

A paper prepared for an open seminar *Opportunities and challenges for future regional development*  
The Nordic Committee of Senior Officials for Regional Policy, Nordregio's Board of Directors and the  
Ministry of Transport and Local Government of Iceland  
12 September 2019  
University of Akureyri, Iceland

## Green Path Development and Change Agency in Nordic Regions

### A Collage from the Observations of the Gonst Project

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#### Abstract

This paper is premised on the idea there are no one-size-fits-all theories and models for transforming regions towards greater sustainability. Consequently, green path development calls for place-sensitive policies, supportive institutional arrangements and the identification of particular leverage points for transition. All this leads to issues related to change agency. This paper proposes that to enhance green path development and to truly construct sustainable regional development models, we need to better understand what actors can actually do to transform and reinvent their regions, and how this can be achieved. There is a need to reach beyond policy formulation and implementation debates. In this paper, these issues are scrutinised from the perspective of green path development and change agency in Nordic regions. The paper is based on the Nordic research project 'Where Does the Green Economy Grow? The Geography of Nordic Sustainability Transitions.'

## 1 Introduction

With climate change advancing and the challenge of sustainable development mounting, there is an increasing need to find solutions to many wicked problems locking us into the past and to provide workable, alternative visions for the future. In this paper, these issues are scrutinised from the perspective of green path development and change agency in Nordic regions. The scrutiny is based on an extensive Nordic research project, 'Where Does the Green Economy Grow? The Geography of Nordic Sustainability Transitions' (Gonst).<sup>1</sup> In practice, this paper is a collage of the work done and tentative observations made in one of the six work packages of the project by August 2019.

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<sup>1</sup> The Gonst project brings together investigators from six universities and research institutes in Denmark, Finland, Norway and Sweden. It is funded by the Nordic Green Growth Research and Innovation Programme in cooperation with NordForsk, Nordic Innovation and Nordic Energy Research [grant number 83130]. The project is coordinated by Lund University. See more at [gonst.lu.se](http://gonst.lu.se)

The starting point for the project is that there are no one-size-fits-all theories and models to be readily implemented for transforming regions towards greater sustainability. Consequently, the second starting point is that green path development calls for place-sensitive policies, supportive institutional arrangements and the identification of particular leverage points for transition. In our thinking, all of this leads to issues related to change agency. The concept of path development is used to situate manifold developments and related agency into a dynamic framework. From these starting points, the Gonst project seeks to answer the question of where and how the green economy is growing. The project is based on a mixed methods approach, utilising both qualitative and quantitative techniques. This paper draws mainly upon the qualitative case studies, while quantitative methods have been applied in the analysis of the importance of human capital and technological specialisation in the greening of the Nordic countries and their regions (see Tanner et al., 2019; Østergaard et al., 2019).

Observations made in studies focusing on cluster development, regional innovation systems or the resilience of regions have led academic research to focus more and more on issues related to change agency (e.g., MacKinnon et al., 2018). Moreover, recent literature on the dynamics of regional development shows that translating the observations and experiences from the past to the conscious creation of new development paths necessitates linking change agency both conceptually and functionally to path development frameworks (Karnøe and Garud, 2012). Consequently, this paper proposes that to enhance green path development and to truly construct sustainable regional development models, we need to better understand what actors can actually do to transform and reinvent their regions, and how this could be achieved. The many issues related to green path development may be reduced to our capacity to think, act and make decisions across many divides. The need to revisit regional development capabilities is more urgent than ever. What we need is a robust theory and practical recommendations not only on what kind of policies are needed but on *how* to influence, lead complex processes, and hence to embed the capacity to transform regions strategically. As a result, in being increasingly and simultaneously confronted with ecological as well as social and economic difficulties, regions face the issue of leadership more urgently than ever. Yet sustainable regional development is difficult to achieve in practice because of constraining rules, procedures, short-term perspectives and conflicts of interests. To overcome these and many other bottlenecks, change agency needs to be better understood than it has up to this point.

This paper aims tentatively to answer following questions: (a) what kinds of agency are required in green path development, and (b) what are the main actors in the efforts to green regions? First, to outline the conceptual framework, the concepts of green growth, path development and the trinity of change agency are briefly introduced. Tentative observations of the case studies carried out in the Gonst project are then introduced, and third, issues related to agency are briefly discussed.

