



BIOMETHANE FOR EUROPE

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Green Gas Poland 2018 | Warsaw | September 12th 2018

KEY FACTS



2007
foundation



40
employees



Munich, Berlin,
Dortmund & Budapest



200 Mio.
revenue

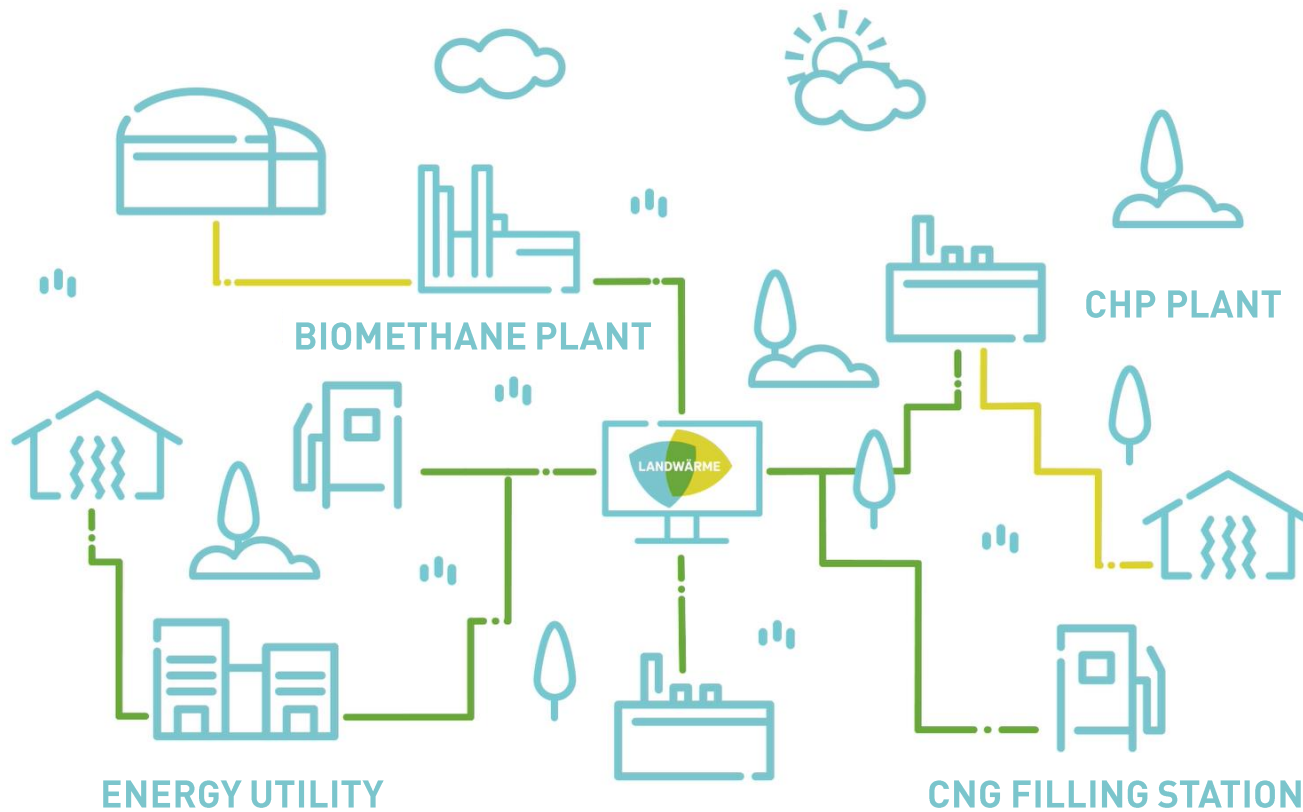


active in 10
member states



more than 3 TWh
trading portfolio

OUR ROLE IN THE VALUE CHAIN



**BIOMETHANE
PRODUCTION**

TRADING

SERVICES

WE SUPPLY MORE THAN 250 UTILITIES AND ENERGY SUPPLIERS WITH GREEN GAS



e-on

Stadtwerke Gießen
SWG

 **Erdgas Südwest**

ESB

 **RhönENERGIE**
FULDA

LichtBlick
 *die Zukunft der Energie*

 **EnBW**

 **stadtwerke**
Schwäbisch Hall GmbH

 **naturstrom**
ENERGIE MIT ZUKUNFT

RWE

 **erdgas
schwaben**
Wir sind da, wo unsere Kunden sind

•polarstern

YEARLY PRODUCTION OF 200 GWH BIOMETHANE AT OUR OWN SITES



1. WITTENBURG
since 2015



2. FELDBERG
since 2015



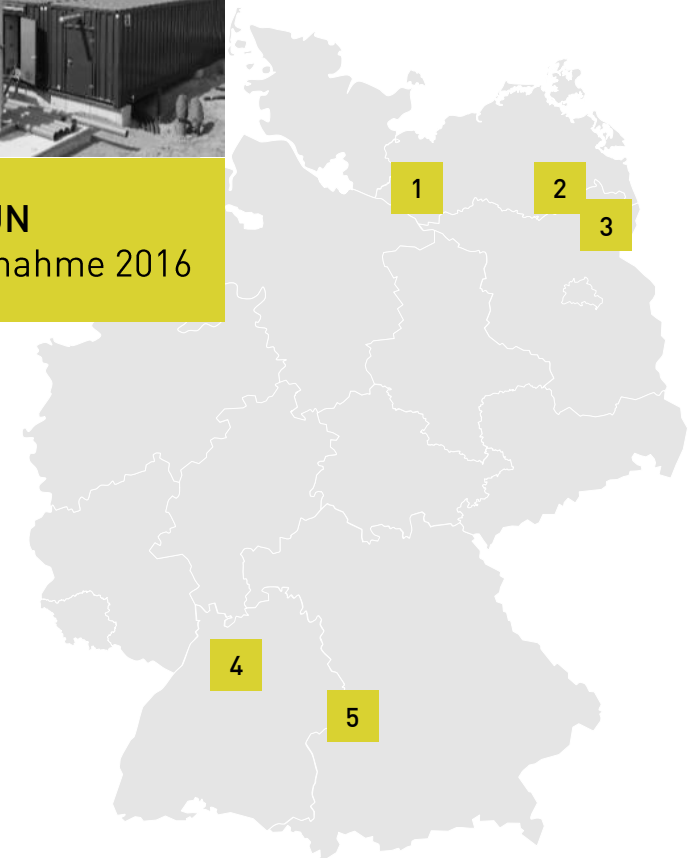
3. PENKUN
Inbetriebnahme 2016



4. SCHWAIGERN
since 2013



5. REIMLINGEN
since 2015



A close-up, low-angle photograph of tall, thin grass stalks with seed heads, bathed in warm, golden light, likely from the setting or rising sun. The background is a soft, out-of-focus blue sky.

BIOMETHANE MARKET

FIELDS OF APPLICATIONS FOR BIOMETHANE



HEATING SECTOR

Blending of biomethane as eco-gas



BIOFUEL SECTOR

Biomethane for refuelling natural gas vehicles



COMBINED HEAT AND POWER GENERATION

Biomethane for producing electricity and heat in CHP-units

CERTIFICATION OF BIOMETHANE IS OF UTMOST IMPORTANCE



A close-up, low-angle shot of tall, thin grass stalks with seed heads, bathed in warm, golden light, likely from a low sun. The background is a soft, out-of-focus blue sky.

