Erich HOEDL*

EUROPE 2020 STRATEGY: THE ROLE OF REGIONAL R&D CLUSTERS

Abstract: The Europe 2020 Strategy will replace the Lisbon Strategy for the next decade, a period, where several South Eastern European countries are supposed to join the European Union. To cope with existing differences in competitiveness SEE-countries can rely on its available high standards of scientific knowledge, which have to be bundled and transferred to the economy, especially to industry. The European triangle of education, research and innovation represents an adequate concept to enhance competitiveness, provided: (a) education includes more entrepreneurship, (b) research becomes more interdisciplinary along the lines from basic to applied research and (c) innovation is targeted to industries of national and regional relevance. Out of the seven flagship initiatives of the Europe 2020 Strategy, the Innovation Union, Digital Society and Resource Efficiency are particularly relevant for R&D. Experiences show that important progresses depend mainly on (a) well designed cooperations between research institutions and industry and (b) a regional clustering of R&D activities on subjects of economic and societal importance. Regional clusters bring together Universities, Academies and business by bridging their different organisational cultures. As their general aim is an augmentation of competitiveness, its efficiency can be enhanced by the concepts of „open science" and „open innovation", contributing to the societal spread of knowledge. Several regions of the European Union have successfully developed regional clusters, which can rely on the Framework Programmes, Structural Funds, EIB etc and national public and private funds (companies, foundations). Well focussed clusters are also to the advantage of Universities, Academies and other research institutions and contribute to a balanced brain circulation, by being a regional R&D-network, surpassing national boundaries and being linked to the concerned global scientific community.

The general target of the Europe 2020 Strategy is to „turn the European Union into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion" (Commission 2010, p. 3). If we look closer at the seven flagship initiatives, in nearly in all of them S&T plays an out-standing role – even greater than in the Lisbon Strategy. For smart growth the proposed Innovation Union and the Digital Agenda for Europe relay on the triangle of ed-

* Prof. Erich Hoedl, Vice-President, European Academy of Sciences and Arts

ucation, research and innovation as well as sustainable growth with the flagship initiatives for Industrial Policy for Globalisation and the new initiative for a Resource efficient Europe. The reinforcement of the European Research Area is not only a reflex to the limited success in the past decade, but also responds to growing pressures from global developments, were emerging countries are augmenting S&T to an unprecedented degree and succeed in gaining competitiveness. These developments demonstrate, that augmenting competitiveness runs not any more by increasing first the general welfare of a country and starting from this basis to strengthen S&T. On the contrary, S&T itself has become the primordial driver for coming out from relatively lower living standards and to gain competitiveness. Although some SEE-countries are not yet Member States, early and selective adherence to the Europe 2020 Strategy and especially to S&T-intensive flagship initiatives will enhance its existing high scientific potential and facilitate accession. Experiences of countries which are already Member States demonstrate clearly, that their benefits from the European Research Area augment their competitiveness.

For augmenting competitiveness one of the basic concepts in industrialised and emerging countries are innovative regions and industrial clusters. Whereas innovative regions include several economic branches and aim at regional growth poles, clusters concentrate on one economic branch and is in most cases a part of a regional growth pole. Beyond the well-known Silicon Valley, Boston Area etc. also in Europe there is already a large number of innovative regions, which are focused on the existing structure of industry, for example for declining industries, rural areas and innovation driven new industries in cooperation with research institutions and public authorities. As the orientation of innovative regions depends on the local and regional situation they may concern traditional and modern industry, agriculture and the service sector and be national and/or transborder. Examples of different forms are actually existing in Valencia / Spain, Twente / Netherland, Värmland / Sweden etc., with different quota of public and private participation depending on the priorities of the national innovation system and evidently on the existing scientific potential of the region (Dill/Vught 2009).

