

# SOCIETY

29 November 2018

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# OVERALL QUESTION

Under what business and institutional conditions would expansion of biogas solutions occur?

# BRC Society – Particular foci

- “Societal conditions”
- Market development - Business expansion
- “New sectors”?
  - Producers and users
  - Drivers and Barriers for expanding production and use
  - Business models
  - Visions and strategies
  - Policies

# BRC Research Projects

Complementary, directed toward regions and business, respectively:

- RP4 (Harald Rohrer, Magdalena Falde, Amelia Mutter, Kristina Trygg) ***Biogas solutions in the sustainable region: users and future visions***
- RP5 (Hans Andersson, Thomas Magnusson, Mikael Ottosson)

2015-16 ***Biogas in the pulp and paper industry – drivers, barriers and open business models***

2017-18 ***Biogas Business and Organization***

# RP4 Biogas solutions in the sustainable region: Users and visions

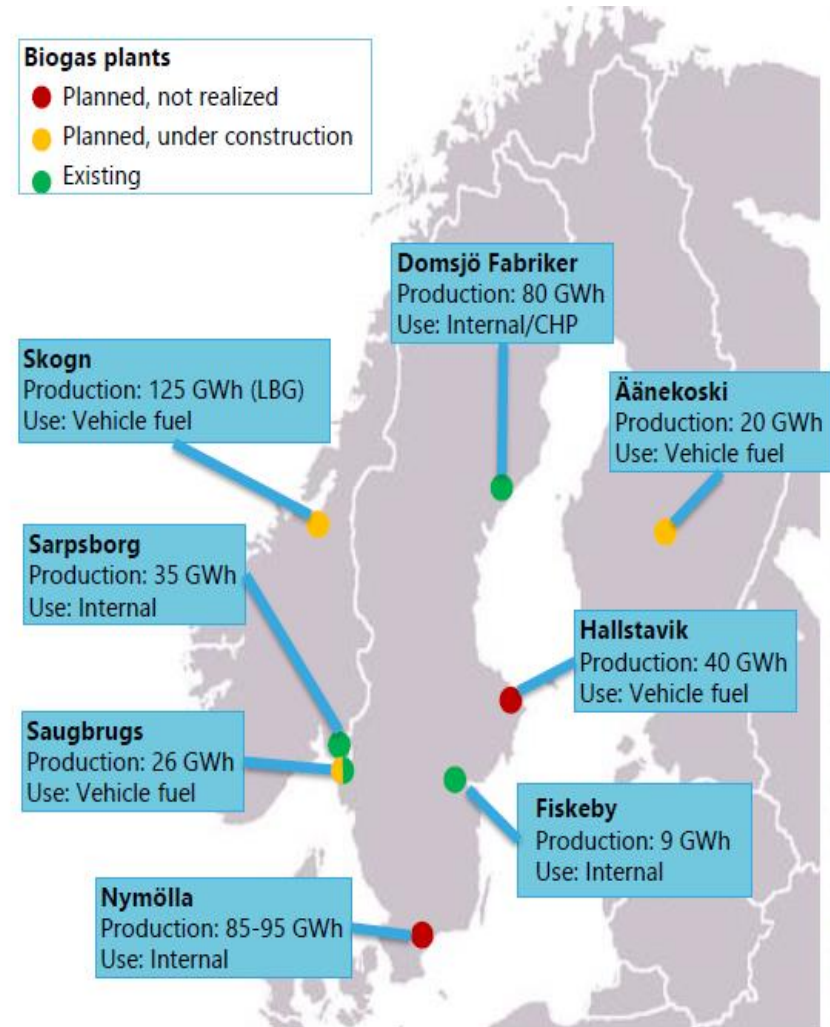
- (Comparative) case studies (Östergötland/Linköping – Västerås/Malmö...)
- The involvement of users in the biogas development in different regions
- Municipal drivers and long-term visions for biogas development (Magdalena)
- Competing visions for future fossilfree public transport – Can they be reconciled? (Amelia)
- Local network based initiatives for regional development (Kristina)

## RP 5 (Year 1-2)

Original aim: analyze barriers and drivers for enabling biogas production in the Swedish pulp and paper industry. Investigate prospects for “open” business models

Problem: Swedish examples very limited and development not very dynamic

Important contributions explaining the barriers to biogas development in forest industry (and other industry)

