Merritt Norton
CH4 Energy

Public Service Commission of Utah

Technical Conference

Sept 2, 2009

Liquefied Natural Gas (LNG)

Cryogenic Liquid

- Super-cooled methane -260F.
- 600 times more condensed than liquid
- Non-toxic
- Non-corrosive
- Odorless
- Colorless
- Half the weight of water

Advantages of LNG

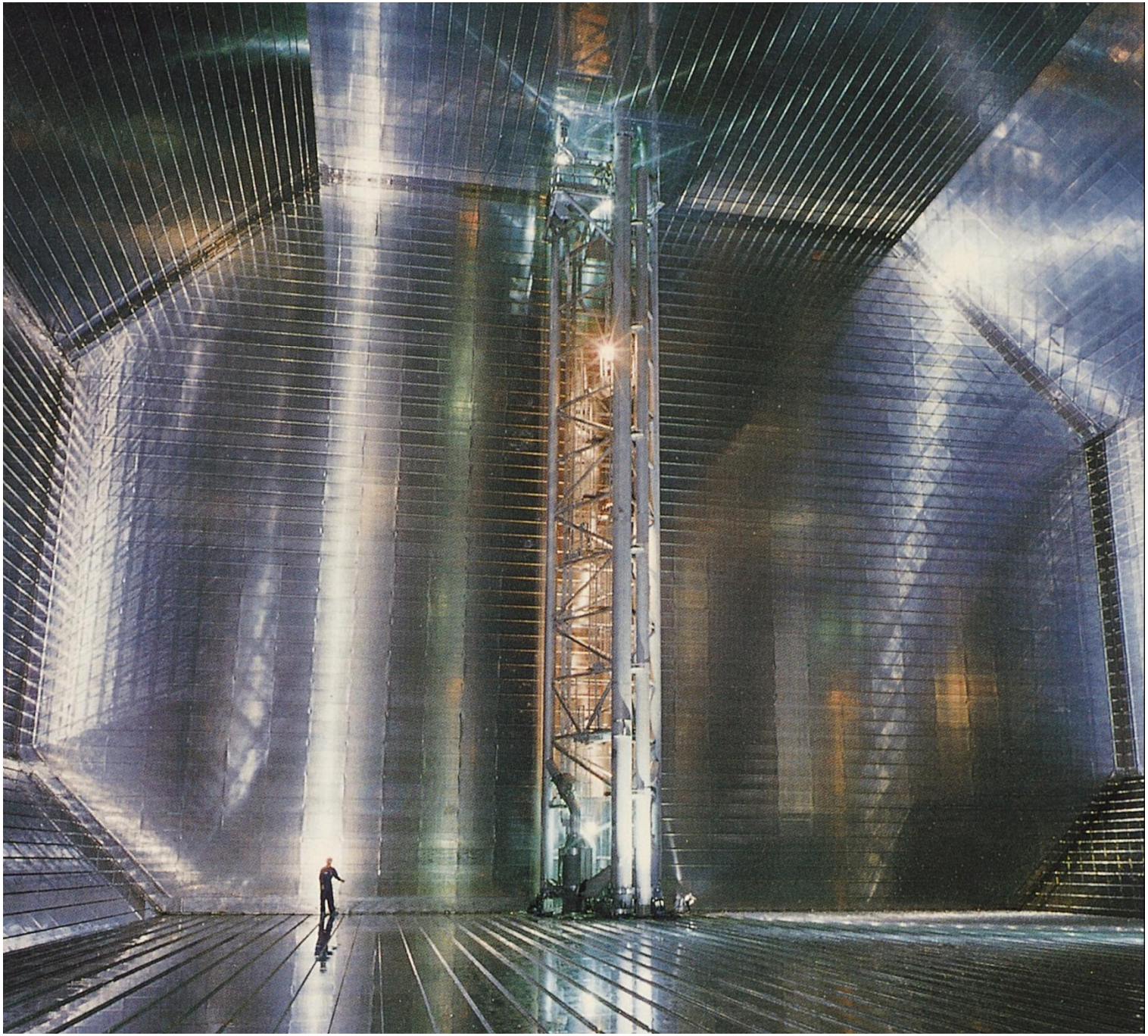
Clean, low cost, abundant in North America

1. Extends vehicle range
2. Lower-cost vehicle-fuel tanks
3. L/CNG requires much lower power to produce
4. Bridge fuel to hydrogen

Topics

- How LNG is produced
- Heavy-Duty Vehicles
- LNG L/CNG Stations
- LNG Safety
- New CNG Compression Technology
- Bio-Methane

MOZAH
موزه



Shen Shen, China

LNG Loading Facility

LNG Transport (China)