## **The cases**

In total, eight case studies have been conducted. The focus in each regional case study is slightly different, as the cases were selected based on the quantitative analysis (four cases) and the reputations of regions for being frontrunners in their own countries (four cases). Several case studies revolve around the bioeconomy (Scania, Värmland, Trøndelag and Central Finland), while the Hordaland, Northern Jutland and Southern Denmark cases are about the greening of the maritime industry and offshore wind industry (Andersen et al., 2019). The case of the Tampere region deals with developments around generic technologies, which can be categorised under the rubric of cleantech. In this paper, the main emphasis is on the Danish, Finnish and Swedish cases. The empirical case analysis is based on 79 interviews with key actors as well as the analysis of secondary data consisting of the main policy documents, media archives and earlier studies of the case regions.

## **2 The key concepts: Green growth, path development and change agency**

### **Green growth**

Many governments all over the world have adopted the “green growth” thinking to frame the greening of their economies. By doing so, they aim to highlight the economic opportunities rather than the many threats arising from climate change (Capasso et al., 2019). The Organisation for Economic Co-operation and Development (OECD) defines green growth as enhancing economic growth, but simultaneously secure ecological sustainability. Therefore, there is a need to speed up innovation underpinning sustained growth and new economic opportunities (Green Growth, 2015). This line of thinking is based on a conviction that we need green industries that “develop and sell products, solutions or technologies that improve the environment, either directly or through a more efficient utilization of resources” (Grillitsch and Hansen, 2019, p. 2166). Green growth may have highly varying characteristics, as shown in a review introducing 50 Nordic green growth cases (Mikkola et al., 2016).

All the countries and regions studied in the Gonst project have adopted the green growth agenda.

### **Green path development**

Green path development refers to industrial development around products, solutions or technologies that “reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services” (UNEP, 2011, p. 16). Green path development opportunities and practices vary between regions (Grillitsch and Hansen, 2018), but at all events, all sorts of actors at different scales have adopted sustainability thinking and embedded it into their own strategies and objectives. Often all of this is reflected in ambitions to boost green industries (Coenen et al., 2015; Hansen and Coenen, 2015).

Grillitsch and Asheim's (2018) three broad categories are useful in the categorisation of green paths. (1) *Upgrading* is about existing industrial paths changing qualitatively, potentially in three different but intertwined ways: (a) climbing in the hierarchy of global production networks by introducing green services and products, (b) introducing major changes by the adaptation of new green technologies and/or the introduction of new sustainable business models (renewal), or (c) identifying, creating and/or invading niches to tackle issues raised by climate change and other environmental demands. (2) *Diversification* refers to existing industries diversifying into new green industries, and (3) *emergence* is about the creation of completely new green industries, which are not based on the existing competencies and technologies or market demand from the existing regional industries (Grillitsch and Hansen, 2018).

Put simply, all the cases are about upgrading existing industries and businesses towards greener practices. The main ambition is not only to enhance sustainability measures but also to improve the regional conditions so that businesses and other actors would be able to improve their positions in the global production networks by greening their offerings and finding new niches. Technology development is one of the key dimensions in these efforts. It seems that upgrading is the main line of action, but accompanied by hopes, intentions and explicit objectives to diversify the regional economies and perhaps to potentially introduce something completely new. The borders between regional development paths are not fixed or non-renewing.

### **Trinity of change agency**

Grillitsch and Sotarauta (2019) argue that regional transformation and path development call for three types of potentially overlapping agency: innovative entrepreneurs, place leadership and institutional entrepreneurship. They label these three forms of agency the *trinity of change agency*. The first of the three, *innovative entrepreneurs*, are capable of perceiving emerging opportunities and are willing to take risks for value creation. Innovative entrepreneurship is a driving force for change (Shane and Venkataraman, 2000). Regional transformation also needs risk-taking and opportunity-savvy *institutional entrepreneurs*, who work to change the institutional arrangements. They are individuals or groups of individuals, but also organisations or groups of organisations, that initiate change processes with the ambition to change institutional arrangements or introduce new elements to them (Battilana et al., 2009; Sotarauta and Pulkkinen, 2011). Institutional entrepreneurs are crucial, as they pave the way for other actors. For their part, *place leaders* pool competencies, powers and resources for collective action. They work first and foremost for their locality or region. As path development is about multi-actor, multi-vision and multi-ambition processes, place leadership is an essential element in any effort to transform a region. Grillitsch and Sotarauta (2019) suggest that the absence of one or more forms of the trinity of change agency or poor interplay between them may be among the main reasons why efforts to transform regions so often fail. Conversely, a well-balanced trinity of change agency may be one of the success factors.

