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Institut de Recherche sur les Transports, l'Énergie et la Société

UNIVERSITÉ DE TECHNOLOGIE DE BELFORT-MONTBELIARD

Building a Smart Specialization in Regions based on Social Network Analysis Tools. The Case of Franche-Comté Region

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Les politiques publiques d'innovation et de recherche au défi d'une transition durable

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Outline

- Context
- Objective of the paper
- Hypothesis
- Previous literature
- Overview of the data
- Methodology
- Main results
- Discussion, limits and policy implications

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Context

European Innovation Policy

- Role of knowledge and innovation on growth and competitiveness
- Regional level is considered as the good level of policy innovation deployment
- The allocation of a part of FEDER subsidies is linked to the capacity of regional policy-makers to design a strategy to stimulate the regional innovative potential
- Two phases :
  - 2007-2013 : Regional Strategy of Innovation
  - 2014-2020 : Smart Specializations Strategy (S3)

European Cohesion Policy (2014-2020)

- Some European Regions are more innovative than others
- Public policy aims to reduce these gaps

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The Smart Specialization Strategy (S3) Concept

- ***The importance of a Smart Specialization Strategy (S3) to regional growth:***

  "A good S3 will catalyze structural change and the emergence of critical clusters so that agglomeration externalities, economies of scope and local spillovers can be fully realized in the process of knowledge production and distribution."

  Guide to Research and Innovation : Strategies for Smart Specialisations (RIS3), European Commission, May 2012

- ***A S3 consists in defining a method to help policy makers to identify desirable areas for interventions in such a 'vertical' logic (some technologies, fields, sub-systems) Foray (2013)***

What is Smart Specialisation ?

Landabaso (2011)

= no top-down decision, but dynamic/entrepreneurial discovery process

= global perspective on potential competitive advantage & potential for cooperation

= source-in knowledge, & technologies

= priority setting in times of scarce resources

= getting better with something specific

= focus investments on regional comparative advantage

= accumulation of critical mass

= not necessarily focus on a single sector

"…The elements of economic productivity – strong infrastructure, a skilled workforce, and interrelated networks of firms – come together with smart economic strategy on the regional level to drive prosperity".

(Guidance on developing place-based policies for the USA FY 2012 Budget)

Why S3?

- Making (hard) choices and defining a regional vision: Defining where regions wants to go in terms of competitiveness through innovation.
- Focusing minds, efforts and (scarce) public resources on the development of a limited number of thematic or (cross) sectoral innovation priorities in each region.
- Identify factors of competitiveness (critical mass) and bottlenecks, enabling General Purpose technologies, and concentrate resources on key priorities.

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To sum up

- **Policy makers are invited to prioritize their public research and innovation investments in specific fields where clusters of activities should be developed and based on Smart Specialization elements.**
- **Selected niches had to be characterized by:**
  - The existence of an entrepreneurial search process
  - Domain (specialization field)
  - Their relevant size
  - Their connectedness which determines the potential for learning about the opportunities and the magnitudes

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Objective of the paper

How to identify the fields of regional specialization, that is niches, with high level of innovative potential and consequently with long-term growth perspectives?

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Hypothezes

- **Our hypothesis is that regional innovative potential depends not only on resources or knowledge capital accumulation, but also on actors networking capacity and spillover effects.**
  - What is important for regional growth is not only a diversified regional economy, but a high number of sectors that are technologically related to each other in a region (Boschma, 2013).
- **The Social Network Analysis (a statistical analysis of networks structure based on seminal works of Moreno (1934), Freeman (1979), Wasserman (1994)) may be used to identify the most connected technological fields.**

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Previous literature

Title	Authors	Main Findings
A Role Based Ecology of Technological Change	Podolny and Stuart, 1995 *The American Journal of Sociology*	The size of the niche and the status of the actors within the niche have a positive effect on the likelihood that subsequent innovations will build upon the focal innovation.
Networks, Knowledge and Niches: Competition in the worldwide semiconductors industry	Podolny, Stuart and Hannan, 1996 *The American Journal of Sociology*	New technology builds on an already existing technology and in so doing becomes the foundation for new technological know-how.
Technological Relatedness and Regional Branching	Boschma and Frenken, 2009 Chapter of Book*: Dynamic Geographies of knowledge creation and innovation*, Routledge.	The relatedness between technologies used among firms in a region affect the nature and scope of knowledge spillovers. Regions with different but technologically related activities benefit more from spillovers. New industries emerge from related industries.

