



HEXAGON

# SUSTAINABLE LIGHTWEIGHT SOLUTIONS FOR MOBILE PIPELINE® AND MOBILE REFUELING



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Malmö, Sweden 14-08-2018

# CONTENT

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- **HEXAGON COMPOSITES GROUP**
- **MOBILE PIPELINE®**
- **MOBILE REFEULING**







HEXAGON

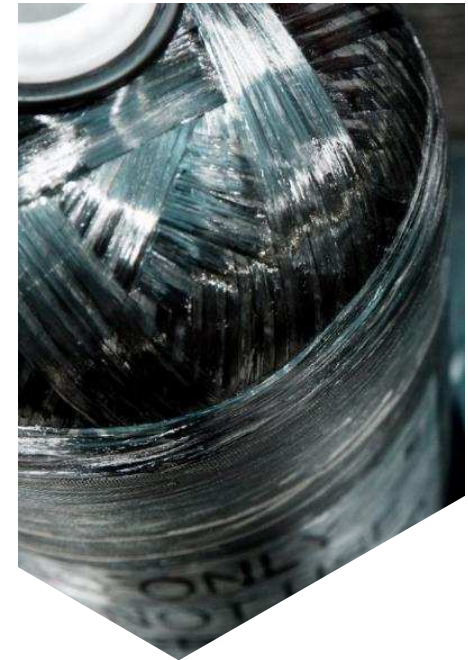
# HEXAGON COMPOSITES GROUP

# HEXAGON COMPOSITES GROUP

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**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



HEXAGON RAGASCO

## MOBILE PIPELINE®



HEXAGON XPERION  
HEXAGON LINCOLN  
HEXAGON RAUFOSS

## HYDROGEN & LIGHT-DUTY VEHICLES



## HEAVY-DUTY VEHICLES



AGILITY FUEL SOLUTIONS  
(50% JOINT VENTURE)



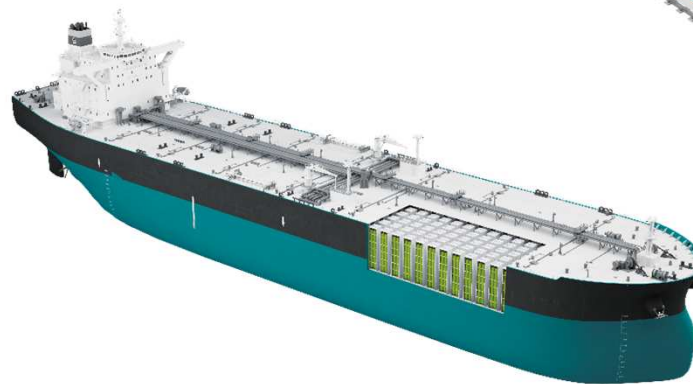
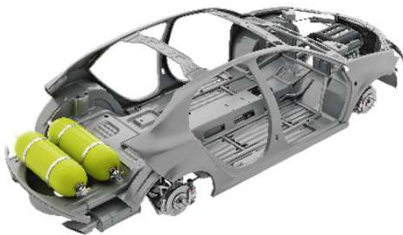
Low-pressure  
cylinder LPG