### 3 Some tentative empirical observations from the Gonst case studies

In this section, some selected observations from the case studies are discussed to highlight the nature of path development and change agency. As the interview data have not yet been fully analysed, all the observations are preliminary and suggestive. More systematic analyses and reporting will follow.

The case study on **The North Denmark Region** is about regional path renewal in greening the maritime sector, evolving from the existing shipbuilding industry in the region. For this line of industry, North Jutland has an advantageous geographic location in the middle of the North Sea, Kattegat and Limfjord. It has developed into a well-functioning hub for several small- and medium-scale maritime equipment manufacturers and service providers. The maritime industry has grown by adding new value-added business activities around maritime equipment manufacturing. Maritime service providers have been integrated into shipping, fishing, offshore oil and gas, and offshore wind power (for more, see Andersen et al., 2019).

The case study emphasises the complex interplay between multiple actors at all levels of governance (Andersen et al., 2019). Local and regional authorities have assumed the role of place-based leaders, while the many private and public-private actors are the central entrepreneurial actors. They have played an important role in developing green shipping and green maritime technology by investing in specialised R&D units. The regional authorities have played an instrumental role in prioritising the maritime industry as a main target of the region and then formulating a regional strategy to promote the region's maritime industry. The regional authorities have focused on developing competencies, supporting business development, organising networks with regional firms and maritime organisations and aligning with EU funding programmes for the regional maritime industry (Sotarauta et al., forthcoming).

However, the greening of the maritime sector has been slow and gradual due to the uncertain nature of global and EU-level regulations and the different interests of shipping ports, shipowners, cargo owners, and maritime equipment manufacturers and suppliers. Actors need to navigate a complex set of institutional arrangements, including environmental regulations set by the International Maritime Organization (IMO) and EU for greening the maritime industry. Due to the global nature of the maritime industry, the region has struggled to introduce significant green initiatives, except for new, innovative demonstrations and test initiatives by the maritime equipment suppliers in the region (Andersen et al., 2019).

The case study of **The Region of Southern Denmark** is about the emerging offshore wind energy sector in Esbjerg. It has benefitted from the symbiotic relationship with the offshore oil and gas industry, developments in the onshore wind industry and the presence of suitable infrastructure conditions provided by the Esbjerg port area (Andersen et al., 2019). Indeed, according to Andersen et al. (2019), relatedness to existing regional industries, the presence of relevant knowledge and skills in the region, and the implementation of specific regional policies and programmes can be seen as essential factors for regional path development. The port of Esbjerg has played a key role in enhancing the new industry in the region. It has worked together

with offshore wind firms and suppliers in the region and aimed to solve their challenges moving forward. The port authority offers a flexible infrastructure for different offshore wind firms and provides continuous support by adopting flexible approaches. In a short paper, it is not possible to fully discuss the whole spectrum of actors that have contributed in their own ways to the greening of the maritime industry, but it is worth mentioning that, in both Danish cases, the regional universities have collaborated with the regional maritime and offshore wind industries and supported the development of new knowledge for product and service development.

