



Innovation in the Öresund-Kattegat-Skagerak region: Strengths and potentials for cross-border regional cooperation

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CIRCLE (Centre for Innovation, Research and Competence in the Learning Economy)

- New multidisciplinary centre of excellence in research on innovation and entrepreneurship at Lund University (established in July 2004)
- CIRCLE is financed by the Swedish Agency for Innovation Systems (VINNOVA), Lund University and Blekinge Technical University 2004-2010, and from 2006 for 10 years by the Swedish Research Council (Linnaeus grant)
- In autumn 2007 co-location of research and teaching in innovation and entrepreneurship together with LUIS (Lund University Innovation System) at LUCIE (Lund University Centre for Innovation and Entrepreneurship)
- Becoming one of the largest centres in Europe of its kind with 35 researchers employed
- <http://www.circle.lu.se/>



Different *modes* of innovation

- *'How Europe's Economies Learn. Coordinating Competing Models'* : Different *modes* of innovation and *forms* of work organisation (Lorenz and Lundvall, 2006)
 1. *STI* (Science, Technology, Innovation) – high-tech (science push/supply driven) – R&D based
 2. *DUI* (Doing, Using, Interacting) – *Competence* building and *organisational* innovations (*learning* work organisation) market/demand driven (non-R&D based)



Some empirical observations I

- Economic performance: Global competitiveness

	2005	2008	2009
○ Finland:	1	6	6
○ Sweden:	3	4	4
○ Denmark:	4	3	5
○ Norway:	9	16	14



Some empirical observations II

- Promoting Innovation Systems approach:
 - *Finland*: Science and Technology Policy Council and TEKES
 - *Sweden*: VINNOVA (Swedish Governmental Agency for Innovation Systems)
- Share of R&D:
 - *Finland*: 3.7%
 - *Sweden*: 4.0%




Nordic innovation strategies

- **Finland:** *Science-driven* high tech strategy focusing on *radical product innovations*, with NOKIA as the champion (**STI** mode of innovation)
- **Sweden:** *Technology-based* strategy of *process innovations* and *complex product improvements*, through R&D investments in large industries (**STI** mode of innovation)
- **Denmark:** *Market/demand-driven entrepreneurialism* characterized by *non-R&D based, incremental product innovations* especially within consumer goods sectors (**DUI** mode of innovation)
- **Norway:** *Resource-based* strategy for *process innovations* in large, export industries (**STI** mode of innovation) and *non-R&D based innovations* in SMEs (**DUI** mode of innovation)

Explanation I: Institutional framework: Varieties of capitalism – institutional complementarities (macro level)

VARIETIES OF CAPITALISM	Liberal market economies (LME)	Coordinated market economies (CME)
Financial regulation	Short-term financial markets, equity financing	Long-term patient capital, debt financing
Corporate governance	Shareholder value, limited business coordination; antitrust laws	Stakeholder value, strong business associations, intercorporate networks
Innovation systems	Radical innovation, involving sharp breaks with extant processes	Incremental innovation involving continuous process development
Capital-labor relation	Decentralized bargaining, contentious workplace relations	Coordinated bargaining, statutory worker representation
Training and employment	Basic education and firm-specific training, short tenure, high turnover jobs, high interfirm labor mobility	Vocational training, long tenure, low turnover jobs, low interfirm labor mobility



Explanation II: Forms of work organisation across European nations (micro level – DUI mode of innovation)

- **‘Learning’ forms of work organisation (CME):**
 - + : **Netherlands, Denmark and Sweden (and Norway)**
 - - : **Southern countries and Ireland**
- **‘Lean’ forms of work organisation:**
 - + : **UK, Ireland, Spain and France**
 - - : **Netherlands, Denmark, Sweden, Germany and Austria**
- **‘Taylorist’ forms of work organisation:**
 - + : **Southern countries and Ireland**
 - - : **Netherlands, Denmark and Sweden**
- **‘Simple’ forms of work organisation:**
 - + : **Southern countries**
 - - : **Netherlands, Denmark, Finland and UK**



What is a Regional Innovation System (RIS) – narrow definition:

- A RIS is constituted by two sub-systems and the systemic interaction between them (and with non-local actors and agencies):
- The *knowledge exploration and diffusing sub-system* (universities, technical colleges, R&D institutes, corporate R&D, technology transfer agencies)
- The *knowledge exploitation sub-system* (firms in regional clusters as well as their support industries)
- *STI* (Science, Technology, Innovation) mode of innovation – science driven; radical innovations



What is a RIS - broad definition:

- A wider system of organisations and institutions supporting learning and innovation, and their interactions with local firms
- *Developmental (creative) learning*: learning work organisations, interactive learning (user-producer relationships), inter-firm networks
- *DUI (Doing, Using, Interacting)* mode of innovation – market/demand driven, non-R&D based; incremental innovations



VINNVÄXT: Regional Growth through Dynamic Regional Innovation Systems

- To promote sustainable growth in regions by supporting the formation of dynamic and effective regional innovation systems to create international competitive economic activity
- VINNVÄXT is competition based (top-down program design)
- The winners receive 10M SEK per year under a 10-year period (50% co-financing)
- Focus on (potential) regional strengths (but not picking the winner)
- Triple-Helix based – mobilisation of regional actors (bottom-up)



