

National report for NIND deliverable D8:

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1. Desktop study on Denmark

In the autumn 2006 Denmark started to implement the base or ground for a new national innovation policy. Early 2007 the resulting national innovation strategy was published and set into work (see InnovationDanmark 2007-2010), after it was announced as part of the Governments Globalisation Strategy in the spring 2006. Medio 2007 several of the initiatives have been implemented, started up or planned in details to start up a.s.a.p. The national innovation strategy will be updated annually by the Danish Council for Technology and Innovation. The following section of the note describe and report on these initiatives and the arguments behind, based on the InnovationDanmark report, the most recent TrendChart 06 report, the PolicyMix 06 report, and the Danish back ground document for deliverable D4 in NIND among others.

1.a Emerging trends that relate closely to future innovation

In recent years (2005 and forward) it has been recognised that Denmark needed a specific policy for innovation placed in between the R&D policy and the business policy implemented so far. Hence, in 2006 the work started to create the base for a Danish innovation policy, see InnovationDanmark 06. Among other items, the government stated in its Globalisation Strategy that Danish firms should be among the most innovative in the world, use the highest proportion on R&D and be among the best to use and implement new results and knowledge, i.e. all stated as goals and frames for a Danish innovation policy. The government further stated in the Governments "Globalisation Strategy" (2006) that investments in education, research and innovation are the key to secure future global competitiveness and welfare.¹ Hereby, the government introduced the need for a separate but still interacting innovation policy parallel with the established policy areas for R&D and businesses as well as for education, i.e. research, knowledge and absorption capacity.

Actually, user driven innovation was first mentioned in a FORA report in 2003 as an input to develop the national business policy.² It was recognised that innovation was

¹ Out of 14 chapters with 350 initiatives, 3 chapters directly concern R&D and innovation, 3 concerns entrepreneurship, cooperation and partnerships and 2 concern university education and life-long learning. The rest concerns general education, global perspectives in a small open economy and national coherence in a global society.

² FORA is a research and analysis division under the Danish Enterprise and Construction Authority.



more than technology and natural science so the concepts of price driven, user driven and science driven innovation was introduced and related to the business policy needs. In 2004, the two firms "Inside Consulting" and "Oxford Research" published the report "Brugerdreven innovation i dansk erhvervsliv". However, already in 1996, Jon Sundbo published "Innovationsteori - tre innovationsparadigmer", so it has taken a decade from the first thoughts have been systematically presented until it resulted in a spoken demand for an innovation policy.

In recent years several new innovation policy trends have emerged, going from simple indicator based policy to more complex and targeted but also more coherent innovation policy based on new innovation theories and supported by composite indicators, regional indicators and a broader innovation definition, c.f. the 3rd edition of the Oslo Manual (2005). This development will continue towards an indicator based innovation policy targeted to the individual firms' needs and simultaneously securing regional as well as national coherence. In the late 1990's and early 2000's there has been a growing focus on cluster strengths but today it seems like the analysis' behind and the following policy initiatives have been the first steps towards a more coherent view on the entire national innovation system such that the clusters were used as good examples (being more innovative) and examples to learn from. Hence, they also raised the demand for an innovation policy in Denmark.

Among the newest priority areas for the innovation policy are the service sector, innovation in the public sector, innovation and variety, innovation in educations, and innovation in all regions of the country, c.f. InnovationDanmark 2007-10. The latest initiative from the Ministry of Science, Technology and Innovation through the Danish Agency for Science, technology and Innovation, DASTI, is an open call for the identification of the most important research areas for Denmark.³ The aim is to qualify the priorities behind the choice of the future strategic research initiatives, i.e. better strategic research policy priorities.

1.b Trends being high on agenda

The main object for Danish innovation policy has been to increase the coherence of and reduce barriers for knowledge flows in the Danish economy, hereby increasing the ability to think and create innovatively in all areas of the economy. The argument is that firms' ability to act innovatively and use new knowledge is the main condition for future competitiveness in an open global economy. One of the main goals has been to increase the knowledge sharing and diffusion among public as well as

³ Everybody can contribute with their personal or professional opinion through a web based homepage www.forsk20015.dk

private actors in the economy.⁴ The logic behind the proposed innovation policy is basically linear starting with R&D followed by knowledge diffusion, innovation and ending with growth, employment and welfare, i.e. a linear path from idea to invoice. As a partial illustration this seems plausible, but in reality the relations between the R&D, business and innovation policy is quite more complicated like the thought behind the concepts of regional (clusters), national or global innovation systems; RIS, NIS and GIS.

