

Trading in Biogas

Opportunities in Specialist Markets

Klaus Huber

Riga, 22 October 2012



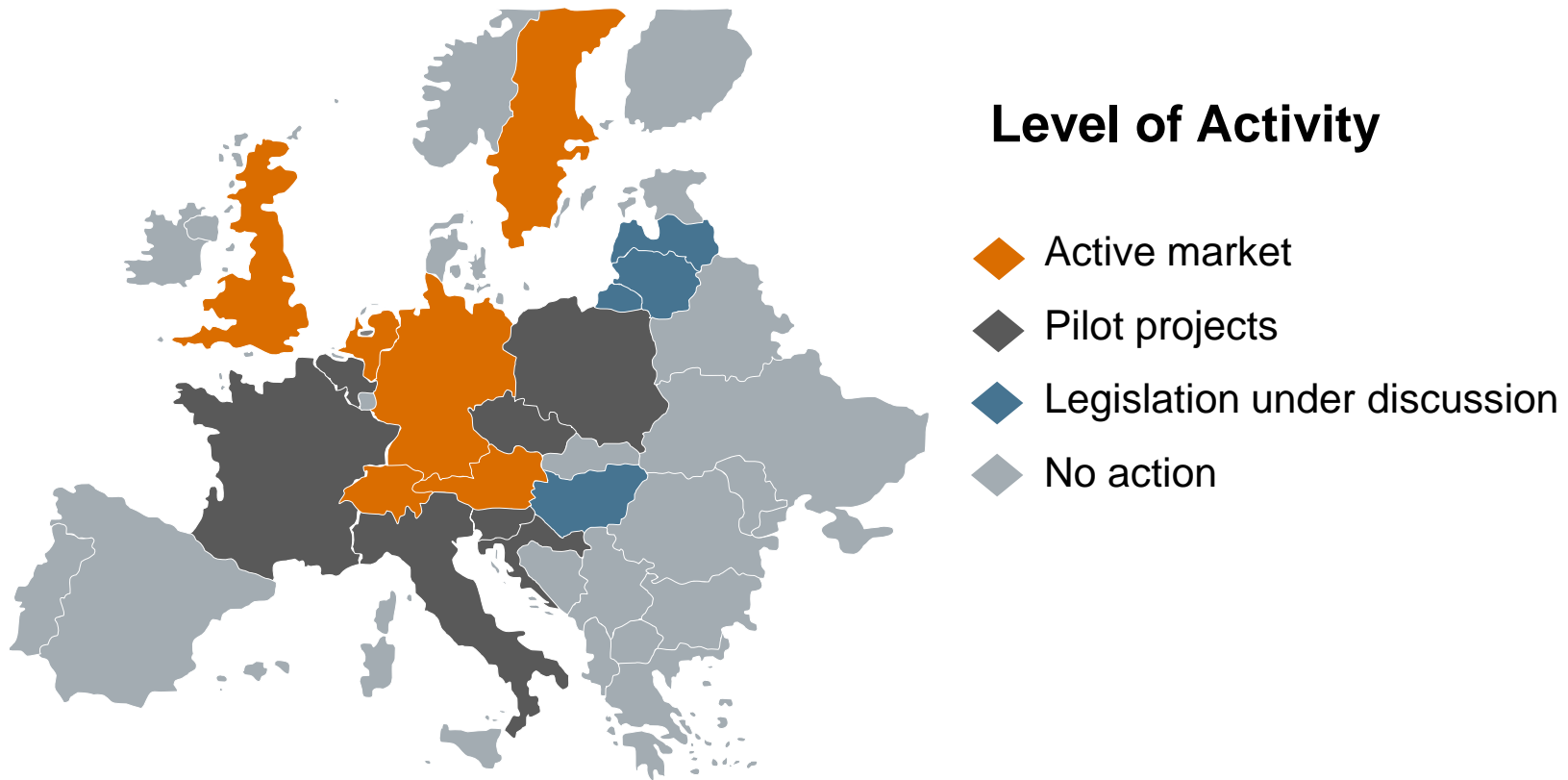
Bio Klaus Huber

- Focus on biogas markets since 2006
- Developed Germany's first and leading biogas trading house
- Platform awarded with Innovation Prize 2009 by Deutsche Energie-Agentur
- Current projects:
 - Concept and launch of a European biogas trade exchange
 - Start-up company: biogas supply to residential customers