Medicon Valley: Life Science – From Local Integration to Global Visibility

- Long history of pharma and medtech in the region (Astra, Pharmacia, Gambro etc).
- Strong growth of biotech firms (DBFs) since early 1990s (today ~ 35 DBFs). Successful academic life science research. High quality health care.
- Medicon Valley Academy established in the mid 1990s as an initiative by Lund and Copenhagen Universities to promote knowledge transfer between companies, universities and health care organisations in the region.
- Early enthusiasm has decreased. Global collaboration proved indispensable. MVA strategy was revised. Less focus on local integration, more on global visibility (e.g. attract VC and research funds, link up with other CoE etc).
- Other LU initiatives with similar rationale: BMC, Stem Cell Centre, Swegene, SCIBLU

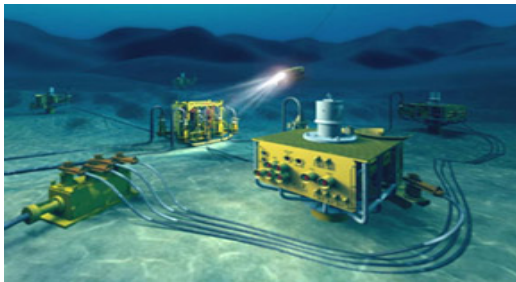
Norway: The six first NCE



Instrumentering Trøndelag



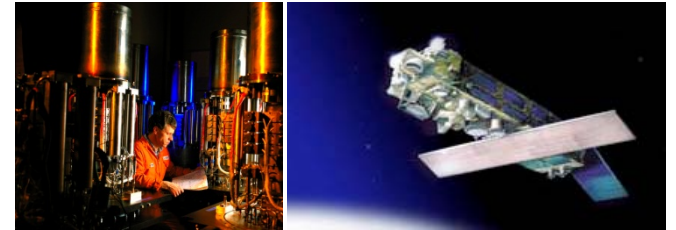
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Møre



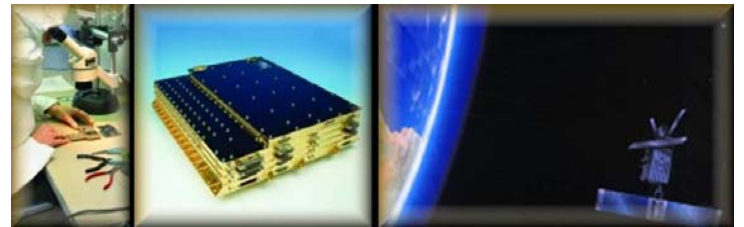
SubSea Hordaland



Raufoss, Lettvektsmaterialer



Systems Engineering Kongsberg



Microsystems Vestfold





Norwegian Centres of Expertise (NCE)

- Most international competitive regional clusters
- Not co-located with universities (as in Sweden and Finland)
- Part of strong national innovation systems (NIS) and not of RIS (as in Sweden and Finland) – STI mode of innovation
- Interactive learning with suppliers and sub-contractors in regional clusters (DUI mode)



The combination of STI and DUI modes of innovation

- Research has shown that a *combination* of the two modes of innovation improve the performance of firms (Berg Jensen et al., 2007)
- Research has also shown that broad sourcing for knowledge for innovation (i.e. not only collaborating with R&D institutions or basing innovation only on experience based knowledge) makes firms more innovative (Laursen and Salter, 2006)



Finland's National Innovation Strategy: New proposal

- In order to meet global challenges, innovation policy must be *broad-based* and *comprehensive*:
- *Innovation activity in a world without borders*
- *Demand-driven, non-R&D based innovation policy (DUI mode of innovation)* to complement the
- *Systemic approach of science and technology policy (STI mode of innovation)*
- *Innovative individuals and communities* (creative class/talents)



The combination of STI and DUI modes of innovation

- *Cognitive distance* has to be reduced and *absorptive capacity* increased to achieve such a combination
- The *STI mode* includes *applied* research and not only *basic* and the *DUI mode* is also found in innovation processes of science based firms representing *bridging mechanism* reducing the *cognitive distance*
- Internal *competence building* through *developmental learning* in *learning work organisations* and *organisational changes* increase *absorptive capacity*
- Needs both *narrow* and *broad* RIS to be implemented

Regional Innovation Policies: A Classification of Policy Instruments

	Support: Financial and technical	Behavioural change: Learning to innovate
Firm-focused	Financial support Brokers	Mobility schemes
System-focused	Technology centres	Regional innovation systems



What can be achieved at the regional level – the role of RIS narrowly defined

- Competitive research and innovation environments can only be established in a limited number of regions
- Such regions must have strong research universities, competitive industries and proactive regional governments building RIS
- These regions will be able to serve R&D intensive domestic industry as well as to attract R&D units from MNCs



What about the ordinary industries in the ordinary regions – the role of RIS broadly defined

- RIS have other tasks than only supporting R&D intensive industries, as regions have other types of industries that are in need of innovation support from RIS (firms based on the **DUI** mode of innovation)
- Knowledge creation and innovation in all types of industries with different knowledge bases
- Easier to achieve optimal combinations of science and user driven innovation (**STI** and **DUI** mode of innovations) on the regional level due to spatial and social proximity especially favouring the **DUI** mode of innovation (interactive learning)