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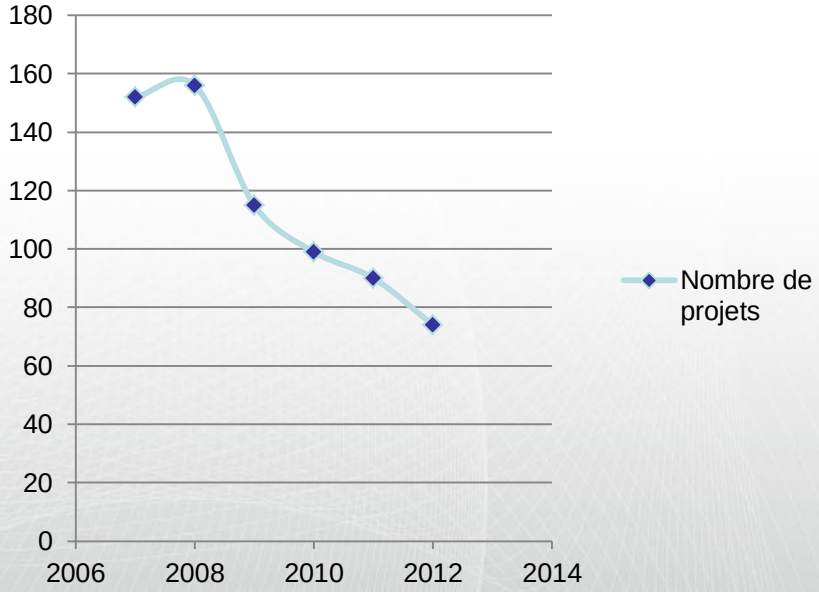
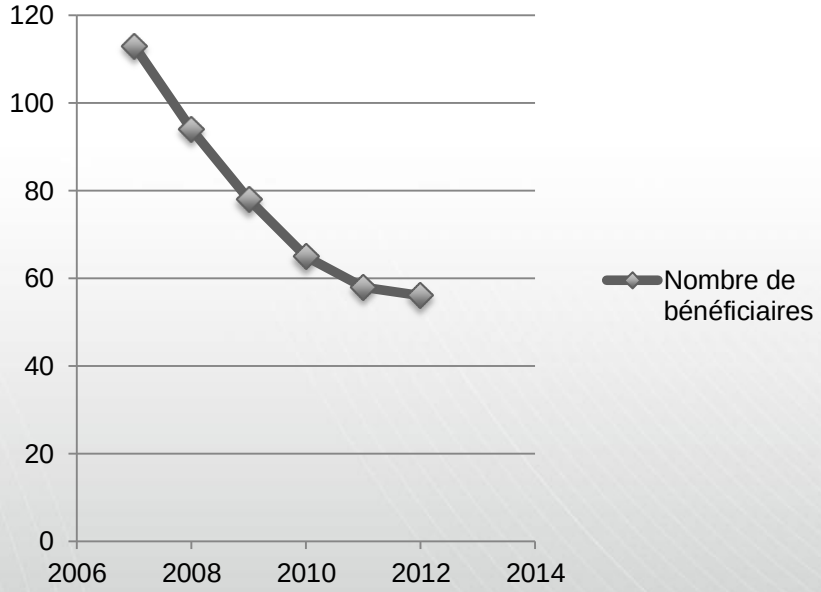
Overview of the Data

Data concerns 598 private or public projects of research and innovation (from 2007 to 2012) with public subsidy of OSEO in Franche-Comté

Number of Projects



Number of organizations



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How to make a choice ?

- **In order to identify niches with innovative and diffusing potential, we:**
  - Use a diachronic approach (from 2007 to 2012) taking into account the technological dynamics;
  - Identify sectors that are technologically related to each other in the region. According to Boshma (2013): the higher the related variety in a region, the higher regional growth;
  - Identify the number of actors financed in a technological field.

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Methodology : affiliation networks

- **We consider a two mode networks which consists of two types of nodes (actors and events) and ties among them:**
  - Actors are the first set N={1,2,…,n} of nodes refers to technological field of an innovative project
  - Events are the second set M={1,2,…,m} of nodes refers to sectors of application of an innovative project
- **Affiliation networks are relational:**
  - They show how actors and events are related;
  - They show how events create ties among actors;
  - They show how actors create ties among events.

