

This file was downloaded from BI Open Archive, the institutional repository (open access) at BI Norwegian Business School <http://brage.bibsys.no/bi>.

It contains the accepted and peer reviewed manuscript to the article cited below. It may contain minor differences from the journal's pdf version.

Rubach, S., Hoholm, T., & Håkansson, H. (2017). Innovation networks or innovation within networks. *IMP Journal*, 11(2), 178-206 DOI: <http://dx.doi.org/10.1108/IMP-09-2015-0057>

Copyright policy of *Emerald Publishing Group*, the publisher of this journal:

“Emerald supports authors' voluntary deposit of their own work. Once an article has been published by Emerald, an author may voluntarily post their own version of the article that was submitted to the journal (pre-print) or the version of the article that has been accepted for publication (post-print) onto their own personal website or into their own institutional repository with no payment or embargo period.”

<http://www.emeraldgrouppublishing.com/openaccess.htm#green>

An additional written agreement between Emerald and BI Norwegian Business School states these rights to BI authors.

Innovation networks or innovation within networks

Accepted for publication in the IMP Journal (vol.11:2, 2017)

Authors:

Synnøve Rubach, Østfoldforskning (sr@ostfoldforskning.no)

Thomas Hoholm, BI Norwegian Business School (thomas.hoholm@bi.no)

Håkan Håkansson, BI Norwegian Business School (hakan.hakansson@bi.no)

Structured abstract

<i>Purpose of this paper</i>	This article presents a longitudinal case study of a regional innovation policy initiative, in which ideas with regard to how innovation might be facilitated were changing over time. Through the scrutiny of insights in industrial network studies (IMP), the authors seek to shed light on the challenges created by policy interventions aimed at constructing complementary networks for the facilitation of innovation. That is to say, the authors endeavour to understand the interfaces between innovation networks and industrial networks, and the way in which they may influence innovation.
<i>Design/methodology/approach</i>	This study is based on a longitudinal case study of four successive regional innovation projects in Norway. Data is drawn from relevant policy documents and project documentations, as well as from participatory observation of application processes and project activities.
<i>Findings</i>	The study shows that regional innovation policy concerns first and foremost the interaction within and between relatively established diverse networks, which affects both structuring and restructuring. Changes in innovation policy required the re-configuring of constellations of business networks, research networks and policy networks. All initiatives required mobilisation input by persistent actors – often boundary organisations or researchers. The construction

	<p>of innovation networks served as an instrument in the production of new interfaces between businesses, researchers and policy makers. The use and usefulness of these networks as perceived by the business actors, were heavily influenced by the way in which the networks were configured</p>
<p><i>Research limitations/implications</i></p>	<p>Generalisation based on in-depth qualitative case research requires further testing across similar and varying cases, and there have hitherto been relatively few studies of the interfaces between industrial and innovation networks. Despite this it can be argued that the conceptual distinction between constructed and emerging networks is a productive one in the study of networked innovation dynamics.</p> <p>During the research into this longitudinal case, it has been interesting to observe the way in which innovation research, and thus its influence on innovation policy, has changed over time. It would be beneficial if further studies were to be conducted on the way in which this has played out.</p>
<p><i>Practical implications</i></p>	<p>The administration of the public funding of innovation network activities requires great care. Where innovation policy initiatives are closely related to established industrial networks, it may be possible to strengthen innovation dynamics, challenge established practices and conceptions, and contribute to expanding, or even initiate innovation activities. In the first place, new activities need to be initiated in a way that supports the long-term development of actual business networks; and secondly, innovation policy bodies should be prepared to stimulate activity over longer periods of time.</p>
<p><i>Originality/value</i></p>	<p>This paper engages in, and combines, two parallel and rarely interacting debates on, respectively, innovation within innovation policy (innovation systems, clusters, networks)</p>

	and industrial network studies (IMP and others). The authors make an “ideal type” distinction between alternative “constructed” networks and “emerging” networks, and the way in which they influence innovations.
--	--

1 Introduction

Innovation policies in European contexts have in recent decades focused on inter-organisational relations as an important means for enhancing innovation. In particular, the notions of clusters and of innovation systems have had a significant impact on innovation policies. These have emphasised local geographical co-location and interaction as the key to enhancing and expanding innovation (e.g. Nelson, 1993; Lundvall, 2010; Asheim & Coenen, 2005). The expected outcomes of participation in such initiatives are innovation, increased business-research collaboration and value creation, and industrial and work place development. When examining these policies more closely however, we see that they frequently lack a deeper understanding of significant aspects of business networks: what they comprise, and how they are shaped and maintained (Håkansson, Ford, Gadde, Snehota & Waluszewski, 2009; Hoholm & Håkansson, 2012; Brekke, Rubach & Hoholm, 2014). The authors argue that they fail to take into account an important paradox that exists in all such attempts to influence established networks. Every business network already has a number of heavy development processes taking place within its interactions. These are built on existing resources and performed activities. In order to achieve something else – an innovation that is not a consequence of the existing interactions – there is a need to disrupt what is already happening, and at the same time mobilise support for the “new” element from the existing actors. Consequently, two different and quite contradictory factors are required. Firstly, the development of some kind of alternative network. It is not enough that one actor is changing – in order to change a network one needs a changing force created by a group of companies – a new network in fact. Secondly, and paradoxically, this new network will have to overlap, at least partially with the existing one. It must include a group of the existing actors and their activities and resources in order to succeed at an economic level. Thus, many policies and policy instruments aimed at the creation and fostering of innovation in networks (or clusters or innovation systems) seem to rely on relatively naïve conceptions with regard to the difficulties of creating innovation in business networks.

In this article the authors present a longitudinal case study of a regional innovation policy initiative, in which ideas concerning the facilitation of innovation were changing over time. By scrutinising insights in industrial network studies (IMP) (e.g. Waluszewski, 2006; Håkansson *et al.*, 2009; Shih, 2010; Cantù & Corsaro, 2011; Ingemansson & Bygballe, 2011), the authors seek to shed light on the challenges created by policy interventions aimed at constructing complementary networks to facilitate innovation. In other words, the authors seek to understand the interfaces between innovation networks and industrial networks, and the way in which they may influence innovation.

The discussion is based on a historical case study (Berg & Lune, 2012) of four regional innovation projects receiving funding from four consecutive innovation programs in the Research Council of Norway: Value Creation 2010 (VC2010), and Instruments of Regional R&D and Innovation (VRI 1, 2 and 3). They followed one another chronologically within the same geographical region (“East”). They were all funded by the Research Council of Norway (RCN) and co-funded by a regional fund and resources from the participating actors. The initiation and execution processes differ interestingly in relation to the creation of the networks and their subsequent influence. This article is therefore able to discuss how varying attempts to create network effects, in terms of innovation processes involving several firms, will (and indeed *do*) influence innovation policy practices and thereby their potential outcomes. From these empirical materials, the article investigates what can be achieved through the practice of political and economic policy.

2 Conceptual framework

2.1. Constructed versus emerging networks

The starting point for this article is the assumption that there is a need for interaction between networks for the development of innovations (e.g. Håkansson & Waluszewski, 2007; Hoholm & Håkansson, 2012; Hoholm & Olsen, 2012). Crossing the borders between varying mindsets, knowledge and skill bases stimulates the generation of new combinations - and thus innovation (e.g. Fagerberg, 2005; Leonard-Barton, c1995; Stamm, c2008). To join or become part of a new network is one of many possible ways of crossing borders and allowing the flow of new ideas and knowledge from the world outside and into one’s own domain (Lam, 2005).

As described in the introduction, in outlining the two parallel and rarely interacting debates on innovation within respectively innovation policy (innovation systems, clusters and networks) and industrial network studies (IMP and others), this paper is making an “ideal type” distinction between “constructed” networks and “emerging” networks, and the way in which they influence innovation. All networks are undoubtedly constructions created by the actors involved, but some are constructed in a very conscious manner, often financed by government authorities and driven by one or a few actors within a comparatively short time period, in order to achieve specific goals. These are often known as innovation networks or cluster projects. Other networks have emerged as the long-term result of a number of actors’ business interactions with one another, where no one has control of the whole network (see Table 1).

Table 1 Comparison of constructed and emerging business networks

	Constructed networks (innovation network and cluster projects)	Emerging networks (business networks)
How they come about	Constructed by geographical co-location, facilitation of arenas for interaction, etc.	Emerging from economic and professional interaction between involved companies over time.
How they are coordinated	Typically initiated, facilitated and managed by one or several core units (often known as facilitating organisations).	Actors are self-organising and coordinated through interaction, creating networks together.
Focus	Short- to mid-term time perspective. Actor focus (facilitating social interaction, initiating and strengthening relations).	Long-term time perspective. Substantial focus: performing and improving networked activity patterns and resource combinations.
What drives the networking	Consensus-driven (a need to find and maintain common interests for it to work). Exploring areas of mutual benefit, maximising joint benefit, typically oriented towards knowledge sharing and complimentary exchanges. Tends to be dependent on designated drivers, such as incentive mechanisms and active management/facilitation	Friction and interaction driven. Networks are (largely un-intended) outcomes of numerous interactions over years. Relationships may be formed even when one organisation is motivated to interact but the other is not, as some actors may be powerful enough to induce the other to interact. Power/dependency linkages. Self-sustainable and self-organising.
Core/non-core activity	Demands for participants to take time-outs and move to arenas of facilitated interaction. Focus on exploration beyond current core business and business relationships (requirement of 'additionality' means facilitating activities that would not otherwise have been carried out).	Activities are primarily core business activities: exchange, mutual adaptation (development and improvement), etc.
Choice of participants	Based on conscious choice to join (and to leave). Often some kind of membership registration involved, some demand a membership fee.	Many small business-related choices and incidents gradually creating lock-ins and path dependence.
Local/global	Local and regional systems: successful local interaction may lead to new businesses and to international competitiveness.	Global networks are always an effect of the emergence of many relatively stable local interactions/networks (aggregation). Economic and professional reasons for denser and more far reaching networks (power concentration, technology, supply chains, etc.).

Source: Based on Cummings (1980), Håkansson *et al.* (2009), Hoholm & Olsen (2012), Normann & Fosse (2013) and the Norwegian Innovation Cluster handbook (<http://norinclu.no/veileder/>)

Table 1 sums up and amplifies some significant features of the two alternative types of networks, as they are typically described in the relevant literature, in order to enable analysis and discussion of the networked aspects of innovation. In the first perspective, there is an assumed need for some kind of “alternative” network to achieve any change in the existing business network. In the second perspective, the network is collectively developed through the actors working with that which already exists. It can therefore be seen that innovation is largely the outcome of mutual adaptations in business relationships over time.