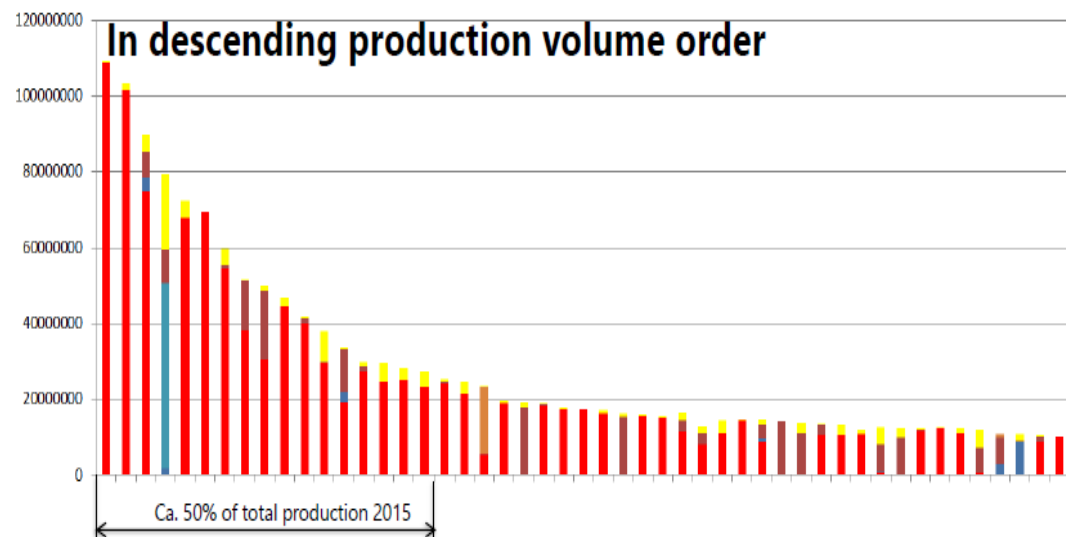
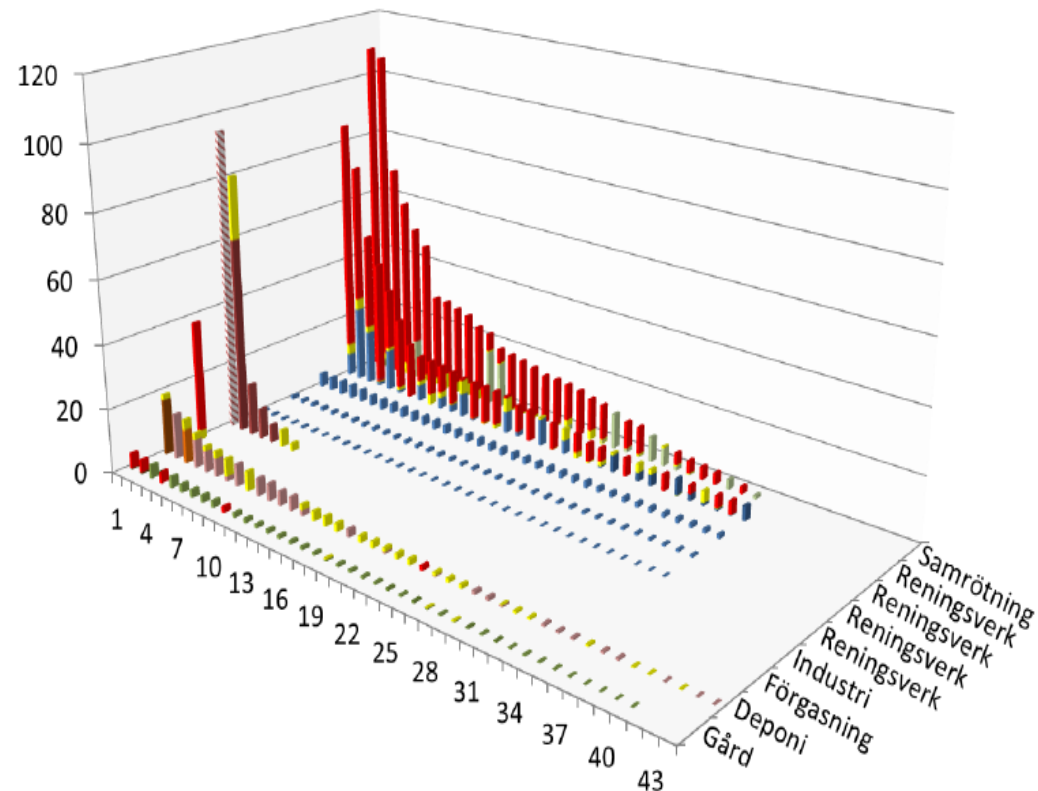