High-pressure  
cylinder CNG & H<sub>2</sub>

# HEXAGON APPLICATION FIELDS

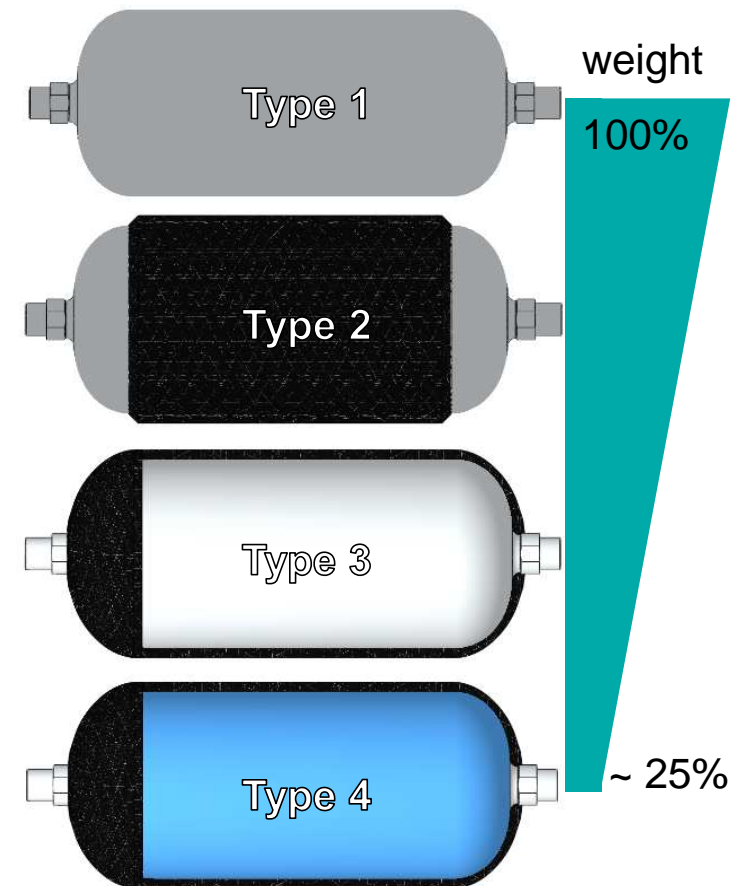
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**Truck & Bus  
applications via  
Agility Fuel Solutions**

## 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







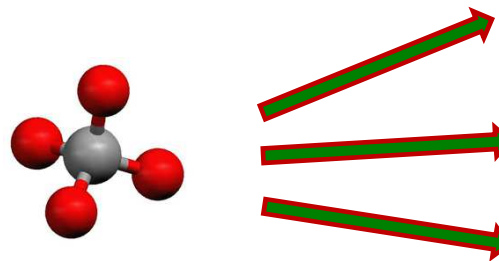
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**MOBILE PIPELINE®**