2.2. Constructed networks

Arguments for the importance of more limited and ‘constructed’ networks for the facilitation of innovation can be found in the literature. It is widely acknowledged that innovation often arises out of meetings between economic actors in the fields of science, technology and markets. Through interaction over time, new constellations of actors may gradually become more and more stable, whilst becoming increasingly mutually dependent on one another (Van de Ven, Polley, Garud & Venkataraman, 1999). Hence it is argued in the innovation systems literature, that the development of regional innovation requires instruments and policies that are adapted to local conditions (Tödting & Trippel, 2005), and related to regional knowledge bases (Asheim & Coenen, 2005). These come about through systematic learning, both during the actor’s own development of practice, and from others with similar experiences (Gustavsen, 2011). In order to implement and facilitate innovation system policy recommendations, an organisational entity outside the existing regional organisational set up is often created (Austenå, 2011, p. 47). This seeks to construct an alternative social reality (Austenå, 2011), and is often financed through diverse public funding agencies¹. The idea being that in constructing local or regional networks it should be possible to enhance innovation.

2.3. Emerging networks

Arguments for the importance of the emerging types of networks for innovation can be found in the IMP literature. One early insight gained from studies of business relationships was their importance for technical change and innovation (Håkansson, 1987; Håkansson 1989, 1993; Lundgren, 1994). These innovations are part of development processes, that have tended to shape relatively stable structures over time (Håkansson *et al.*, 2009; Håkansson & Ford, 2002, p. 133). Companies create increasingly stable links over time between repetitive production and logistic activities, as well as ties between technical and organisational resources (Baraldi & Strömsten, 2006). All these links and ties are important ingredients in a process where both established and new resources and activities are combined and recombined (Vercauteren 2007;

¹ In Norway, this is carried out through programmes such as the Programme for Regional R&D and Innovation (VRI), the Research Council of Norway’s main support mechanism for research and innovation in Norway’s regions, and Norwegian Innovation Clusters, a government-supported cluster programme.

Ingemansson, 2010; Linne, 2012). Within the IMP we can see two different kinds of development based on the existence of this type of process. The first stresses the possibility of managing networks by the creation of strategic nets (Möller & Svahn, 2003; Möller, Rajala & Svahn, 2005). This shows clear similarities to the constructed networks in Table 1. The alternative stresses the fact that the development is so complex that the companies have to try to live with it, while influencing others in a more incremental way (Håkansson *et al.*, 2009). According to the latter view, interaction always arises out of *something*, from some kind of established constellation of activities and resources. In order to understand what it means to try to put forward something new in such a context, the concept of “friction” has been introduced (Håkansson & Waluszewski, 2002; 2007). This concept helps to explain how changes such as the introduction of innovation may be difficult to achieve because of resistance from the established structure, and moreover, how such interaction is likely to produce unintended, and possibly destructive or de-stabilising effects. Friction may also contribute positively to innovation when there is a match between the way in which the innovation will recombine resources or link activities with that of some other contemporary changes pulling in a similar direction. In general, however, friction will typically favour incremental innovation as it is a conservative force, primarily mobilising historical values and structures as a way of defending the previous investments in place.

From the perspective of the emerging network, there is a connection between the local and the global, because “attention is directed towards *indirect* effects that are never merely local; such effects distribute across interfaces to other resources – also transforming them” (Hoholm & Olsen, 2012, p. 345). From this perspective, it would be difficult for policy practices to create new emerging networks that challenge and develop the existing ones. Policy practices that are not well aligned with the established interaction, or that lack sufficient resources over time, are likely to fail.

Other typologies of networks

Parallel distinctions have been made in attempts to understand these relational and network dynamics. Normann and Fosse (2013) categorise those referred to in this article as emerging and constructed networks, as “organic” and “project-based” clusters. An organic cluster, partially resembles ‘emerging networks’, being based on regional strengths and developing local externalities and specialised cluster organisation, typically without the need for political, organisational and financial support. A project-based cluster has to be mobilised and must establish a common platform before seeking funding from innovation programmes, as in the inception of the ‘constructed networks’ referred to here. This funding is used to finance structured and systematic development, in order to trigger the anticipated growth potential, and to launch and develop the cluster’s base. One example in Norway is the way in which such project-based networks and clusters are developed and funded through Norwegian Innovation Clusters², a government-supported cluster programme. This programme finances clusters at

² <http://www.innovationclusters.no/english/>

different “levels”: ‘Arena’ for immature clusters, ‘Norwegian Centres of Expertise’ (NCE) for mature clusters with a national position and ‘Global Centres of Expertise’ (GCE) for mature clusters with a global position. The financing of the NCE projects covers, for example, a range of activities, such as network construction, both within the cluster and with external operators; analysis and strategy processes; development of ideas and project proposals, and marketing of the cluster. In addition, the financing covers the employment of staff who can direct these processes within the NCE project.

Another distinction was made by Cummings (1980) between the exchange approach and the power/dependency approach to developing inter-organisational relationships. In the exchange approach, relationships are characterised by a high degree of co-operation and problem solving, where the linkages are symmetrical (Cummings, 1980, p. 325). Here the focus is on exploring areas of mutual benefit and maximising joint benefit, and therefore also on “complimentary exchanges” (Cummings, 1980). By contrast, in the power/dependency approach, relationships are characterised by a high degree of bargaining and conflict, where the linkages are asymmetrical (Cummings, 1980, p. 325). Relationships may be formed even when one organisation is motivated to interact while the other is not. The motivated actor is, in that case, powerful enough to induce the other to interact – a so-called power/dependency linkage (Cummings, 1980). This is partly parallel to the comparison of what this paper refers to as “constructed” and “emerging” organisational networks, where the aims of constructed networks tend to resemble Cummings’ exchange approach, and the dynamic of emergent networks include conflict and friction (Håkansson & Waluszewski, 2007; Hoholm & Olsen, 2012). In order to balance Cummings’ view, however, the authors would argue that (1) conflicts are likely to occur even in constructed networks, and there is a probability that they would threaten the network and lead to its fragmentation if strong enough, and (2) there are also many complementary exchanges in emergent networks, alongside power games, friction and conflict (Håkansson & Waluszewski, 2007). That is to say, in practice these “ideal types” of network formation are mixed.

In summary, there are strong arguments in the research literature for the necessity of both constructed and emerging types of networks. Hence the key questions in this article will be: What characterises the interface between these types of networks; how are they related, and how do they influence one another?

3 Methodology

This is a longitudinal case study, documenting the history of a series of regional business development and innovation projects. Written documents such as applications and regular reports, including the final reports from each project to the financing bodies, have been important sources of data. These documents have been supplemented by meeting notes from the various steering groups and project groups. In cases where the available material has failed to inform the researchers on a specific matter, the actor(s) involved have been contacted and consulted on the matter. As such, it can be characterised as a historical case study, which “...attempts to systematically recapture the complex nuances, the people, meanings, events,

and even ideas of the past that have influenced and shaped the present” (Berg & Lune, 2012, p. 305).

While historical research has played an important role in the understanding of innovation (e.g. Hounshell & Smith, 1988), retrospective research creates problems of post hoc rationalisation and/or interpretation (Hoholm & Araujo, 2011). In our study, however, the historical written sources have been paired with an insider’s perspective (Ragin & Amoroso, 2011, p. 101), as important supplemental sources of data have emerged from participation in the application processes and the conducting of the various projects. This has enabled the authors to capture and analyse the case with some of the advantages found in prospective studies of innovation processes (Hoholm & Araujo, 2011), thus reducing the chance of closing the (interpretations of the) account prematurely (Cox & Hassard, 2007). The authors have had various different roles in the different projects. The first author has been involved in most of the projects, from the last part of the VC2010 project onwards. The role has in some activities been as engaged researcher (Levin & Ravn, 2007; Van de Ven, 2007) and in other activities more as an onlooker (Van de Ven, 2007). During the studied projects, she has been highly involved in the documentation of activities, including project meetings, as well as being involved in some project activities with the various economic actors. As an involved qualitative researcher throughout most of the phases described in this case study, her field notes have also been important for reconstructing some of the informal aspects of the processes. The second author has been involved in two of the research projects. In addition to contributing to the discussions within the research team, his work has primarily been in relation to administration and publishing. The third author has had a more distant role, participating in analysis and discussion of the findings, and thereby taking a more critical role, challenging the insiders’ interpretations and arguments.

A study’s trustworthiness can be judged by the criteria of credibility, transferability, dependability, and conformability (Guba and Lincoln, c1989). Guba and Lincoln’s (c1989) credibility criteria are prolonged engagement, persistent observation, peer debriefing, member checks, negative case analyses and progressive subjectivity. While the case has been discussed in hindsight, the principal written documentation used is that produced during the case. Historical data has however been combined with real-time participant observations, in addition to checking particular issues with other participants. It should also be noted that the perceived results were central for the participating actors during the projects, and thus also for the participating researchers. They are therefore fairly well accounted for in relevant documents.

We cannot specify the external validity of our study with regard to transferability, but we have provided a comprehensive description of the time and the context of our study, making it possible for those interested in making a transfer to judge if this is possible (Lincoln & Guba, c1985, p. 316). Stake (2000) makes the point that a case faces a hazardous passage from writing to reading. The transferability rests as such on the resonance and relevance other readers find in relation to our study. The criterion of dependability lies in the judgment of the research process and is concerned with the stability of the data over time. Lincoln and Guba (c1985, p. 316) state that there can be no credibility without dependability, and a demonstration of the former is sufficient to establish the latter. Conformability relates to the process of assuring that

the interpretations and outcomes are rooted in the generated data and “*are not simply figments of the evaluator’s imagination*” (Guba & Lincoln, c1989, p. 243).

4 Regional innovation and network interfaces

This chapter tells the stories of four successive policy initiatives to stimulate regional innovation.

The story starts in 2001 with the mobilisation of actors to partake in an application for funding of a regional pre-project as part of the Value Creation 2010 programme (VC2010). In 2007 the programme was replaced by the ten-year Programme for Regional R&D and Innovation (VRI). There have been three programme periods in VRI – known as VRI 1, 2 and 3.

