The Robust scenario-based concept implemented on an energy hub

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Abstract

Nowadays, energy hub concept is one the suitable systems to supplies energy demands. Implementing an energy hub is challengeable today, because of applying different converters and energy storages, matching them together, facing with uncertainty surrounding, and finally environmental aspects. In our paper we propose an energy hub that contains 1. Combined heat and power unit 2. Auxiliary boiler 3. Electric heat pump 4. Intelligent parking lot 5. Transformer 6.Wind turbine (Wind farm) as renewable energy. Using of renewable energy also, considered in this paper as a huge power source to face with electricity demand. This unit is much important for environmental aspects because of low environmental pollutions. Wind turbines have noises and these issue make them a little harmful for environment. Output power of wind turbine has modeled by 10 scenarios that have generated by weibull probability distribution function and monte-carlo simulation. Generated power by chp unit with respect to bought power from upstream grid, and wind turbine power, can charge in batteries of intelligent parking lot vehicles and use in suitbale time. On the other hand, thermal demands also supply. Power of upstream grid buy with respect to confidence bounds that achieved by historical prices. According to above explained method, uncertainty parameters consider. Electric vehicles and their entry and exit times, also are uncertainty. Each vehicle can enter the parking between 6 a.m. and 6 p.m. each vehicle can be in parking between 2-8 hours. Chp unit has presented with triple operational zones in first time in our work, this advantage makes it more effective and efficient.

Biography:

Mohammad Jahandide was born in Sirjan, Iran in 1996. He received the BSc (BEng) degree in Electrical Power Engineering from Sirjan University of Technology, Sirjan, Iran, in 2019. In a cooperation work between Sirjan University of Technology, Sirjan, Iran and the Center for Research on Microgrids (CROM), Energy Technology, Aalborg University, Denmark,He contributes with Dr. Seyyed mostafa nosratabadi

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