Agenda

- Biomethane Markets
- Value Chain
- Trading practices and economics
- Outlook

Grid-Grade Biogas Accelerates In Europe



Source: Green Gas Grids, own analysis

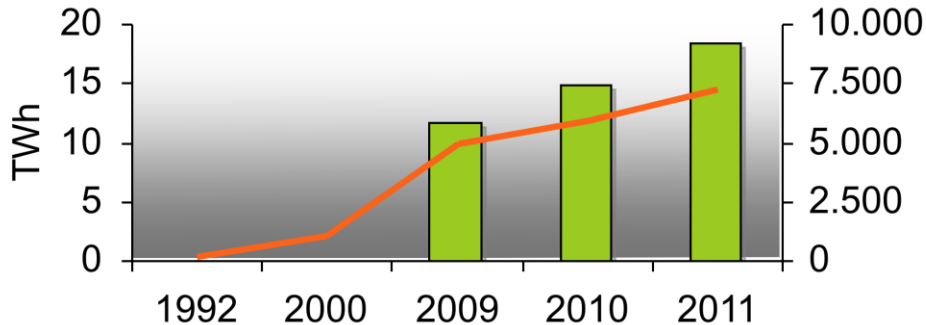
German Biogas Production Grows Rapidly

Biogas to Power



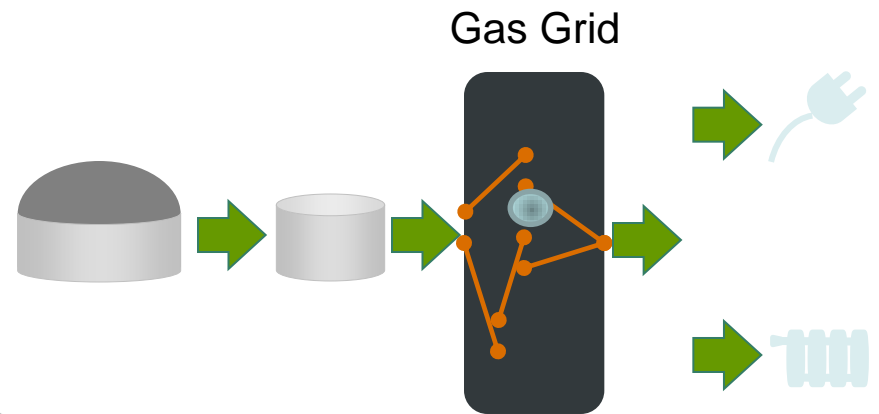
Number of plants and production

■ TWh (electric) — # of plants



Market 2011E: Eur 6.9 B

Biogas to Grid



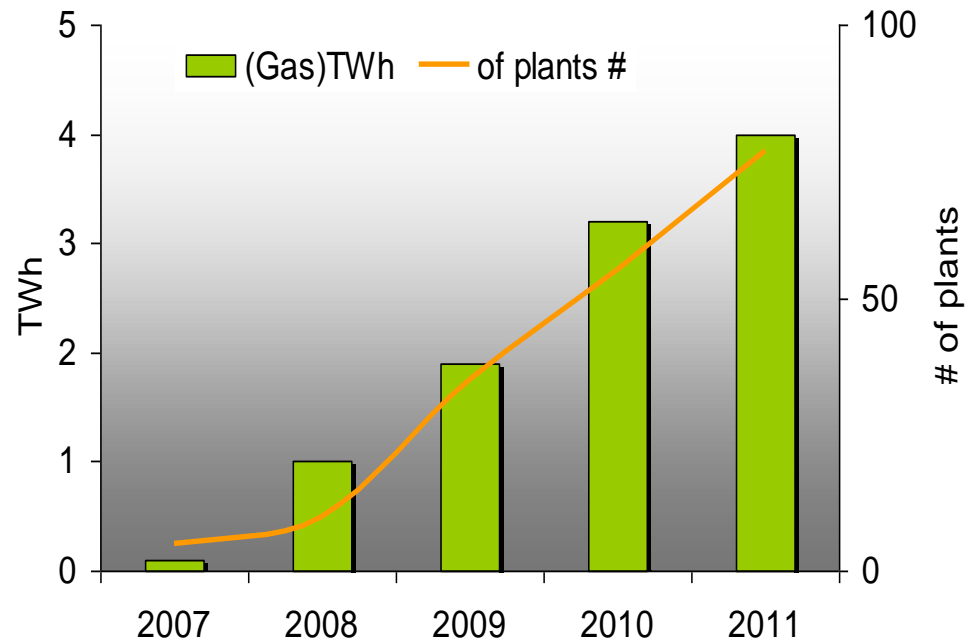
Market 2011E: Eur 250 M