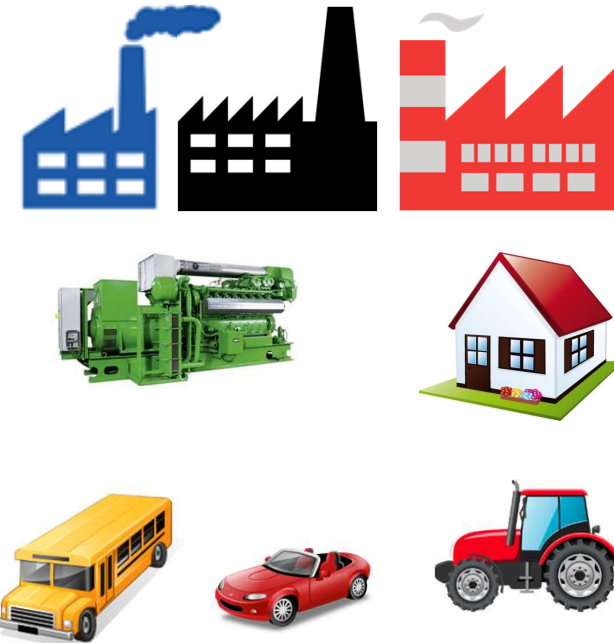


## WHAT MEANS MOBILE PIPELINE® ?

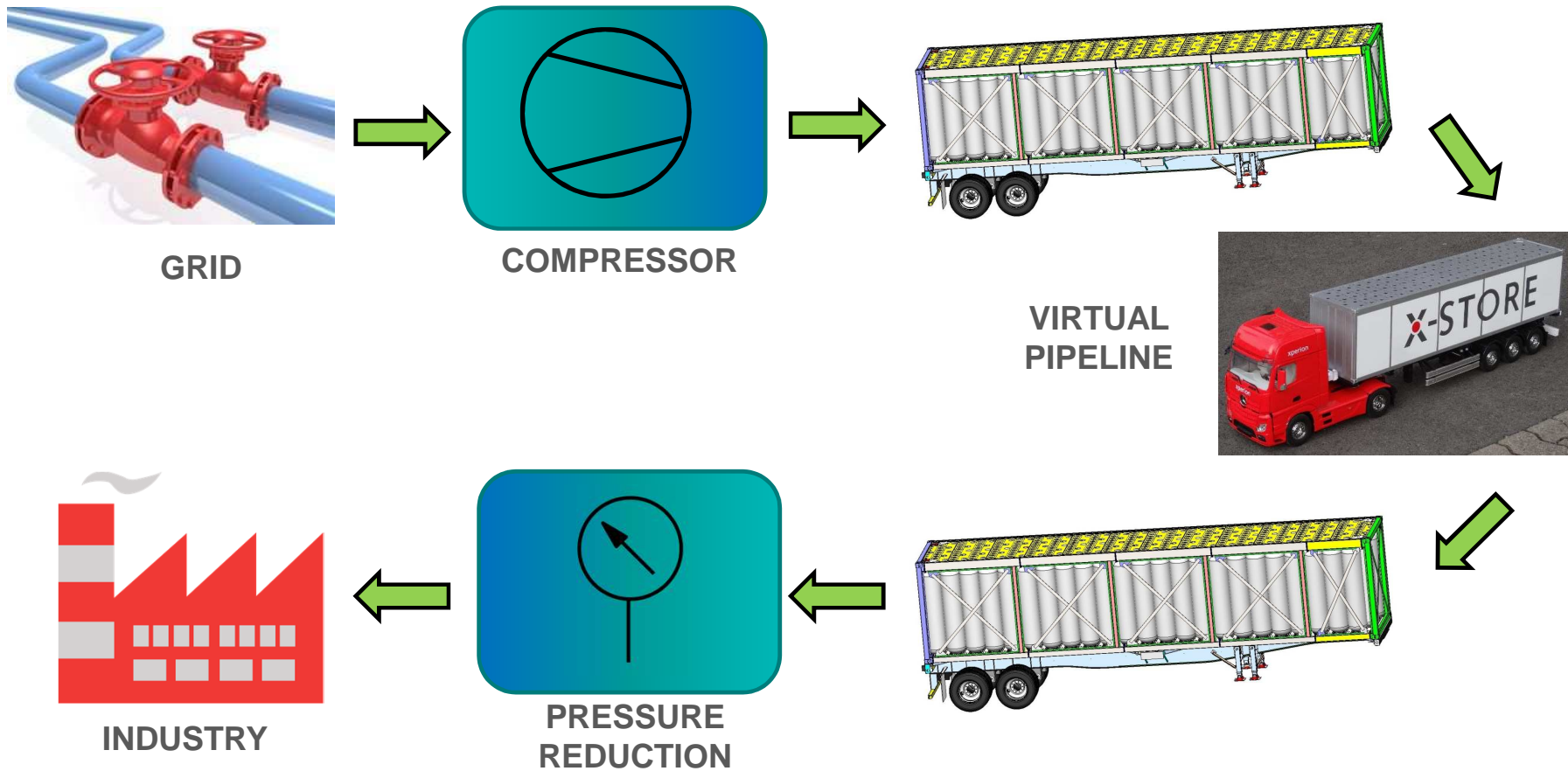
- Transport of gas where there is no grid
- Possible for different gases
  - CNG / Bio-Methane / Hydrogen / other technical gases



- 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)

