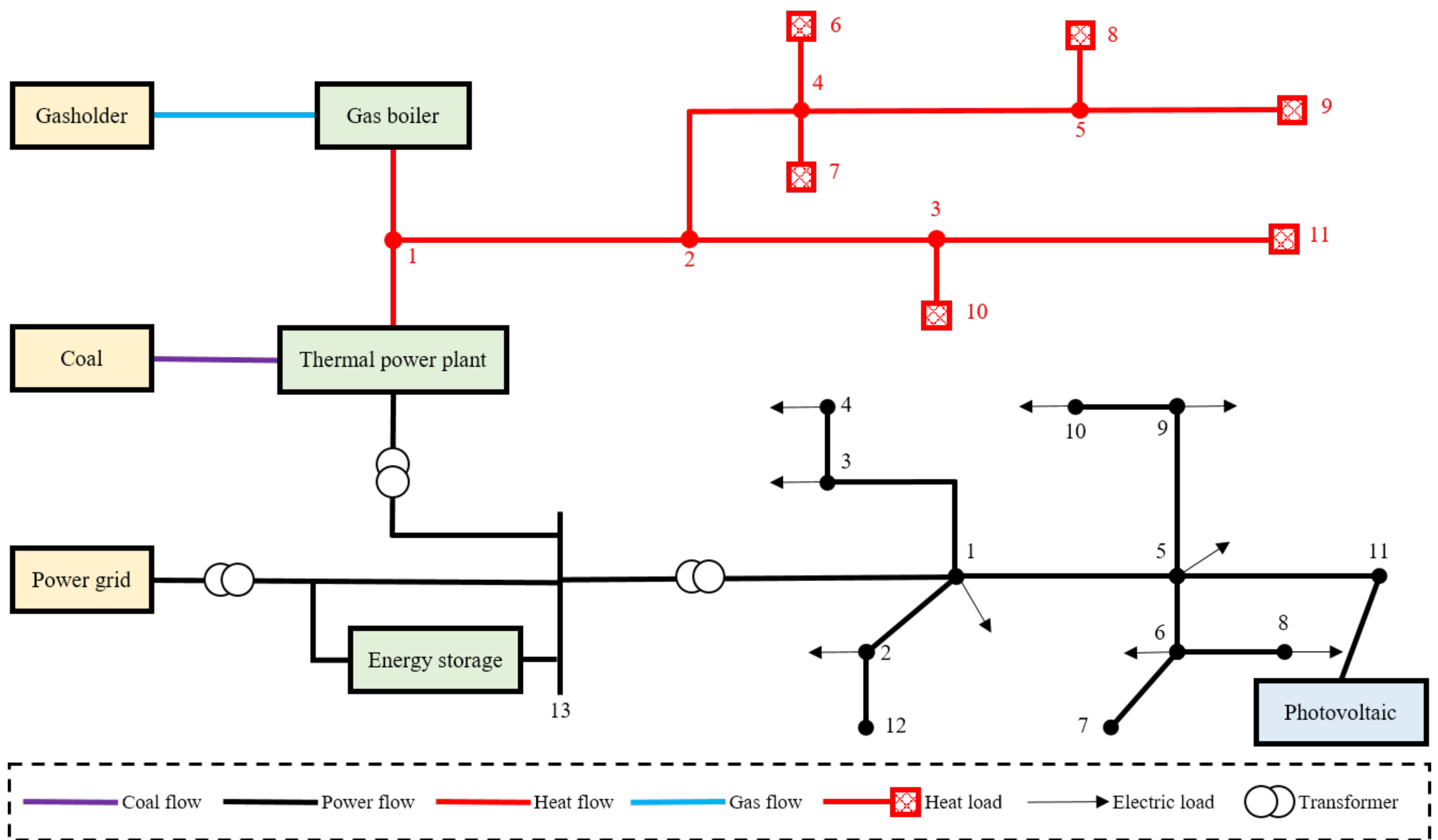


Fig. 1 Example structure of industrial park integrated energy system

### Conclusion

An economic optimization operation strategy of the integrated energy system for industrial park is proposed in this paper. The research results show that compared with the existing technology or research results, the proposed industrial park integrated energy system has advantages of flexible operation mode, low carbon and high efficiency.

The proposed gas boiler operation strategy, energy storage system operation strategy, economic optimization operation strategy more close to, meet the actual industrial park engineering application requirements. The model of equipment and transmission and distribution energy system established is more refined and the operating constraints of equipment and transmission and distribution energy system set are more comprehensive. The model established and the economic optimization strategy proposed are reasonable and effective.



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