



We supply gas everywhere

## Standardization for LNG for Road Filling Stations and Trucks

Company presentation  
Market experience and perspectives

Tallinn, May 16<sup>th</sup> 2018

[www.cryogas.pl](http://www.cryogas.pl)



## Company profile

- ✓ Distribution and sales of the liquefied natural gas – LNG. Natural gas supplies by grids.
- ✓ Construction of LNG consumption facilities in Poland and in the Baltic States.
- ✓ More than 30% of the Polish LNG consumption market share within five years of operations.
- ✓ Several LNG regasification systems for industrial consumers.
- ✓ LNG marketing as motor fuel – trucks, garbage trucks, buses.
- ✓ Fleet of cryogenic semi-trailers for LNG transport.
- ✓ Official supplier of LNG bunkering for vessels in the Port of Gdansk and the Port of Gdynia.
- ✓ Team leading Polish specialists in LNG market.

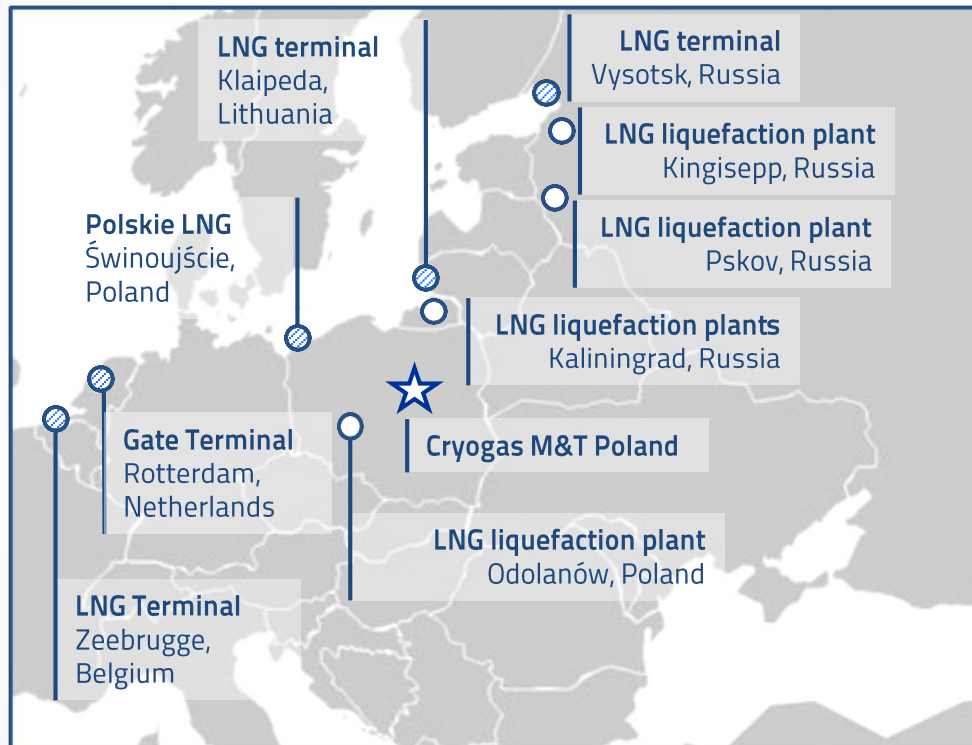


## Company movie presentation



Click picture to watch movie on [YouTube](#)

## Directions of LNG deliveries



○ LNG liquefaction plants

● LNG sea terminals

### LNG liquefaction plants

- Kaliningrad, Russia
- Pskov, Russia
- Kingisepp, Russia
- Odolanów, Poland

### LNG sea terminals

- Rotterdam, Netherlands
- Zeebrugge, Belgium
- Świnoujście, Poland
- Klaipeda, Lithuania
- Vysotsk, Russia



## Purposes of Cryogas LNG deliveries

### Natural gas vehicles

- Reduction of fuel cost.
- Lower CO<sub>2</sub> and NO<sub>x</sub> emission.
- Lower noise emission.

LNG/CNG for city buses, garbage trucks, transport companies.



### Bunkering

- Reduction of fuel cost.
- Lower exhaust gases emission.
- Fulfil present and future SECA standards.

LNG for seaway vessels.  
LNG for inland waterway vessels.



### Industry

- Heat production.
- Process steam production.
- High efficient cogeneration (CHP).

Industry customers without access to natural gas grids network.



