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Non-electric Application of Nuclear Energy in Korea

Nuclear energy has been considered as a carbon-free alternative of the unabated fossil fuels for electric and non-electric applications. To replace various kinds of energy consumption with it, a nuclear reactor is required to be multipurposable. A small modular reactor (SMR) has an advantage in a site flexibility, which is possible to construct the unit near a demanded site. The application of SMR as a energy source make possible to achieve a carbon-free or carbon-less energy consumption instead of the conventional petrochemical-based one.

In recent, Korea struggles to secure a renewable energy source for maintaining the socioeconomic development. The government endeavors to reduce the emission of green house gas in a industrial part, which is almost 62% of the national energy demand. The amount of own renewable energy source is limited in Korea. In addition, the total production of green hydrogen is still lacking compared to significant requirements in global countries, so it is hard to import all national demand of green energy as a green hydrogen. In this context, the integration of SMR with a industrial complex can be a viable suggestion for relieving a burden on the carbon-tax and balancing the energy mix along with the renewable energy.

Herein, The overall demand for a thermal source on the industrial complex, which include a petrochemical complex and a steel industry in Korea, is discussed. It will introduce the application of a gas-cooled reactor as a thermal source for a industrial complex, especially for producing hydrogen such as a reforming or other process.

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