Source: Fachverband Biogas, dena, own analysis

A New Grid-Grade Biogas Market Emerges



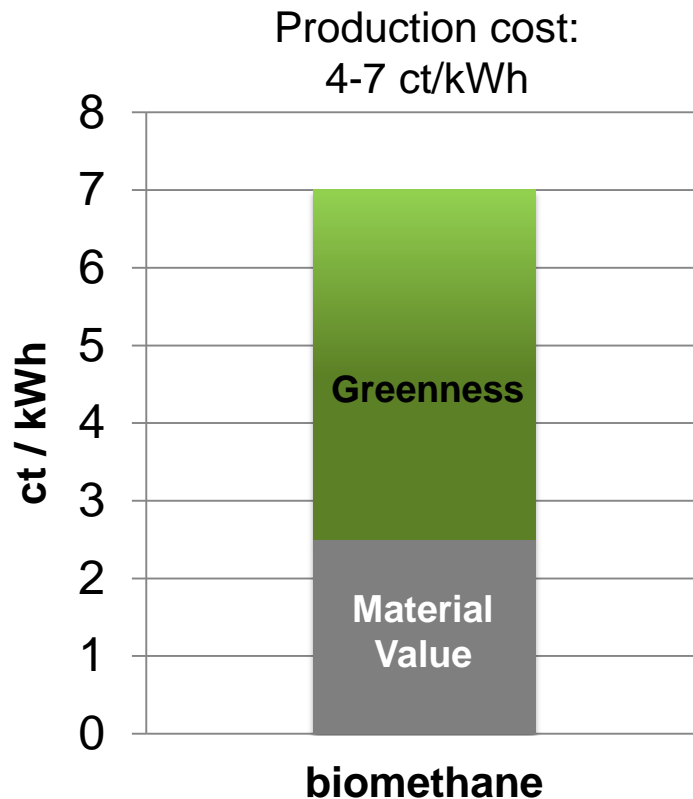
Biomethane Plants and Production



Political Target: 60 TWh / pa Biogas To Grid By 2020

Source: Fachverband Biogas, dena, Bundesnetzagentur

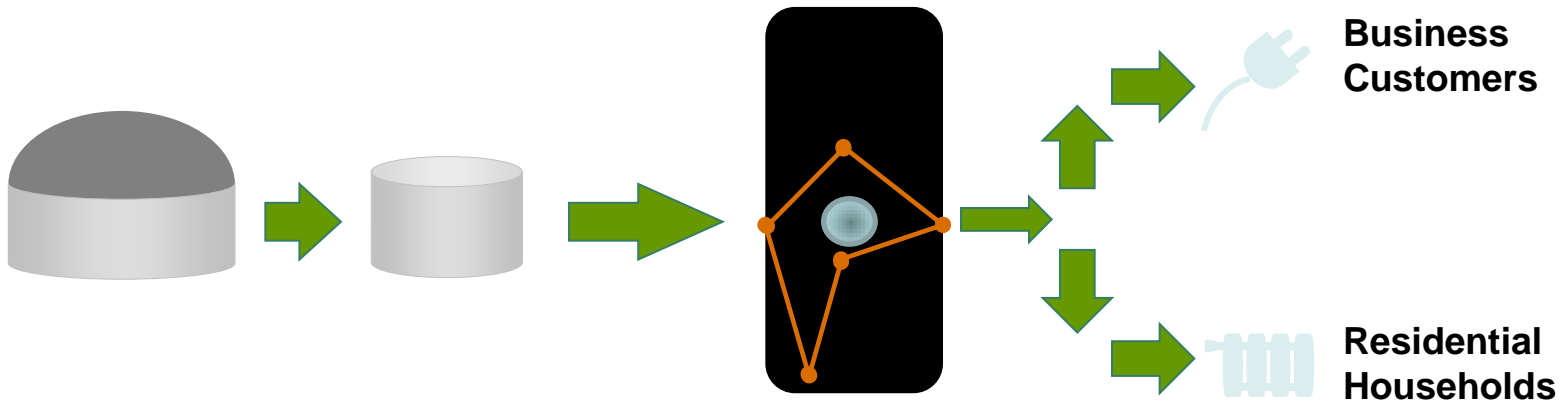
Economic Incentives Required



Incentives

- Biomethane substitutes natural gas
- Higher production cost needs compensation
- Examples: feed-in tariffs, privileged network access, grid-transport flexibility

