ac perspektive

Working Paper of the Institute for Innovation and Technology | Nr. 12

Diana Sündermann, Carlos Valenzuela, Marc Bovenschulte

Regional Innovation Strategies for Chile – Taking Advantage of European Experiences in Smart Specialisation

Abstract

In 2010 the Chilean Regional Governments started "Proyecto RED",[1] to meet the national innovation legal framework. The project has been running for the last two years with the support of the European Union, the Vice-Ministry for Regional and Administrative Development, and the International Cooperation Agency. Due to geographical and historical factors, the Chilean industry has been based mainly on the exploitation of natural resources and run by a heavy administrative system housed in the so-called Metropolitan Region. Thus the country's economy has been characterized by an asymmetrical development, which has been favouring the distribution of resources in regions with economies which have grown thanks to their mineral resources (Antofagasta), fishing/aquaculture (Puerto Montt) and of course the administrative region.

Consequently, all efforts put into innovation strategies have been focused on the capital, while the other 14 regions remain – more or less – economically weak. Proyecto RED included 7 of the 15 regions to implement Regional Innovation Strategies (RIS), and prepare these regions for competing on the world market. Since the early 1990s the concept of the regional innovation system has been deployed in Europe. The importance for Europe to focus on the regions as "it [the region] appeared to be the most appropriate scale for innovation-based learning economies"[2] has not decreased over the last 20 years; quite the opposite is the case. Experience has shown that the European concept of regional innovation is applicable to Chile, and that there is a grand potential for the Chilean regions' economy with the help of the regional governments to push (technology-based) industry to the level of world competitiveness.

The Relevance of Network-Based Value Creation

The competitiveness of nations and regions is nowadays not only determined by single companies, but significantly by the innovative activities of entire industries and branches. For this reason, regional and national competitiveness have become the central topic for the economic and technology policy worldwide. Innovative firms grow faster and are more likely to survive during a recession. Policy makers can influence the efficiency and effectiveness of innovation systems by providing fertile framework conditions. As a consequence, the existence of strategic elements for coordinating innovation and technical development is a main challenge for the economic progress and competitiveness. The systematic structuring and analysis of innovation systems, the identification of success factors and basic requirements have been described extensively in the scientific literature and are today part of almost every political and strategic outline. In the last decades of the 20th century, the complex and mostly centralized approaches of national innovation strategies and steering tasks – a very well-known example is provided by the powerful activities of Japan's Ministry of International Trade and Industry (until 2001) – were increasingly complemented by regional approaches resulting from the cooperation processes found in industrial districts and clusters.[3] As a consequence, the national innovation strategies changed from central steering and a "one size fits all" methodology to the implementation of general framework conditions and relatively flexible instruments. Different sectors and regions were given support in outlining their specific needs depending on the functioning logics and mechanisms found in their innovation "eco systems". As a consequence, "regions, especially when they have developed clusters and appropriate administrative machinery for supporting innovative enterprise, represent more

1 www.proyectored.cl
2 Doloreux, D. and Parto, S. (2011). Regional Innovation Systems: A Critical Review. In: Anna Koroban (2011). "Regional Innovation Strategies and Sustainability in Selected EU Countries" (Master´s Theses). Lappeenranta University of Technology, Finland.
3 Porter, M. (1990): The Competitive Advantage of Nations. Free Press, New York

meaningful communities of economic interest, define genuine flows of economic activities and can take advantage of true linkages and synergies among economic actors. Regions have to seek competitive advantage from mobilizing all their assets including institutional and governmental ones where these exist, or press for them where they do not."[4]