## Cryogas as the LNG supplier for trucks

### LNG road tests for transport companies

- Activity:** Long distance tests of LNG trucks  
**Start:** June 2015  
**Fleet:** - IKEA Distribution North Europe  
- Unilever Poland  
**Status:** Cryogas provides LNG supplies and infrastructure.



### First LNG station for municipal services

- Activity:** Design & construction of LNG/LCNG station  
**Start:** September 2015  
**Fleet:** Municipal garbage trucks  
**Status:** Refuelling of Light and Heavy Garbage trucks owned by municipal company (PGK Śrem). Station is open 24/7 to the public.





### First motorway LNG/CNG station

- Activity:** Design & construction of LNG/LCNG station  
**Start:** January 2018  
**Fleet:** HD trucks, LDVs  
**Status:** Station at design stage. Project in cooperation with local petrol company (UNIWAR).



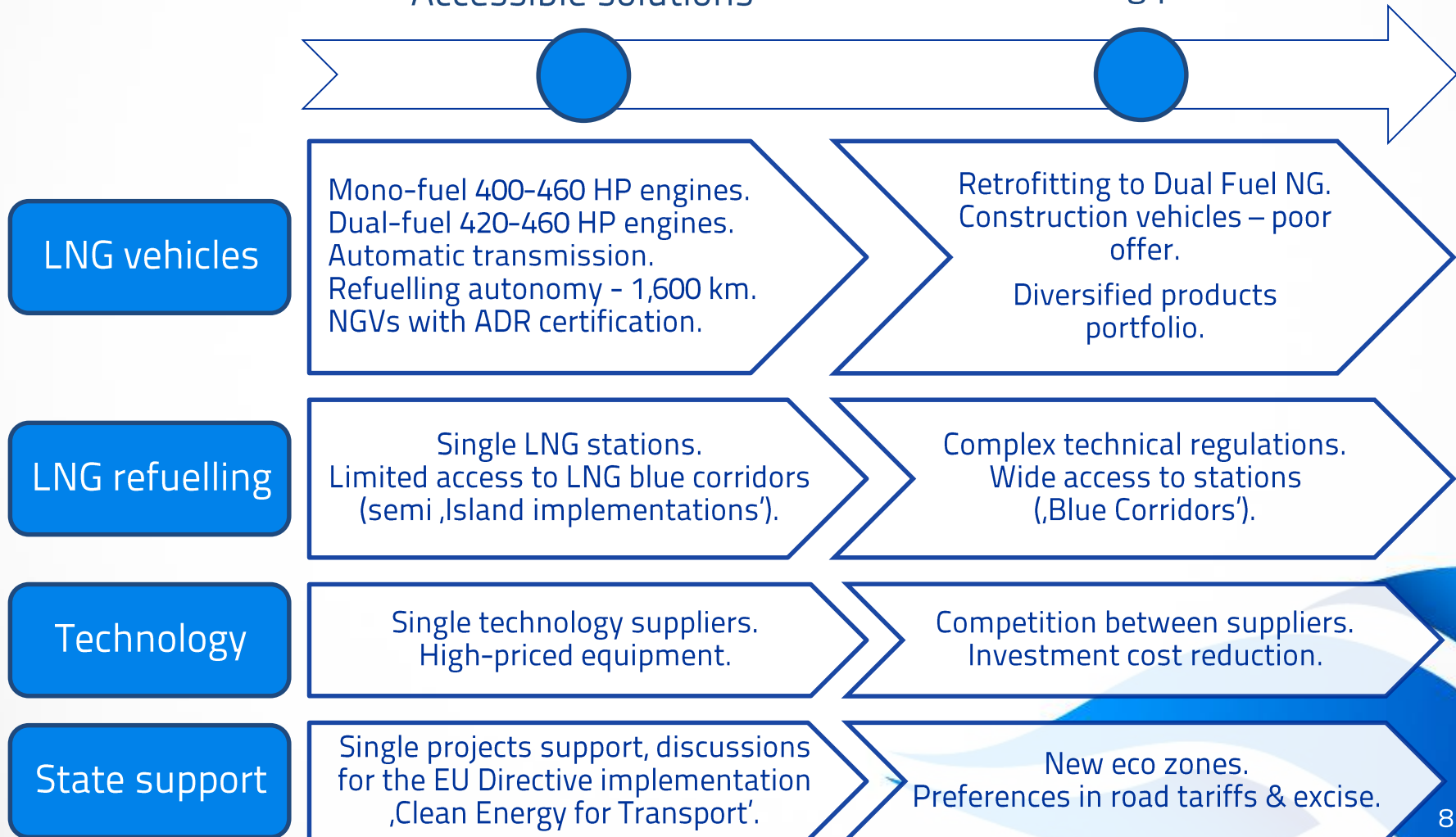
## Real road tests of Iveco Stralis LNG

	IKEA	Unilever
		
<b>LNG Vehicle</b>	Iveco Stralis 330 Natural Power	Iveco Stralis NP400
<b>Consumption / 100 km</b>	25,0 kg LNG vs 30,0 L Diesel	23,6 kg LNG vs 27,7 L Diesel
<b>CO2 – LNG vs Diesel</b>	-7%	-11%
<b>Benefits</b>	Similar use to Diesel truck, significant noise reduction.	Comfortable cabine, similiar use to Diesel truck.
<b>Challenges</b>	Not enough power, limited range (750 km), limited availability of the stations.	Lack of experience in LNG usage, limited aviability of the stations, no standard fuel cards.
<b>Further details</b>	On-line report <a href="#">here</a> .	On-line report <a href="#">here</a> .