# RP5 (Year 3-4)

## Biogas Business and Organization

Reorientation:

- Broad/comprehensive analysis of the current Swedish biogas sector and its development
- Structure of production, distribution and use/markets, ownership, actors, strategies and business models



# IP Projects

- Common examination of implementation challenges
- Stimulate dialogue and mutual learning
- Create a basis for synthesis, identification of research needs, and priorities for the development of the centre.
- Arenas for dialogue and interaction with BRC partners and members, providing important inputs and feedback to RPs (RP4-IP1 (Regions), RP5-IP5 (Forestry))
- Widening the focus of the BRC beyond the RPs, e.g. additional policy analysis/discussion



# Additional research

- Biogas export for increased competitiveness and global sustainability (Olof Hjelm, Wisdom Kanda)
- What is really an “environmental bus”? (Thomas Magnusson, Stefan Anderberg, Sofia Dahlgren)
- Biogas in the Transport Sector – An actor and policy analysis (KTH, Jonas Ammenberg, Stefan Anderberg)
- Different biogas production and use patterns. Comparisons between different countries and regions in Europe (Stefan Anderberg)
- Future transports in Östergötland (Axel Lindfors, Mats Eklund, Sofia Dahlgren, Stefan Anderberg)
- ...

# **BRC Society**

## **Major findings and highlights**

**The particular societal benefits and opportunities of biogas may be of increasing importance in the coming decades:**

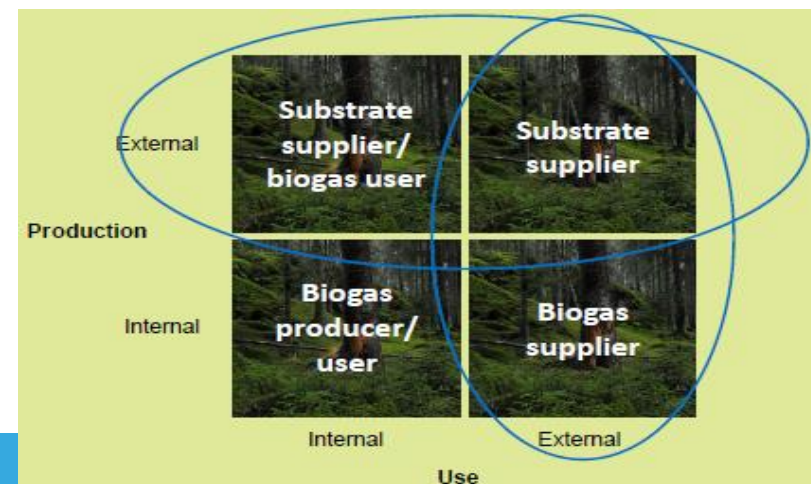
- Biogas can contribute to increased resource efficiency on different system levels
- Creates many different values and solves different problems at the same time
- Predictable economic preconditions
- Biogas sector still early in its development, important improvement potentials. Biogas production often a side activity that is not continuously focused for investments.
- Large untapped production expansion potentials

# ***Regions/Municipalities***

- Successful regional development of biogas systems in Sweden has been based on particular regional preconditions, long-term strategies and patient development of regional networks and systems
- Often positive effects beyond environmental improvements e.g. firm development, and regional development capacity building
- Today, bold goals, but municipalities lack distinct long-term visions and strategies for the "energy transition"!
- Municipalities/Regions have difficulties to navigate between different alternatives
- Different alternatives/visions compete rather than interact/are combined
- Difficulties to incorporate the multidimensional benefits of biogas in decision-making/procurement processes
- Needs for improved evaluation tools!

# ***Why are not biogas production potentials in (forest) industry explored and realized?***

- Under business-as-usual, firms' focus and priorities are on **core product and processes**
- Incentive for biogas production in forest industry - cost reduction rather than revenue
- Reluctancy to engage in activities that are peripheral and may disturb core processes
- Biogas solutions can become interesting in situations where they may assist removing barriers for capacity expansion
- Firms with biogas production or sale as "core" probably the key for developing biogas solutions in industry?
- To identify **the core** in firms central also in relation to other industry sectors!



