LNG: A Proven Carbon Reduction Solution for Kazakhstan's Transportation Network

CONDOR PETROLEUM INC

UNECE Decarbonization Workshop
November 24th – 25th 2021
Almaty, Kazakhstan

Don Streu
President, CEO and Director

LNG Overview

- Liquefied Natural Gas ("LNG") is a cryogenic fuel derived from natural gas
  - A -162 ^{0}C liquid stored at low pressure
  - 600 times less volume than natural gas
  - 2.4 times more energy output than CNG
    - LNG is superior to CNG for high horsepower applications and extends operating ranges
- Easy and safe to transport and store
  - LNG is non-explosive, non-corrosive, non-toxic
  - If released, evaporates quickly and disperses, leaving no residual residue
- Conventional LNG plants are complex and expensive
  - Generally implemented for marine export sales
  - Multi-year construction times and +US$10 Billion
- Modular LNG ("mLNG") plants are more efficient and cost-effective
  - Localizes LNG production and distribution
  - Ideal for regions with limited pipeline networks
  - Smaller footprint

Conventional LNG Plant –15,000,000 TPA

Modular LNG Plant –75,000 TPA

Multiple Benefits of LNG Implementation

- More environmentally friendly than diesel
  - 30% lower greenhouse gas emissions, 95% lower particulate emissions, 100% lower sulphur emissions
  - Supports Kazakhstan's energy transition plans and emission reduction commitments
  - No soil or water contamination
- Enhanced engine performance and less wear
  - LNG has +20% more BTU energy output than diesel (by weight)
- Kazakhstan's transition to LNG will reduce diesel fuel demand
  - Reduces need to expand local refining capacity
  - Reduces dependence on foreign fuel imports
- Standardizes fuel used by international road transport fleets to that of Western Europe and China
- Numerous LNG industrial applications are already proven worldwide
  - Long-distance road haul trucks, mining haul trucks, rail locomotives, agriculture machinery, remote power generation, marine vessels

LNG powered Mine Haul Truck in Canada

LNG Locomotive with Fuel Tender in the U.S.

Kazakhstan's Energy Transition is Underway

- Government Resolution No. 797
  - Expands the use of Kazakhstan's natural gas resources to replace diesel as a motor fuel
    - Decreases GHG emissions and lessens climate change
    - Contributes to energy self-sufficiency by reducing diesel imports
  - Allocates 500 million cubic meters of natural gas per year to gasify the transportation sector
- Government Action Plan includes
  - Establishing LNG and CNG fueling stations and distribution networks
    - Over 200 fueling stations to be constructed in Kazakhstan
    - Services the Western China to Western Europe, and Khorgos to Tashkent freight corridors
- Planned gasification of the transportation sector
  - 30,000 vehicles identified as candidates for LNG and CNG conversions
  - Locomotive pilot study is underway with early 2023 LNG trials
  - Ongoing discussions with mining companies on LNG conversions and infrastructure

