

Latest Developments in Nitrogen Rejection Units

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The shift toward electrifying large-scale liquefied natural gas (LNG) facilities represents a pivotal development in the energy industry's decarbonization efforts. Traditionally reliant on gas turbines to drive refrigeration compressors—major contributors to greenhouse gas emissions—produce the amount of electricity needed to operate, LNG plants are now increasingly adopting electric drives. This transition is driven by growing regulatory demands for lower carbon footprints and adherence to stringent environmental standards.

By leveraging electricity from renewable or low-carbon-intensity sources, electrified LNG plants can significantly reduce emissions, enabling cleaner and more sustainable production. Beyond the environmental benefits, electrification enhances operational reliability due to the lower maintenance requirements of electric motors and ensures more consistent production output, as electric power is less sensitive to ambient conditions.

However, this transformation introduces new technical challenges. One key issue is the management of nitrogen in the feed gas. In conventional setups, nitrogen rejected to meet LNG specifications was blended into the fuel gas and combusted in turbines. With the elimination of the fuel gas network in fully electric plants, alternative nitrogen disposal strategies are required. In response, Technip Energies has developed innovative standalone Nitrogen Rejection Unit (NRU) schemes. These not only enable monetization of high-purity nitrogen (e.g., N4.0, or 99.99 mol% purity) but also facilitate helium recovery with purities exceeding 80% and recovery rates above 96%.

As renewable energy becomes more accessible and electrification technologies mature, fully electric LNG plants are poised to become the industry standard. This paper intends to review the different NRU schemes which allow to match the above challenges, to discuss their respective advantages and drawbacks and to present solutions which have been implemented by Technip Energies on selected LNG projects.

To view the **full technical programme**, visit <https://lng2026.com/technical-programme>

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