

**S3 Platform Peer-Review Workshop for  
National RIS3  
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**Smart Specialisation Strategy Croatia**

(S3 Croatia)

**Background Information**

## REPUBLIC OF CROATIA – GENERAL INFORMATION



Croatia is located in Central and Southeast Europe, bordering Hungary to the northeast, Serbia to the east, Bosnia and Herzegovina to the southeast, Montenegro to the southeast, the Adriatic Sea to the southwest and Slovenia to the northwest. It lies mostly between latitudes 42° and 47° N and longitudes 13° and 20° E. Part of the territory in the extreme south surrounding Dubrovnik is a practical exclave connected to the rest of the mainland by territorial waters, but separated on land by a short coastline strip belonging to Bosnia and Herzegovina around Neum. The territory covers

**56,594** square kilometres (21,851 square miles), consisting of 56,414 square kilometres (21,782 square miles) of land and 128 square kilometres (49 square miles) of water. It is the 127th largest country in the world. Elevation ranges from the mountains of the Dinaric Alps with the highest point of the Dinara peak at 1,831 metres (6,007 feet) near the border with Bosnia and Herzegovina in the south to the shore of the Adriatic Sea which makes up its entire southwest border. Insular Croatia consists of over a thousand islands and islets varying in size, 48 of which are permanently inhabited. The largest islands are Cres and Krk, each of them having an area of around 405 square kilometres (156 square miles). The country is divided into 21 regional divisions.

With its population of **4.389,2** million in 2012, Croatia ranks 125th by population in the world. Its population density stands at 75.9 inhabitants per square kilometre. The overall life expectancy in Croatia at birth is 75.7 years. The total fertility rate of 1.5 children per mother is one of the lowest in the world. Since 1991, Croatia's death rate has continuously exceeded its birth rate.[81] Since the late 1990s, there has been a positive net migration into Croatia, reaching a level of more than 7,000 net immigrants in 2006.



County	Seat	Area (km <sup>2</sup> )	Population at 2011 Census
Bjelovar-Bilogora	Bjelovar	2,652	119,743
Brod-Posavina	Slavonski Brod	2,043	158,559
Dubrovnik-Neretva	Dubrovnik	1,783	122,783
Istria	Pazin	2,820	208,440
Karlovac	Karlovac	3,622	128,749
Koprivnica-Križevci	Koprivnica	1,746	115,582
Krapina-Zagorje	Krapina	1,224	133,064
Lika-Senj	Gospić	5,350	51,022
Međimurje	Čakovec	730	114,414
Osijek-Baranja	Osijek	4,152	304,899
Požega-Slavonia	Požega	1,845	78,031
Primorje-Gorski Kotar	Rijeka	3,582	296,123
Šibenik-Knin	Šibenik	2,939	109,320
Sisak-Moslavina	Sisak	4,463	172,977
Split-Dalmatia	Split	4,534	455,242
Varaždin	Varaždin	1,261	176,046
Virovitica-Podravina	Virovitica	2,068	84,586
Vukovar-Syrmia	Vukovar	2,448	180,117
Zadar	Zadar	3,642	170,398
Zagreb County	Zagreb	3,078	317,642
City of Zagreb	Zagreb	641	792,875

## REPUBLIC OF CROATIA – GENERAL ECONOMIC OVERVIEW

According to The World Bank, Croatia can be considered a high-income market economy. From 2002 until 2012, Croatia's GDP growth rate averaged 1.8%, reaching an all-time high of 5.4% in 2003 and a record low of -6.9% in 2009. Croatia began an economic transition in the late 1980s. After 2000, the restructuring of the Croatian economy with the ultimate goal of joining the EU has led to steady growth rates. The most important sector of the economy is services (62.2% of GDP in 2012), with tourism accounting for an estimated 15.4% of GDP. In 2012, the Croatian nominal GDP stood at EUR 44 billion (0.3% of EU-27 total), while GDP per capita in purchasing power parity was EUR 10,300 (62% of the EU-27). Aside from the services sector, metal processing, food processing, pharmaceuticals, electronics, chemicals and timber industry lead the industry.