NEW BIOMETHANE PROJECTS IN EASTERN EUROPE

VAST POTENTIAL CAN BE REALIZED



DEMAND FOR GREEN PRODUCTS

- Germany, Switzerland, Benelux countries
- Developing market by climate-conscious costumers

HIDDEN PRODUCTION CHAMPIONS

- Eastern European countries
- Huge agricultural space, unused waste, and residue potential

BIOFUEL SECTOR

- Italy, Sweden & the Netherlands
- Advanced natural gas vehicle market and continuously expanding infrastructure

CRITERIA FOR NEW PROJECTS



ECONOMICALLY ATTRACTIVE



- Sourcing should meet price level in Germany
- Prices mainly driven by subsidies

“SUSTAINABLE” INPUT MATERIAL



- Avoid dedicated crops such as maize silage
- Input mainly based on residues, waste, or manure (RED)
- Certification of value chain (traceability & documentation)

“EASY” PROJECTS



- Brown field project with existing biogas production
- Significant size: min. 700 – 1000 Nm³ biogas / h

POTENTIAL FOR POLISH PROJECTS



POLISH SUPPORT SYSTEM DIFFERS IN SIZE

- up to 0.5 MW plants
- 0.5 - 1 MW
- larger than 1 MW

AND INPUT MATERIAL

- Agriculture
- Waste & sewage
- Landfill

EUROPEAN DEMAND

- does **not** differ in size: price matters
- Focused on certain input
 - No dedicated biomass (maize)
 - No landfill gas

POLISH SUPPORT SYSTEM MUST BE FLEXIBLE

- Right to split the volumes
- Right to switch between support scheme and direct sale option (Pay-back support)



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The background is a photograph of tall, thin grasses with seed heads, bathed in warm, golden light, likely from a low sun. A semi-transparent teal rectangle is overlaid on the lower left portion of the image.