Each programme time frame started out with a project application period where the regions developed their project proposals. These applications were required to be based on one or several industrial focus areas where there was an evaluated need for innovation and development. There was also a requirement to establish a regional board with participation from the main actors in the regional innovation system. This board had overall responsibility for framing the project, and generally it was this group that decided where the project should concentrate its efforts. For various reasons, the actors from this region sitting on the board have changed over time. The programme provided a package of various innovation “instruments” that the project applicants could choose from (see Table 2), and in addition the projects have had to include research with regard to following up and evaluating the outcomes.

In the case region, the four programme periods (VC2010, VRI 1, 2 and 3) resulted in several more application processes because certain applications were rejected. We have followed the programme time frames, and subsequently structured the story of the four parts of our case study into three recurrent themes: (1) the content and change of the policy, such as the focus of the policy initiatives, their instruments, and the roles of research and of business; (2) the shaping of regional projects responding to the policy initiatives (who was involved, how was it decided?), and (3) the resulting project set-up, or, in other words, the shape of the “constructed” network.

A summary of the changes and differences between the programme periods can be found in Table 2.

4.1 VC2010 (2005 – spring 2007)

4.1.1 Policy

The Value Creation 2010 programme (VC2010) was launched in 2001 as a cooperation between the Research Council of Norway (RCN), the Confederation of Norwegian Enterprise (NHO), the Norwegian Confederation of Trade Unions (LO), and the Norwegian Industrial and Regional Development Fund (SND, which in 2004 became part of Innovation Norway). It was built to acknowledge the fact that the broad participation of the companies’ employees could have significant effects on learning, development and innovation. To quote two central

participants: “In VC2010 [...] we have to invest in everyday innovations, those ideas and possibilities that are created at the single workplace” (Professor Bjørn Gustavsen, in Kaafjeld & Hansen, 2010, p.34-35). Moreover, “[w]e are carrying out action research. This means researchers going in and working together with managers and employees in the companies. Our main product is practical action, not texts” (VC 2010 coordinator Anne Marie Skulberg, in Kaafjeld & Hansen, 2010, p. 34–35).

VC2010 had the following goals:

- to contribute to increased value creation through the joint work of companies and researchers, relating to organisation development and innovation.
- to reinforce the effects of cooperation on productivity and value creation, innovation, competence, work environment and the creation of more attractive jobs.
- to further develop competence in research milieus with a primary focus on organisation sciences, and targeted towards companies.
- to strengthen knowledge with regard to development and innovation, to make it more accessible to the companies and to stimulate the companies to increase the use of R&D competence.
- to create and strengthen company networks which reinforce mutual learning and other benefits from cooperation.
- to develop new forms of cooperation and arenas internally within a single company.

It was thus a programme intended to empower both individuals (employees and managers), companies and research communities.

4.1.2 The writing and decision making process

The region was not one of the those that took part in the first programme period in VC2010, even though it made several attempts to apply for projects (pre-project in 2001, 2002 and 2003, and main project in 2003 and 2004). Two researchers, one from the regional research institute and one from the regional university college, headed the development of the second project application process, together with the “regional development coalition” consisting of the Confederation of Norwegian Enterprise (NHO), the Norwegian Confederation of Trade Unions (LO), Innovation Norway, the County Council, the regional university college, the regional research institute and the local authorities in the region.

The VC2010 project in the region involved experimenting with and researching tripartite cooperation³ and employee-driven innovation, facilitated by action researchers. In this way the researchers could engage with practitioners in their local settings. In the application the project was shown to be targeted towards two types of companies: those that anticipated that they were or would be facing challenges of increased internationalisation and globalisation in their

³ Tripartite cooperation between the County Council, the LO and the NHO.

market, and those that wanted to increase their value creation through collaboration with other companies in networks.

4.1.3 Project set-up

The regional VC2010 project focused on cooperation in innovation and increased value creation in the food and packaging industries. Industry in the region was, and still is, highly affected by international competitive forces. The food and packaging industries represented at that time the two biggest industry sectors in the region, with more than 6,000 man-years (Onsager, Bolkesjø, Bugge Amundsen & Foss, 2003, p. 86). Five single-company development projects and four network projects were run in the region. The network projects were, however, all still in the initiation phase when the VC2010 project ended in 2007.

The companies, and the researchers involved, co-developed, tested and documented the results of participatory organisational models for innovation. As an example, a supplier of food products such as meat and eggs developed what it called “resource groups” at departmental level, which self-managed and developed their own production processes. A producer of packaging and display solutions, and one of the leading manufacturers of beverages in cartons in Norway, both developed self-managed teams, which gained responsibility for operations and continuous improvement projects. An artisan bakery used employee-managed workgroups in the planning and follow-up of the building process, and the start-up phases of a new factory.

The researchers acted as facilitators in these development projects, and were deeply embedded in company projects. The researchers’ team comprised eight researchers from the regional university college and the regional research institute. All costs relating to the researchers involved were covered by the VC2010 project, and no additional project funding was required from the participating companies.

The industries’ self-reported results showed more stable operations, and improvements in technological solutions, production planning, workplace modelling and the workplace environment. The packaging and display producer reported a 20% increase in efficiency on the cardboard machine, and the manufacturer of beverages in cartons reported a 17% increase in efficiency in their production process.

The critical factors for the participatory organisation of innovation processes were found by the researchers involved to be the company’s organisational culture, and how accustomed or willing the members were to engage with new methods across hierarchical and departmental boundaries. It was noted, however, that even the ways the researchers acted and involved themselves, and thus how the participatory innovation processes were guided and accomplished, were found to influence the organisational cultures of the various companies. The researchers’ deep involvement was found to lead to better results within the companies.

Two networks were involved in the mobilising phase in the last phase of the VC2010 project: a company network focusing on increased process competence in order to achieve higher efficiency and reduced losses in the food industry, and a network focusing on a new system for a more inclusive work life. In both cases some stakeholders were included as participants. Two

other networks were still only at an ideas level when the project terminated: a network for union representatives and a branch network, both relating to the food and packaging industries.

VC2010 was intended to last until 2010, but in 2007 the Research Council of Norway decided to merge several different research programmes into one larger 10-year programme. The result was VRI – The Programme for Regional R&D and Innovation. The new programme included several instruments: dialogue and broad participation (Klev & Levin, 2009), competence brokering⁴, and small R&D projects and mobility schemes (Furre, Horrigmo, Flatnes, Hansen, Brastad & Moodysson, 2012). This became a major support programme for regional innovation in the Research Council of Norway.

4.2 Second phase: VRI 1 (autumn 2007 – 2010)

4.2.1 Policy

VRI 1 required the initiative to consist of one overall project (‘interaction project’) that promoted cooperation between various regional actor groups, and at least one innovation research project (see Figure 1). These had to be linked to one another. In VC2010, this distinction was not made, as research was then seen as an integrated part of practice. The primary objective of the VRI 1 programme was to foster knowledge, innovation and economic growth through regional cooperation, especially between enterprises and research institutions, and to strengthen R&D efforts within the regions.

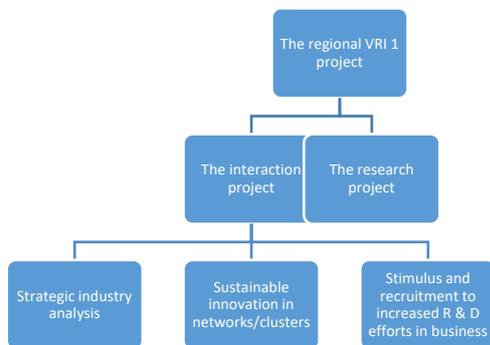


Figure 1 Regional VRI 1 project structure

4.2.2 The writing and decision making process

The writing of the VRI 1 project application was led by the project manager for VC2010. This was a consequence of VC2010 having been transferred to the new programme without a normal, competitive application process. In the case region, VRI 1 was a prolonging of VC2010 as the same company-based project initiatives continued. The project that promoted interaction

⁴ The RCN uses in its VRI programme Marsden’s (1982) definition of brokerage as “a process by which intermediary actors facilitate transactions between other actors lacking access to or trust in one another”. Brokers are used to compensate for a perceived weakness in the market. This weakness is caused by the fact that many companies, especially SMEs, do not have R&D personnel or collaborate with R&D institutions; neither do they use available public means and financing of R&D activities.

between various regional parties, however, came to include a number of old sectors (food and packaging) and some new (energy and environment). The energy and environment focus area included (1) renewable energy combined with ICT and energy trading, and (2) the recycling industry. The innovation research project included action research projects at a packaging producer and four food-producing companies. In addition, the researchers planned to work with three 'learning networks', all initiated in VC2010: one focusing on increased process competence for higher efficiency and reduced loss in the food industry, one for union representatives, and one for a more inclusive work life. A branch network initiative in VC2010 was not pursued further.

4.2.3 Project set-up

Both the research project and the interaction project were based on action research (as in VC2010), where the researchers were also acting as development agents. The project's overall goal was to:

- (1) increase the number of firms taking part in R&D projects and contribute to the increased use of internal and external R&D resources in the firms to meet the national average level;
- (2) increase the number of firms partaking in national and international R&D-projects, and
- (3) develop at least three actively cooperating clusters/networks within business sectors in the region, and strengthen the cooperation with similar partnerships in the capital-area.

Dialogue and broad participation were the most important instruments used in the interaction project (Klev & Levin, 2009). As an example, in 2007, one company network within the project was initiated by a heterogeneous group of companies. An extensive description of this endeavour can be found in Rubach (2011, 2013). The network consisted of four loosely coupled traditional industry companies (food and packaging, construction products and brewery) that did not have any business relationships with each other. The participating companies suggested cooperative task forces. As such, the network was tailored by the researchers to fit the participants' needs. In May 2010, only three companies were still actively engaged in the network, as the fourth had had to withdraw. The discussions in the network focused on the establishment of potential new workgroups, recruitment of new member companies and the aim and content of a possible Lean forum. During the autumn the project entered a critical phase where certain incidents created problems, and the network activities soon faded. In addition, the regional partnership decided to exclude further funding of this particular network and it was not long before the network dissolved.

Another initiative in VRI 1 related to an established network in the recycling industry. This network arose out of earlier strategic processes within the region. A biogas workgroup was established as a sub-network, where participants from the recycling network took part, together with supplementary, relevant companies and organisations. The primary network aimed to be a strategic, competence-based network for the business area, whereas the biogas work group dealt with concrete business development. The biogas initiative was carried forward into a bigger regional initiative during the final phase of VRI 1. This took the form of a larger network project which was run from autumn 2010 until the end of 2013, managed by a hired-in project manager

and funded by the county authorities. In 2014, the initiative was led by the head of the climate, water and agriculture section in the regional development department within the county council. It focused on the formulation of objectives and strategies for the county's further investment in biogas. With the biogas initiative vanishing from the recycling network's core activities, new initiatives with a particular need for the development of innovative solutions (such as construction waste handling) were planned in the primary network during the spring of 2010. These were included in the application for the second VRI project period.

