

A WÄRTSILÄ COMPANY



Vaasa Gas Exchange

Kent Kongsdal Rasmussen

Wärtsilä Puregas Solutions

Since October 2017 part of the Wärtsilä group



Location of HQ

Kalmar, Sweden

Number of Employees

40

Sales Companies

Nordic, Germany, UK and the USA

Upgrading Technology

Chemical Absorption

Number of Plants

30 in operation (2002 onwards), 4 in production



Manufactured and fully tested
before delivered to site

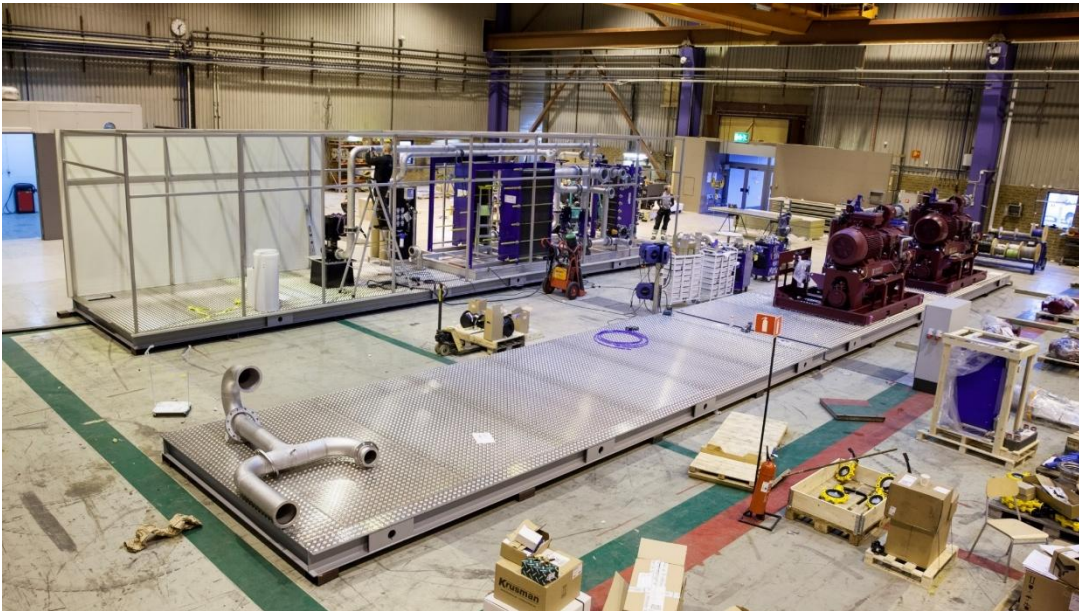
High-Grade Stainless Steel
used throughout

