Topic: Optimisation of LNG Cold Utilisation at a LNG Receiving Terminal

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## ABSTRACT

LNG cold energy utilisation technologies, which are techniques that make use of the cold energy from LNG cryogenic temperatures (-163 degree Celsius) during re-gasification process, instead of wasting it into seawater, have been studied. Eleven (11) technologies for LNG cold energy utilisation are identified, i.e. air separation and liquefaction unit, cryogenic power generation, and etc. The technologies were assessed, screened and prioritised by multi-criteria decision making tools, Analytical Hierarchy Process (AHP), technology analysis and strategy concept. Technology Prioritisation Framework is developed to identify the best selected LNG cold energy utilisation technology.

The framework has been applied in a case study at the first LNG (Liquefied Natural Gas) receiving terminal in Thailand. Under site specific constraint in Maptaphut location, the analysis shows that LNG integration with the gas separation plant (GSP) option is selected. The GSP-LNG integration option is chosen because it is the most appropriate technology to be applied as the LNG cold energy utilisation technology in Maptaphut LNG receiving terminal in Thailand due to its characteristic that can fulfil and offer the most appropriate value on the economical, environmental, social criteria and business strategic fit of owner company at the same time. Thermodynamic analysis of the selected technology show that the GSP-LNG integration plant can save up to 42 MW of electrical consumption and generates around 27% less exergy loss when compare to the GSP-LNG receiving terminal standalone system.

**Keywords**: LNG Cold Energy Utilisation, Technology Selection, LNG Receiving Terminal, Analytical Hierarchy Process, Technology Strategy, Gas Separation plant