Having defined the need for an innovation policy, several public and private actors are involved in setting the agenda. Concepts such as user driven innovation, open innovation, service innovation (not just innovation in services) and identification of various innovation types have been introduced recently in the policy setting to target the development of a national innovation policy. The Ministry of Economic and Business Affairs (Danish Enterprise and Construction Authority, DEACA) has for example focused on the user driven innovation, regional innovation and how to find, measure and implement targeted innovation and entrepreneurship policies. The Ministry of Science, Technology and Innovation (Danish Agency for Science, technology and Innovation; DASTI) has focused more on R&D, national innovation, knowledge diffusion, IPR etc.

The broad and overall common trend is however to increase the cooperation between knowledge institutions and firms, to increase the commercialisation of public R&D, and to have a specific SME focus. The aim is to create possibilities and structural frames for firms to faster renewal of organisation, management, processes, products and services.

1.c National specific initiatives related to industrial structures etc.

In Denmark there has traditionally been Governmental Research Institutions, GRI, and Governmental Technological Service Institutions, GTSI, as knowledge providers and diffusers in between universities and firms. The first have recently been merged into the universities and the latter has been privatised (or at least made independent). The merge of the GRIs is argued with synergy effects and improved competencies. The latter is argued with higher commitment and free competition. The GTSIs are meant to increase their effort as knowledge brokers and match makers between universities and other research institutions and firms, however mainly in technology and natural science.

⁴ This is argued on the OECD finding that knowledge diffusion is one of the most important sources for welfare and growth (OECD; Science and Industry Outlook; 2000). Here OECD also points on the fact that there is an additional positive economic effect of R&D when there is an effective knowledge diffusion of R&D results.

1.d Concluding remarks

In Denmark, a lot of innovation policy related initiatives have been implemented in recent years. This makes it difficult to measure effects of each of them separately. However, the overall impression is that the national strategy to increase the innovation awareness has been fruitful for the Danish competitiveness.

2. Policy maker interviews - summary

In order to test whether the policy areas result in use or demand for indicators measuring effects, input etc. a few policy makers have been heard in a structured discussion.

2.a Interview guide

The resume of the policy makers' comments follow the sketched interview guide from Juha which is based on Arundel's interview guide for a similar purpose, see guide text in the appendix. The structure is as follows: Current policy and use of indicators, their importance and adequacy, and future policy and indicator needs.

2.b Summary of interviews

In current years, a more focused and differentiated innovation policy has emerged. It follows the belief that Denmark is better to compete globally on knowledge than price. Hence, a marked public investment has been pointed at the innovation policy area. The universities basic research is seen as the ground for raising the knowledge level in Denmark to the benefit of Danish firms if and only if this knowledge is transferred to the firms in an efficient way. For this purpose the communalities now has the responsibility for the business sector services, the regions has the responsibility for the regional growth strategies and the state has the responsibility for the national innovation and R&D policy. All actors have competitiveness as the goal and are expected to coordinate their actions.

As many as possible is the mantra right now regarding indicator use. The hope is that at least some are usable. This is a consequence of an enormous pressure to document effects of the implemented innovation policy. The trade off is between coverage, availability (already sampled), type specific special information, as well as timeliness. There is an increasing understanding of the need to develop measures based on existing data although the special issues often are covered by small scale special data collections. For policy purposes (illustration) case examples are still used to document linkages and effects. Too many indicators are difficult to present as inputs to determine policy, the demand is often that the conclusion can be figured or that the many indicators can be gathered and illustrated by one comparable measure.

Some indicators are used as proxies in lack of better indicators. However, more precise data requires new data collections and new burden on the firms. This is not good policy behaviour in Denmark nowadays. The ministries try often to require survey responses from firms in connection with contracts on research funding etc., i.e. there is an increasing awareness of the information and effect measures and documentation already ex ante.

Especially, the innovation type measures are an increasingly important area together with the regional coverage. As examples are the Danish focus on user driven innovation and the emerging focus on open innovation as well as the subregional coverage of the CIS2006 in Denmark (19 subregions with a specified uncertainty limit). Among other new focuses are blue/red ocean strategies, design, management strategies, services, knowledge linkages and clusters, regional and subregional innovation systems or knowledge clusters.