Built-in redundancy of key
components such as
compressors and blowers

Easy access for maintenance

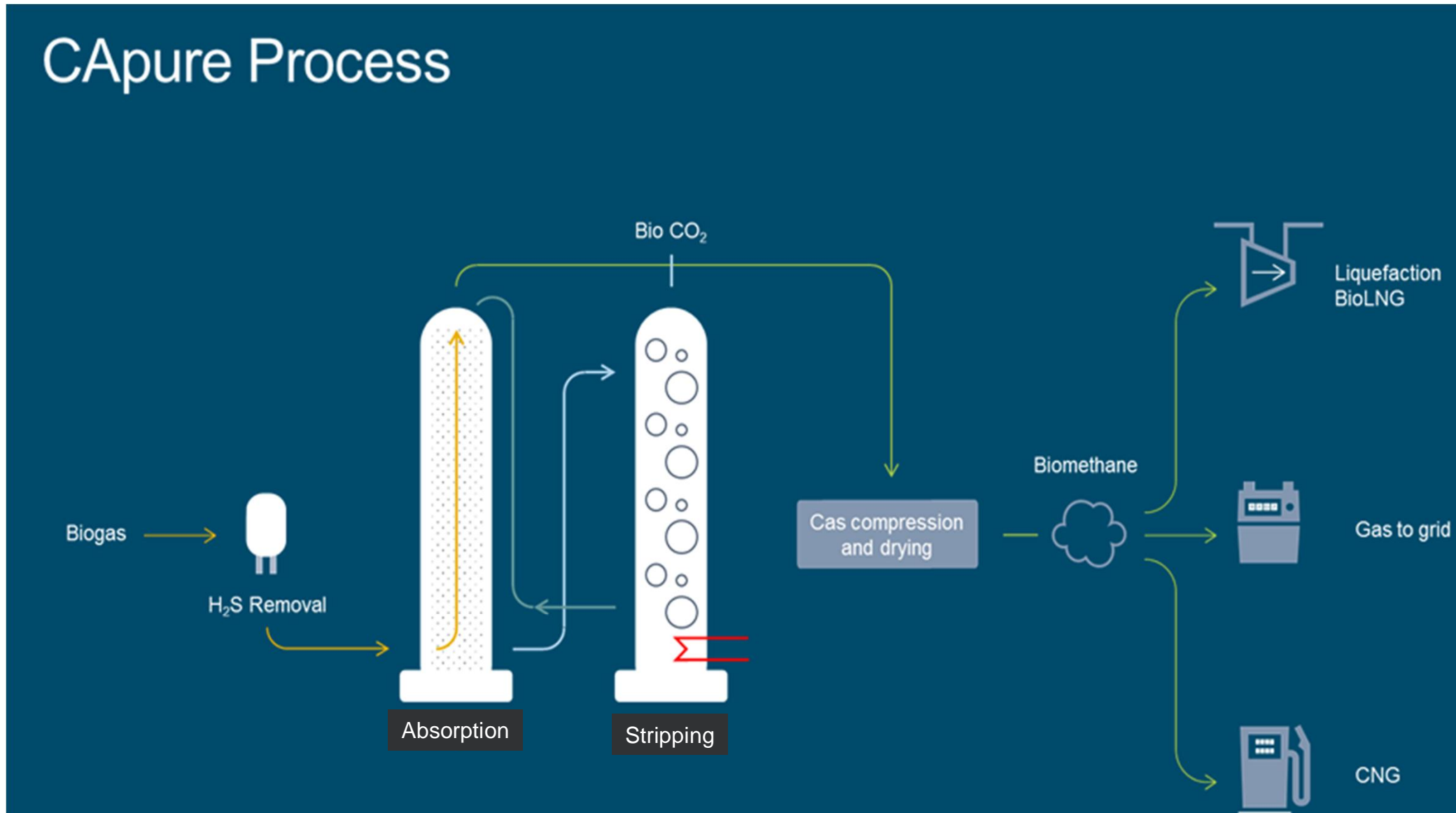
5 months lead-time from
order to Ex Works Kalmar,
Sweden delivery





CApure™ process (standard version)

CApure Process



CApure™ technology

Value proposition



Methane slip < 0,1% minimises GHG emissions and optimizes revenue.

