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# An optimal energy management system for a commercial building with renewable energy generation under real-time electricity prices

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## Highlights

- This paper presents an approach to the energy management and control of the effective cost of energy in real-time electricity pricing environment.
- A given energy demand for commercial usage in the city of Tshwane (South Africa) is used to investigate the behaviour of the designed method during low and high demand periods.
- As grid integrated renewable energy resources, photovoltaic (PV) is an important consideration in assuring excellent power supply and environmental issues in the commercial building.
- The results show that the proposed adaptive MPC strategy can promote the new approach of an optimal electrical system design, which reduces the energy cost to pay the utility grid by about 46 % or more depending on the set target.

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