## On the way to HD mobility powered by LNG

Accessible solutions

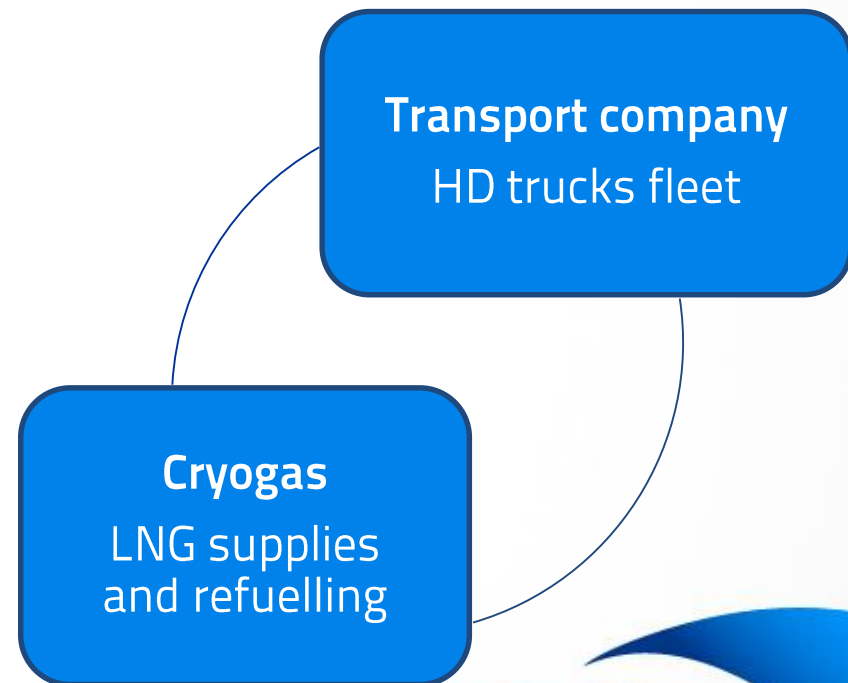
Missing points





## **Cryogas M&T Poland Solution** for trucks powered by LNG

- LNG price - parity to Diesel indexed price.
- Price components:
  - ✓ Cost of natural gas;
  - ✓ Excise and road tax;
  - ✓ Tenancy fee for LNG station.
- Possible price reduction - Increased contract's period/volume.
- Each LNG station is tailor-made solution.
- 24h/7 days Cryogas control of the station.
- Cryogas is responsible of all aspects in reflect to:
  - ✓ LNG supplies and refuelling;
  - ✓ LNG station design, construction and maintenance.



## LNG refuelling station - scheme



1. **Cryogenic semi-trailer.** Maintains a low temperature of liquefied gas during transportation.
2. **Cryogenic tanks.** Used to store gas in liquefied form.
3. **Cryogenic pump** transfers the fuel to the LNG dispenser.
4. **LNG dispenser** measures the amount of fuel taken, and then an LNG vehicle – truck, bus or other heavy vehicle – is fuelled by using a standardized nozzle.

## LNG stations – possible applications



Source: Producers, Cryogas

Fixed station	SKID station (movable)	Container station (mobile)
Fully area arrangement	Station area arrangement	Area adjustment
Vertical LNG tank	Horizontal LNG tank	
50 HD trucks & more	Up-to 50 HD trucks/day	

### Location requirements

For setting the LNG station is required area ready for HD trucks handling (LNG supplies) and access to 20 kW electricity.