The case study of the **Tampere Region** (Finland) deals with cleantech. The region and the city have adopted the concepts of circular economy, cleantech and bioeconomy. Both aim to construct policy platforms for the mobilisation of new kinds of ecosystems and thus find novel ways to identify the policy contents as well as to organise interaction and communication between various actors (Sotarauta and Suvinen, 2019). The ambition of using platforms as policy vehicles is to contribute to building value chains, enhancing their quality, introducing innovation and creating additional value. Land-use planning, main infrastructure projects and waste management are used as innovation platforms to build innovation ecosystems, i.e., to mobilise heterogeneous groups of actors to benefit from each other's competencies. From a policy perspective, the core actor is the City of Tampere, and at an operational level the infrastructure actors are seen as anchor organisations. Interestingly, it is much more common than in a cluster policy to have infrastructure-related organisations (waste management enterprises, energy enterprises, electricity companies, land-use planning) to take a central role in specific projects. Earlier, in the context of development programmes, the lead was often taken by the main industrial companies and/or universities. This represents a clear deviation from the earlier local innovation policy approach that was constructed around multi-year and multi-actor development programmes to identify policy platforms on something the city was already doing (for more, see Andersen et al., 2019; Sotarauta and Suvinen, 2019).

The case study of **Central Finland** focuses on the bioeconomy. As in the case of Tampere, also in Central Finland, the developments are organised around platforms as a specific ecosystem is being constructed around the new bioproduct mill of Metsä Group. The mill itself produces not only high-quality softwood and hardwood pulp but also a range of other bioproducts (tall oil, turpentine, bioelectricity, product gas and sulphuric acid). The company is building the first ring of the ecosystem around its mill – its products as well as multiple material flows, including side streams and effluents produced by the manufacturing process. Some of the first-ring partners are converting the side streams of pulp production into bio products that either create additional value to the local community (district heat) or are new businesses in their own right (bioenergy). Instead, the local development actors are actively involved in constructing a second ecosystem ring. They work to mobilise companies from different industries, such as manufacturers related to bioeconomy, knowledge-intensive services, logistics, maintenance services, housing, and so forth, and they also aim to induce scientific

research groups to become members of the ecosystem and potentially also to locate in the region.

With local development actors, Metsä Group has initiated divergent changes, which in time are expected to change not only regional conditions for the forest industry but also those in the industry more broadly. If in Tampere the leadership is in the hands of the city council, in Central Finland the institutional leader is one of the Finnish forest industry giants. In a way, the new bioproduct mill is simultaneously about path upgrading and diversification, and potentially also the emergence of something new. It is not only in search of new products but is also constructing a novel ecosystem with other actors around its new bioproduct plant. The bioproduct mill is seen as a platform for other organisations to experiment with and produce their own products (Andersen et al., 2019; Sotarauta and Suvinen, 2019).

The case study of **Värmland** (Sweden) addresses the efforts to boost bioeconomy. The crisis in the existing pulp and paper industry in the 1990s forced the region and the companies to search for new development paths. As in Central Finland, a new vision of change for a traditional pulp and paper industry has emerged, its focus being on utilising waste streams and developing new services and products by extensive collaboration among core stakeholders. While in Central Finland the core institutional leader is a corporation, in Värmland leadership is shared between the Värmland Region and the leading firms (Stora Enso, Billerud Korsnäs, etc.). Basically, all the main corporate players of the region have been mobilised to contribute to diversification and upgrading the existing bioeconomy-related path, and a designated cluster organisation has been established to take care of the management of collective development efforts. The core private organisations share the ambition to push the industry forward with public agencies. In the regional development programme, some critical issues have been raised: (1) the peripheral nature of the Värmland Region, which makes it difficult to attract skilled, high-quality workers, and (2) the vested interests of the incumbent pulp and paper manufacturing firms in structural maintenance and an exclusive focus on exploiting existing competencies (Andersen et al., 2019; Jolly, Grillitsch and Hansen, 2019).

The case study of **Scania** (Sweden) focuses on the path creation on the biogas industry in Southern Sweden. This case study highlights the role of strong alignment with the waste management, agricultural and food, and public transportation sectors in the region, as well as strong system-building activities by the regional stakeholders and strong political support by the regional government (Andersen et al., 2019). Although the biogas industry in Scania began with a promising start and scaled up rapidly until 2011, it faced significant challenges due to strong competition with the emerging electric vehicle sector and direct competition with cheaply imported biogas from Denmark. In recent years, the biogas sector in the region has seen a considerable reduction in investment, with biogas producers not being able to sell their biogas due to overreliance on a single buyer, i.e., the regional public transport authority *Skånetrafiken*. For the future of the regional industry, there is a need for more stable and transparent rules at

the national level in terms of long-term support mechanisms and stable incentives to reduce uncertainty for future investments in the regional biogas industry.

