Regionalperspektive BIOGAS

HOCHSCHULE OSNABRÜCK
UNIVERSITY OF APPLIED SCIENCES

DRIVERS AND BARRIERS FOR THE DEVELOPMENT OF COOPERATIVE BUSINESS MODELS IN THE BIOGAS SECTOR FOR THE TRANSFORMATION OF THE ENERGY SYSTEM

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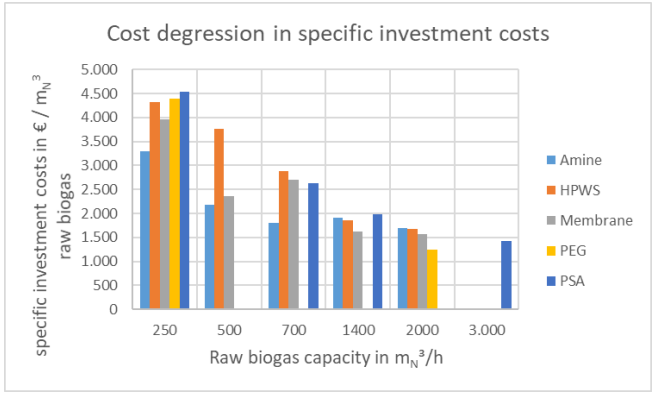
IDEA

- Energy transition
  - Decentralization of power generation
  - Requires new actors
  - Integration through various approaches e.g. in cooperation in citizens' initiatives or cooperatives
- Existing biogas plants in Germany
  - Expiry of feed-in tariff from Renewable Energy Sources Act after 20-years
  - Business model innovation is needed

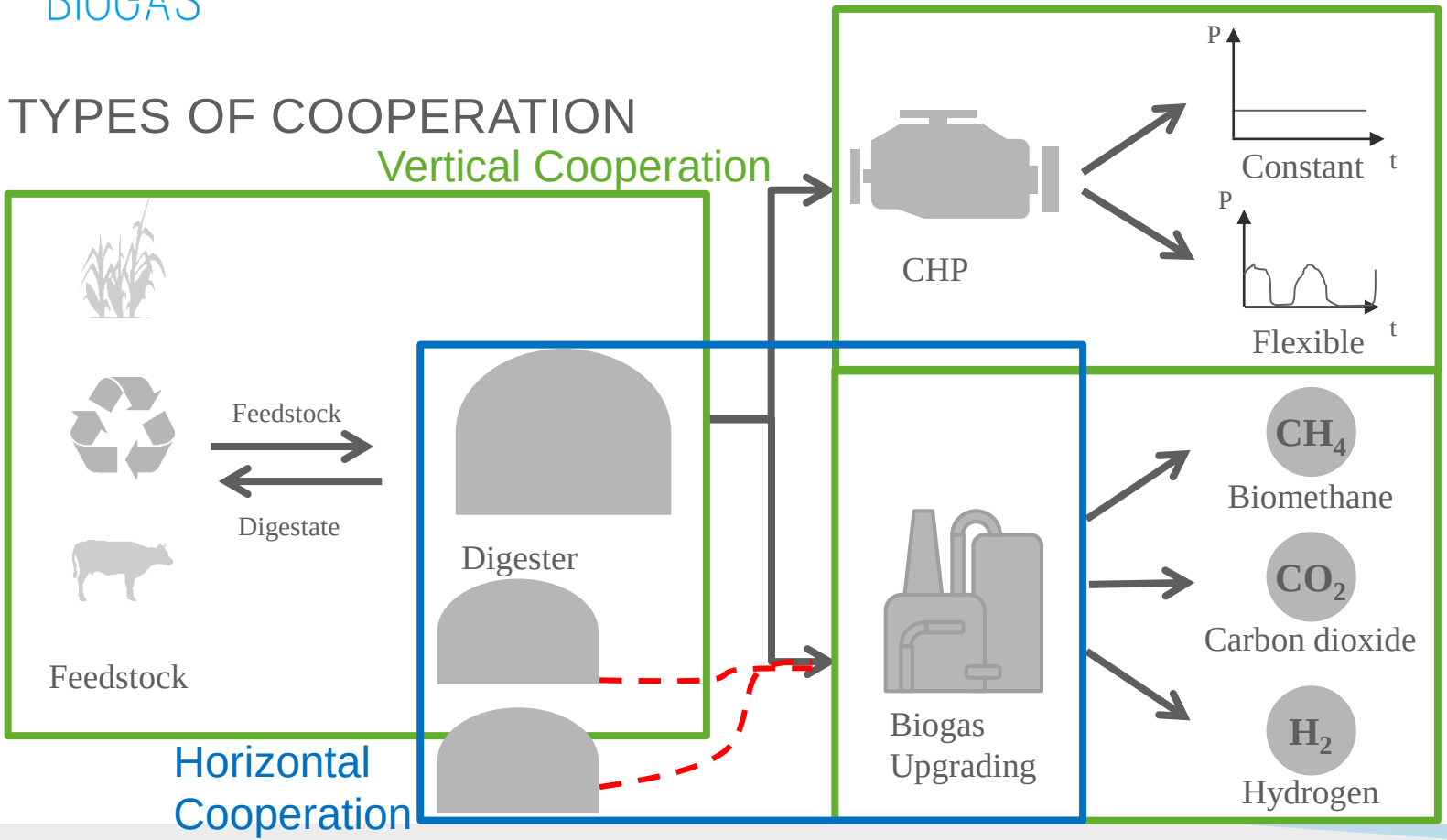
What are the main drivers and barriers for biogas plant operators to join cooperatives?