The European Union has already in its 7th Framework Programme in the objective Capacities included the concept of „Regions of Knowledge" with research-driven clusters, where universities, research centres, enterprises and regional authorities cooperate (Commission 2005, pp. 41). Europe 2020 intends to launch „European Innovation Partnerships" between the EU and national levels to speed up the development and spreading of new technologies by building the „bio-economy" by 2020 and by other key technologies for industry and older people to live independently. It intends to strengthen the role of the EU- instruments like the Structural Funds, Rural Development Funds, R&D programmes, etc. and the cooperation with the European Investment Bank (EIB). Under the perspective of organisation, the EIT and its already established three KICs on Climate, Energy and ICT are particularly interesting. Europe 2020 aims to establish a Digital Single Market, which would facilitate cooperation all over Europe, including cooperation between the Regions of Knowledge were best practices are applied. In sum, the European Union

develops its Research Areas to a large extent toward a manifold and divers regional bundling of its cooperative research, awaiting also exchanges and a spreading of results in favor of regional, national and European-wide innovation. Therefore, those countries which are not taking part in these networks by creating some Regions of Knowledge can only marginally benefit from rapidly growing new knowledge. But equally important will be the loss in competitiveness in those national economic sectors, which are potentially competitive, both from the side of the existing economic structure and its possibility to coordinate their scientific capacities.

To develop a competitive Region of Knowledge, embracing several economic sectors is bound to have already an efficient landscape of companies as well as a widespread and strong S&T capacity. Where on both sides deficiencies exist a selection of one or very few economic sectors and related research capacities will be adequate. A strive for interregional competitiveness will not be successful without a concentration on well defined innovation activities depending on the situation and a well balanced judgement on expectable private and public resources. Also for clusters patience will be more effective than overdone ambitions. If one sector – more or less broadly defined – is chosen it would be a cluster, but it has also an innovative function for the whole region, were possible other clusters emerge and in the longer run the whole region may become a Region of Knowledge.

Starting from a relatively low standard, the development of a cluster depends on several circumstances, which are to be ameliorated step by step. With reference to the triangle of education, research and innovation the foremost two aspects are to select companies prepared to innovate in defined areas and to find researchers with theoretical knowledge and some practical experience. Where researchers are not already in close contact with the concerned companies, institutional arrangements with legal contracts should be postponed until the cooperative projects are well defined and informally accepted. During the problem-finding process a moderation by neutral experts can bring together the two different cultures in companies and research institutions, which are in many cases the most important obstacle for scientific cooperation.

As a cluster embraces several and growingly a larger number of companies, researchers may have individual contracts with firms as well as with some sort of a research centre of the cluster, with an own legal personality, covering the research activities concerning the majority of the common problems of the cluster. This research centre has to be financed both by private and public money, for which EU-funds can be raised together with local and national funds. Remuneration should be given to all participants according to the finally established contracts, including property rights. Individual contracts between researchers and firms should be reduced successively by contracts with the cluster research centre, which can be the hub for developing a self-sustaining public-private partnership, cooperating with all concerned research institutions.

Throughout Europe many different and specific models of cooperation between companies and research institutes have been established according to regional circumstances. Whereas formerly individual project-contracts between

companies and researchers, resp. research institutions were in the majority the tendency goes now towards longer term strategic partnerships and – as Europe 2020 notes – to public-private partnerships and the creation of a regional culture of innovation. Successful innovative regions in Europe and USA (Faulker 2006, pp. 201) integrated not only the immediate stakeholders, like firms, Universities, research institutes, banks, private equity capital etc., but also schools and vocational education and the civil society, especially opinion leaders. Emerging spin-offs and young companies are supported financially and mentally by experienced personalities and the whole region will develop to an openess toward modern science and technology. Such a culture of innovation reproduces itself toward some „ecotop of innovation", taking care also for unwanted and negative side-effects.

Experience show that such a comprehensive development process takes at least a decade and may be even more. In regions which start from a low level of science and technology applications, such a process can hardly be started area-wide. It has to grow selectively from the bottom, where probably one conceptually developed cluster may take the leadership on the way to a longer journey. Therefore, to find out the appropriate economic branch and the suitable research capacities at the regional level and beyond is decisive. For developing a restrained part of the regional economic structure toward modern science and technology the concept of „open science" and „open innovation" gains of importance (Chesbrough, h. et al. (2006).

Until now, in many cases innovation is still understood as a process were companies have a certain knowledge to produce marketable goods, to be enhanced by their own knowledge capacities or selective cooperation with research institutes. Then, the newly gained knowledge is applied for new products and if patented it can be sold for fees to other appliers, which themselves also gain exclusivity. This „closed innovation" hampers an overall spread of new knowledge, especially in cases were further developments of an important innovation can be expected in the same or in other economics branches (Bernard 2010, pp. 257). „Open innovation" has to take knowledge from all relevant outside sources and to allow to use the newly produced knowledge under defined conditions. No doubt, a certain pool of knowledge of a firm must be exclusive and their patents can earn a relevant income.