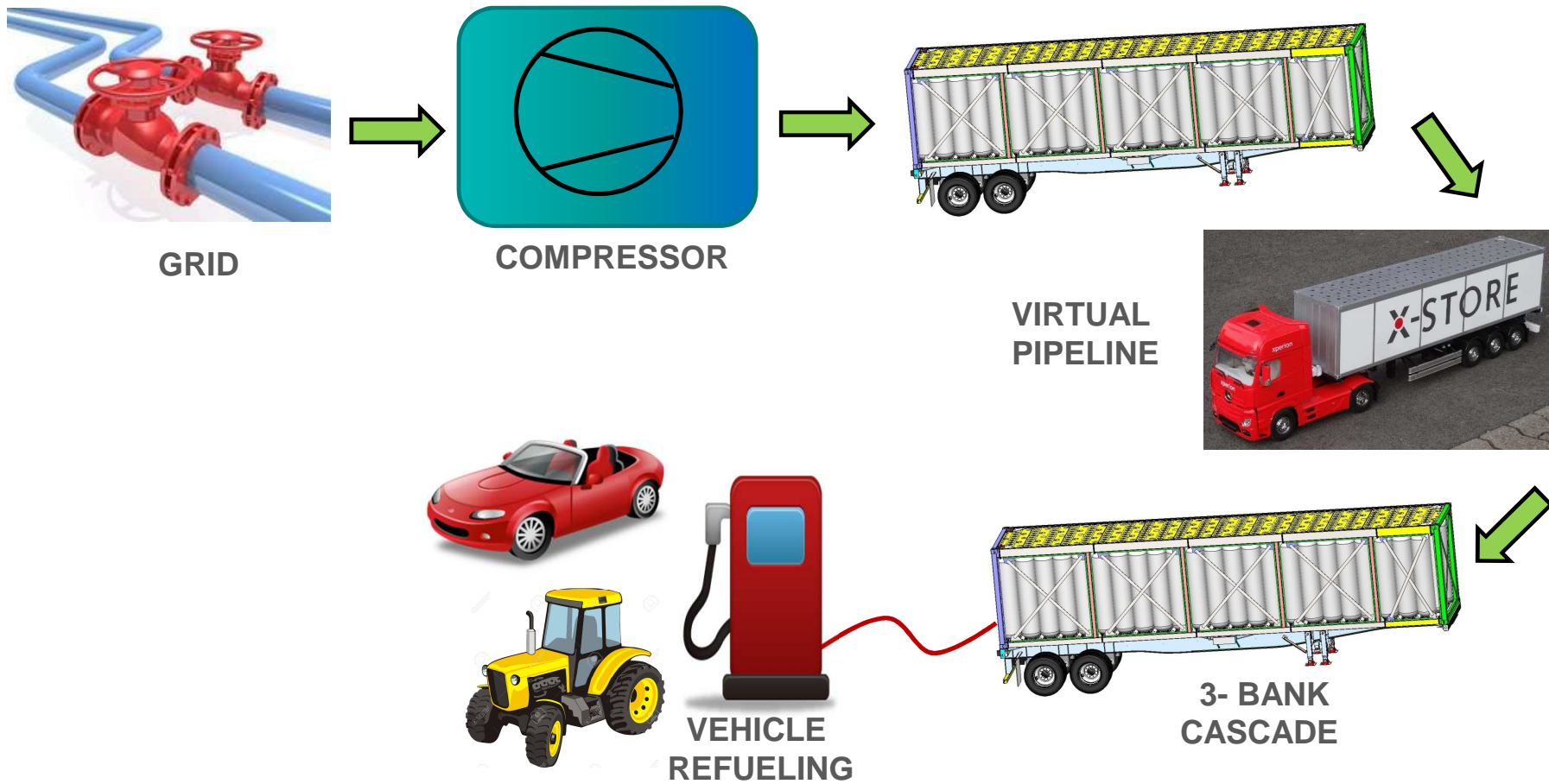


# Mobile Pipeline<sup>®</sup> Grid to Industry

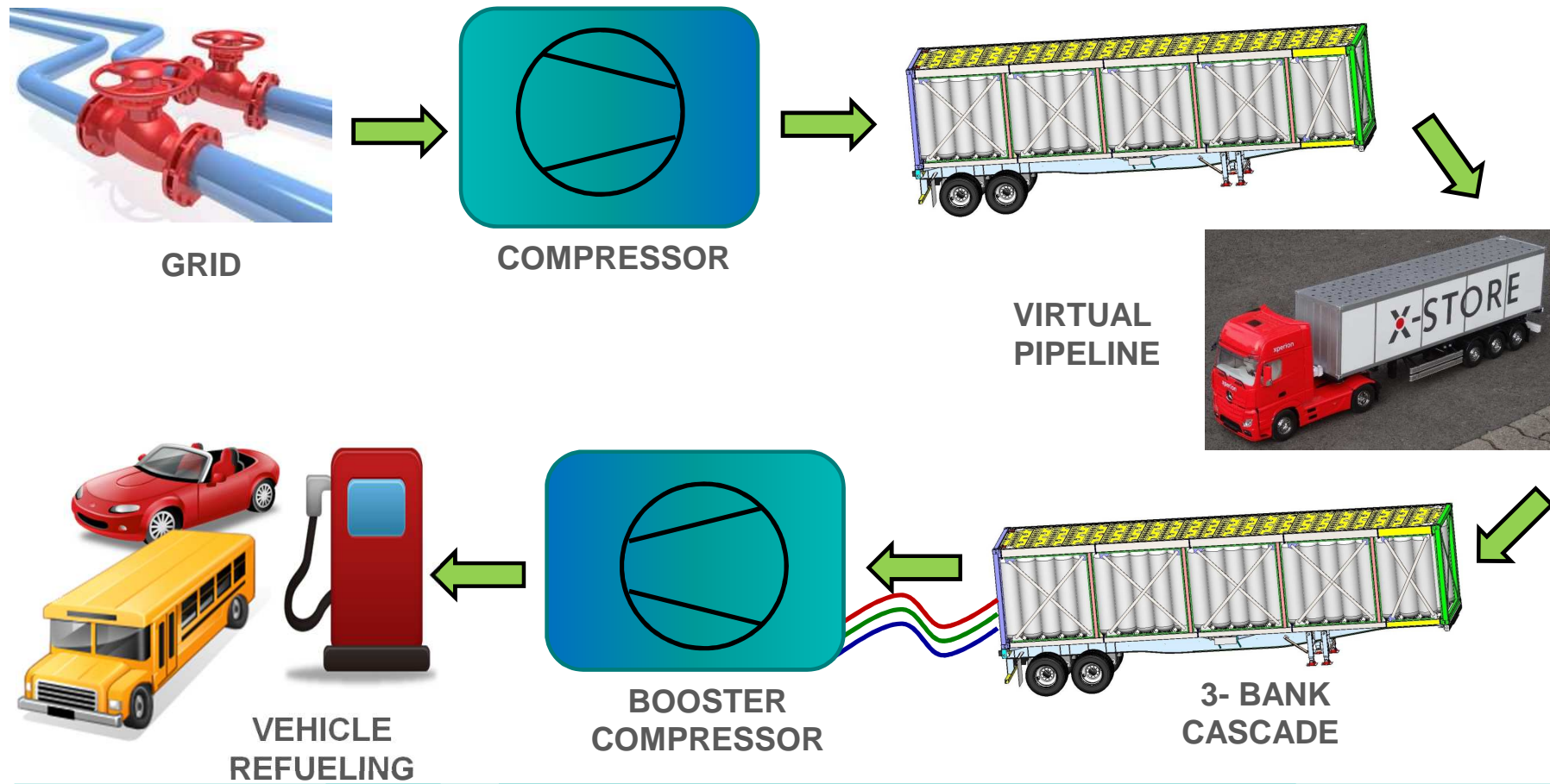




## Vehicle Refueling – Passive

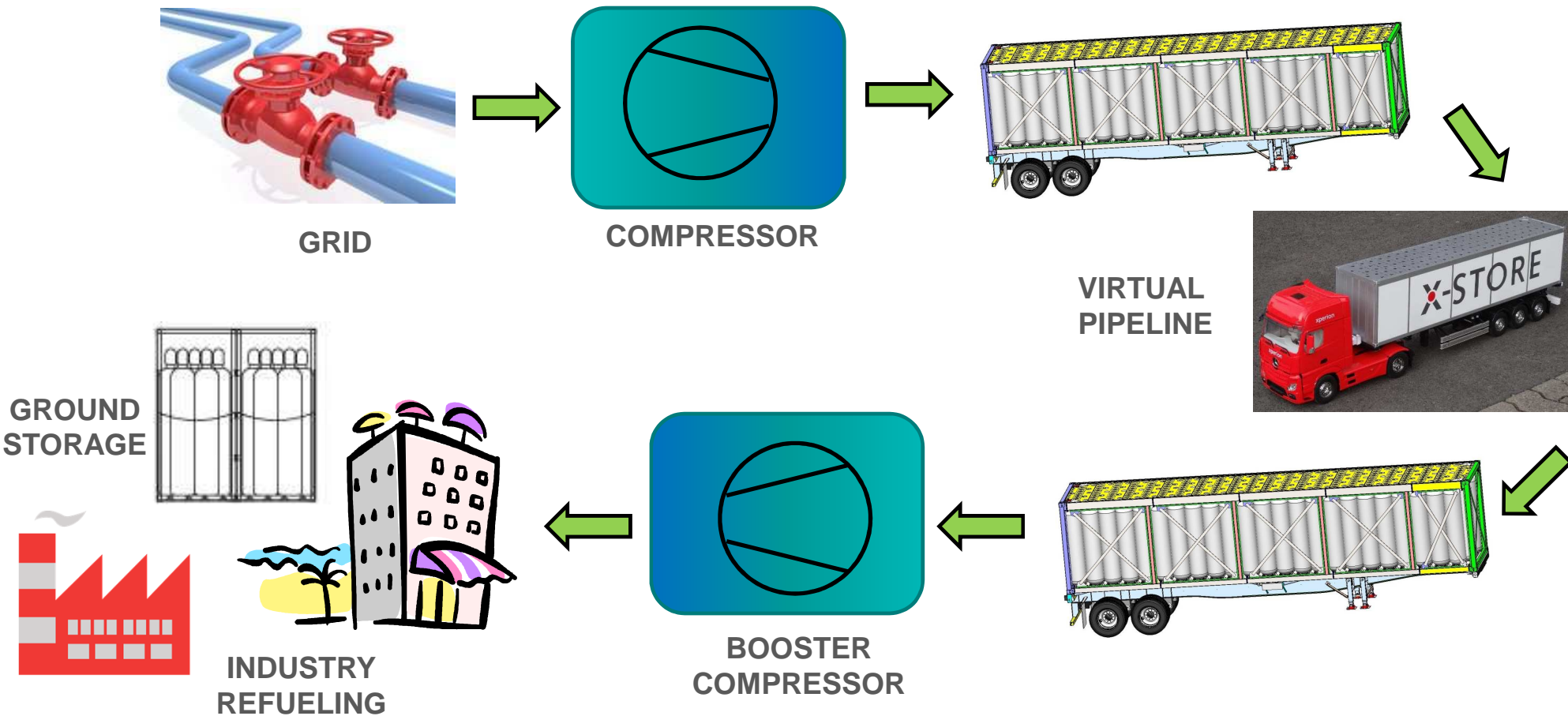


## Mother to Daughter station – Active Refueling

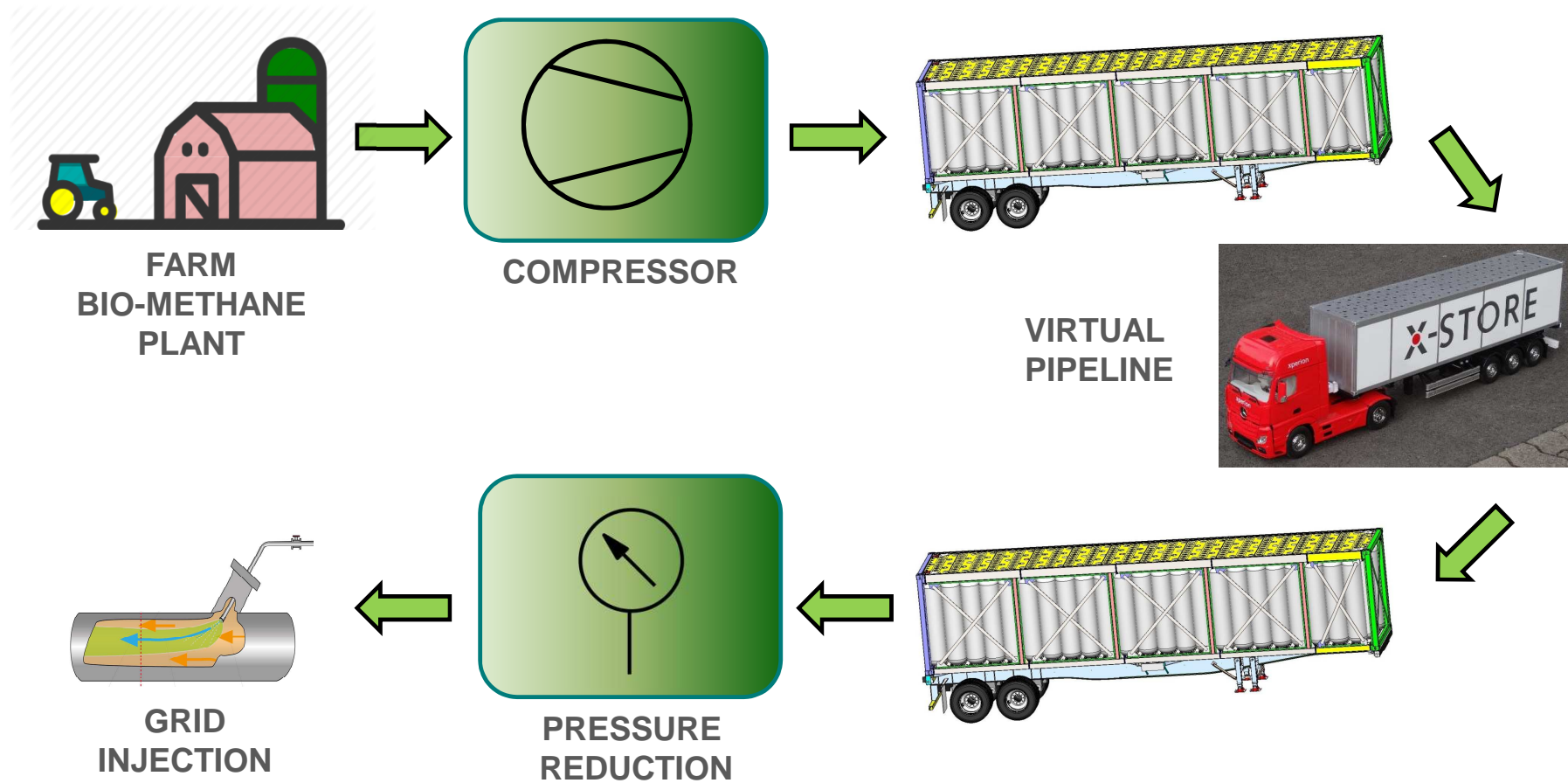




