



## Techno-economic modeling analysis on power plant performance optimizations

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The highly regulated electricity market in China requires many coal-fired power plants to do load following along with the power grid fluctuations, resulting in low thermal efficiencies and low capacity factors which impair the plants' operating performances and economics. China Energy Investment Corporation Limited ("China Energy") is the world's largest energy and power company with 230GW installed total power generation capacity, including 178GW capacity from 478 coal-fired power generating units which produced 760 billion kWh electricity output and approximately 600 million tons CO<sub>2</sub> emission in year 2017. China Energy is making effort to improve its existing coal-fired power plant fleet load following capabilities and operating efficiencies which not only enhance its profitability and market competitiveness, but also reduce its overall plant emissions including its carbon footprints. A Power Plant Smart Management (PPSM) platform is under development to manage and optimize the operations of its exiting power generation fleet, the PPSM platform includes customized numerical model of each power plant unit which can provide techno-economic modelling analysis on plant performance optimization solutions and the impacts of variations of operating and market conditions. This paper presents one of the PPSM case studies on a coal-fired thermal power plant unit, the techno-economic modelling analysis on various solutions optimizing the plant's load following performance and CHP efficiency, and the impacts of the market variations such as fuel, electricity and district heating etc.