Long-Haul Truck LNG Fueling Station

Locomotive LNG Fueling Station

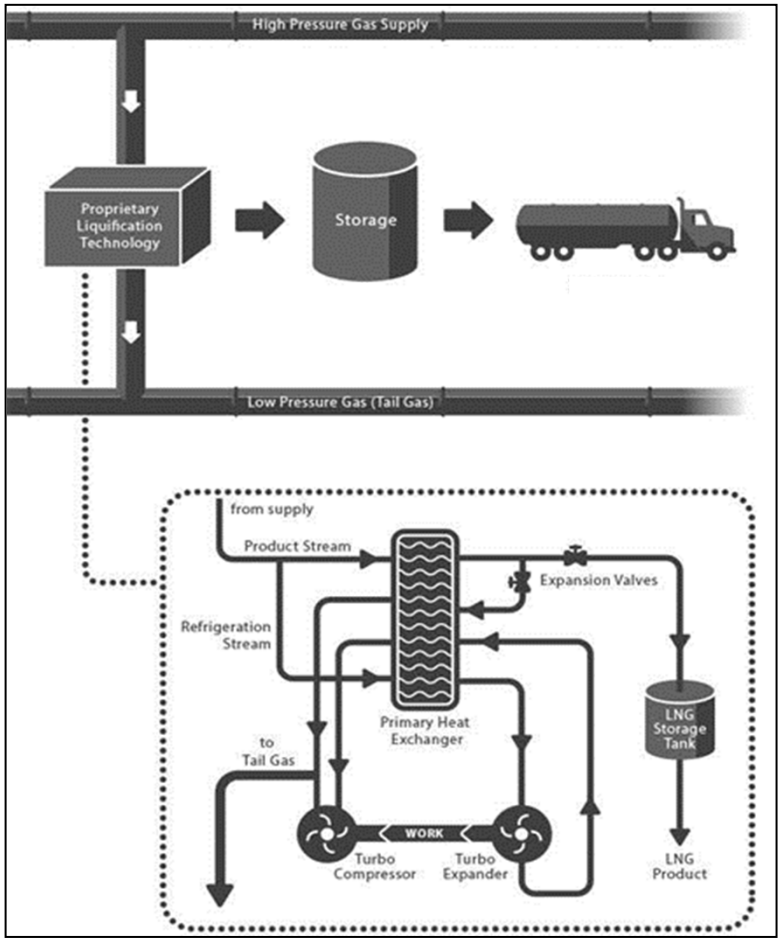
LNG for Mine Haul Trucks and Locomotives

- Condor has identified large open-pit mining operations as priority beneficiaries of LNG
  - Significant volumes of fuel are used in mining operations
  - Fuel consumption increases as the open pits get deeper, requiring more haul trucks
- Haul trucks use a blend of 70% to 80% LNG and the remainder diesel
  - Caterpillar, Komatsu, Belaz and Hitachi are easily converted to dual-fuel usage while maintaining the flexibility to operate on diesel-only if required
- Multiple operator studies of dual-fuel usage confirm that truck performance, payload, and reliability remain the same as diesel-only fueled trucks
- LNG locomotives have a longer operating range compared to diesel locomotives
  - Fuel tender with ~45,000 liters LNG capacity is hauled directly behind locomotive
    - Less frequent re-fuelling requirements
    - Supports one or two locomotives, thereby reducing overall capital investment requirements
- Kazakhstan Temir Zholy ("KTZh") is evaluating proven LNG conversion technology
  - Pilot program is designed to improve efficiency, increase locomotive speeds, reduce fuel and operating cost, and reduce environmental impacts
  - Convert two existing diesel locomotives to LNG by early 2023
  - Once the pilot project is completed, KTZh to convert 280 additional locomotives
    - New locomotives to operate 100% on LNG

Industry Leading LNG Technology

- The Condor group has proven expertise in modular LNG production and distribution
  - Built the first greenfield LNG facility in the U.S. for the supply of marine fuel
  - Technology was developed by the U.S. Department of Energy
    - Group has +40 U.S. patents
- Technology provides best-in-class efficiency
  - Natural gas used as the refrigerant source
  - No need to store and recycle large quantities of nitrogen, ammonia, ethane or propane for the refrigeration process
  - No need for refrigeration compressors, associated piping, utilities
  - Shorter plant construction times
- Easier to operate
  - Multiple feed-gas operating pressures
  - Multiple control points to manage production rates based on fluctuating feed gas rates and pressures
- Modular design easily expands to meet increased demand

Patented LNG Liquefaction Process



Concluding Remarks

- LNG is more environmentally friendly than diesel
  - Promotes a structured energy transition
  - 30% lower greenhouse gas emissions, 95% lower particulate emissions, 100% lower sulphur emissions
- Kazakhstan's LNG transition is underway
  - Action plan includes pilot programs, distribution networks
- Recent technological advancements enables widespread LNG use in the transportation sector
  - Long-distance road haul trucks, mining haul trucks, rail locomotives, agriculture machinery, remote power generation, marine vessels
  - Conversion to LNG has been successfully implemented worldwide
- Condor has industry-leading LNG technology
  - U.S. Department of Energy patented technology
- Condor will install Central Asia's first modular LNG facility in Kazakhstan
  - Fully operational in 2023

Fueling a Long-Haul Truck

Fueling a Mine-Haul Truck