The research processes and the processes of product development have to be more open toward rapidly changing knowledge and market opportunities. This implies feedback relations between the two sides and more cooperative research and development enhances not only the private production sector, but also research. Basic research must take place by deepening disciplinary knowledge and by interdisciplinary research and is finally an important source of basic innovations. Applied research is not only the application of results of basic research, but growingly accompanied by the formulation of problems, which basic research can use for its own advantage. The demarcation between basic and applied research is in many cases vanishing and replaced by problem-orientation. Therefore, the application of modern science and technology generally and in the context of an innovative region, resp. in a cluster gives incentives both to enlarge basic and applied research and product innovation.

The European-wide funding problems of Academies and Universities enforces to a closer cooperation between them and with industry. In countries were the University system is considerably under-funded, teaching activities grow much faster than research. Lacking laboratories in Universities makes research difficult and income generation goes often by enlarged teaching activities producing primarily graduates in social and economic sciences. To educate the badly needed graduates in natural and engineering sciences, including entrepreneurship is with no doubt depending on individual University strategies and the national University policy. During the discussion of the EIT interesting concepts of educational cooperation between the KICs and Universities have been developed (Hoedl 2007). A very similar concept has been elaborated by the US-National Academy of Engineering, which consists of a national network of energy institutes affiliated to Research Universities or Federal Laboratories or they are established as a satellite system (Duderstadt 2010, pp 241). Some US-universities, especially technological institutions tend to strengthen considerably their cooperation with the economy and sees the Research University as a comprehensive knowledge enterprise and a prototype for a new paradigm of American Universities (Crow 2010, pp. 211).

In the last decade European University development is marked by more autonomy and they are obliged to built a specific profile to cope with global scientific competition and to respond to regional a national demands. Under restricted funding Universities have to decide, which department should be promoted and in cases, were efficiency gains are not sufficient, it might lead to diminished funding of other departments. To establish innovative regions and clusters Universities have to go out into a dialogue with the society, resulting in new solutions for education and research to the advantage for both sides. As European Universities in the future will be funded restrictively by midterm state contracts, they have to raise more private money by research contracts, socially acceptable student fees and donations (Commission 2003). Strategic research cooperations with clusters will contribute to structural changes of the Universities and underpin their funding. Creating competitive regions in countries, were Academies plays the main role in research, their effectiveness for regional development can be enhanced by a division of work with Universities, without change of the general landscape of national research activities.

LITERATURE

[1] Benard, M. (2010), Hi-Tech Industry and Universities, in: Weber/Duderstadt (eds.), University Research, etc., pp. 251-270
[2] Chesbrough, H., et. al. (2006), Open Innovation. Searching a New Paradigm, Oxford University Press.
[3] Commission (2010), Europe 2020, A strategy for smart, sustainable and inclusive growth, COM (2010), Brussels, 3.3.2010
[4] Commission (2005), Building the Europe of Knowledge, COM (2005) 119 final, Brussels, 6.4.2005

[5] Crow, M. M. (2010), The Research University as a Comprehensive Knowledge Enterprise, in: Weber/ Duderstadt (eds.), University Research, etc. pp. 211-225
[6] Dill, D. D., Van Vught, F. A. (eds.) (2009), National Innovation and the Academic Research Enterprise, John Hopkins University Press
[7] Duderstadt, J. J. (2010), New University Paradigm for Technological Innovation, in: Weber/ Duderstadt (eds.), University Research etc., 237-249
[8] Faulker, L. R. (2006), Lessons about Regional Economic Development from the Austin Story, in: Weber/ Duderstadt. (eds), Universities etc c. op. 201-210.
[9] Hoedl, E. (2007), Contribution to the Joint Hearing on „The European Institute of Technology" of the European Parliament, Brussels, 2.5. 2007
[10] Hoedl, E. (2006), Lissabon-Strategie and EU-Innovationssystem, in: Hoedl, E. (Hrsg.), Aspekte einer europäischen Wirtschaftsordnung, Marburg, S. 121-138
[11] Weber, L. E., Duderstadt, J. J. (eds.) (2010), University Research for Innovation, London-Paris-Geneve
[12] Weber, L. E., Duderstadt, J. J. (eds.) (2006), Universities and Business: Partnering for the Knowledge Society., London-Paris-Geneve