



*Institutional context and cluster emergence:  
The biogas industry in Southern Sweden*

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## Theoretical starting point: Economic Geography

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- With the evolutionary turn, increasing interest in the spatial emergence of economic phenomena
- Two different views on regional industry emergence:
  - 'Window of locational opportunity' (Scott and Storper 1987, Storper and Walker 1989)  
Firms in emerging industries experience high locational freedom
  - 'Regional branching' (Boschma and Frenken 2009, Boschma and Martin 2010)  
Regional economic development is path-dependent, new industries grow out of existing related industries over time

## Objective of the paper

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- The existing literature
  - has a strong focus on firm-level routines (Mac Kinnon et al. 2009, Morgan 2012)
  - argues that (territory-specific) institutions are responsive to rather than responsible for new development paths (Boschma and Frenken 2009, Boschma and Frenken 2011)
- However ...
  - Is the latter true for all kinds of industrial activities?
  - What is the role of (local and regional) public policy interventions for new regional development paths? (Asheim et al. 2011, Asheim et al. 2013)

How do specific territorial institutions matter for the emergence of the biogas industry in Scania (specific/empirical RQ)?

How can policy interventions work actively in favour of new regional economic development paths (more general/theoretical RQ)?

## Socio-technical transitions

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- Institutions and technologies co-determine one another over time
- Focus on socio-technical systems (involving institutions, infrastructures, users) rather than solely on technologies (Rip and Kemp 1998, Geels 2002)
- Socio-technical systems are not settled in early formation phases; established socio-technical systems exhibit path-dependencies
- Technological innovation systems (TIS) approach (Carlsson and Stankiewicz 1991, Bergek et al. 2008)
  - Takes a process view on early industry formation
  - Identifies key processes in innovation systems

## Functions of technological innovation systems

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Knowledge development and diffusion

Influence of the direction of search

Entrepreneurial experimentation

Market formation

Resource mobilization

Legitimacy

Development of positive externalities

Johnson and Jacobsson 2001, Hekkert et al. 2007, Bergek et al. 2008

The TIS functions target the active construction and set-up of a supportive institutional context in emerging (clean-tech) industries.

## The biogas industry in Scania, Southern Sweden

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- Emerging industry in a region traditionally strong in agriculture and food industries
- Involving a broad network of public and private actors in the region on the supply and demand side of biogas
- Actors: farmers, utilities, food and energy companies, research centers, universities, support organisations
- Ambitious mid-term growth objectives set by regional public policy
- Objective to further strengthen biogas activities in the region



**Figure: Location of Scania, Sweden**

Source: Region Skåne, Department of Economic Development & Innovation, 2009

## Setting the scene: early activities in the region

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- Early activities in the 1980s and 1990s:
  - National regulation on sewage sludge reduction
  - Construction of a natural gas grid
  - Interest to run city busses on natural gas
  - Increasing environmental awareness (collection of organic waste), triggered experiments with upgrading technologies

Initially independent activities;  
increasing awareness of synergies  
between resources spurred technology  
development



**Figure: Location of Scania, Sweden**

Source: Region Skåne, Department of Economic Development & Innovation, 2009

## Industry emergence

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- In 2002 Climate Investment Programme (KLIMP) announced by Environmental Protection Agency (national level)
- Targeted (public) local initiatives for energy efficiency and reduction of greenhouse gasses
- Municipalities in Scania received 25% of the total national funding (period 2002-2008)
- In 2005, foundation of a network and support organisation for biogas actors

Institutions (policy interventions) provided legitimacy and guidance of the search; legitimacy triggered knowledge development and diffusion



**Figure: Location of Scania, Sweden**

Source: Region Skåne, Department of Economic Development & Innovation, 2009

## From industry emergence to growth

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- Crucial year 2007: regional government sets up environmental goals and decides to run the regional public transport (buses) on biogas
- Triggered actors to invest in the *commercial* biogas production
- Remaining KLIMP funding used for the aquisition of buses and public filling stations