Value Chain



Production

Transport
Trade

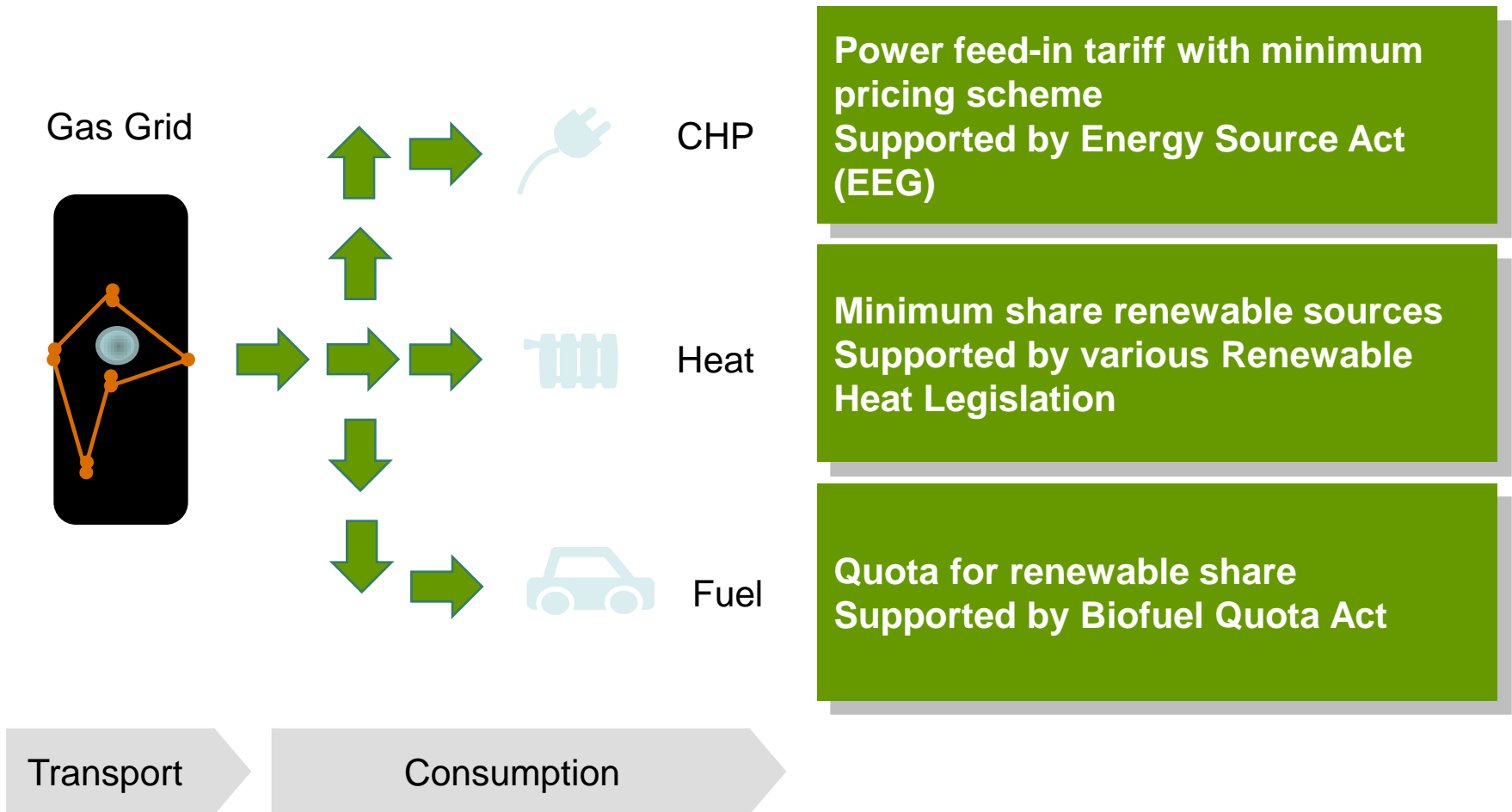
Consumption

Cost:
4-7 ct / kWh depending on
input materials and
technology