#### 4 Discussion: Change agency for sustainability in the North

The case studies show how natural endowments and existing industrial specialisations frame path development (Andersen et al., 2019). Based on their extensive literature review, Capasso et al. (2019) maintain that green growth requires competencies that allow for handling complex, non-routine situations in both the private and public sectors as well as between them. In other words, the different capabilities of change agents need to be pooled, mobilised and coordinated to support green transition, and how actors are motivated to work together in the context of clusters (Värmland, Trøndelag, Hordaland, Norway) or on joined platforms (Tampere Region and Central Finland) (Andersen et al. 2019). Our research work, still in progress, suggests that proactive interaction between innovative entrepreneurship, institutional entrepreneurship and place leadership may indeed play a decisive role in these efforts.

In all of our cases, we can identify actors who have taken the lead in pooling resources, powers and competencies to direct the greening of the development paths. Often, local and regional development authorities play a leading role; they have an assignment to work for the region and also clear societal pressure to green the economy. In the Nordic countries, close collaboration between key actors is embedded in the basic assumptions of the coordinated economy systems, and hence leadership emerges more from the formal governance system than outside it. Importantly in all the cases, several firms in different capacities have been mobilised – or have been among the mobilisers – to contribute to the collective effort and exploit it. The public authorities also play a key role, in slightly differing ways, through their support functions, paving the way for major corporations, SMEs or start-up firms.

Yet the other side of the coin reveals sluggish decision-making and slowly progressing improvements in regulative institutions, as well as a lack of incentives, which are often significant barriers for new path development. The cases also show that, in some regions, the many overlaps between public actors and their provision of specialised services in similar functional domains for a regional cluster have not made the path development any easier. Multiple public organisations with overlapping services and activities create ambiguities in organisations doing overlapping work, serving individual interests and not coordinating with each other. Of course, change agents, by necessity, operate in the jungle of multi-scalar institutional arrangements and face all sorts of difficulties, and hence they more often than not struggle to initiate and direct regional path development (MacKinnon et al., 2018). Change agency can be dauntingly complex, which is exactly the reason it deserves additional attention in both academic research and the world of practice. Importantly, several studies highlight how agency may be distributed but is still a strategic and future-oriented driver for change (Dawley, 2014).

## 5 Conclusion

In sum, institutional leaders provide the change processes with directions, and they work to change institutions to better support the greening of regional economies, while innovative entrepreneurs perceive and strive to realise new opportunities. Our cases suggest that these two forms of agency have both, in their own ways, played central roles in green path development. We suggest that, in the North, institutional entrepreneurship is not based on any individual organisation or a person but is shared regionally and beyond, involving national and international actors. It is shared to control the risk, to better understand the multi-dimensional issues from several perspectives, and to shape as early as possible the notoriously complex multi-actor decision-making processes. In every case region, for the initiation of divergent institutional changes in support of green path development, a shared action has been mobilised; organisations designated to support this by managing boundary-spanning and co-ordination functions have been established, or respective roles have been assigned to an existing organisation.

Moreover, in a fairly typical Nordic tradition, all six cases demonstrate strong local- and regional-level leadership (in concert with national actors and policies) assumed by public authorities. Public actors that have assumed a leadership position consciously aim to construct new collaborative spaces (policy clusters, platforms) with state, non-state, business and research organisations. Continuously evolving emergent forms of action necessitate finding such forms of collaboration that benefit both the mobilised members of the collective effort and the region in question. The systems of institutional entrepreneurship are defined by the roles various actors play to pave the way for green path development in their regions for selected industries, products or other commercial entities. There is not a single actor in search of new visions and works to direct the key processes related to green path development, but many that are interdependent, and who are both directly and indirectly aligned to support each other. The system of institutional entrepreneurship does not determine the unfolding of a new path but frames the actions of influential actors in multiple ways.

We suggest that the enhanced green path development calls for a better understanding of institutional entrepreneurship systems, the various roles actors have in them and the ways they are led. All this necessitates reaching beyond formal policies and modes of governance and focusing more on practices and activities.

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