The CIS data is used already on an aggregated level and for specific purposes in national and regional benchmarks. The Danish aim is to be in the top on all innovation related indicator benchmarks. Hence, the CIS results are mainly used to compare Denmark with other comparable countries on innovation performance. CIS is also used on regional level but so far not for systematic benchmarking. In general, national and international benchmarks building on “easy-to-interpret” indicators have the highest impact on initiating new priority areas for policy making. However, cases, collections of individual indicators and matched data are influencing which, how and where a specific policy is best implemented. The in-depth detailed analysis is mostly used as inspiration for policy makers, advisors and other consultancies trying to make an understanding for future policy needs. There is a need for both indicators and for in-depth analysis but the first has a more direct policy impact.

In the future, there seems to be an increasing demand for evidence based policy, i.e. efficient innovation policies in a small open (global) economy. Hence, the future changes in innovation policy strategies will be in the direction of securing an efficient and well-functioning knowledge market in Denmark, where Denmark’s competitiveness is increased through an intelligent designed coherent national knowledge society.

2.c Concluding remarks

Denmark is already collecting an enormous amount of data that can be used as indicators and there still stands a lot of work to investigate the usability of these for policy making. The existing data sources are increasingly used and supplemented by special purpose collection of new data. For policy purposes, simple aggregated indicators have the highest impact, especially in comparisons or benchmarks.

3. Identification of “new” indicators/ indicator categories needed in future oriented innovation policy making

In line with the emerging need for measures on innovation needs, effects, barriers and other policy relevant indicators, an intense development and test of such new indicators have been on the agenda in Denmark. Especially the two innovation related ministries, Ministry of Science, Technology and Innovation and the Ministry of Economic and Business Affairs, have been active in this area, but also the regional authorities responsible for the regional development and growth have participated. In practise, the work has mainly been done by private as well as public consultancy groups and university researchers in cooperation with national and international colleagues.

3.a Denmark - national point of view

New terminologies such as user driven and open innovation have influenced the policy setting but also the work on typologies such as radical innovators, adaptors, and similar has been introduced recently in OECD projects, Nordic projects and national and regional projects. Similarly, innovation in services as well as service innovation has gained increasing interest. Still, proven positive effect of being such innovation types has to come.

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Appendix

Innocate D8: Interview Guideline (based on Arundel et al.)

Background: What policy area(s) are you responsible for?

A1.1 **CURRENT POLICY.** What significant changes, if any, have occurred in the past five years or so in your area of policy. What drove the change(s)?

A2.1 **CURRENT INDICATORS.** Which statistics or indicators do you currently find the most important for policy development in your area of interest, and what do they use them for?

PROBE for: are these indicators adequate for your needs in terms of:

- i. Scope (cover all aspects of what they would like, for instance gender for education/skills, or sector for R&D)?
- ii. Detail (for instance, available at the regional level, or for different firm sizes, etc)?
- iii. Timeliness: not too long a gap between current year and data availability?

A2.2 **CURRENT INDICATORS.** Do you find any of the indicators that you currently rely upon to be inadequate, outdated, or even obsolete for your policy area needs?

If YES, can you summarize the main problems?

A2.3 **CURRENT INDICATORS.** Can you think of data or indicators that are crucially important for current policy development in your area and which are simply not available today?

A2.4 **CURRENT INDICATORS.** Do you use any of the results of the Innovation Survey in your policy work? (CIS in Europe)?

If YES: what results do you use and for what purpose?

Do you use innovation survey results to compare performance in [YOUR COUNTRY] on specific indicators against performance in other countries?

If NO or minimal use of innovation survey results: why not?

A3.1 In your experience, which types of results have had the most impact on policy making: international benchmarking, descriptive indicators, or more in-depth detailed analysis, including regression models?

A3.2 In general, what are your views on the relative value of indicators versus in-depth analysis in influencing policy and/or producing useful results?

I would now like to ask you a few questions about policy concerns and indicator needs for the future, and if you see any necessary changes coming up. By future, we mean in the medium to long term, such as over five years from now.

B1.1 **FUTURE POLICY:** Do you see any major new developments or challenges in the future that would require a change to your current policies?

If YES: what will be causing the need for these changes, and what types of policies will be needed to meet them?

B2. **FUTURE INDICATORS:** Are there new types of data or indicators that will be needed to help policy meet these future challenges?

B3. More broadly speaking, do you see other challenges on the horizon for policy development outside your policy area?