WHY COOPERATE?

- Existing cooperation culture in different industries
  - Agriculture: essential importance for exploiting synergy effects
  - Renewable energy: citizens' cooperatives make a significant contribution to the participation of citizens in political, social and financial aspects of energy transition
- Motivation for cooperation
  - Enable implementation of certain business models
  - Increase profitability by the exploitation of economies of scale
  - Synergy effects



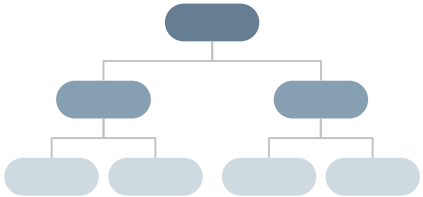
TYPES OF COOPERATION



METHODOLOGY

Semi-structured interviews with plant operators

Validation through literature review

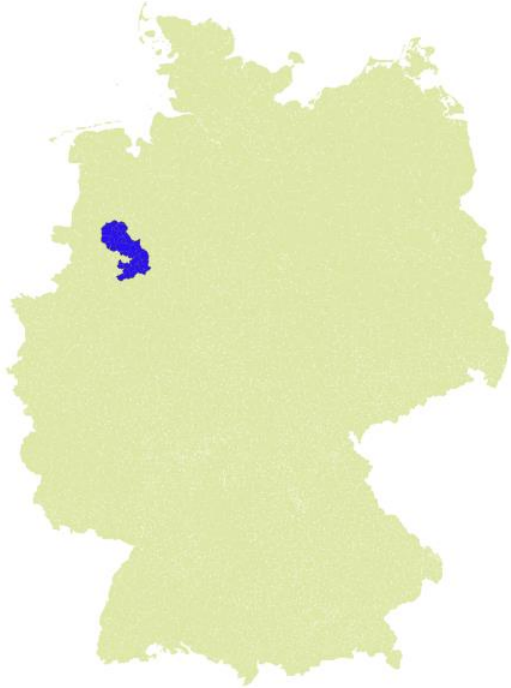


Identification of main drivers and barriers
Clustering

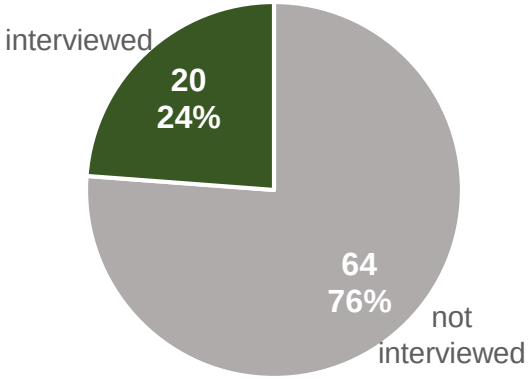
Political instruments

METHODOLOGY

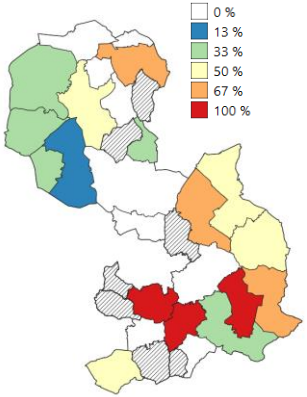
- 20 semi-structured interviews
- Target group: Active biogas plant operators in the administrative district of Osnabrück
- 14 qualitative questions on the continued operation after the end of the feed-in-tariff with a focus on cooperative business models
  →If necessary supplemented by maintenance questions
- Recording and transcription
- Evaluation and clustering of answers