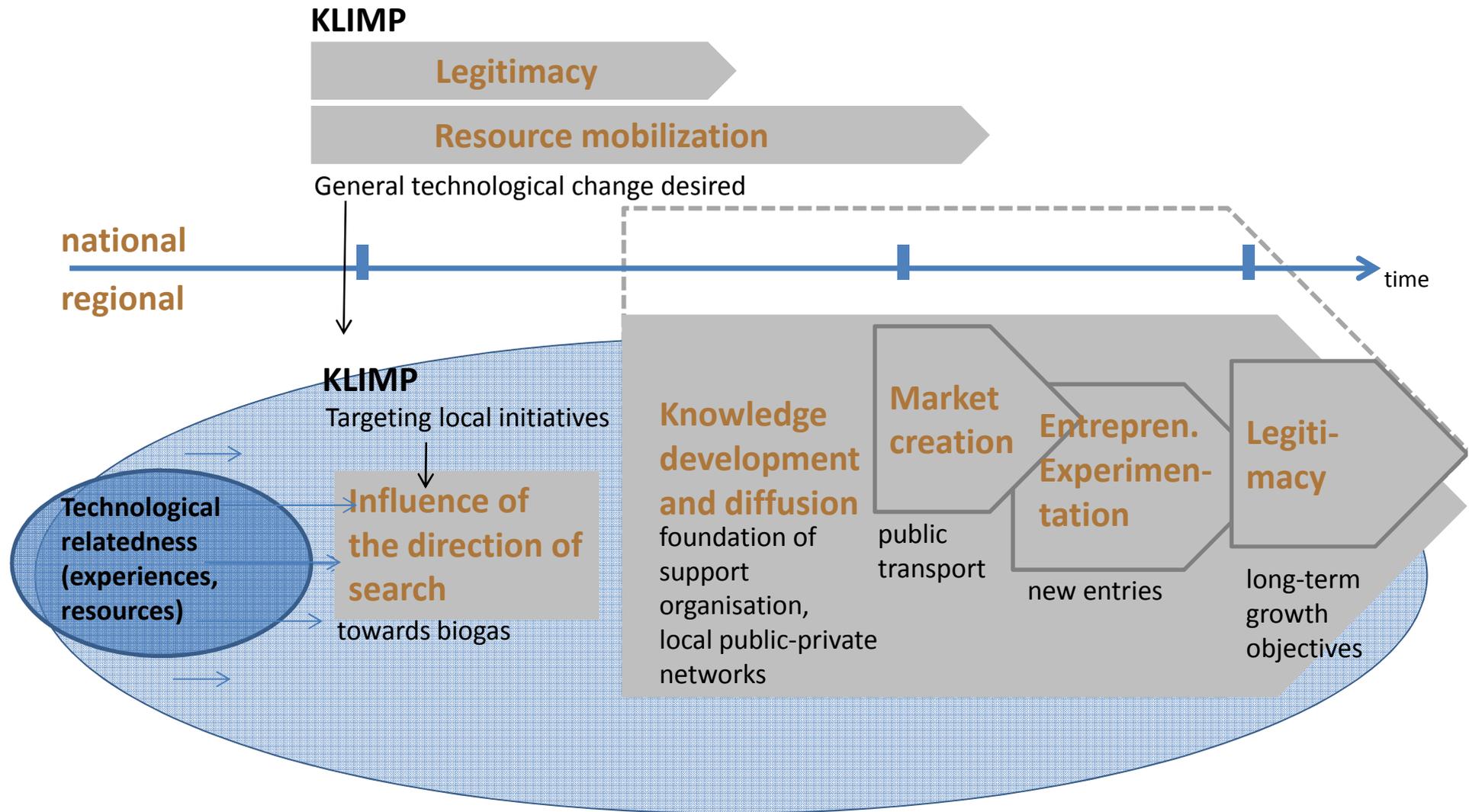
Regional authorities tied up to previous institutional settings; supported market creation and entrepreneurial experimentation



**Figure: Location of Scania, Sweden**

Source: Region Skåne, Department of Economic Development & Innovation, 2009

# TIS functions: a spatial perspective on the region of Scania



## Conclusions

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- Industry emergence not random, nor solely driven by firm-level routines
- In Scania, industry emergence as an (unintended) consequence of a policy programme
- Institutions started to interact, initiated and strengthened functions in the innovation system over time and created path-dependencies and stability
- Scania - a region with a critical amount of TIS functions working in favour for the biogas industry
- Territorial institutions can (and do) matter for regional industry emergence

## Outlook on regional industry emergence

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- Interactions between technology, industry dynamics and institutions important to consider
- Until now, EEG has a strong focus on firms and their routines as main protagonists
- Change required in the empirical analysis of EEG
- Policy interventions can shape behaviours of firms and steer regional economic development paths

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Thank you!

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