Of all the VRI 1 network initiatives, only the initiative for inclusive work-life survived throughout the programme period. The network focusing on improving process competence for higher efficiency and reduced loss in the food industry was run for approximately a year. The network for union representatives was largely driven by the industry itself, with some follow-up by the researchers, but after a few meetings it faded out.

The researchers involved in the interaction project used two other instruments in addition to the establishment of networks. These were competence brokering and mobility schemes, both with the similar aims of creating closer links between R&D institutions and companies. These were run as two separate sub-projects, targeted at single companies in order to mobilise them for R&D-projects in collaboration with academia. The results with regard to the number of launched R&D-projects and the exchange of personnel were disappointing.

Several of the researchers involved in the interaction project were also engaged in the related innovation research project. As a result of their active involvement in the fieldwork during the interaction project, rich data gathering was made possible throughout the entire project period. Amongst other outcomes, two of the participating researchers achieved their doctorate degrees at the end of the project period, each with a thesis based on empirical data from VRI 1 (Andersson, 2011; Rubach, 2011).

4.3 Third phase: VRI 2 (2010–2013)

4.3.1 *Policy*

In the second phase of the VRI programme there was also a requirement that the regional initiatives should comprise an interaction project, and at least one innovation research project. The link, however, between the interaction project and the research project, previously facilitated by action research, was no longer present in VRI 2 (see Figure 2). The primary objective of the VRI 2 programme was to develop knowledge and the ability to run collaboration and innovation processes within the regions, and to promote research-based innovation in Norwegian businesses and industry. This sharpened the focus on collaboration between the triple helix actors, and university–industry–government relationships (Etzkowitz and Leydesdorff, 2000).

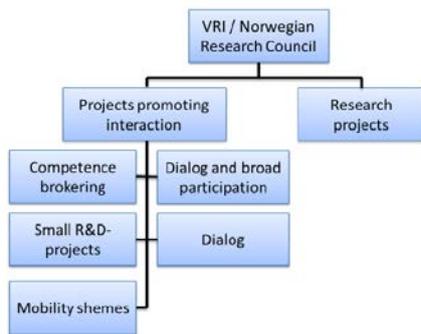


Figure 2 Schematic representation of VRI programme (from Furre *et al.*, 2012, p. 19)

4.3.2 The writing and decision making process

The first attempt at establishing a VRI 2 project in the region started with a workshop in February 2010. The idea was to have a broad, inclusive process where the needs and visions of the regional actors and the industry could be taken into consideration. This was led by the researcher who was the project leader of both the VRI 1 interaction project and the research project. However, because the deadline for the application was found by the Confederation of Norwegian Enterprise to be too short, the industry was not directly involved in the discussions concerning what should be included in the second phase of VRI. The VRI 1 project leader then urged the County Council to take over the administration of the application phase, which they duly did. New actors were thereby introduced as process facilitators and editors of the application process. A “competition” was launched and a group was appointed to evaluate the proposals. These proposals went through two decision “gates” where they were evaluated and ranked, before the final political decision was taken by the board for regional, public project funding. The processes of developing the proposals were demanding for the contributors, who complained that they were disproportional in relation to what could be expected financially in return, if their project was accepted. This created tensions between some of the contributors and the evaluators involved.

The application which was sent to the RCN in September 2010 included five initiatives. Three of the initiatives were new. The first aimed at establishing development projects within the creative industry. The second related to the development of healthcare technology, and the third looked to establish an industry company network. This would primarily relate to traditional industries, such as food, packaging, oil and gas, and construction working with carbon emission reduction through employee-driven innovation, and based on a completed pre-project. The last two initiatives had links back to VRI 1. The first was linked to a publicly funded cluster-project for the energy and ICT industry. This was established during the VRI 1 period and concerned the establishment of liaisons. The second was the further development of the recycling network. Thus, the sector of highest priority in the first project was excluded in the second, with the principal rationale being that the initiatives ought now to be ready to be continued and directed by the industry. The message from the regional board was that it was now time for new sectors to be given the opportunity within VRI. The selected industries were, in the main, of minor size and importance in the region, especially the creative industry and the healthcare technology network.

In addition to the portfolio of initiatives promoting interaction between regional parties, funding was requested for a research project connected to three of the initiatives mentioned above (the recycling network, the creative industry and the network working with carbon emission reduction through employee-driven innovation). The research project was based on action research, and as in VRI 1, it was intended that the researchers would work as engaged in the interaction projects (Greenwood and Levin, 2007; Van de Ven, 2007). This first attempt at mobilising funding for a second project period was rejected, however, in November 2010 by the RCN. Parts of the critique related to the continued use of the regional research professionals, who used action research methods, and who were said to engage too little in publishing their research in international journals.

Those regions whose applications were not accepted by the RCN were invited to improve their project applications with a deadline of April 2011. A new programme steering committee was established in the region, chaired by the County Council and with one representative each from NHO, LO, the University College, Innovation Norway and the Research Council of Norway. It was decided that none of the regional actors with economic interests in the project should be represented on the programme steering committee⁵. This committee decided to exclude all of the initiatives from the first application which were based on action research. This was in all probability the result of unfavourable feedback from the reviewers, highlighting the extensive use of the regional researchers. Three initiatives were now proposed for the interaction project. The first two were, as in the first attempt, the development of healthcare technology and the initiative linked to a public funded cluster-project for energy and ICT industry. The last initiative was new, focusing on the energy efficient rehabilitation of buildings. The new area was linked to the single most important industry sector in the region: the building and construction industry. The NHO was asked to manage the interaction project, ensuring a strong link to the regional companies involved in the project.

This time, however, none of the initiatives were based on tripartite cooperation⁶, employee-driven innovation or action research with a basis in single companies. Moreover, none of the initiatives were grounded in emergent networks with established collaboration and/or innovation practices. Those industries that earlier had been involved in VC2010 and VRI 1 were left out, and the researchers excluded from the application process.

The research project did not come into focus before mid-February 2011, when relevant regional actors were invited to a meeting. The RCN had now stepped in, acting as a mediator in the process. During VC2010 and VRI 1, a knowledge base had been built in relation to action research as a way of working with innovation and development, resulting in a joint professional researcher network in the region, across institutional borders. Because of the regional partnership's move away from action research, some of the researchers who had so far been involved in VC2010/VRI decided that they no longer wished to participate, and a new national research partner was introduced by the RCN. The project turned from research *in action*

⁵ Innovation Norway, however, took the position as project leader for one of the initiatives.

⁶ The County Council, the labour union (LO) and the confederation of enterprises (NHO).

(VC2010 and VRI I) to research *about* action (Coghlan & Brannick, 2005, p. 1)⁷. The dramatic changes to the initial theories and expectations developed in relation to empirical material prior to the writing of the application, meant that new ones had to be established (a more extended description is found in Brekke *et al.*, 2014). This second attempt to mobilise funding for a second project period was accepted in June 2011 by the RCN. Figure 3 shows the VRI 2 project structure.

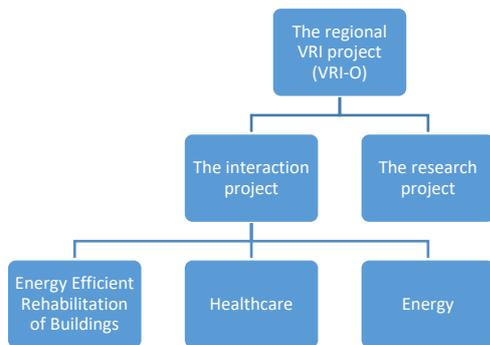


Figure 3 Regional VRI 2 project structure

4.3.3 Project set-up

The priority areas in the interaction project were now led by representatives from two different incubator companies and a hired consultant from a public funding agency. None of these had any previous experience with VRI, or with the instruments to be used, such as competence brokering, dialogue and broad participation (see Figure 2).

The incubator company heading the sub-project for the development of healthcare technology utilised the VRI project as an “umbrella” for all their projects relating to healthcare. The establishment and running of a healthcare network with regular breakfast meetings (nine in total, plus one seminar) became a major part of the endeavour. The number of participants in the network was reported to be 50 by the end of the project period, of which 50% were from the private sector. It was reported that the recruitment of companies to the network was extremely demanding, as the market for health and welfare technology was evaluated as very immature. Four R&D projects were developed, enabled by competence brokerage.

The sub-project for the energy efficient rehabilitation of buildings was aimed at establishing a network/cluster in the region. A regional learning arena was established in relation to the potential renovation of a public high school. An extensive description of this initiative can be found in Brekke *et al.* (2014). The number of participants in the network (principally consultancies, academics and firms of architects) was reported to be 20 by the end of the project period. The development of 15 R&D projects was also reported. These included help in the start

⁷ The researchers’ roles are often taken as given, mirrored through the research strategies applied, varying from onlooker to actor (Van de Ven, 2007, p. 270). The role taken by the researcher is intimately related to Gummesson’s “access to reality”, which is the researcher’s primary challenge (Gummesson, 1993).

up of two related company networks, the running of three student projects at bachelor and masters level, six dialogue conferences and the hosting of two R&D arenas.

Finally, the sub-project linked to the energy and ICT cluster was also headed by an incubator company. This company utilised the project primarily to establish a liaison function (competence brokers) and a simulation centre. It reported the development of 15 R&D projects, the running of ten workshops, 36 student projects at bachelor, masters and doctorate level, and the overseeing of 11 student assistants.

In accordance with the goals of the VRI programmes, it was reported that there was a higher degree of interaction between companies and R&D-actors, as well as increased knowledge in the industry with regard to the various public instruments and funding for R&D projects. It was also reported that a significant number of R&D projects had been established. The problem, however, of separating VRI activities and results from activities funded by other sources, and thus avoiding double counting, remained unresolved in VR2.

In 2012, a consultancy firm carried out a national midterm evaluation of the VRI programme. Among other recommendations, the evaluator advocated the establishment of clear final goals for the programme, in addition to the total decoupling of the interaction projects from the research projects.