An important push forward in the differentiation and broadening of regional profile-sharpening resulted from the rise of new technologies and related business models such as biotechnology, ICT and high-tech related services at the end of the 20th century. This shift in technology also triggered in many countries/regions a structural change – known examples are the European regions in England, Belgium, Spain or Germany that were dominated for centuries by the production of steel and coal. With the rise of new competitors in Asia their competitiveness dropped and whole regions lost their economic base. Some of the regions successfully shifted their industries to new technologies due to early adaption, high flexibility and intelligent investments. This phenomenon, called by Porter the "competitive advantage of nations", can also be noted in regions. The shift of industries towards new technologies is an ambitious process that requires not only new players, new knowledge and new business models. The shift will cause an in-depth change of industrial production. It is quite clear that for example a shipyard cannot simply be "upgraded" to produce smart phones. The whole productive "ecosystem" has to be reinvented. And even the established high-tech ecosystems undergo a permanent evolution that is more and more dominated by principles of self-organisation and decentralisation.

The Role of New Technologies for Structural Change

An illustrative example is provided by the progress in information and communication technologies (ICT) of the last 50 years: The centralized mainframe computers were produced by a handful of global players like "Big Blue" IBM. The next step, the Personal Computer, allowed new players from Asia and SMEs to join the sector; consequently, a rising number of technology providers appeared on the market. The next step were Smart Systems, which are integrated micro systems that set up ad hoc networks etc. (Internet of Things). In coincidence with the network-based functioning of Smart Systems, the productive/industrial structure is also dominated by numberless (small) companies that collaborate in network economies.[5] As a result, it is most likely that new technologies and business developments (the formation of a "project economy") are in favour of disperse, flexible and recombinant structures and companies. This means that some high-tech sectors, even if many of them require massive investments in RTD infrastructure, offer a great potential for new players in the field that do not look back on history and tradition in industry.

Such a process was exemplarily outlined for the case of El Salvador, Central America. The general idea was to take advantage of the development of smart and embedded systems for electromobility that might open the space for new and flexible innovation regions:[6] Due to the shift in the propulsion paradigm from fuel to electricity, tomorrow's vehicles will need new controlling devices adapted to electricity-based mobility. To develop the software of such smart and embedded systems (that represent an exponentially growing market), there is no need to install clean rooms or a chip plant, but all that is needed are computers, developer kits and simulation tools. Therefore, software is one of the most outstanding examples of the participation in high-tech without making large financial investments and therefore a very interesting field for countries in transition.[7]

It is obvious that software is an example for a promising and successful development and therefore it can be found in the catalogues of nearly every region or nation when it comes to future sectors and strategic planning in order to improve competitiveness and growth. The same is true for biotechnology/nutrition, health/medicine (many times in conjunction with biotechnology), tourism and the creative sector (including media design). The very number of today's worldwide "Health Regions" gives an idea of how established the "pathways to growth" already are. It is therefore not sufficient to focus on a general sector but it is very important to concentrate on a niche that is related to the general and existing strength of a region and that reflects the (global) market situation and anticipates new developments and trends as well.

4 Cook, P. & Memedovic, O. (2003): Strategies for Regional Innovation Systems: Learning Transfer and Applications. UNIDO, Vienna
5 Bovenschulte, M. (2011): „Was wird sein, wenn die ganze Welt vernetzt ist?" iit-perspektive 5, iit Berlin
6 The idea was to focus on a specialized segment of the ICT/software sector in order to avoid direct competition with established players as the U.S., but also emerging players like India or Russia.
7 Bovenschulte, M. (2010): "Fomentando los Sistemas Nacionales de Innovación en Centroamérica – Estrategia de Sistemas Nacionales de Innovación para Honduras y Guatemala: Hacia una Agenda de Innovación Regional". Programa Desarrollo Economico Sostenible en Centroamerica DESCA/GTZ. iit Berlin

Smart Specialisation

In Europe, these reflections resulted in a further-developed concept of regional innovation strategies that includes now an approach towards smart specialisation. Following the EC definition provided by a recent document, Regional Innovation Strategies for Smart Specialisation (RIS3) are integrated, place-based economic transformation agendas that have the following five objectives:

- They focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development, including ICT-related measures;
- They build on each country/region's strengths, competitive advantages and potential for excellence;
- They support technological as well as practice-based innovation and aim to stimulate private sector investment;
- They get stakeholders fully involved and encourage innovation and experimentation;
- They are evidence-based and include sound monitoring and evaluation systems.[8]

In the case of Chile, a RIS3 approach is a great hope for a country aiming at a diversification of the economy (public agency ProChile – Export Promotion Bureau – runs a well-appointed program for the same purpose) in order to overcome the dependence on mining and fishing/aquaculture and to promote economic development towards a higher value.