PIONEER PROJECT KAPOSVÁR, HUNGARY

BIOGAS PRODUCTION SINCE 2008



- Biogas plant since 2008 at the site of a sugar factory



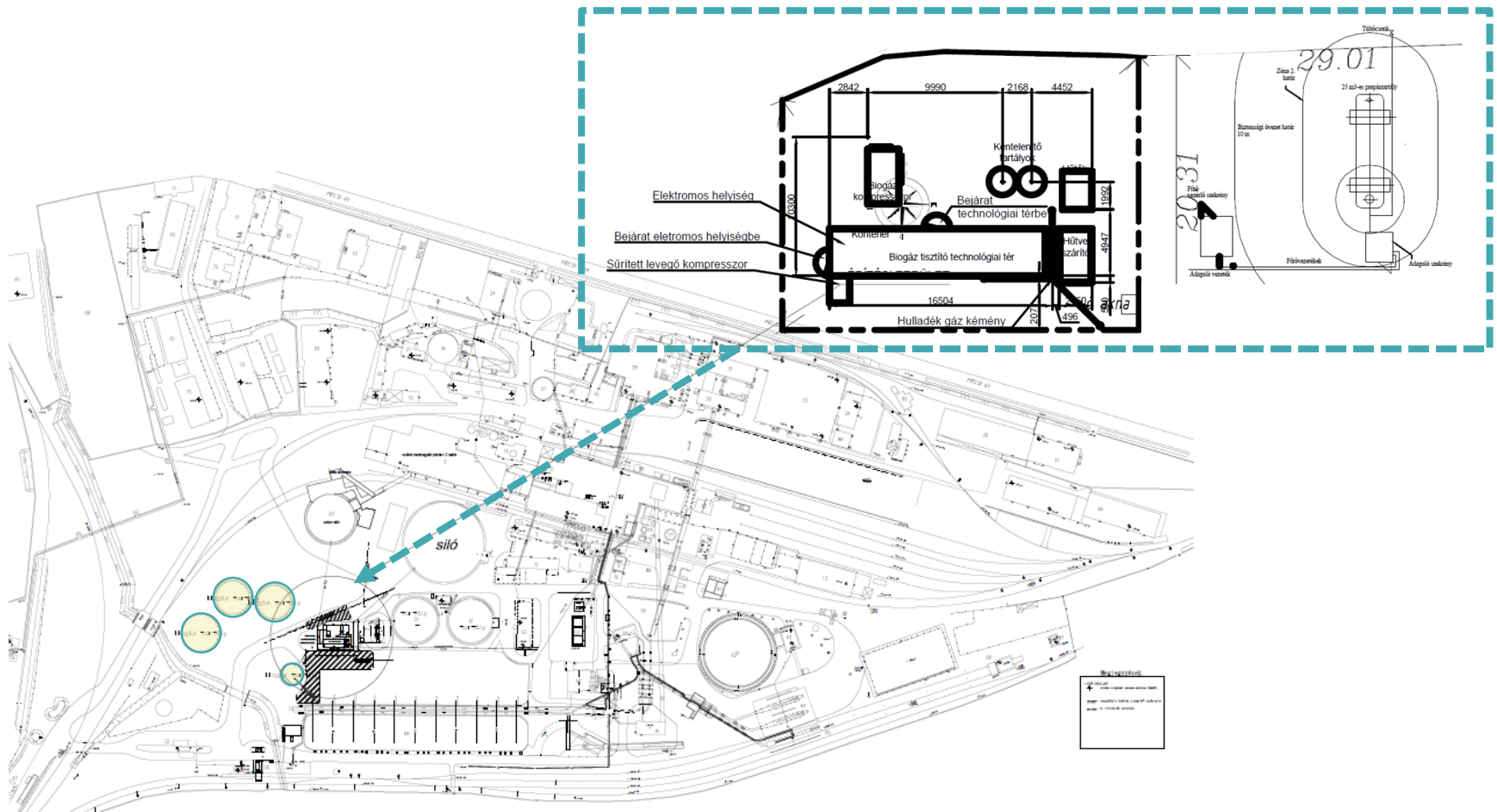
- Input: > 270.000 t of residues and waste
 - 85 % from the sugar production
 - 15 % external sources
- Until 2015 the biogas was used for:
 - Electricity & steam production at existing plant during the sugar campaign
 - Heat production at a municipal bath



BIOGAS UPGRADING STARTED IN 2015



BIOGAS PLANT AND UPGRADING UNIT AT THE SUGAR FACTORY



GOING EAST MEANS FACING MANY ADVANTAGES, YET ALSO SOME CHALLENGES



GIVEN SITUATION & ADVANTAGES

- Available biomass
- Lower costs
- Low competition with feed-in tariffs
- Widespread existing gas grid



CHALLENGES IN OUR PROJECT

- No regulation on biomethane feed-in
- Complicated gas regulation
 - Registration as local gas trader
 - Use of local REMIT system
 - Different gas units (MJ vs. kWh, norm vs. standard m³)
- Implementation of German and Swiss sustainability criteria
- Distance and language

LANDWÄRME AS PROJECT DEVELOPER AND EXCLUSIVE TRADING PARTNER



CONSULTING

- Project development: planning and engineering of upgrading facilities
- Coordination of all auditing and certification steps and monthly GHG calculation

TRADING

- Landwärme is the exclusive buyer of the biomethane produced on site
- Gas sales to Germany and several other central European countries