## Mother to Daughter station – Industry Refueling

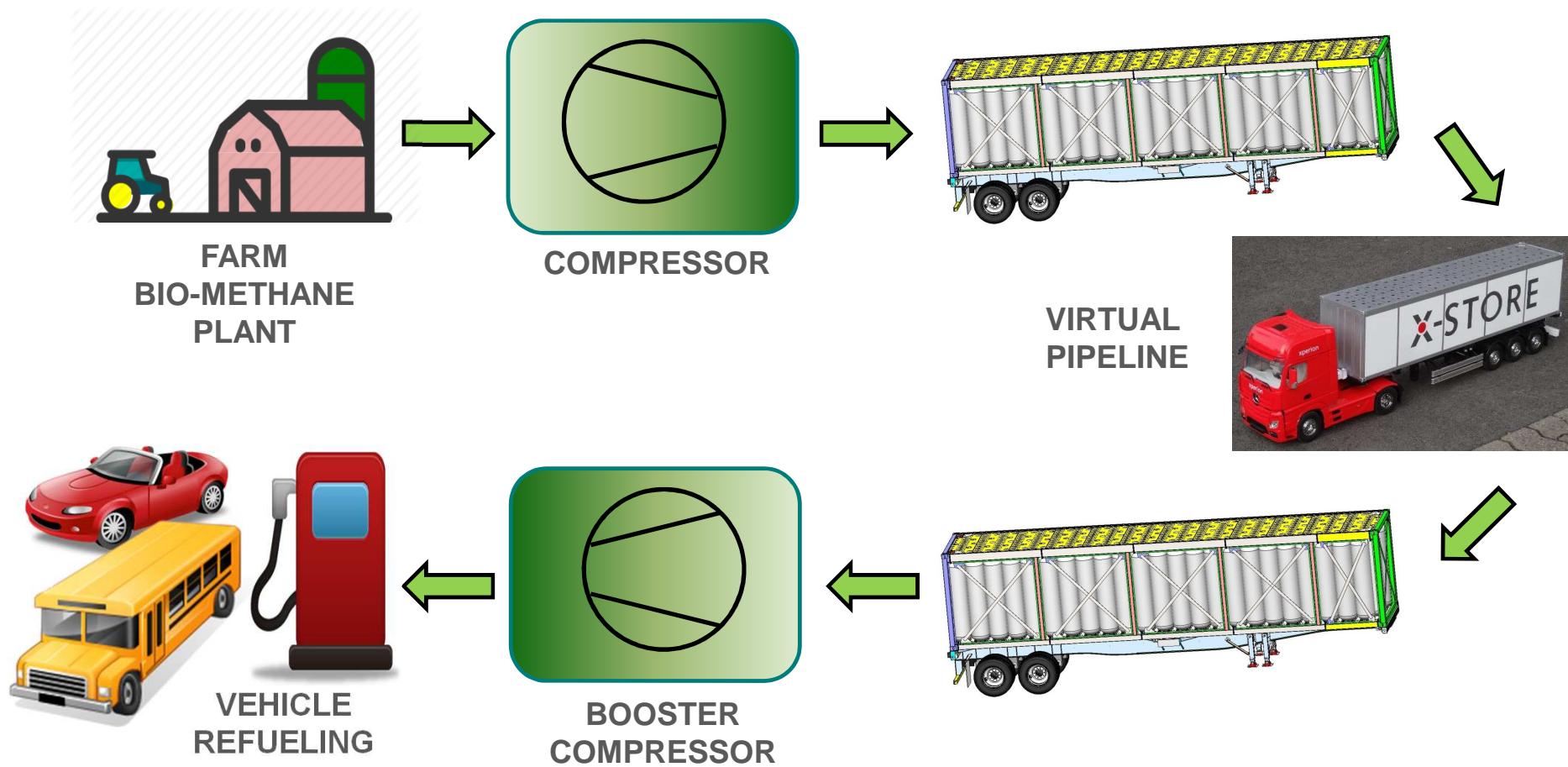


## MOBILE PIPELINE® - Bio-Methane from Farm to Grid





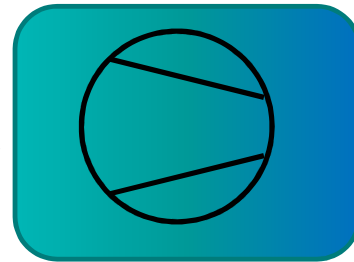
## MOBILE PIPELINE<sup>®</sup> - Bio-Methane from Farm to MRU



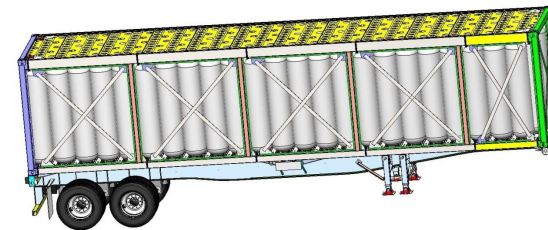