Satellite Station

LNG Plant, Australia

Micro-LNG

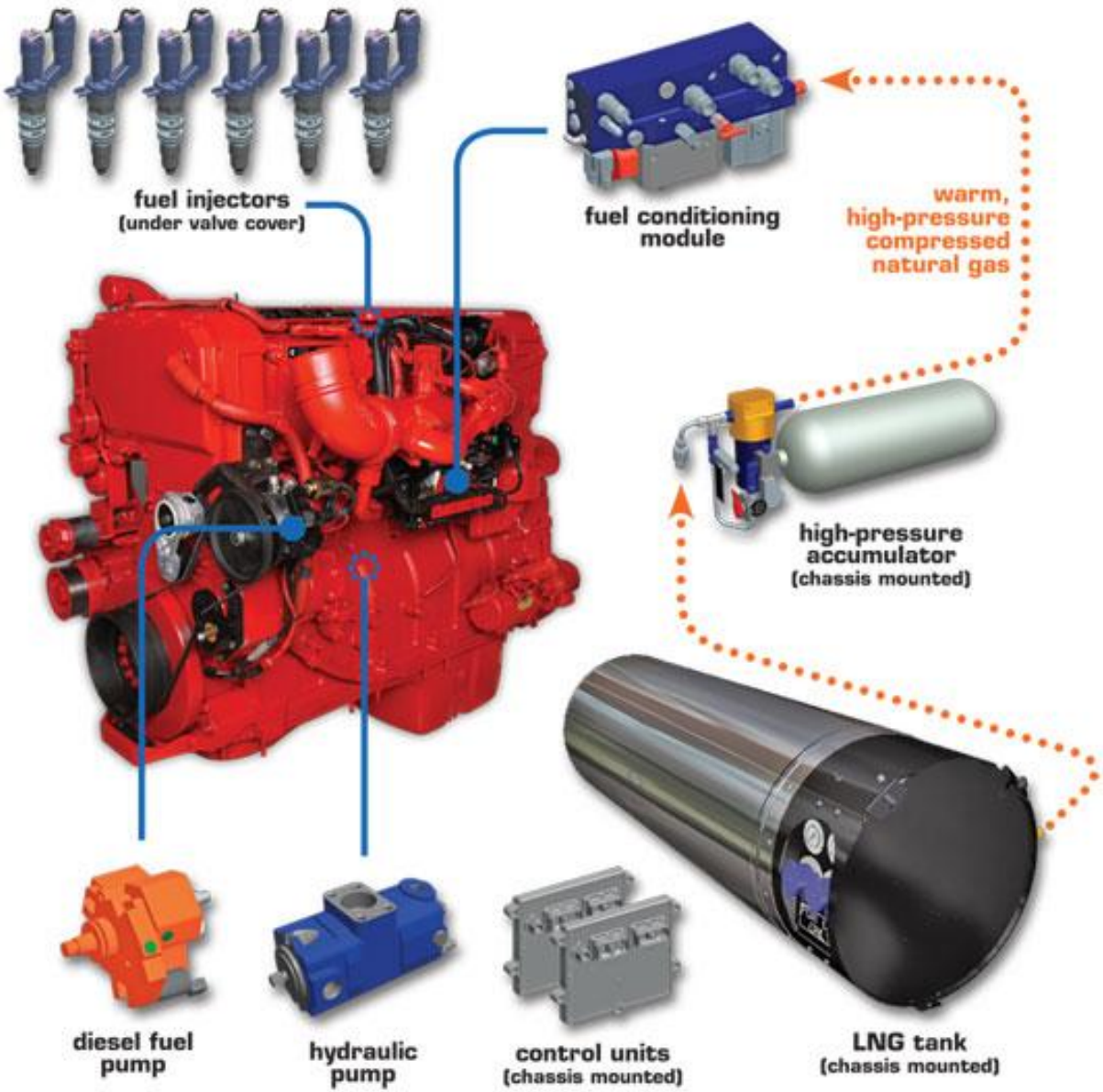
Satellite Station, Norway

Heavy-Duty Engines

Engine Technology

1. Spark-Ignited
2. HPDI

Liquefied Natural Gas Kenworth T800


fuel injectors
(under valve cover)
fuel conditioning module
warm, high-pressure compressed natural gas
high-pressure accumulator
(chassis mounted)
diesel fuel pump
hydraulic pump
control units
(chassis mounted)
LNG tank
(chassis mounted)

WM
Recycle.
Why waste a good thing?
WM
Powere
Natural

GreenFleet

LNG Fueling Stations

City Mesa, AZ

City of Mesa, AZ

LNG-L/CNG Fueling Station

Sun Metro

Grand Canyon, South Rim

NEXGEN

Korea

LIQUEFIED NATURAL GAS
START
STOP
TOTAL SALE
TOTAL GALLONS
PRICE PER GALLON
EMERGENCY STOP
2
DANGER
NO SMOKING
NO OPEN FLAMES
NO SPARKS

LNG L/CNG Safety

- National Fire Protection Code 52 (LNG)
- National Fire Protection Code 70 (Electrical)
- ASME 31.3 (Pressure Vessels)

Primary Safety Systems

- Methane Detection
- Flame Detection
- Manual Station Shut-Off
- Odorant

Bio-Methane

- Landfill gas
- Agriculture
- Other organic feedstock

CH4 Energy

- Merritt Norton

  4004 North 850 East
  Provo, Utah 84604
  mnorton@CH4-Energy.com

  mobile 425-213-6105