Cost:
0,5-2 ct / kWh
depending
on location,
user profile
etc

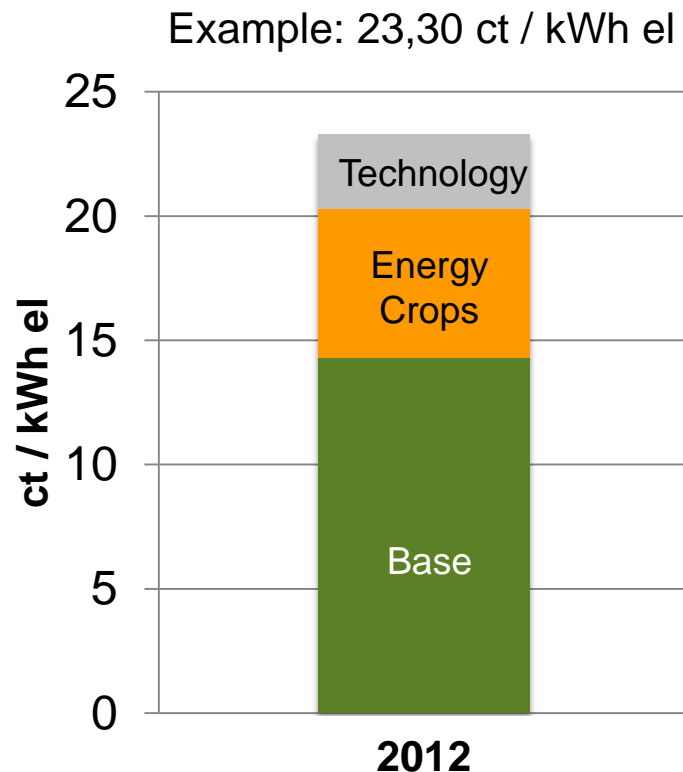
Economics:
e.g.: opportunity cost versus
use of natural gas