Chile on the Jump Towards Innovation

Until 2005, the Chilean economy grew at a 5.6 % per annum and according to the International Monetary Fund Chile was among the nations featuring the highest economic growth globally.[9] Macroeconomic management and institutional development arise as major strengths, thereby placing Chile 33th in the Global Competitiveness Index.[10]

Despite this outstanding development, Chile still has deep imbalances as a country. A deeper analysis, reveals that there are great weaknesses that have an impact on key-success drivers for the new global economy, namely higher education, innovation, and business sophistication.

As shown in the World Economic Forum Report year 2012, Chile has dropped two positions in the Global Competitiveness Index, from place 31th to 33th. This has been mainly due to a lower productivity, poor educational system and inadequate innovation in most industries.

The conclusion is straightforward: "Chile has done a good job growing old-style, and now is time to keep up such good performance but under the new rules of engagement of global competition and the Economy of Knowledge."[11]

Country	2010 – 2011	2012 – 2013	Country	2010 – 2011	2012 – 2013
Switzerland	1	1	Czech Republic	36	39
Sweden	2	4	Thailand	38	38
Singapore	3	2	Poland	39	41
United States	4	7	Spain	42	36
Germany	5	6	Portugal	46	49
Australia	16	20	Italy	48	42
China	27	29	India	51	59
Chile	30	33	Panama	53	40
Estonia	33	34	Brazil	58	48

Table 1: Innovation ranking of selected countries (Source: Global Competitiveness Index 2010-2011)

8 European Commission (ed.) (2012): Guide to Research and Innovation Strategies for Smart Specialisations (RIS 3). Brussels
9 World Economic Outlook Database 2007
10 World Economic Forum 2012–2013
11 Consejo Nacional de Innovación para la Competitividad – National Board of Innovation for Competitiveness – Hacia una Estrategia de Innovación para la Competitividad, vol. II; Chile 2007–2008

Designing the Foundation for Innovation

The creation of the Consejo Nacional de Innovación para la Competitividad (CNIC) – National Board of Innovation for Competitiveness – in 2005 drove major developments in the creation, evolution, and maturity of a National Innovation System, by stating a strategic vision on innovation challenges, producing an innovation policy consistent with this vision, and allocating strong budget support to implement pro-innovation policies.

Through the National Strategy for Innovation[12] and the Innovation and Competitiveness Agenda for 2010 – 2020, the CNIC has made clear its goal towards the promotion of business innovation and production diversification, for which efforts have been made to develop the following strategic pillars:

- Strengthen business innovation
- Build strategically-oriented science capabilities
- Develop human capital at all levels
- Strengthen the development of the third mission among universities
- Consolidate a legal framework for innovation.

Actions taken after the National Innovation Strategy creation came along with growing resources allocated by the government which made possible to build the tools and conditions for academia and research organizations, as well as businesses to enhance their scientific and innovation research activities. These instruments, however, have had a national inward vision, rather than a regionally oriented view, which is reflected in the strengthening of the regions that historically have had greater capacity in terms of research and innovation.

Each region in the country has a different status on Science, Technology, and Innovation (CTi), regarding their policies and implementation of their strategies and working agenda. Despite the efforts that have been made since 1992, we have seen the first results in the construction of a regional legal framework for establishing a Regional Innovation Strategy since the launch of Project RED 2010. This work has benefited regions XV, I, II, IV, Metropolitan, VI and VIII.