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Statistical Results : Network Size

	2007	2008	2009	2010	2011	2012	Whole network
# of actors n (techno. fields)	23	22	22	24	25	25	48
# of events m (sectors of application)	29	21	25	21	30	23	59
# of possible ties n*m	667	462	550	504	750	575	2 832
# of ties	151	121	98	83	75	70	598
Average degree of actors	12 Min 1 Max 21	10,36 Min 3 Max 16	7,45 Min 0 Max 16	10,25 Min 0 Max 20	5,20 Min 0 Max 13	4 Min 0 Max 13	16,75 Min 1 Max 38
Average degree of events	12 Min 2 Max 25	9,71 Min 2 Max 21	8,08 Min 0 Max 19	6,57 Min 0 Max 16	4 Min 0 Max 16	4,17 Min 0 Max 11	22,13 Min 1 Max 47
Density	0,226	0,261	0,178	0,164	0,100	0,121	0,211

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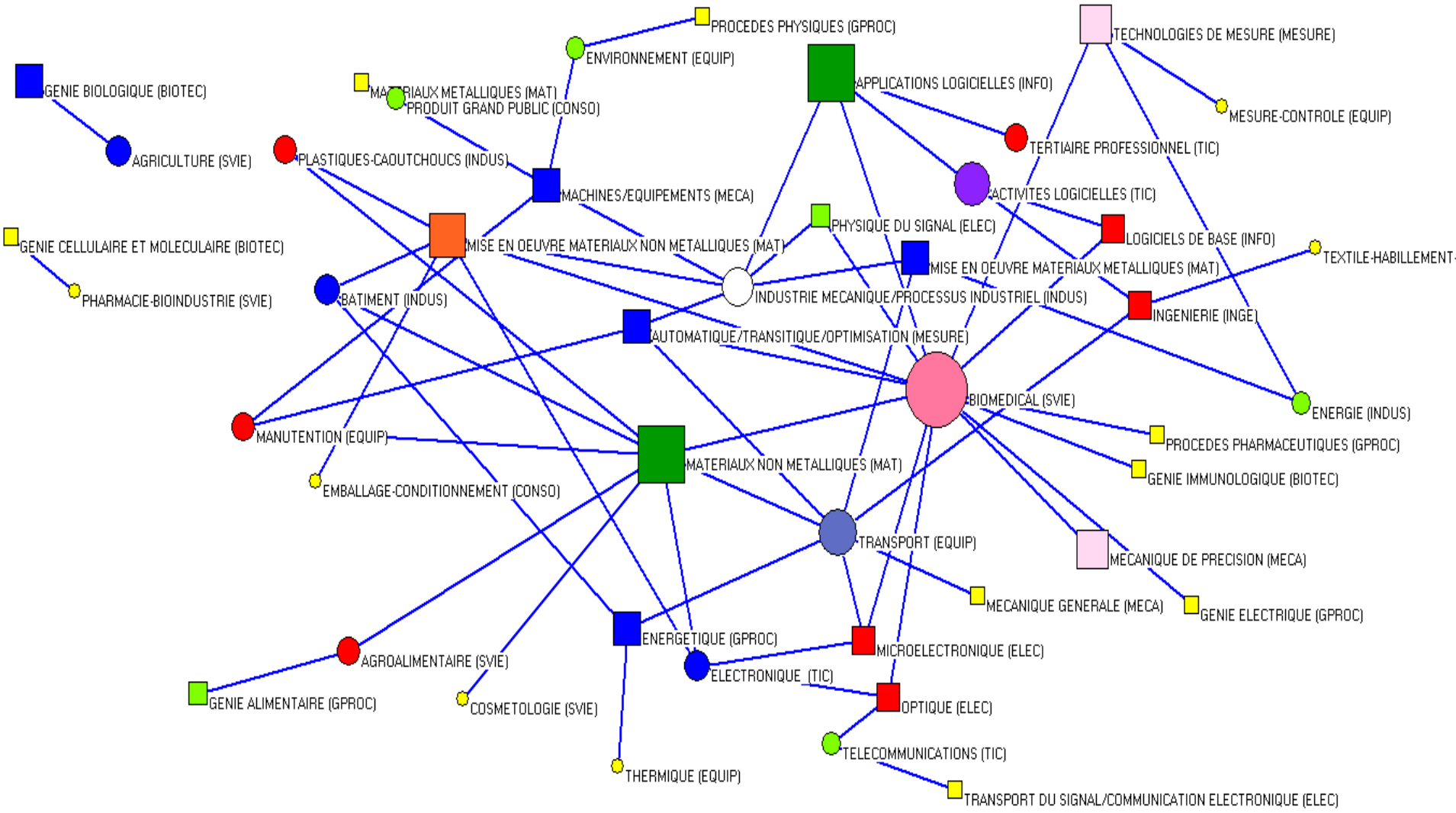
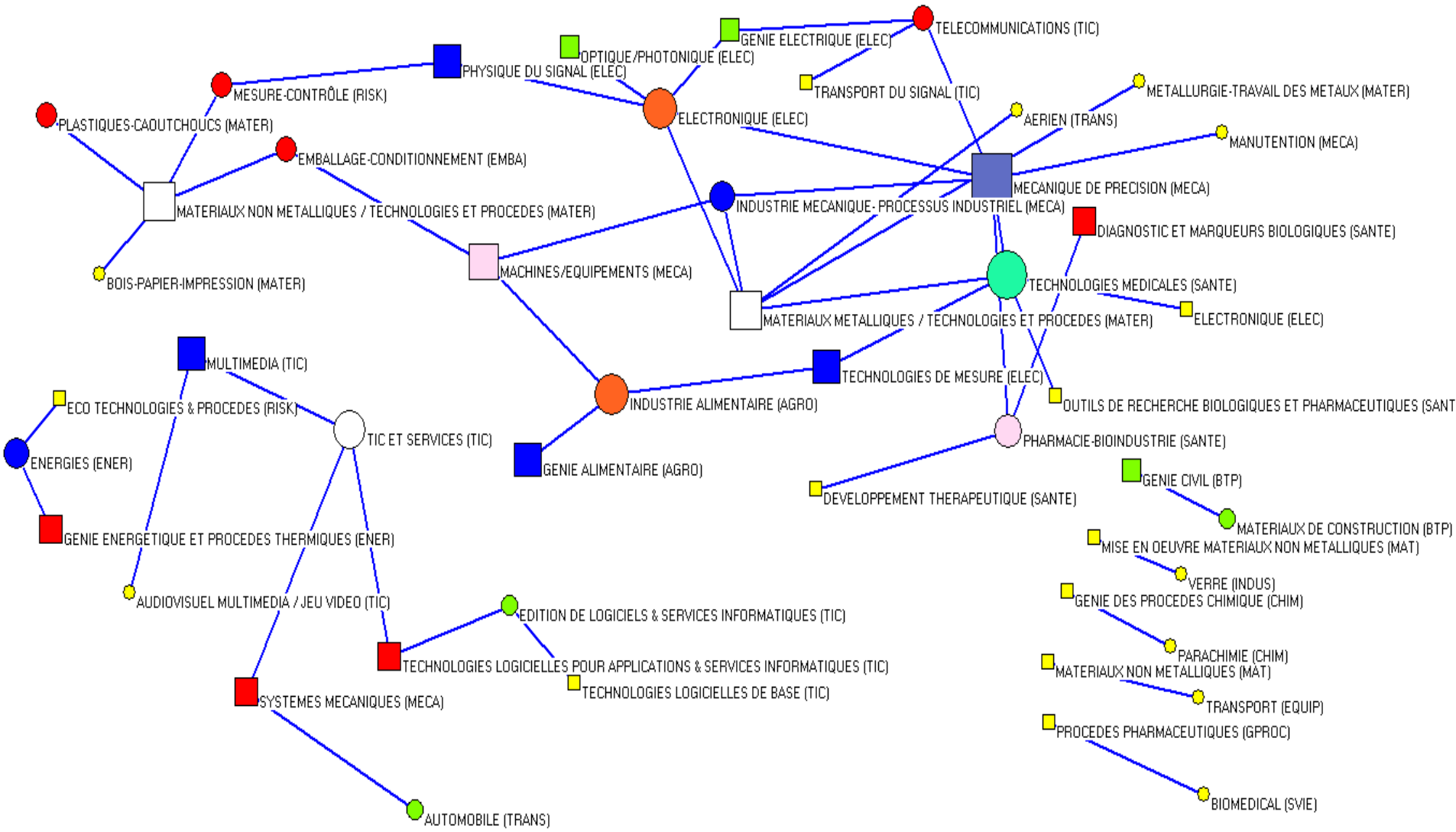
Two-mode networks 2010



Two-mode networks 2012



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Discussion and policy implications

- Our objective is not to provide additionnal weight or importance to sectors, but to explore related activities between sectors and technologies in order to identify the potential fields of regional smart specialization .
- Our analysis shows the existence of knowledge transfer between the two sets of nodes (technological fields and sectors).
- Franche-Comté Region has many related technologies and this can be considered as an opportunity to develop new industries and initiate new growth opportunities.
- The evolution of the two-mode networks analysis from 2007 to 2012 shows that new sectors are, at the one hand, related to existing and local sectors in the region. On the other hand, this new sectors are based on more specialized and sophisticated technologies.
- Consequently, the orientation of public policy had to take into account this specific dynamic of technological development and the timing of this development.

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Future Researches

- **Our study has focussed on one region**

  ➔ cooperation between regions?

- **Public policies had to take into account the technological change and the timing of this changement**

  ➔ understand and explain the process of technological change

- **Strategic Niche Management can be used as a research model and a policy tool.**

Thanks for your attention

Questions and comments are welcome