# MOBILE PIPELINE® - From Grid to Heavy Horse Power Refueling



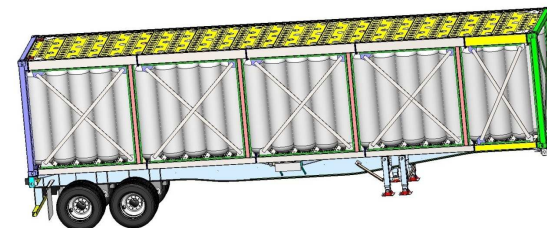
GRID



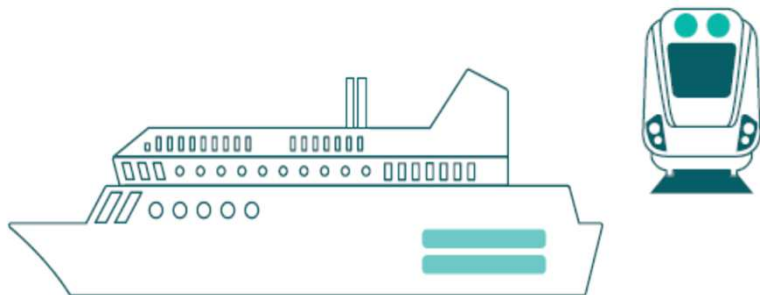
COMPRESSOR



VIRTUAL  
PIPELINE



ON-BOARD FILLING  
or  
CONTAINER SWAP



SHIP / TRAIN / EQUIPMENT  
REFUELING

## ► From Grid to Marine Fuel



## 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

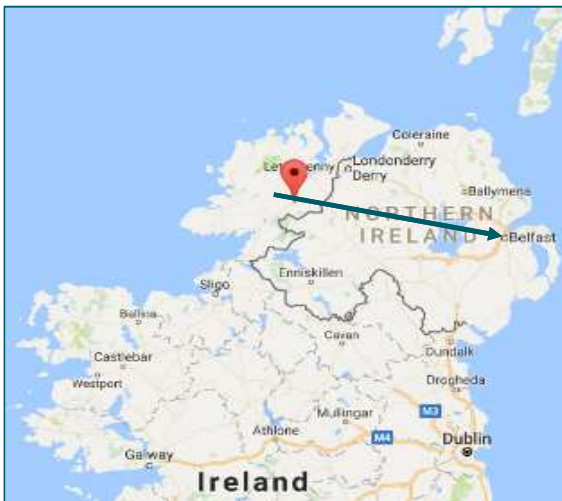


Source of pictures : [www.processkontrollgt.se](http://www.processkontrollgt.se) (2x)



## CASE STUDY GAS TO INDUSTRY - IRELAND

- Fourteen 20ft ADR approved SmartStore<sup>®</sup> transport units bring Bio-Methane to industry
- Production of approx 1,000 Sm<sup>3</sup>/hr Bio-Methane
- Filling of SmartStore<sup>®</sup> 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 refueling 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

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- 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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