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Towards a green accelerator: implementing energy-saving practices at NSRRC

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Taiwan heavily relies on imported fuel for power generation, making the country susceptible to energy market risks. To mitigate this issue, the government is actively promoting the adoption of renewable energy sources, such as solar and wind power, while also encouraging companies to enhance their energy-saving efforts. At NSRRC, five major energy-saving practices were implemented, including (1) optimizing chiller services, (2) energy-saving operation of accelerator booster magnetic power supplies, (3) heat recovery by heat pumps, (4) fouling remove from heat exchangers and (5) replacement of compressed air compressors from 2020 to 2022. These practices resulted in an annual energy saving of 3.59 GWh, representing a 4.9% reduction in electricity consumption at NSRRC compared to 2019. The implementation of these practices also led to a reduction in energy costs, saving approximately 11 million New Taiwan dollars, and yielding a payback period of 4.3 years. Moreover, a regression model was developed to forecast energy consumption at NSRRC with an r-square value of 0.926. NSRRC obtained the energy management certification of ISO 50001 in 2019, which has facilitated the continuous improvement of energy efficiency. Going forward, NSRRC plans to utilize machine learning methods to establish the optimal operating mode for its air conditioning system.

Footnotes

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Asia

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