IHS Markit

LNG Regasification Terminal

PEP Review 2020-06

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Abstract

From 2000 to 2019, global natural gas production increased from 2,440 to 4,000 standard Bcm (80,060 to 140,800 standard Bcf), at an average growth rate of 2.6% p.a. The United States registered the highest growth, nearly 4.4% p.a., and is now the biggest producer of natural gas. ([1] IHS Markit, 2019)

Natural gas is, after oil and coal, the third-largest energy provider in the world today. It is a cleaner source of energy and is therefore replacing coal and oil in many applications. According to an IHS Markit projection, gas consumption will overtake coal by mid-2020s and oil by 2050. ([2] IHS Markit, 2019)

Over long distances, natural gas is cooled and liquefied for transport in specially designed LNG carriers. LNG trade is increasing at a much faster rate than the increase in natural gas production. In 2019, about 12% of the natural gas produced was traded as LNG, up from about 7.5% in 2008. LNG now accounts for approximately one-third of all traded natural gas. ([7] BP Statistical Review of World Energy, 68th edition, 2019).

As of 2019, there are 42 LNG importing countries and 21 exporting countries ([4] International Group of Liquefied Natural Gas Importers, 2019).

At its destination, LNG is converted back into natural gas for consumption as an energy source in regasification terminals.

There are approximately 200 existing functional regasification terminals in the world today and another 45 under construction. Sizes range from tiny (<0.1 MMtpa) peak shaving facilities, to large (>2, all the way up to 50 MMtpa) facilities catering to multiple users (power plants, industrial complexes, distribution companies). ([5] IHS Markit, 2020)

This review addresses the technology and economics of an LNG regasification terminal, with a processing capacity of 4 MMtpa of LNG, and using ORV (Open Rack Vaporizer) and SCV (Submerged Combustion Vaporizer), which are the dominant regasification technologies today.

It includes the process flow diagram, material balance, major equipment sizes, and specifications. Cost data—including battery limit and offsite costs, variable costs, capex, opex, and overall production costs—is provided.

This review provides insight into various aspects of the technical design of such a facility. It can be used as a tool for cost estimation for different plant capacities. It will be beneficial for planners, producers, and designers who are looking for independent data for ethane export terminals.

An interactive iPEP Navigator module of the process is included, which provides a snapshot of the process economics and allows the user to select the units and global region of interest.

The technological and economic assessment of the process is PEP's independent interpretation of a commercial process based on information presented in open literature (such as patents or technical articles) or in-house generated data (e.g., HYSYS simulation, equipment cost estimation). While this assessment may not reflect actual plant data fully, we do believe that it is a sufficient representation of the process and process economics within the range of accuracy necessary for economic evaluations of process design.

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