RESULTS



Share of interviewed biogas plants



Share of interviewed biogas plants in municipalities

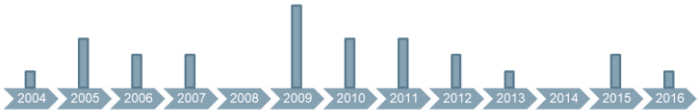
Plants according to size category:

Installed capacity	Share
Up to 75 kW	13,8 %
Up to 500 kW	27,6 %
Up to 1 MW	24,1 %
Over 1 MW	34,5 %

Plants according to substrate use:

Substrate usage	Share
Share manure < 30 %	17,2 %
Share manure < 80 %	58,6 %
Share manure > 80 %	20,7 %
Other	3,4 %

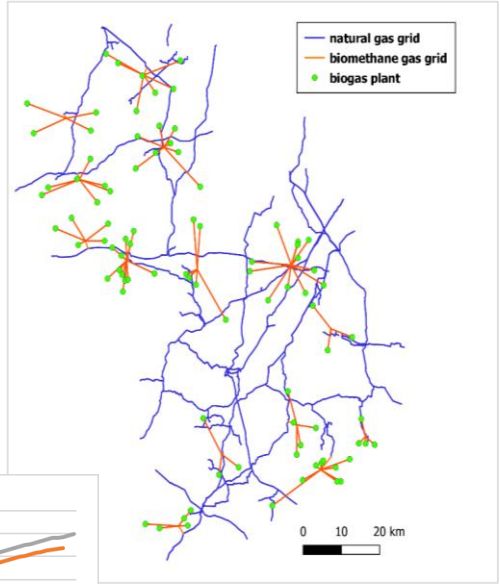
Year of initial operation:

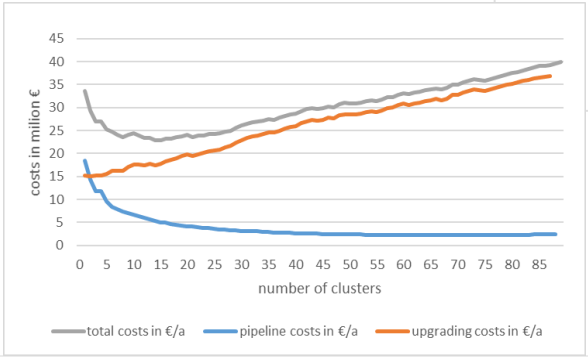


JOINT UPGRADING INFRASTRUCTURE

- Aim: optimal upgrading infrastructure based on investment costs for upgrading plants and pipelines
- Individual purification
  - Annual system costs: 39.87 million euros
  - Even the smallest purification plants are significantly over dimensioned
- Joint purification
  - Annual system costs: 22.82 million euros
  - Cost savings: 43 %
- Make use of spatial proximity of biogas plants

→ Exploitation of cost degression





RESULTS – MAIN DRIVERS

Political & Legal	• Stimulating framework conditions • Reduction of dependency on fossil fuels
Economic & Technological	• Expectation of synergies • Planning reliability • Access to new markets
Sociocultural	• Motivating, innovative environment • Better use of capacities and strengths • Strengthening regional value creation
Ecological	• Increase in plant efficiency • Promotion of the circular economy

RESULTS – MAIN BARRIERS

Political & Legal	• Lack of political support • Competition to other renewable energies • Unfavorable regulatory environment
Economic & Technological	• Uncertainty about future development of energy markets • Lack of flexibility due to longer-term contractual obligations
Sociocultural	• Cooperation with current competitor • Cultural differences and lack of trust • Acceptance by the general public
Ecological	• Use of monocultures • Emissions from plant • Pollution from transport

RESULTS

Drivers and Barriers	Action
Uncertainty	Clear political framework Long-term contracts
Social factors (lack of reliability and disagreement)	Include external partner →purchase agreements with the individual partners
Expectation of synergy effects	Exploitation → Information on the advantageousness of cooperation needs communication and initiators
Positive expectation of returns	
Responsibility for securing the energy supply	

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