Proyecto RED, led by Regional Governments in collaboration with the Vice-Ministry for Regional and Administrative Development, the European Union, and the International Cooperation Agency, aims at supporting government policies and strategies to promote innovation and competitiveness in Chile. In 2013 Proyecto Red has started a second phase, incorporating more

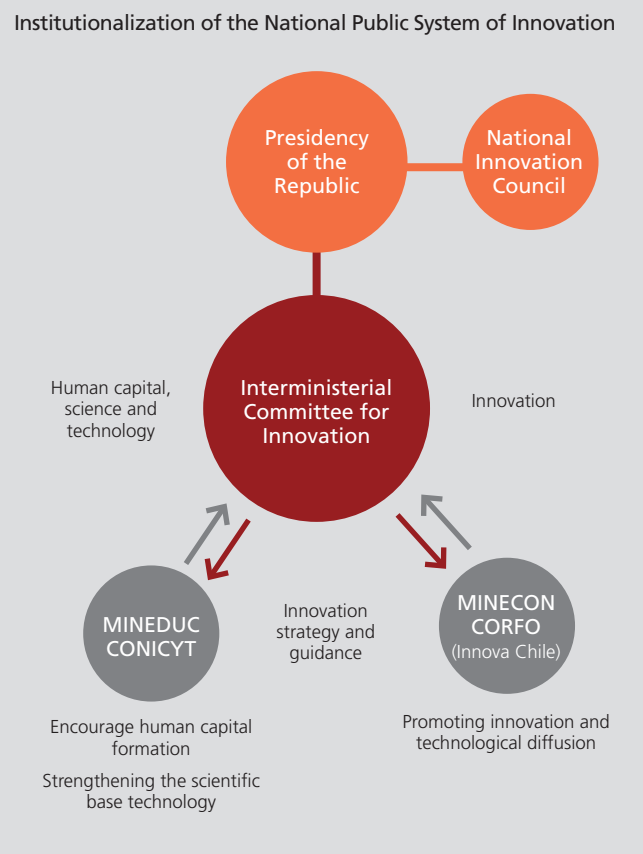

Figure1: Institutionalization of the National Public System of Innovation (Source: National Committee for Science and Technology Research (CONICYT).

regions and providing technical assistance to those regional governments which have participated in phase one of the program.

Notably, Chile has ample resources to meet its innovation goals, but a regional dimension should be added to the innovation legal framework to join both public and private efforts. Public efforts are required since the goal is the well-being of the country and likewise, the private effort is required because unless innovation takes place in the business world it will not grow stronger.

The current task is to strengthen leadership, capitalize on the efforts made, and develop the ability to build networks and appropriate links to the regional production industries and local academia in order to lay the foundations for a regional legal framework seen as part of a National System for Innovation. It is noteworthy that, in the continuation of this goal, local institutions have understood the importance of the experiences of others, in this particular case, the learning attended by European regions.