4.4 VRI 3 (2014–2016)

4.4.1 *Policy*

In general accordance with the recommendations made in the evaluation report, new rules and guidelines were issued for the VRI 3 phase. The regional consortia could now seek funding for a “base” interaction project, but could also include a “competitive” project. The competitive project would be judged against similar project applications made by the various regions, and only the best would be funded. The research project applications were to be made independently of the interaction projects. The principal objective of the VRI programme was formulated in VRI 3 so as to develop knowledge regarding collaboration and innovation processes in the regions, and to promote research-based innovation in the workplace.

4.4.2 *The writing and decision making process*

Once again, therefore, the structure of the VRI projects was altered. This time the County Council established a task force to sketch out an application. It consisted of a consultant from IN and an employee at the County Council. The actors who had been involved in the VRI 2 interaction project were invited to consider participating in a VRI 3 project. An invitation to deliver a proposal was also issued to a fourth initiative, relating to the creative industry. As in the VRI 2 application process, the proposals went through several “gates” where they were evaluated and ranked, before being put through a political decision process in the regional steering committee. The eventual conclusion was to exclude the healthcare technology initiative. As a result, the VRI 3 application then consisted of three initiatives: sustainable buildings, creative industry and smart energy solutions (see Figure 4).

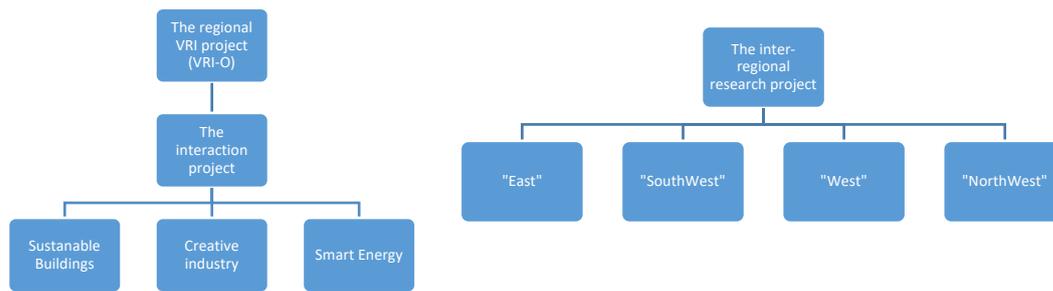


Figure 4 Regional VRI 3 project structure

The process of generating a research project application was by this time no longer considered an issue for the County Council or any of the other regional actors involved in the interaction project. A decision was made by some of the researchers who had been involved in the VRI 2 research project, to develop a new application. This time, however, they were required by the RCN to cooperate with research groups across regions. This was the start of a long back and forth process in the search for relevant collaborators and a common research theme. Both were eventually agreed upon, and the application sent.

In December 2013, the actors involved were notified that neither the interaction project nor the inter-regional research project had been granted funding from the RCN. The RCN, however, urged the regional actors to apply again for funding for a regional interaction project. The field was also opened up for new research project applications, as only one of seven applications had been granted funding in the first application round.

Participants from the County Council now took sole responsibility for editing the second application for funding for the interaction project. The opportunities for funding were now limited to base-funding which all the regions could apply for. Before the second application was submitted, a researcher from the regional research institute was approached by the County Council and asked to take on the position as project manager. The researcher accepted, in the hope of being able to use some of the acquired competence from the long line of previous projects. A new application was made in spring 2014 and funding was granted in April 2014.

The regional researchers simultaneously revised the research project application and it was submitted in April 2014. In June the RCN notified acceptance and in October 2014 the contract was signed. Relationships between the regional interaction projects were limited. An important change came about as the VRI 3 interaction was about to commence, when LO (the labour union) withdrew from the steering group. The tripartite idea, which had been an important factor from VC2010 onwards, was finally destroyed as LO also withdrew from the national VRI steering group.

4.4.3 Project set-up

In VRI 3, priority areas within the interaction project were led by participants from an incubator company, a network facilitator of a company network and an assistant professor at the regional university college. Only one of these had any experience with VRI. The person with experience withdrew from the project in spring 2015 and was replaced by a newly employed colleague.

This time, the principal instrument in use was competence brokering, so as to facilitate the establishment of small R&D projects where a company could collaborate with a research group. Funding of such small R&D projects was the second instrument used. The instrument “dialogue and participation” (see Figure 2) was also used, with the goal of establishing a network for sustainable buildings. The instruments in use and the following activities were thus simplified when compared with VRI 2.

In the sustainable buildings project, a new facilitator was in place by autumn 2014, as the facilitator from the VRI 2 project had had to withdraw. The focus for the new facilitator at the outset was to find new footholds for a network focusing on sustainable buildings. The facilitator applied for and was granted pre-project funding in December 2014 from the ARENA programme. This funding was intended to strengthen the mobilisation of companies to the network and to enable certain activities. From spring 2015, the associated members of the network were primarily drawn from academia and consultancies. By early 2016, dialogue with a number of industry companies had finally been carried out, a network meeting planned, and a change to more industry related activities appeared to be in sight. The ideas had, however, still not materialised in specific projects or planned common activities with or for the industry.

The central aim in VRI 3 was to mobilise companies with little or no experience in R&D to involve themselves in such activities together with relevant research milieux. This time, the criterion of ‘additionality’ provided some challenges. Additionality here means the extent to which funding from VRI would provide additional effects, such as endeavours and actions by the participating companies, that they would not otherwise have carried out. Such criteria are central to EU competition regulation, and thus also required in Norwegian innovation policy, as well as that of the entire EEA. In a way, mobilising companies with little R&D experience to become involved in such activities, together with research groups, took VRI 3 back to the VC2010 idea. A major difference here, however, can be seen in what the researchers did in these R&D projects, together with the companies. There was no longer a focus on process or organisational issues, but rather a seeking to facilitate technological support for the companies in their innovation efforts. Another difference was that mobilisation of the industry to apply for R&D-projects, soon became the main endeavour, whereas in VC2010 and VRI 1 the programme funded actual projects to be performed in and for the industry.

The sub-projects for both the creative industry and smart energy related to existing facilitated company networks. Both of these already had a pool of companies which could be mobilised for R&D projects. The third area, sustainable buildings, did not have this base and there was therefore a need first to find relevant companies, then recruit them to the network initiative and to mobilise them to take part in R&D projects.

4.5 Aftermath of the projects for the excluded networks

During the second VRI 2 application process, there was a clear turning away from bottom-up and action research-based initiatives towards politically managed initiatives. The industry became less and less involved in working up the initiatives, and also in the initiatives themselves. These became heavily managed from “outside” the companies – and several of the actors within relevant industries were not included in the daily activities in these initiatives.

One can ask what happened to the networks from VRI 1 that were left out of VRI. Eventually the recycling network from VRI 1 proved to be unable to run such innovation network projects without external support. This was because they lacked the resources and capacity required to manage the activities. After several rounds of seeking alternative funding, the network activities continued to run for a while at a minimum level, struggling to engage the industry actors, before reaching the stage of having to evaluate a total renewal of the network or termination. Another network started to fall apart. The participants argued that they lacked resources to maintain network activities, and that they needed more members to increase activity levels. The only initiative which survived was a Lean forum, which is now a well-established regional forum for visits to the various member companies, lectures and the exchange of experience. At the very end of VRI 2, the incubator company which had managed the healthcare network went into liquidation. The network was stranded. Relevant actors and parts of the work were, however, transferred to a related network attempt in another part of the region.

Table 2 Summary of changes and differences between the programme periods

	VC2010 (2004–2007)	VRI 1 (2007–2010)	VRI 2 (2011–2013)	VRI 3 (2014–2016)
Purpose	The programme shall contribute to increased value creation in business, by encouraging businesses to work with researchers on organisational development and innovation.	The programme is designed to foster knowledge, innovation and economic growth through regional cooperation, especially between enterprises and research institutions, and strengthen R&D efforts in and for the regions.	The programme is designed to develop knowledge of and ability in collaboration and innovation processes in the regions, and promote research-based innovation in Norwegian business and industry.	The main objective is to develop knowledge of and ability in collaboration and innovation processes in the regions, and promote research-based innovation in the workplace.
Instruments used in regional project	Action research Organisation development Dialogue and broad participation	Action research Organisation development Dialogue and broad participation Competence brokerage Mobility schemes	Dialogue Competence brokerage Learning arenas Small R&D projects	Dialogue Competence brokerage Small R&D projects
Priority areas	Food- and packaging industry	(A) Strategic industry analysis (B) Sustainable innovation in networks/clusters (C) Stimulus and recruitment to increased R&D activities in business (D) Action research projects in the food and packaging industry	(A) Healthcare technology (B) Energy efficient rehabilitation of buildings (C) Smart energy	(A) Creative industries (B) Sustainable buildings (C) Smart energy
Establishment of alternative networks as a project activity ((NEW) means that it is a new network which is included in the project)	(1) Company network for process development in the food sector (process and organisational innovation) (2) Network focusing on new system for a more inclusive work life (organisational and social innovation) (3) Network for union representatives in the food and packaging industries (learning exchange of experience) (4) A branch network for the food and packaging industries	(D1) Company network for process development in the food sector (organisational innovation) (D2) Network focusing on new system for a more inclusive work life (organisational and social innovation) (D3) Network for union representatives in the food and packaging industries (learning) (B1 (NEW)) Network of traditional industry companies (Rubach, 2011) (mainly learning, exchange of experience) (B2 (NEW)) Network for the recycling industry, taskforce on biogas (process and product innovation)	(A1 (NEW)) Innovation network for development of healthcare technology (product innovation) (B1 (NEW)) Innovation network related to energy-efficient rehabilitation of building (Brekke <i>et al.</i> , 2014) (process and product innovation)	(B1) Innovation network/cluster for sustainable buildings (process and product innovation)
Overlap with organic emergent networks	(1) Partly overlapping. Connected to a project financed by Innovation Norway and lead by Matforsk (now Nofima) (2) No overlap. Theme network related to the national Agreement on a More Inclusive Working Life	(D1) Partly overlapping. Connected to a project financed by Innovation Norway and lead by Matforsk (now Nofima) (D2) No overlap. Theme network related to the national Agreement on a More Inclusive Working Life	(A1) Some relations to other projects in healthcare sector (mostly related to public sector) (B1) Very little overlap with emergent business network, except as related to consultancy and academia	(B1) So far, very little overlap (only consultancy and academia partaking), no industry network developed yet

