SUSTAINABLE LIGHTWEIGHT SOLUTIONS FOR MOBILE PIPELINE® AND MOBILE REFUELING

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CONTENT

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• MOBILE PIPELINE®

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HEXAGON COMPOSITES GROUP

High growth technology company manufacturing composite pressure tanks and assembling systems for storage of natural gas, hydrogen and propane

• Headquartered in Aalesund, Norway
  – facilities in Germany, Norway, USA, Canada and Brazil
  – sales offices in India, Singapore and Russia

• 820 employees
  – of which 412 employees in Agility Fuel Solutions (50% JV)

• Listed on Oslo Stock Exchange (OSE:HEX)
  – market cap of approx. EUR 490-500 million
HEXAGON BUSINESS AREAS

LOW-PRESSURE LPG

MOBILE PIPELINE®

HYDROGEN & LIGHT-DUTY VEHICLES

HEAVY-DUTY VEHICLES

HEXAGON RAGASCO

HEXAGON XPERION

HEXAGON LINCOLN

HEXAGON RAUFOSS

AGILITY FUEL SOLUTIONS (50% JOINT VENTURE)

Low-pressure cylinder LPG

High-pressure cylinder CNG & H₂
Hexagon Application Fields

Truck & Bus applications via Agility Fuel Solutions
TYPE-4 CYLINDER UP TO 75% LIGHTER THAN STEEL

- Type 1: full steel design
- Type 2: steel design + hoop-wrapped CFK laminate
- Type 3: steel/aluminum liner + CFK laminate
- Type 4: polymer liner + CFK laminate
MOBILE PIPELINE®
WHAT MEANS MOBILE PIPELINE®?

- Transport of gas where there is no grid
- Possible for different gases
  - CNG / Bio-Methane / Hydrogen / other technical gases

- Different applications
  - CNG from Grid to Industry
  - CNG from Grid to Power Generation
  - Bio-Methane from Production Plant to Industry or to Power Generation
  - Bio-Methane from Production Plant to Grid
  - CNG or Bio-Methane to Vehicle MRU (Mobile Refueling Unit)
Mobile Pipeline® Grid to Industry

GRID → COMPRESSOR → VIRTUAL PIPELINE → INDUSTRY

PRESSURE REDUCTION
Vehicle Refueling – Passive

GRID ➔ COMPRESSOR ➔ VIRTUAL PIPELINE ➔ 3- BANK CASCADE ➔ VEHICLE REFUELING
Mother to Daughter station – Active Refueling

GRID → COMPRESSOR → VIRTUAL PIPELINE

VEHICLE REFUELING → BOOSTER COMPRESSOR → 3- BANK CASCADE
Mother to Daughter station – Industry Refueling
MOBILE PIPELINE® - Bio-Methane from Farm to Grid

FARM BIO-METHANE PLANT → COMPRESSOR → VIRTUAL PIPELINE → GRID INJECTION → PRESSURE REDUCTION
MOBILE PIPELINE® - Bio-Methane from Farm to MRU

FARM BIO-METHANE PLANT

COMPRESSOR

VIRTUAL PIPELINE

BOOSTER COMPRESSOR

VEHICLE REFUELING
MOBILE PIPELINE® - From Grid to Heavy Horse Power Refueling

From Grid to Marine Fuel

GRID → COMPRESSOR → VIRTUAL PIPELINE

SHIP / TRAIN / EQUIPMENT REFUELING

ON-BOARD FILLING or CONTAINER SWAP
X-STORE® Transport units for CNG & Bio-Methane

- Due to lightweight Type-4 cylinders ➔ high transport capacity (payload up to 10 tons)
- Modular concept; available from 10ft to 45ft with ADR approval
- Multiple cylinder MEGC concept
- Available as 3-bank cascade system for MRU application
- Several options available to fully serve customer requirements
- Frame fully galvanized to prevent for rust
CASE STUDY VEHICLE REFUELING - SCANDINAVIA

- Transport of CNG from Grid to Daughter station
- Transport of Bio-Methane to Daughter station
- Offloading to stationary refueling station
- Booster compressor, ground storage, dispenser

Source of pictures: www.processkontrollgt.se (2x)
CASE STUDY GAS TO INDUSTRY - IRELAND

- Fourteen 20ft ADR approved SmartStore® transport units bring Bio-Methane to industry
- Production of approx 1,000 Sm³/hr Bio-Methane
- Filling of SmartStore® at the Mother station
- Cross-Boarder transport
- Gas delivery to five (5) CHP-plants and at five (5) Daughter stations
CASE STUDY - ISRAEL

- Mother station – CNG from Grid
- 12 X-STORE® units supply gas to eight (8) daughter stations
- 1 cascade X-STORE® unit for vehicle refeuling via MRU
- In Israel ADR legislation is applicable

Source of pictures: Supergas Israel
DIFFERENT APPLICATIONS FOR MOBILE PIPELINE® - EUROPE
DIFFERENT APPLICATIONS FOR MOBILE PIPELINE® - WORLDWIDE
CONCLUSIONS

• There is no restriction to use CNG or Bio-Methane, even if there is no grid available
• There are multiple solutions for Mobile Refueling of vehicles or small industry
• Mobile Pipeline® products are available in different sizes and capacity
• Due to lightweight Type-4 cylinders within Europe there is a maximum payload of up to 10 tons of gas
Thank you for your attention

Please visit us at the exhibition

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