12 www.cnic.cl/content/view/469646/Un-camino-de-desarrollo-para-Chile.html

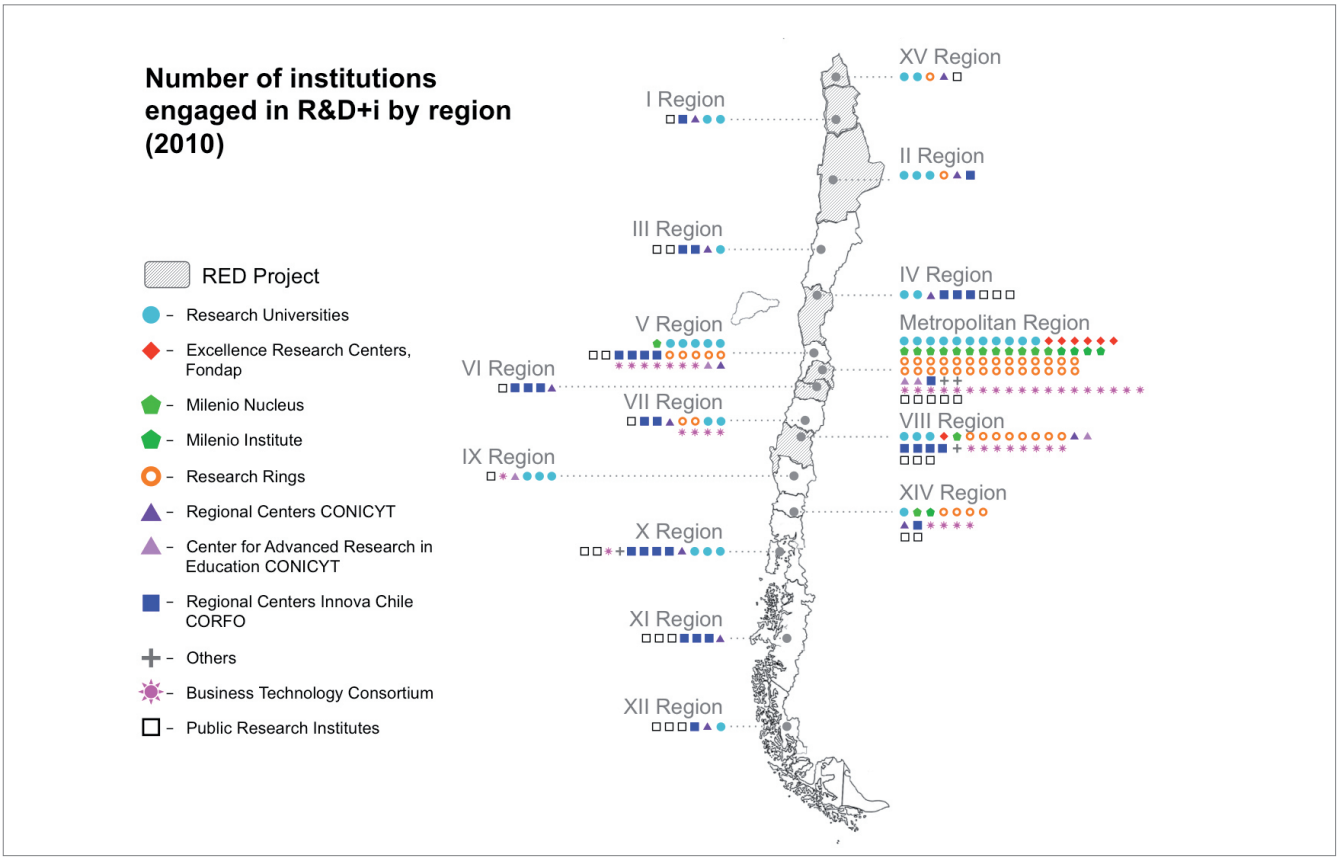

Figure 2: Data: Number of institutions engaged in R&D+i by region in 2010 (Source: Diagnostic Capabilities and Opportunities for Development of Science, Technology and Innovation in the 15 regions of Chile: An Overview, CONICYT 2010. Figure: Carlos Valenzuela 2012)

Regional Innovation Strategies in Europe

Europe has a comparatively long history in innovation research and was forced very early to establish a flexible model for the improvement of regional development and growth due to the strongly pronounced diversity that can be found in different traditions and cultures, languages, geographical localization and conditions etc. As the on-going economic crisis calls for a strong but flexible strategy, the fall of the Berlin Wall and the resulting process of European integration can still be seen as an interesting example of transition and transformation of societies and economies. Due to the national separation and assignment to two political and economic blocks, Germany can be considered a huge laboratory for growth policies including regional innovation strategies.

