

Study of Using Energy Storage to Mitigate the Impact of High Renewable Energy Penetration to the Grid

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Session The value and benefits of energy storage

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Abstract

The concept of Smart Grid is probably the most popular topic in the power systems field. Energy storage and renewable energy are two of the most important topics within Smart Grid. In Taiwan, the development of renewable energy such as photovoltaics and wind power has grown rapidly over the past decade, and the installed capacity is expected to increase drastically in the near future. However, with high penetration of renewable energy, the impact to the grid such as excess power and overloading of transmission lines should not be overlooked.

Precautionary measures such as installing or replacing transformers with higher capacity, increasing conductor size, or installing voltage regulator, etc. has been considered or implemented. However, if those measures are still not able to overcome the impacts, installation of energy storage system becomes inevitable.

This session presents the feasibility of using energy storage as a solution in both regional side and grid side to mitigate high renewable energy penetration to the grid. Lastly, a few micro-grid demonstration sites which consists of renewable energy resources and energy storage systems have been implemented in Taiwan to avoid blackouts in case of natural disaster, which will also be briefly introduced in this session.