Consumption Path Determines Value



Pricing Environment Is Driven By Legislation

Minimum Pricing Scheme



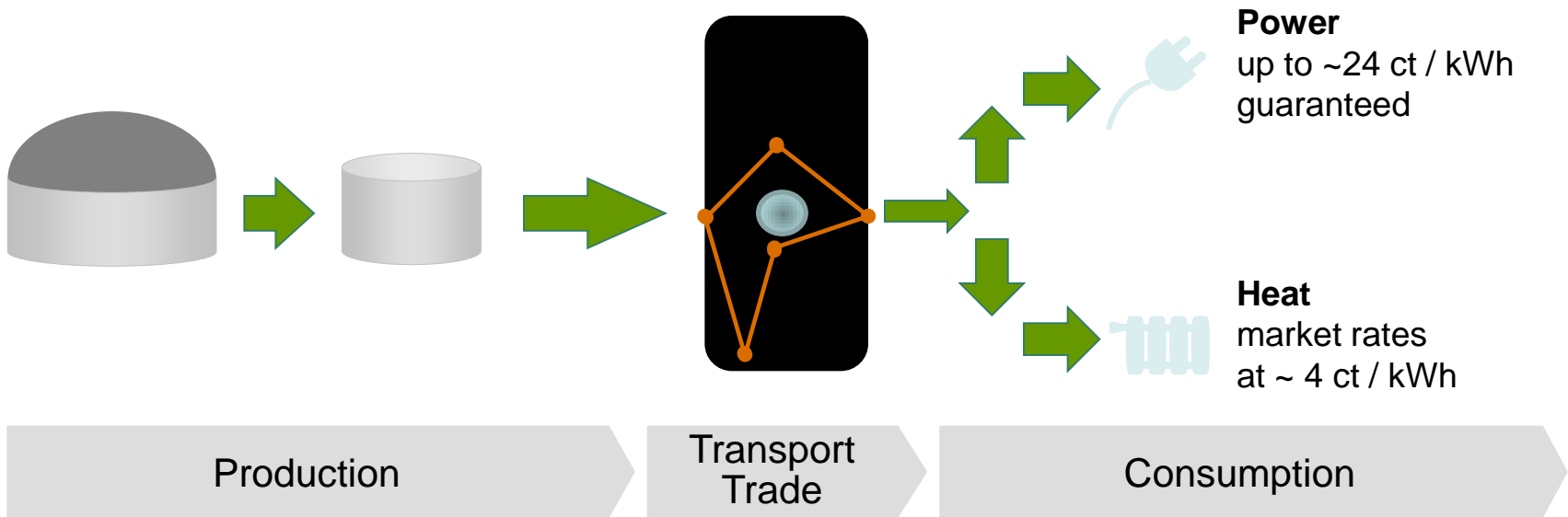
Product Examples

- **Base**
- **Base + Energy Crop**
- **Base + Energy Crop + Technology**

Source: EEG (Energy Source Act)

