

Per Högselius, Linköping University

# **The Transformation and Integration of Innovation Systems in the Baltic Sea Region**

## **The Cases of Telecommunications and Energy in Estonia**

### **1. Purpose, relevance and theoretical framework**

#### *1.1. Background*

The project addresses the on-going economic and political transformation processes in the Baltic Sea region from the perspective of technology and innovation. The basic underlying idea is that the ability to generate and exploit innovation will be of crucial importance for future economic development and welfare in the new market economies on the Eastern shores of the Baltic Sea – in the same way as innovation is the main driving force in Western economic development (e.g. Edquist, 1997).

#### *1.2. Purpose*

The project focuses on the transformation of post-socialist *innovation systems* and their integration with the West. The purpose of the project is to identify the patterns that these processes follow and why they follow those patterns.

#### *1.2. Relevance*

Effectively functioning innovation systems and the integration of domestic innovative activities with foreign innovation systems are crucial factors for domestic development and competitiveness. From a policy perspective, knowledge of the process by which systems and system linkages are built are consequently of key importance. In the Baltic Sea region, specifically, innovation systems in East and West were almost perfectly isolated from each other until the end of the 1980s, and the development of new linkages between the systems may, in a long-term perspective, serve to radically strengthen the whole Baltic Sea region. However, innovation systems do not necessarily integrate with each other in any spontaneous way, and integration must therefore be supported in suitable ways. This cannot be accomplished effec-

tively without knowledge of the nature of the process by which systems integration and transformation takes place.

The project will point both at the opportunities and at the limits of achieving increased competitiveness through public policy-making in the field of innovation and technological change. The use of the systems of innovation concept enables a ‘diagnostic analysis’ of the innovative economy (Edquist, 2001), which means that it will be possible to point at the weaknesses in the process of establishing linkages between two integrating innovation systems.

### *1.3. Theory*

The integration of Eastern Europe with the West and North European economies resembles in many ways the integration of late industrialising countries (such as the Asian tigers) with the more advanced industrialised countries. There are numerous theoretical models in the latter field of research with respect to the role of technology and innovation (e.g. Bell, 1997; Hobday, 1995). However, there are also major differences between Eastern Europe and the late industrialising countries, mainly because East European countries already have an industrial history and thus do not build their innovation systems from scratch after 1989. This makes the problem of transformation and integration with the West more complex.

The proposed theoretical solution is to use an *evolutionary* approach, since evolutionary theories deal explicitly with the problem of path-dependencies and the cumulateness of technological change. This allows us to take into account Soviet heritage as well as the effects of new linkages with the Western world. An evolutionary approach implies an analysis of technology, supporting institutions and the structure of the sectors as *co-evolving* with each other, instead of viewing technology and industry structure simply as a response to institutional reform (Nelson, 1994). This also highlights the important point that policy makers are subject to learning, i.e. ‘policy capabilities’ have to be developed (Edquist *et al.*, 1998). These policy capabilities do not necessarily *precede* radical changes in the innovation system. It is argued that this view lies closer to reality than other theoretical alternatives.

## **2. Methodology and empirical material**

### *2.1. Methodology*

The project focuses on a single country, *Estonia*. However, in order to deal with the role of history, the methodology applied is comparative across two *sectors*. The two chosen sectors are *telecommunications* and *energy*.

These sectors are chosen because they show considerable similarities in many respects – except for their specific histories in Estonia, which diverge radically. Both sectors are intimately related to large infrastructure systems; both are dependent upon strong regulation; both have during the past decades been highly innovative in the West; and not least did both sectors in Estonia enter close collaboration with predominantly Swedish firms around 1990. But historically, whereas Estonia developed a highly advanced energy sector during Soviet occupation, telecommunications were subject to severe underdevelopment and neglect.

This means that the two Estonian sectors are appropriate for a most similar cases design: the sectors are similar in many respects, yet they differ on the crucial dimension of interest – which in this case is the history. More specifically, following the theoretical reasoning above, it should be considerably easier to restructure and re-orient domestic innovation in telecommunications than in energy (which should be subject to substantial momentum).

Within the comparative analysis, a *pattern-matching method* is applied (cf Yin, 1994:26). Several competing possible patterns are constructed in advance, each one representing a hypothesis of a pattern that the transformation and integration process should follow according to a specific theoretical argument. For example, one hypothesis might be that history has a very limited or no influence on post-socialist innovation systems. In that case, the pattern of change should resemble that of so-called ‘late industrialisers’ to a great extent. A competing hypothesis might be that the Soviet-era R&D base is crucial for fostering post-socialist innovation, in which case we should expect a strong deviation from the ‘late industrialising’ pattern.

## *2.2. Empirical material*

For each of the two sectors, the project studies one Estonian firm which play key roles in the process of transformation and integration. These have been selected with the help of a preliminary empirical study (Högselius, 2001). The selected firms are the large network utilities Eesti Energia (for energy), and Eesti Telekom (for telecommunications). However, the *units*

*of analysis* are not these organisations themselves, but their (changing) relationships to other elements of the innovation system, such as policy makers and manufacturers of equipment. The focus is on *change-generating* relationships.

The time period stretches from 1980 to 2000, thereby enabling an analysis of the continuing role of Soviet history in the post-socialist Baltic Sea region.

The main empirical material consists of semi-structured interviews that are carried out with representatives of firms and other organisations. As described above, the units of analysis in the study are inter-organisational relationships, and interviews with both of the interacting organisations are in this connection used to map why linkages have been created and destroyed, what the contents of interaction are and what the consequences of interacting have been. Additional data will be collected in the form of firm-specific written material, as well as policy documents from different levels of policy making.

### *References*

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