During the process of joining the two Germanys after 1989, a major part of industrial and value-adding structures in the eastern part was lost. The reason for the economic decline were low innovativeness, low productivity and – as a result – low competitiveness on international level of the former GDR. Economic development and industrial policies focused primarily on the development of a specific industry in each region. Being faced with competition from Western Germany and the international market after the fall of the Berlin Wall, the "Neue Länder" (the 5 eastern federal states) had to cope with a lacking growth of their local/regional economies resulting in unemployment and migration to more thriving regions in Germany (and abroad). Most of the states were not able to "turn around" their regional innovation systems because relevant stakeholders were locked-in in their old perspectives on regional development policies. In combination with low efficiency and missing flexibility, the still-existing potential has not been used in an adequate manner; and some political priorities did not help either.

This situation starting in the 1990s shows an evident parallel to many countries in transition, which (at least outside the main development poles normally found in the capital regions) do not yet have an established and diverse value-adding structure, whereas Eastern Germany did no longer have a strong economic base. German politics both on regional and national level concentrated on the creation of some technical/economic pilot projects but also pushed forward a broad process of regional development starting with the "InnoRegio" program (1999 – 2006; 250 M € in total for 25 selected regions) in order

to trigger the formation of network structures that coin the profile of their regions. The approach was extended by additional instruments that were grouped under the common program "Unternehmen Region" ("Entrepreneurial Regions", on-going) encompassing an ample set of methods and funds for starting aids, specialization, growth and commercialization.

First lesson: Establish Appropriate Regional Policies (the Case of Saxony-Anhalt)

The Federal State of Saxony-Anhalt is a good study case because it has undergone a large variety of regional developments. Saxony-Anhalt shows some industrial growth nuclei permitting the manufacturing of high-quality and competitive products and which access global markets. At the same time, it is coined by a generally weak SME structure and public strategies focus on an improvement of innovativeness and competitiveness of disperse "low profile" economic situations that do not have a strong link to academia either.

Taking the above-mentioned impact of new technologies on structural change, in the last years Saxony-Anhalt, in conjunction with Thuringia and Saxony, has been able to form a worldwide hot spot for solar energy. Using the disperse competencies and potential of the "Solar Valley",[13] the three federal states were able to impulse a successful development towards high-tech and renewable energies. Even if the recent consolidation phase and related market clearance due to overcapacities result in a decline in growth of the solar energy industry, the yielded substance in RTD and value-adding can be considered a solid base for future prosperity and stand out as successful transformation processes.

Hand in hand with the given examples of technology and business development, Saxony-Anhalt has been running for several years now cluster and innovation strategies. Saxony-Anhalt currently prepares a full regional innovation strategy in line with RIS3 in order to fulfil the EC requirements for the acquisition of EFRE-funding for innovation support. The European Union provides structural funds like the European Regional Development Fund (ERDF) that can be used up to a total share of 80 % of the general budget for innovation support fulfilling the precondition of an established RIS3. The Structural Funds are tools the region uses to implement policies to strengthen the European Union's social and economic cohesion principles. This results in the promotion of a harmonious, balanced and sustainable development of the Community by narrowing economic, social and territorial gaps. It is one of the three goals pursued by the European Union to implement the social and economic cohesion policies that aim at strengthening employment, competitiveness and attractiveness of the region. Measures taken are: anticipating economic and social changes, raising and enhancing the quality of investments in human capital, innovation and promotion of the knowledge society, entrepreneurship, protection and support of the environment.

The Big Accomplishment of Emilia Romagna, la più brava

Acknowledging the progress that has been made in Eastern Germany in order to "reinvent" industrialization, it might be helpful to draw attention to one of the "champions league regions": The Emilia-Romagna in Italy. It has gained worldwide recognition as the "Third Italy"[14] and is key for the understanding of regional cooperation processes, network structures and multi-player innovation. The value creation and productive system in Emilia-Romagna is strongly based on SMEs that are characterized by high RTD expenditures and a strong export orientation. The region is one of the textbook examples of industrial cooperation in networks, clusters and temporary and problem-based consortia. The competitiveness of the system takes advantage of the profound implementation of interchange and mutual learning, and consequently of a high "absorptive capacity" of the different players; a basic prerequisite for the intake and application of knowledge.[15]