Highest methane purity, reduced requirement for propane enrichment

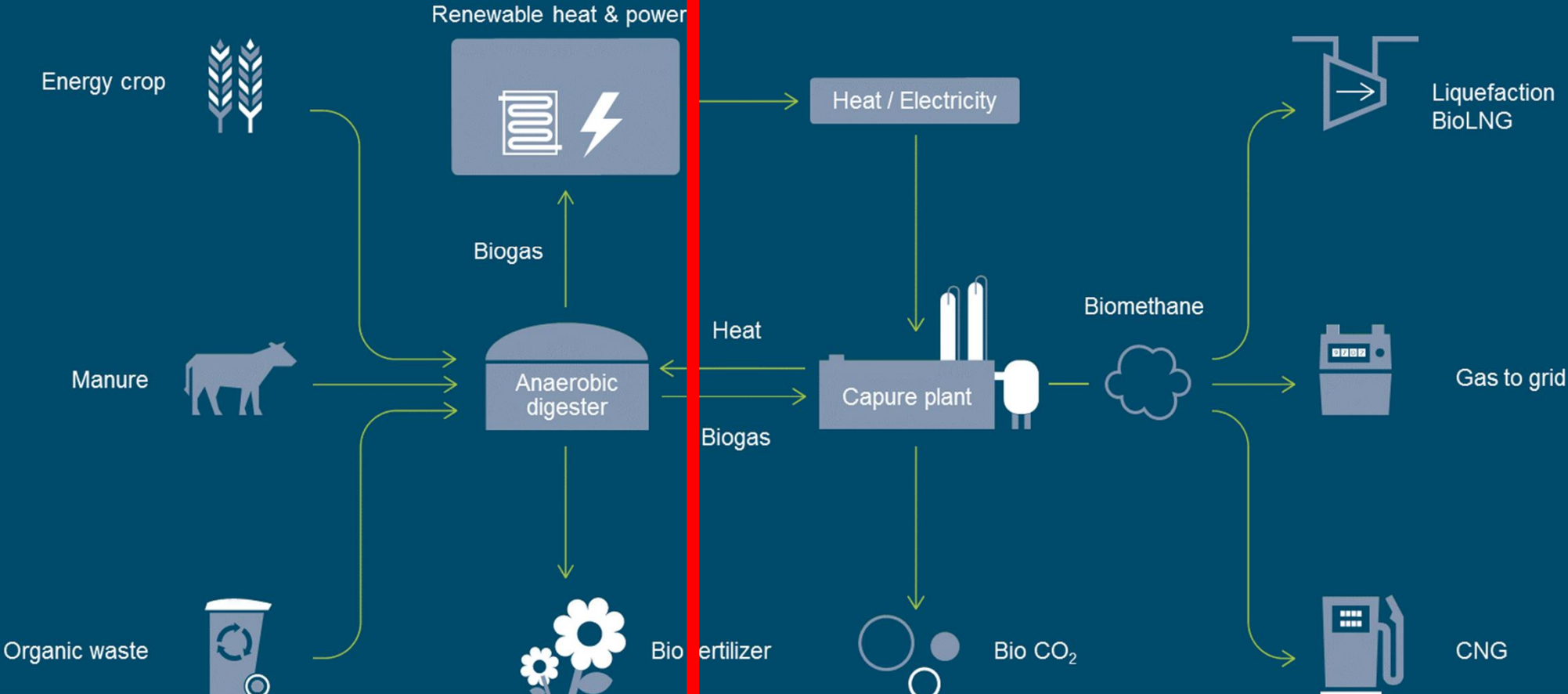
Product range flexibility

Low cost of ownership CAPEX / OPEX utility consumption, uptime, service and maintenance.

Thermal integration possibilities, potential OPEX saving.

Biogas Process

Puregas Solutions Potential turnkey scope



CApure™ models



CApure™ Core model	Max Capacity (Nm ³ /h)
CA30	700
CA40	900
CA50	1.250
CA60	2.000
CA70	3.000
CA80	6.000

6 core models - available in 3 versions

- ∅ Version 1: *Standard version used for bioCNG.*
- ∅ Version 2: *H2S models (allow high H2S levels)*
- ∅ Version 3: *BioLBG models (to avoid pre-treatment before liquefaction, CO2 level below 50 ppm in product gas stream, 20 bar biomethane).*

- ∅ *All versions operates between 30% and 100% of maximum capacity.*
- ∅ *All versions have 60% - 70% compressor redundancy, amongst others*

CApure™ for bioCNG

Case study: More Biogas



- Ø 29 shareholders, 18 of which are local farmers
- Ø Located in Kalmar, Sweden and operational since late 2014
- Ø Produces biomethane for on-site gas vehicle refuelling and transportation via road to satellite CNG stations
- Ø No local gas-grid
- Ø Biomethane is compressed to 250 bar to produce bio-CNG
- Ø Demand for green gas to power vehicles
- Ø One central large plant far more economical than several small plants
- Ø Complete process is automatic – biogas plant is unmanned and remotely operated
- Ø The plant produces enough bioCNG to displace over 3 million litres of diesel each year.