CHP Revenues Cap Biogas Pricing

Value Chain - Example

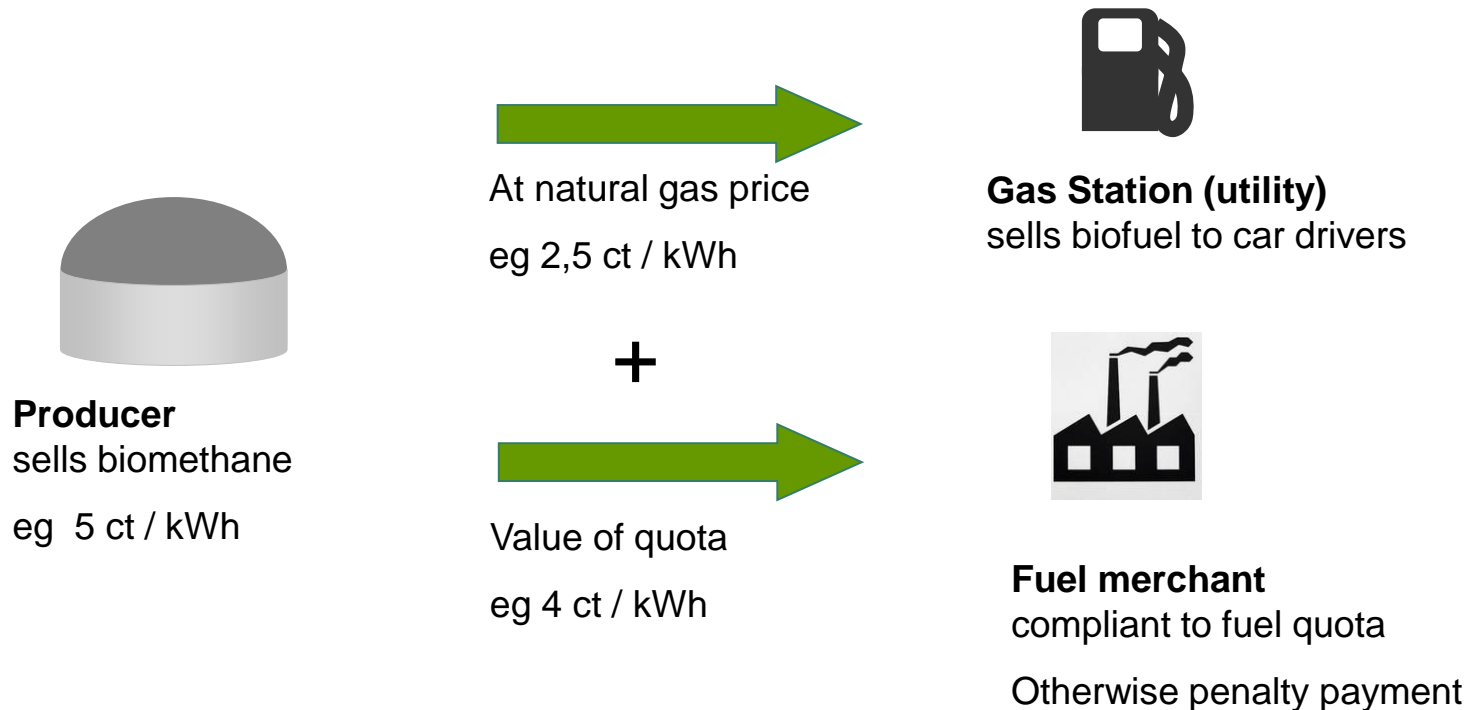


Biomethane Plant:
Typically 40 M kWh / a
Revenues: Eur 2.8 M

CHP Unit:
Efficiency: 35% el, 40% th
Revenues: Eur 3.8 M

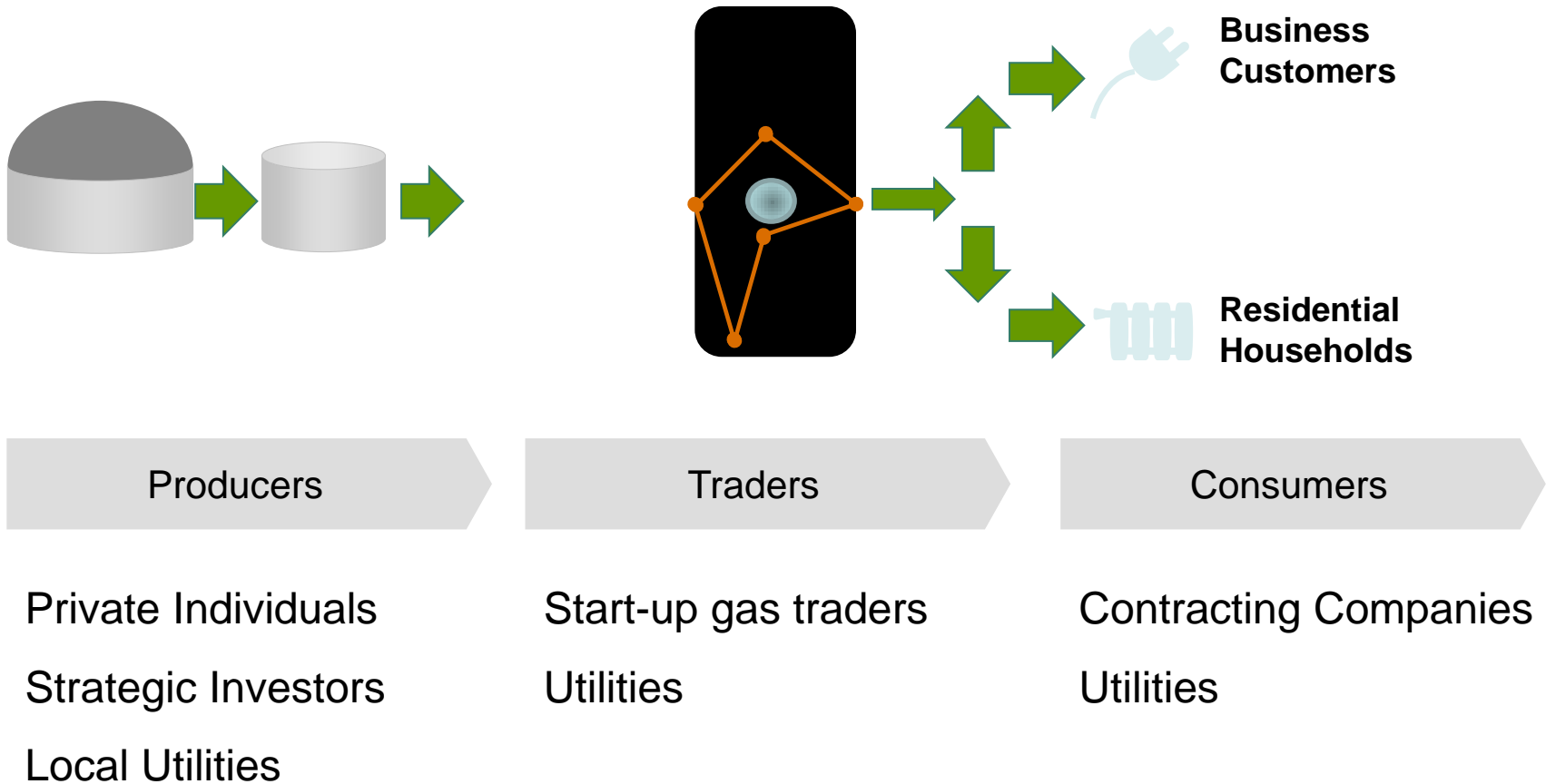
Value of biofuel quota drives fuel use

Value Chain - Example



Margin needs to cover sales, transport and certification

Market Roles



Contractual Parameters

Examples

- flexible start date
- condition precedents

- take-or-pay
- daily minima / maxima



- biogenic characteristics
- origin
- certification

- fixed price
- indexing
- payment terms
- credit rating

Learnings For Trading

- Need for strong and innovative initial partner
- Portfolio helps to calibrate time and quantity deviations
- Use legislative framework and move quickly
- Patience to explain new opportunities

Outlook

- Biogas allocated a strong position in renewable mix
- Transition to a market-driven environment evolving
- Approach to integrated certification process
- Biogas supposed to contribute energy storage

Biogas Has Versatile Talent

Contact

Klaus Huber

Advisor Renewable Energies

Munich / Germany

M: +49 151 28 48 49 90

@: khadvisory@yahoo.com