**Fast and efficient LNG refuelling is accessible for all types of LNG stations (container type as well).**

For HD truck with double tanks it's consume max. 10 minutes.

## LNG refuelling stations for vehicles



Photo. LNG refuelling infrastructure in Olsztyn and Śrem, set by Cryogas M&T Poland

**Activity: Design and construction of LNG stations for vehicles refuelling**

**Commissioning: November 2014 – Olsztyn; September 2015 – Śrem**

**Comprehensive investment process of building LNG filling station:**

1. Executing a complete construction design.
2. Obtaining required permits.
3. Assigning construction managers and inspectors.
4. Executing construction and sanitation works.
5. The official technical authorization of constructed station.

## LNG bunkering solution offered by Cryogas M&T Poland

### Experience and perspectives

- **Poland. LNG Truck-to-Ship bunkering**
  - ✓ Gdańsk/Gdynia. Cryogas is the official LNG bunkering supplier. Participation in working group for safety and technical operational instructions.
  - ✓ Service/regulations extension for other Polish ports.
- **Baltic States. First steps already made**
  - ✓ First LNG supplies for vessels operator (Truck-to-Ship deliveries).
  - ✓ Activities for expanding truck-to-ship bunkering.





## LNG satellite stations for industry

- **Lower cost of heat/process steam production**

Low fuel price. Saving guarantee based on the market fuel prices. Higher combustion efficiency. Reduced maintenance and operating costs of boiler.

- **Environmental friendly fuel**

Reduction in CO<sub>2</sub> emission and elimination of particle matters emission.

- **Payment for consumption, not for delivery**

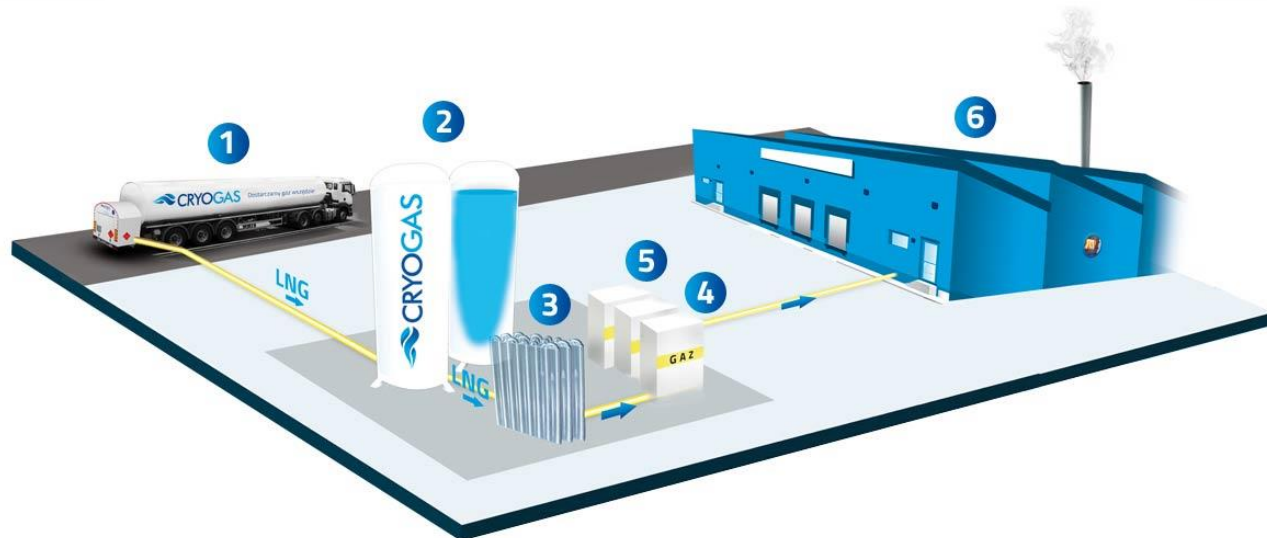
Metering by the flowmeter installed just before customer's devices using LNG.

- **Multitude of applications**

LNG can be used i.a. for high efficient CHP units.



## LNG satellite station for industry - scheme



1. **Cryogenic semi-trailer** – maintains a low temperature of liquefied gas during transportation.
2. **Cryogenic tank** – set for storage of liquefied gas.
3. **Atmospheric vaporizers** – used to convert the LNG to gaseous form.
4. **Measuring & reduction station** – gas measurement and pressure reduction.
5. **Odorization** – addition of the characteristic smell to the gas.
6. **Facility boiler.**

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LNG & CNG for transport

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