	(3) Partly overlapping. Part of the competing and collaborating network between the companies (4) Partly overlapping. Part of the competing and collaborating network between the companies	(D3) Partly overlapping. Part of the competing and collaborating network between the companies (B1 (NEW)) Partly overlapping. No connection between the companies, two were competitors (B2 (NEW)) Partly overlapping. Some supply-chain relations, some competitors		
	VC2010 (2004–2007)	VRI 1 (2007–2010)	VRI2 (2011–2013)	VRI3 (2014–2016)
Status at end of project	(1) Network project was developed (2) At an idea/planning level (3) Attempt to establish a network did not succeed (4) Attempt to establish a network did not succeed	(D1) Died out in 2008 (D2) Died out in 2008 (D3) Lasted until project end 2010 (B1) Died out/transferred to a Lean network initiative (B2) Network still existing, running on low gear. Biogas project run as separate project with external facilitator (not connected to the recycling network)	(A1) Died out/included in a similar network in another part of the region (B1) Still exists, attempting to raise a new project arena	
Status in 2016	(1) Does not exist (2) Does not exist (3) Does not exist (4) Does not exist	(D1) Does not exist (D2) Does not exist (D3) Does not exist (B1) Lean network still exists, now limited activity to visiting different companies in network (B2) Network for the recycling industry is struggling with low interest from the industry, low activity level. Biogas project taken over by County Council, current status not known	(A1) Network that took over still exists, collaborates with a cluster project in the capital (B1) Part of attempt in VRI 3 to establish a network/cluster for sustainable buildings	(1) In the making

5 Analysis and discussion

5.1 Constructed and emergent networks: what is at stake?

One way of seeking to understand what is occurring in this story of changing innovation policy work is to ask what was at stake in the developing networks, and for whom? One of the outcomes of these policy initiatives was a definite constructed network structure relating generally to the existing business network. The overarching network story appears to unfold as follows.

The need for improvement in current business practice

During the first two phases of the case study, i.e. the VC2010 and the VRI 1 policy programmes, the aim of the policy appeared to be to stimulate and assist in the improvement of current business practice. Organisational development, tripartite collaboration and action research constituted the basic approach. Policy was shaped through tripartite collaboration between policymakers, employers and employees. It privileged intra-company projects, facilitated by action researchers, and involved other, more technical research groups when deemed useful. One could say that the policy makers, facilitated by action researchers, plugged directly into single actors' established business networks. Employee-driven innovation became central, with social science action researchers insisting on research questions being formulated with or by the participants, and the research process being a joint problem-solving process where local knowledge was to be exploited and local solutions to be developed (Håkansson & Waluszewski, 2002). With this objective, it was not too difficult to mobilise businesses to join, thereby making their staff and business resources available. The research problems were typically related to the improvement of established activities as the "constructed" network significantly overlapped with the established business network (Lundgren, 1994; Håkansson & Waluszewski, 2002). In addition, the researchers' costs were covered by the project – enabling them to become immersed in the local situation and to be a more or less "free" resource to be used by the companies in their development work. Heavy activities and resources were mobilised and instigated, and the "constructed" networks focused chiefly on their role as knowledge sharing arenas.

A need for the creation of new business in the region

A new set of ideas appeared, particularly in connection with the launch of VRI 2, creating a new set of aims. The triple helix model and innovation mobilisation discourses were communicated through the channels of the OECD and the EU, as well as through the gradually stronger research networks of economists and geographers proposing a theory of "innovation systems" (Nelson, 1993; Lundvall, 2010). The theory's rhetoric is not too dissimilar from previous ideas: innovation thrives where there is interaction, that is to say collaboration and competition, among co-located businesses, universities and the public sector. The core is about creating favourable system dynamics where knowledge may be gained, shared and commercialised. Interactive innovation would occur through knowledge sharing across organisations and the joint use of a local or national pool of knowledge. This pool would be

found in such areas as talent, education, research, knowledge embedded in businesses and systems, and infrastructure (Etzkowitz, H., & Leydesdorff, L., 2000). Silicon Valley (US), Cambridge (UK) and other innovation hotspots became famous and admired examples of how it could, and, indeed, should be done.

Now the ideal differed from that of the previous regime. The focus was no longer simply on improving single businesses. The creation of new business or business areas became the major target, primarily through commercialising knowledge (Asheim & Coenen, 2005). VRI 2 and 3 are examples of the way in which this new agenda influenced regional innovation policy. It was no longer as useful to rely on the joint interests of employers and employees. The companies' needs were not necessarily seen to overlap with the needs of the region. Policy makers started to exercise more influence, make analyses and evaluations of their needs and potentials, and then take part in making decisions. Business networks and research networks had to be convinced and mobilised to engage with the new aims of innovating. In practice, it proved relatively easy to mobilise the representatives of the employers and employees, as well as universities, with regard to the new programme. NHO, LO, Innovation Norway and regional university colleges all supported the objectives, in their positions around the table where priorities and decisions were made. It was not so easy, however, to mobilise the businesses themselves. Many businesses sent some of their staff to workshops and networking events - activities that represented the core of the "innovation programme". They were, on the other hand, much more hesitant in committing too much of their time, not to mention their business resources, to the project activities.

One obvious reason for this is that the businesses' core activities were no longer regarded as central to the policy programme, as its innovation focus had more to do with creating *new* businesses. Thus, there were relatively low ambitions with regard to existing business networks, and a greater focus on the creation of new networks. This is exemplified by the increased focus on the generation of project proposals targeted towards regional, national and international research funding schemes. The projects no longer covered the costs of the action researchers' involvement. Instead they covered those of consultants who could guide the companies (the competence brokers) during the research application processes, and those who could facilitate network arenas.

Most of the businesses' time and resources, however, were already fully occupied with their established business networks. Many businesses therefore attended the policy programme activities just enough to keep themselves informed, but no more, feeling unable to justify the expense of activities that seemed merely peripheral to them. Innovation, if it is not directly related to existing activities, may seem too risky and expensive a game. Thus changes in the terms of the mobilised network can be seen to have been quite dramatic.

A solution to this difficulty of mobilising the established business networks in the region, was to further expand the ambition to establish, or construct, new networks. In the case study, a number of industries and networks were involved in the projects throughout the different policy programmes, evoking very different dynamics and network constellations (see Table 2). "Innovation network" initiatives were begun, sometimes involving actors within established

industries in the region, but increasingly, these initiatives sought to establish *new* networks within industries that were only scarcely represented in the region. In this way, the proponents of the innovation programme could argue that they were engaged in regional innovation, while having more success in involving businesses. Such businesses were typically more isolated, sometimes in their start-up phase, and therefore in greater need of arenas for interaction and support. Furthermore, in these areas the criterion of additionality could more easily be fulfilled.

Network overlaps in VRI 2

As an example one can compare the three parallel projects in VRI 2, relating to healthcare (welfare technologies), energy (IT systems for energy management) and construction (the energy efficient rehabilitation of buildings). The energy-related network had been developed for a number of years, partly through a set of entrepreneurial start-up companies, and partly through several different policy supported network initiatives. The network project operated as a membership-based community, where triple helix actors (Etzkowitz and Leydesdorff, 2000), R&D organisations, and others could join as partners. The membership was fee-based. In addition, the facilitating organisations received public funding through the Norwegian Cluster Programme, enabling the employment of a number of people serving the cluster project. While vulnerable, and organised in a way that required continued public economic support, they still appeared to achieve a higher degree of network stability than other initiatives. In addition, the funding and instruments provided by being part of the VRI project were used to strengthen the initiative, especially in mobilising student projects, and helping start-up firms to apply for research projects. It could be said that this network was a hybrid network, between an entrepreneurial emerging business network and a constructed innovation network. The most visible effect of the network project was the large number of established R&D projects receiving public funding.

The healthcare technology network was more of a constructed innovation network. A regional and semi-public innovation and incubator company took the responsibility of mobilising businesses, user organisations and research groups in engaging in joint workshops and other networking activities; the objectives being to initiate more development work with regard to solving the needs of health and care services. This industry was not previously strong in this region, but regional policy makers as well as users (health and care service providers) had put healthcare technologies high on their innovation agenda, and the regional university college had developed educational programmes related to this topic. While the VRI 2 activities became lively arenas for public discourse on the future of care, the innovation agency ended up running most of the projects they initiated themselves, with relatively little involvement from businesses. The incubator company was able to renew trust from the policy makers for several years, as they succeeded in establishing projects. When all is said and done, the establishment of new projects was, and still is, an important measure of success. Ultimately, however, it became harder to mobilise both basic funding from the owners and project funding. Eventually the incubator company was declared insolvent and closed down.

The third network initiative, which concerned construction, was a brand new initiative and the actors taking part had no previous history of involvement, either in improvement or innovation.

Again, policy representatives as well as public users (school, municipal construction agencies and Innovation Norway) became the core of the constructed network. The construction industry was relatively fragmented in the region, but there were some important companies supplying the industry nationally, in fields such as insulation, architecture, 3D modelling and consultancy. A few companies agreed to join, but they did not find it interesting enough, and were not invited to several of the network meetings. Much of the project thus ended up being occupied with the public actors, R&D representatives and consultancies as they analysed, evaluated and planned how to go about the rehabilitation of a chosen school building.

In this case study the argument shows the way in which the public policy actors changed over time, from emphasising improvement and learning to facilitating innovation. There was no observable articulated resistance to this. On the contrary, most business actors were continuing to maintain their established ways of doing and developing business in their respective established networks.

5.2 How innovation policy initiatives are enforced

The analysis concerns the way in which regional policy for business and innovation has evolved in the last decade in one region of Norway. It is important to take a closer look at some specific conditions that played important parts in creating and limiting the direction of the new initiatives. These also influenced the development of networks, from VC2010, through VRI 1 and VRI 2, to VRI 3. In this analysis of the changing ideas that were influential on regional innovation policy, four factors, or “conditioners”, were found to be of particular significance:

- (1) the introduction of the triple helix model
- (2) the politicisation of decision processes
- (3) the application of the principle of additionality, and
- (4) the way in which projects are measured.

The triple helix model

First of all, the introduction of the triple helix model (Etzkowitz and Leydesdorff, 2000) in this case, overturned the tripartite collaboration model which was stronger in VC2010 and VRI 1, and redefined understanding and prioritising in business development. One reason for this appears to be the fact that this new model proved to have stronger powers in supporting the needs of politicians to formulate visionary policies, applying the rhetoric of innovation and innovation systems. This notion, however, seems also to have created a distance from the established businesses. It led to a systematic under-estimation of the time and complexity involved in translating academic research into commercialised outcomes, including amongst others, products and processes. (Waluszewski, 2006). It also appears to have led to a systematic downplaying of the interests, needs and uses of the established business network actors.