Although the main regional clusters were originally based on traditional sectors, they are now highly specialized in taking advantage of the technical and engineering knowledge that is enriched by related services. Products and services (often complementarily joined in order to set up hybrid value creation[16]) are successfully exported and turn even SMEs into global players. The main regional clusters are:

- Mechanical engineering,
- Motor industries (especially sports cars and motorcycles),
- Agro-food and packaging,
- Construction materials and technology (especially ceramics),
- Biomedical and electro medical,
- Textile and footwear.[17]

13 For further information see www.solarvalley.org/home?lang=en
14 Hadjimichalis, C. (2006): "The End of Third Italy as We knew it?" Wiley: Antipode; vol. 38, issue 1, p. 82–106
15 Cohen, W. & Levinthal, D. (1990): "Absorptive Capacity: A new Perspective on Learning and Innovation". Administrative Science Quarterly, 35 (1), 128 – 152
16 "Hybrid value creation is the process of generating additional value by innovatively combining products (tangible component) and services (intangible component)." (www.hybridvaluecreation.com/definitions.html)
17 www.eriknetwork.net/regions/emilia.html

The development of the Emilia-Romagna region is consistent with the goals set by the European Lisbon and Göteborg strategies, aiming towards a knowledge economy, which will be likely to bring about sustainable economic growth with a high social cohesion.

Final advice: Enlightening Strategic Know-How and Boosting Funds

What can be learned from comparing European experiences in regional innovation with Chilean needs for development? East German regions and Emilia-Romagna offer outstanding and dynamic examples of innovation and competitiveness strategies taking into account two very different socio-economic starting points and conditions for regional development. Complementary to the potential to reflect the contrasting situations in the two regions, there is a strong overlap which highlights the importance of the European support provided by strategic know-how and investment through adequate funding schemes. The combination of "Work in Progress" (Eastern Germany) and "European Excellence"[18] (Emilia-Romagna), considering regional innovation strategies, will provide a highly relevant and interesting situation for learning and exchange and will therefore be of very high value for Chilean regions. It seems to be a promising and adequate means for the improvement of Latin-American regional knowledge-based value creation to analyse the different models of European clusters and regional programs. Taking the regional variety of Europe into account, it is easy to identify approaches and modules that can be adapted to local requirements. In each case, attention should be given to models that cover the complete "knowledge triangle", integrating education, research and innovation as the cornerstones of a regional "knowledge ecosystem". Doing so, a key issue from the European RIS3 concept should be taken very seriously: Developing and implementing a regional innovation strategy means to do it 100 %. Numberless examples have shown that a half-hearted implementation, low backing by public authorities, lack of commitment of private companies and the unwillingness to overcome personal and institutional egoisms will ruin even the best strategy.

18 http://cordis.europa.eu/paxis/src/emilia_romagna.htm

Contact
Institute for Innovation and Technology (iit), Steinplatz 1, 10623 Berlin, Germany

Authors:

Diana Sündermann
CAMCHAL - Cámara Chileno-Alemana de Comercio e Industria A.G.
Av. El Bosque Norte 0440 Of.601
Las Condes, Santiago
Chile
Phone: +56-2 2203-5320
Fax: +56-2 2203-5325
dsuendermann@camchal.cl

Carlos Valenzuela
CAMCHAL - Cámara Chileno-Alemana de Comercio e Industria A.G.
Av. El Bosque Norte 0440 Of.601
Las Condes, Santiago
Chile
Phone: +56-2 2203-5320
Fax: +56-2 2203-5325
cvalenzuela@camchal.cl

Dr. Marc Bovenschulte
VDI/VDE Innovation + Technik GmbH
Steinplatz 1
10623 Berlin
Germany
Phone: +49-30-310 078-108
Fax: +49-30-310 078-376
marc.bovenschulte@vdivde-it.de

iit-Perspektive Nr. 12, February 2013

Layout: Jennifer Büttner, André E. Zeich