CApure™ for bioCNG

Case study: More Biogas

Virtual Pipeline to local CNG stations

- Ø *Six bays where composite trailers are automatically filled with bio-CNG*
- Ø *Five bays in operation and one left free for next trailer delivery*
- Ø *bio-CNG transported by road to bus depot and local CNG stations (mother & daughter principle)*



CApure™ for bioCNG

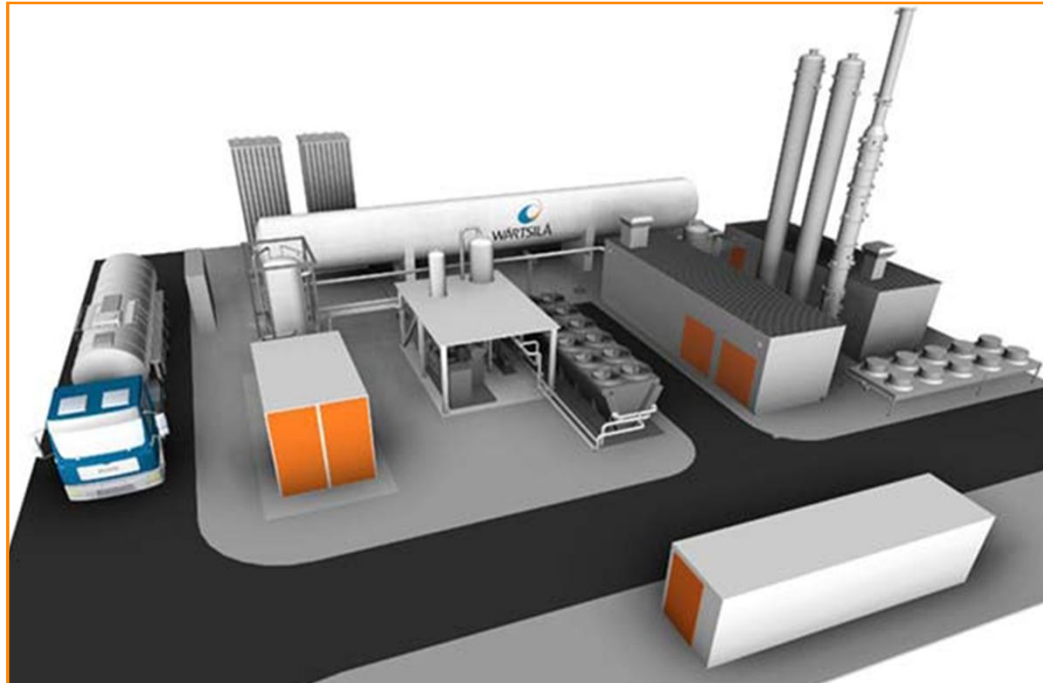
Case study: More Biogas

On site bioCNG refuelling station



Small scale bioLNG

Principle



Integrated solution

- ü CApure™ biogas upgrading
- ü MR biogas liquefaction

Historically



New



On-Going Project

Case study: Biokraft AS

Owner	Biokraft AS
Type	Mini liquefaction plant
Tank net volume	350 m ³
Capacity	25 TPD / 9,125 TPA
Size of liquefaction unit	12 m x 20 m
Gas source	Biogas from fish industry and paper mill waste
Details	Biogas to be used on city buses in Trondheim
Scope of supply	Liquefaction plant, incl. <ul style="list-style-type: none">• Cooling system (Ambient air)• MR liquefaction process• Storage tank• Electrical and control systems• Service agreement• Installation of plant Excl. Civil works
Delivery method	EPC
Delivered	2017



Trends

Europe

- Ø Looking for bioCNG and bioLNG solutions has often been driven by lack of access to grid, though in the past years it has been more and more the market pulling the demand.
- Ø EU ten T and blue corridors initiatives have accelerate projects all over Europe.
- Ø Several large cities are banning or planning to ban diesel vehicles, which is likely to accelerate the transition to gas driven vehicles and if private cars influenced then likely to increase focus on various hybrid solutions.
- Ø Car manufacturers are reconsidering their strategy in diesel cars.

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PUREGAS 
SOLUTIONS

Thank you for your attention!