# ***Policy-related challenges***

- The biogas sector – traditionally very policy-dependent
- Lack of stability and long-term predictability in central regulations, and lacking coherence between different levels of government harmful
- Decreasing the dependence on policy and increasing resilience to policy changes important for actors to be able to develop long-term strategies.
- Biogas solutions are often cross-sectoral and can come into conflict with established regimes, legislation and political goals in different sectors.
- Biogas is very competitive in a climate policy setting, but the frames for evaluation of different alternatives matter!
- Difficult for actors to internalize the value creation in the individual economies
- Biogas would gain from a broader multipurpose sustainability framing and analysis and innovative policies connecting energy, climate and different environmental goals.

# Internationalization challenges

- Biogas companies use a variety of strategies and business models for internationalisation dependent on the type of company and its international experience, on the proximity of the target market to Sweden and type of offering.
- A variety of barriers and drivers for internationalisation among companies. The perceived barriers decreases with export experience.
- Need for more interaction between larger companies to bring along smaller companies as suppliers
- Strong need for an arena where actors can learn from each other and to bridge the gaps between different types of companies.
- Need for actively selecting target markets and adapt sales strategies to particular markets.

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# New markets are forming!?

Many and great potentials for expanded use in different sectors:

- Industrial use of gas
  - Agriculture
  - Heat and electricity
  - Road transport
  - Steel industry?
  - Shipping?
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- In industry, use areas that do not represent a major cost and where "soft" values provide the first "entrance"
  - Liquidification/LNG key for opening expanding new transportation markets for biogas





# Market expansion New organization and actors

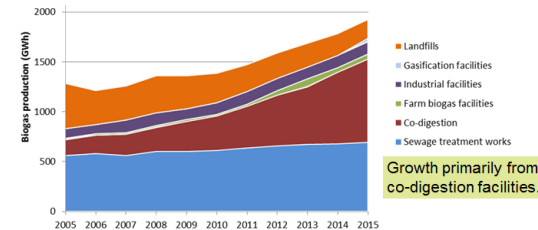
- To develop systems with expanded production and use demand improved distribution capacity
- Increased importance of global distributor
- Development of parallel systems, growth models and organization types:

*The local (public) and the global (private)*

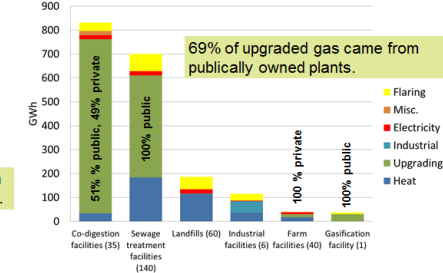
## RP 5 "Biogas Organization and Business"

From niches to local and global market formation  
- the qualification of the Swedish biogas sector

Biogas production in Sweden



Use of biogas produced in Sweden



## Market formation assumes growth!

### Different growth models:



	Local model	Global model
Offer	System solution	Discrete product
Actors and Networks	System integrators / Municipalities	Distributors, Large private firms
Institutions	Institutionalized protection	Institutional reforms

### Conclusions

- Several different versions of "the same" market may evolve simultaneously under what may at first glance appear to be very similar conditions
- Different actors active in the creation of different versions of "the same" market
- Local and global are two contrasting growth models, characterized by different kinds of market offers and institutional frameworks
- In terms of renewable markets public actors are important in several different roles – policy makers, producers as well as customers

### Comparison of two regions

	Östergötland	Västra Götaland
Central actor	Tekniska Verken	Göteborg Energi
Production technology	Digestion	Digestion and Gasification
Number of production plants (ownership public/private)	13 (10/3)	47 (33/14)
Produced volume	151 GWh	351 GWh
Percentage of production in publicly owned plants	98%	64%
Percentage of biogas upgraded	89%	75%
Distribution system	Local CBG-pipes, Pressure bottles	CNG-pipes, LBG, Local CBG-pipes, Pressure bottles
Main distributor	Publically owned	Private company
Filling stations (ownership public/private)	11 (10/1)	46 (39/7)
Perception of Natural gas	(Unwanted) fossil fuel	Potential synergies, enabler



# **BRC SOCIETY – Important research foci**

(in the new Fo's!)

- Expansion processes and structural development of the biogas sector
- Drivers and barriers of new and alternative uses of biogas.
- Realizing the production potentials of different sectors
- Development of visions, strategies and interplay between different fossil-free alternatives at different levels of society
- Industrial strategies and business models in relation to production and substitution
- Support for local-regional, industrial and national policy makers e.g. assessment tools and policy analyses
- Incorporating of the multifunctionality of biogas solutions
- Policy risk minimization strategies in the biogas sector