The politicisation of decision processes

Secondly, as a consequence of the downplaying of the tripartite collaboration model, evaluations, priorities and decisions with regard to which industries, networks and activities should be involved in the innovation programme, became more political. The triple helix model gave the politicians a more central role in development matters. As the agenda of single companies and established business networks no longer defined the direction of innovation policy in practice, the question became one of the interests and needs of the region. The representatives of the region were primarily the policy makers themselves, alongside the regional representatives of the employers' confederation, the employee unions, and the regional agencies supporting economic activity. From the observations made in this study, it would appear that *regional interests could come to be evaluated in terms of fairness and potential, for want of a better expression*. Fairness refers here to the responsibilities of politicians to avoid privileging certain groups over other groups and thereby support established networks; thus leading the policy initiatives in this case study to prioritise different industries and networks over time. *The term potential refers here to the need for policy makers to produce strong visions to inspire regional innovation and new technologies. International business and regional jobs have become important elements in many regional innovation policies.*

The principle of additionality

Thirdly, there is the principle of 'additionality' in the granting of project funding for innovation initiatives. Much of the public funding of innovation and business development activities is channelled through the Research Council of Norway (research- and innovation-based activities), Innovation Norway (innovation-based activities), and regional funding bodies, as well as a few more specialised agencies such as science parks and incubators. Additionality is an important criterion, stemming from EU competition regulations, when these agencies are to decide on funding for innovation projects. It refers to the extent to which the project adds to that already being done, and it can therefore be said that it is difficult to argue for the funding of activities which would have been carried out anyway. Thus *innovation funding is bound to be relatively peripheral to the basic economic interests of business actors and networks* that are already in existence and working. (Baraldi & Strömsten, 2006) This principle often appears to privilege public or private advisory organisations by giving them a central position in the constructed network, through specialising in applications for project funding in collaboration with businesses and academics. The problem, then, seems to be that it is difficult to achieve the committed participation of the partners in the project, leaving much of the project work to the advisory organisation. Additionality can therefore be seen to work well in legitimising the spending of public money. It is however, also problematic where it results in a lack of commitment of time and resources from business actors, because they do not see the project as benefitting their central activities. *From a network perspective, additionality means that existing relationships are not in focus, as it requires in itself that new relationships be built.*

How projects are measured

In the fourth place, it is not easy to measure the outcome of innovation activities or the existence of long-term substantial networks. It is one thing to formulate visionary regional innovation policies, to have the ambition to create new networks, or to direct and support certain kinds of innovation activities, but an entirely different issue to actually measure the outcomes. Measurement throws up major challenges and uncertainties: what is to be measured? Patents? Business profit or turnover? Market share, or new jobs? How should a trustworthy relationship between activities and suggested outcomes be established? When should this be measured? The commercialisation of basic science will often take up to 20 years. Applied research can take less time, but can still take several years. This means that, in the evaluation of completed projects, as well as that of new project applications, more short-term activities are often measured instead. As shown in the analysis of the VRI 2 project, *reported results run typically along the following lines: How many new collaborative projects have been initiated by the innovation network project? What activities have been performed during the project, and with which participants? How did the participants experience and measure the value of the activities?*

One major problem with these short-term activities is that they are not necessarily good indicators of a positive long-term development. This applies both in business and research, and in the fields of both innovation and knowledge development, short-term gains need not be signs of long term success.

5.3 How innovation networks may influence innovation

In conclusion, this paper has analysed the longitudinal case study of regional innovation policy from the perspective of networks. It becomes very clear that regional innovation policy in this case largely concerns the interaction within and between various more or less established networks. This in turn affects structuring and restructuring. The expectation is that this will resemble many other regional innovation initiatives. In the introduction it was argued that current regional innovation policies in Norway and the EU, emphasising geographical co-location and interaction (e.g. Lundvall, 2010; Nelson, 1993), tend to underestimate the difficulties encountered in trying to create or influence inter-organisational networks (Håkansson et al., 2009).

Interfaces and the issue of overlapping

In this case study, the change in innovation policy required the re-configuring of the constellations of the business networks, research networks and policy networks involved. By disentangling the networks, change was facilitated within and across these networks. Sometimes they were separated or played against one another; at other times established networks adapted to the new regime and could thereby be utilised in driving the new programme of action. All these initiatives involved significant mobilisation efforts by persistent actors,

often boundary organisations or researchers, pushing and pulling the industry actors. In the change from company based development to regional innovation, the construction of innovation networks served as a crucial instrument in the production or enforcement of new and stronger interfaces between businesses, researchers and policy makers. There are, however, some requirements as to the way in which interfaces should be configured, in order to be perceived as useful to business actors and business networks. Some disentanglement from embedded business networks may trigger novel ideas and new partnering opportunities, while overlap with established business networks is required to enable innovation in practice.

The authors are doubtful as to how much innovation will arise out of initiating innovation networks per se. The application of an industrial network perspective in the analysis of innovation policy and regional innovation activities brings to the fore the severe challenges in making business actors commit to working on what might seem to them to be peripheral activities.

It can be said, however, that the analysis of this longitudinal case study has indeed brought some hope for changes in policy. It is known from previous IMP studies (e.g. Hoholm & Olsen, 2012; Hoholm & Håkansson, 2012) that the proximity of an innovation to an established activity (technical and conceptual rather than geographic) is strongly related to its potential for success. In situations where innovation policy initiatives are closely related to established industrial networks, it may be possible to strengthen innovation dynamics, challenge established practices and conceptions, and contribute to the expansion or even the initiation of innovation activities. This makes a contribution to the literature relating to innovation policy, as it would appear that adaptation to local conditions (Tödtling & Tripl, 2005), relations to regional knowledge bases (Asheim & Coenen, 2005), or learning from others (Gustavsen, 2011) *will not be sufficient to facilitate regional innovation*. It is argued that the interactions and overlaps between innovation network initiatives and established industrial networks are critical for the stimulation of innovation. The core business interests of established industrial networks need to be translated into innovation initiatives in order to mobilise commitment from business actors. Moreover, the knowledge base within industrial networks is distributed among the activity patterns and related resources of multiple actors, and closely related to the situated content of those activities (Araujo, 1998; Hoholm, 2011). *Thus the utilisation of networked knowledge in regional innovation requires a delicate balance between the challenging of established practices and the introduction of novel innovation network initiatives. At the same time it must be recognised that the value of knowledge can be measured against its relevance and its relationship to some or all of the established network.*

Influencing and shaping networks

The work on “strategic nets” within the IMP literature (Möller & Svahn, 2003; Möller, Rajala & Svahn, 2005) has suggested that it may be possible to influence and shape networks, for, among other purposes, that of innovation. From this study it can be argued that the shaping of innovation networks requires either the translation of core business interests into the program of the innovation network, or a serious and long-term commitment by public actors to

sponsorship of the innovation network over a considerable period of time. Friction within the established industrial networks typically lead to more incremental development between interdependent actors (Håkansson & Waluszewski, 2002; 2007), with little room for the introduction of new actors, resources or activities. There may well therefore be a need to challenge the status quo from a policy perspective, although effecting such initiatives would require hard work and long term commitment. In principle, the dilemma seems to be as follows: on the one hand, innovation is extremely costly and risky, and therefore if business actors are to become involved in or committed to innovation activities, these activities need to be closely related to the companies' core business interests. While this may be seen as short-sighted from the business point of view, it is also understandable and rational. On the other hand, in order for innovation to occur there will always be a need to mobilise ideas, resources and activities across a spectrum of actors and even across networks. Innovation will therefore always involve the spanning between and expansion of firm and network boundaries. Thus the gathering of differing practices representing different mind-sets offers opportunities for the sharing of knowledge. The shared activities and opportunities for learning within a constructed network can subsequently spark innovation processes as they form bridges (Hoholm & Håkansson, 2012) to worlds and ideas outside the daily experience. In order that this transformation into innovation can take place, some structured learning processes must be present, both within the network initiative and the single participating organisation (Klev & Levin, 2009; Rubach, 2011). This learning has to be seen as relevant or to be internalised by the companies before it will be put to active use. This requires a dedicated bridging process, including both active exploration within the relevant company, and joint experimentation within the network (Holmqvist, 2003; Rubach, 2011). *In order that network construction initiatives can work, the participants in the network initiative have to be motivated by the opportunity to work together and explore opportunities together with others. Such motivation, it is argued, arises out of the acknowledgement of the core business interests of the participants, within the project.*

Public support and funding

The above mentioned dilemma also represents a challenge to the principle of additionality. While it is easy to understand the need to account for the public funding of innovation activities, it is equally important to understand how and why the additionality principle may lead to a number of wasted innovation activities. That is to say, the public funding of innovation network activities requires great care in its administration. In the first place one can look at the way in which “new” activities can be initiated in a way that supports the long-term development of actual business networks. Rather than trying to initiate a new network around a supposedly interesting, but in reality weak, business network, there may be a far greater potential in supporting and challenging already established business networks. Secondly, one can look at the extent to which innovation policy bodies are prepared to stimulate activity over longer periods of time. Innovation networks are unlikely to become self-sustainable in the short term, and perhaps never. This means that *innovation networks either need to serve an important function for a limited period of time, or that innovation policy bodies need to be prepared to provide continuous support over an extended time period.* Sometimes this issue is dealt with by

the clever writing of grant applications, but perhaps *regional business policy actors should consider being clearer about their long-term commitment to certain sectors*. Thirdly, and perhaps most importantly, one should investigate the extent to which innovation policy initiatives can be used to support already emerging innovative and/or entrepreneurial networks. An example of this is the energy project in VRI 2, *where network initiatives had closer relationships with the emerging entrepreneurial business network, demonstrating the ability to bridge regional, national and international networks, both within academia and business*. This paper suggests that in such situations, public innovation initiatives and public funding may be more helpful, if handled wisely.

5.4 Further research: the influence of changing research ideas on innovation policy

During the research into this case study, it has been interesting to observe the way in which innovation research has changed over time, and has thus influenced innovation policy. It would be beneficial if further studies were to be conducted into the manner in which this has played out. In part, this may be seen as having been a battle between differing social science research frontiers and their respective networks. On the one hand, there was the well-established work research network, employing action research methods to aid business development and to strengthen inter-organisational collaboration. This thinking invariably related to the established activities of the actors involved, and this research network was very closely connected to the existing business network. On the other hand, there was the growing international network of economists and geographers studying the spatial interactions between businesses, academic institutions, and policy; these being the systems within the innovation research network. Their success in formulating models, and inspiring and mobilising policy makers is by now beyond doubt and they became a crucial part of the central policy network. This does not, however, imply that the innovation systems researchers would necessarily have agreed with the policy makers' translation and use of these models in enabling innovation in various local, regional and national environments.

This work has been supported in part by the Research Council of Norway and a regional, public fund in Norway, and through in-kind hours and costs at Østfold Research and the BI Norwegian Business School.

References

Andersson, G. (2011), "The assembly of lean production: an analysis of doing production improvements", 2011:173, Norwegian University of Science and Technology, Trondheim.

Asheim, B. T. & Coenen, L. (2005), "Knowledge bases and regional innovation systems: comparing Nordic clusters", *Research Policy*, Vol. 34, No. 8, pp. 1173–90.

Austenå, H. (2011), *The Facilitating Organisation in Cluster Initiatives: Can It Promote Innovation?*, PhD thesis, 2011:238, Norwegian University of Science and Technology,

Trondheim. Available at: <http://urn.kb.se/resolve?urn=urn:nbn:no:ntnu:diva-15018> (accessed 21 February 2016).

Baraldi, E. & Strömsten, T. (2006), “Embedding and utilizing low weight: value creation and resource configurations in the networks around IKEA’s Lack table and Holmen’s newsprint”, *IMP Journal*, Vol. 1, No. 1, pp. 39–70.

Berg, B. L. & Lune, H. (2012), *Qualitative Research Methods for the Social Sciences*, Pearson, Boston, MA.

Brekke, A., Rubach, S. & Hoholm, T. (2014), “This is not a building: the abductionist journey of a publicly funded regional (non-)innovation project”, *IMP Journal*, Vol. 8, No. 1.

Cantù, C. & Corsaro, D. (2011), “The formation of science and technology parks”, *IMP Journal*, Vol. 5, No. 1.

Coghlan, D. & Brannick, T. (2005), *Doing Action Research in Your Own Organization* (Second Edition), Sage, London.

Cox, J. W. & Hassard, J. (2007), “Ties to the past in organization research: a comparative analysis of retrospective methods”, *Organization*, Vol. 14, No. 4, pp. 475–97.

Cummings, T. G. (1980), “Interorganization theory and organization development”, in Cummings, T. G. (Ed.), *Systems Theory for Organization Development*, Wiley, Chichester, pp. 333–8.

Etzkowitz, H., & Leydesdorff, L. (2000), “The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university–industry–government relations”, *Research policy*, 29(2), 109-123.

Fagerberg, J. (2005). Innovation. A guide to the literature. In J. Fagerberg, D. C. Mowery & R. Nelson (Eds.), *The oxford handbook of innovation* (1st ed., pp. 1-26). New York: Oxford University Press.

Furre, H., Horrigmo, A. M. J., Flatnes, A., Hansen, T. B., Brastad, B. & Moodysson, J. (2012), *Alle skal med!? Midtveisevaluering av Virkemidler for Regional FoU og Innovasjon (VRI)*, evaluation report, Research Council of Norway. Available from: <http://bit.ly/1m4Qeva> (accessed 21 February 2016).

Greenwood, D. & Levin, M. (2007), *Introduction to Action Research: Social research for Social Change*, Sage Publications, Thousand Oaks, CA.

Guba, E. G., & Lincoln, Y. S. (c1989). *Fourth generation evaluation*. Newbury Park, CA: Sage.

Gummesson, E. (1993), *Case Study Research in Management*, Stockholm University, Stockholm.

Gustavsen, B. (2011), “Promoting innovative organization”, in Ekman, M., Gustavsen, B. and Asheim, B. T. (Eds.) *Learning Regional Innovation: Scandinavian Models*, Palgrave Macmillan, New York, NY.

- Håkansson, H., 1989, *Corporate Technological Behaviour. Cooperation and Networks*, London: Routledge
- Håkansson, H. (ed.), 1987, *Industrial Technological Development. A Network Approach*, London: Croom Helm
- Håkansson, H., 1993, Networks as a mechanism to develop resources, in Beije, P., Groenewegen, J., Nuys, O., (eds) *Networking in Dutch Industries*, Garant Uitgivers
- Håkansson, H. & Ford, D. (2002), “How should companies interact in business networks?” *Journal of Business Research*, Vol. 55, No. 2, pp. 133–9.
- Håkansson, H., Ford, D., Gadde, L-E., Snehota, I. & Waluszewski, A. (2009), *Business in Networks*, John Wiley & Sons.
- Håkansson, H. & Waluszewski, A. (2002), *Managing Technological Development*, Routledge, London.
- Håkansson, H. & Waluszewski, A. (Eds.) (2007), *Knowledge and Innovation in Business and Industry: The Importance of Using Others*, Routledge, London.
- Hoholm, T. & Araujo, L. (2011), “Studying innovation processes in real-time: the promises and challenges of ethnography”, *Industrial Marketing Management*, Vol. 40, No. 6, pp. 933–9.
- Hoholm, T. & Håkansson, H. (2012), “Interaction to bridge network gaps”, *IMP Journal*, Vol. 6, No. 3.
- Hoholm, T. & Olsen, P. I. (2012), “The contrary forces of innovation: a conceptual model for studying networked innovation processes”, *Industrial Marketing Management*, Vol. 41, No. 2, pp. 344–56.
- Holmqvist, M. (2003), “A dynamic model of intra- and inter-organizational learning”, *Organization Studies*, Vol. 24, No. 1, pp. 95–123. DOI: 10.1177/0170840603024001684
- Hounshell, D. A. & Smith, J. K. (1988), *Science and Corporate Strategy: Du Pont R and D, 1902–1980*, Cambridge University Press, Cambridge.
- Ingemansson, M. (2010), *Success as Science but Burden for Business? On the Difficult Relationship Between Scientific Advancement and Innovation*, PhD thesis, Uppsala University. Available at www.impgroup.org (accessed 21 February 2016).
- Ingemansson, M. & Bygballe, L. (2011), “Policy and industry views of innovation in construction”, paper presented at the 27th IMP Conference, Glasgow.
- Kaafjeld, E. & Hansen, P. L. (2010), *VS2010: Verdiskaping. Ny Innsikt. Nye utsikter*, PDC Tangen, Oslo, Norway.

- Klev, R. & Levin, M. (2009), *Forandring som praksis: Læring og utvikling i organisasjoner*, [Change as praxis: Learning and development in organizations] Fagbokforlaget, Bergen.
- Lam, A. (2005). Organizational innovation. In J. Fagerberg, D. C. Mowery & R. R. Nelson (Eds.), *The oxford handbook of innovation* (1st ed., pp. 115-147). New York: Oxford University Press.
- Leonard-Barton, D. (c1995). *Wellsprings of knowledge: Building and sustaining the sources of innovation*. Boston, MA: Harvard Business School Press.
- Levin, M. & Ravn, J. (2007), “Involved in praxis and analytical at a distance”, *Systemic Practice and Action Research*, Vol. 20, No. 1, pp. 1–13.
- Lincoln, Y. S., & Guba, E. G. (c1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Linne, Å. (2012), *China’s Creation of Biopharmaceutical Drugs: Combining Political Steering, Military Research, and Transnational Networking*, PhD thesis, Uppsala University, Department of Business Studies. Available from www.impgroup.org (accessed 21 February 2016).
- Lundgren, A. (1994), *Technological Innovation and Network Evolution*, Routledge, London.
- Lundvall, B.-Å. (2010), *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*, Anthem Press, London.
- Marsden, P. V. (1982). Brokerage behavior in restricted exchange networks. *Social structure and network analysis*, Vol. 7, No. 4, pp. 341-410.
- Möller, K., Rajala, A. & Svahn, S. (2005), “Strategic business nets: their type and management”, *Journal of Business Research*, Vol. 58, No. 9, pp. 1274–84.
- Möller, K. & Svahn, S. (2003), “Managing strategic nets: a capability perspective”, *Marketing Theory*, Vol. 3, pp. 209–34.
- Nelson, R. R. (1993), *National Innovation Systems: A Comparative Analysis*, Oxford University Press, Oxford.
- Normann, R. H. & Fosse J. K. (2013) Nettverksstyring av klyngeprosjekter, in Abelsen, B., Isaksen A. and Jacobsen, S.-E. (Eds.) *Innovasjon – organisasjon region, politikk*, Cappelen Damm AS, Oslo.
- Onsager, K., Bolkesjø, T., Bugge Amundsen, A. & Foss, O. (2003), *Østfolds småbyregioner i omstilling: Mellom egenbasert, Oslo-dominert og transregional utvikling*, NIBR report, 2003:07.
- Ragin, C.C. & Amoroso, L. M. (2011), *Constructing Social Research: The Unity and Diversity of Method*, SAGE Publications, California.
- Rubach, S. (2011), *A Dual Organization-Development (OD) Process: Bridging the Learning Processes in a Network and the Local Learning Processes in the Participating Company*, PhD

thesis, 2011:131, Norwegian University of Science and Technology, Trondheim. Available from <http://ntnu.diva-portal.org/smash/record.jsf?pid=diva2:435477> (accessed 21 February 2016).

Rubach, S. (2013), “Collaborative regional innovation initiatives: a booster for local company innovation processes?”, *Systemic Practice and Action Research*, Vol. 26, No. 1, pp. 3–21.

Shih, T. (2010), “The emergence of a successful business network: what was the role of public policy?”, *IMP Journal*, Vol. 4, No. 2.

Stake, R. E. (2000). Case studies. In N. K. Denzin, & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 435- 454). Thousand Oaks, CA: Sage Publications.

Stamm, B. v. (c2008). *Managing innovation, design and creativity*. Chichester: Wiley.

Tödttling, F. & Trippel, M. (2005), “One size fits all? Towards a differentiated regional innovation policy approach”, *Research Policy*, Vol. 34, No. 8, pp. 1203–19.

Van de Ven, A. H. (2007), *Engaged Scholarship: A Guide for Organizational and Social Research*, Oxford University Press, New York, NY.

Van de Ven, A., Polley, D. E., Garud, R. and Venkataraman, S. (1999), *The Innovation Journey*, Oxford University Press, Oxford.

Vercauteren, A. (2007), *Inter-firm Interaction for Technology-based Radical Innovation*, PhD thesis, Hasselt University, Belgium. Available from www.impgroup.org (accessed 21 February 2016).

Waluszewski, A. (2006), “Hoping for network effects or fearing network effects”, *IMP Journal*, Vol. 1, No. 1.