Croatia became the 28th Member State of the European Union (EU) on July 1st 2013. This was, after the independence from the former Yugoslavia on October 1991, the most important political and economical decision. Croatia has full benefits from the EU single market and economic stability, free movement of goods, services, capital and people, and other advantages that EU membership offers.

Over the past decade, Croatia has one of the lowest R&D expenditures in the EU (0.75% of GDP in 2012), with a high proportion invested from public sources (0.41%) and only 0.34% of GDP from the business sector. By comparison, in 2012 EU-27 countries expended on average 2.7 times more on R&D in relation to Croatia.

## CONDITIONS FOR RESEARCH AND INNOVATION

History and geography have given Croatia certain strengths and conditioned its development trajectory. Overall, and until relatively recently, the institutional framework did not facilitate market-oriented innovation. Capabilities in the business sector have tended to

decline over time and the country's current industrial strengths are mostly those of the twentieth century. The country's prospects however opened by joining the EU and now Croatia strives to implement coherent and ambitious policy in area of R&D and promotion of innovation concentrated on responding to challenges, overcoming identified problems and use existing strengths to develop new potentials.

### **Scientific sector – overview of strengths and capacities**

Higher Education Institutes (HEIs) in Croatia include seven public Universities and three private Universities that also offer doctoral education. Science based research is carried out in the majority of the universities although the scope and size of the research groups varies considerably. Key amongst these in terms of size and scientific strength is the University of Zagreb. However, notably strong scientific research activity in certain fields is also seen at the Universities of Rijeka, Split and Osijek.

Croatia has a sound knowledge base and a good tradition in invention. Croatia's researchers are actively collaborating with their European peers and worldwide. Furthermore Croatia has internationally recognized scientists in the homeland and among the expatriates. Thus transforming knowledge into productivity gains and innovation can be considered as a major potential for future economic growth in Croatia.

### **Business sector – R&D&I overview**

As reported by the Central Bureau of Statistics the highest proportion of R&D (33%) was performed as 'scientific R&D', followed by R&D in 'pharmaceuticals' (18%) and 'telecommunications' (14%) sectors. Relatively significant shares have also been observed in motor vehicles (7%), food (6%), civil engineering (5%) and financial and other services (4%).

Medium and large private enterprises make more than 90% of private investments in R&D, and large private enterprises invest the highest portion with more than 60% of investments in Croatia. Little less than 8% of private investments in R&D comes from micro and small enterprises.

Croatian manufacturing industry can best be presented through identified 12 industrial sectors organized through clusters of competitiveness. **Clusters of competitiveness** represent formal collaboration structure and concentration of stakeholders (Triple Helix model) from identified industrial sectors with common interest and capacity to: strengthen competitiveness of sector through pursuing and upgrading existing comparative advantages, focus on R&D&I investments and projects, identify technologies based on identical demand, connect and position in EU and Global value chains.

12 Competitiveness clusters were formed in the first half of 2013, for the following industrial sectors: i) Automotive industry, ii) Wood processing industry, iii) Food Processing industry, iv) Defense industry, v) Health industry and pharmaceuticals, vi) Chemical Industry, vii) Sector of Electro and production machinery and technologies, viii) ICT, ix) Maritime industry, x) Creative industries, xi) Construction Industry, xii) Textile industry

Important role for the future development and strengthening the role of competitiveness clusters will be their focus on R&D&I projects that tend to be funded through ESI Funds. Focused on similar pursuit for technologies that can upgrade their current market position

and identification of projects with joint benefits for the whole sector is the key challenge for Competitiveness clusters in the future.

## IDENTIFIED STRENGTHS FOR R&D&I:

### PRIVATE SECTOR COMPETITIVENESS and R&D

- Critical mass of smaller companies with potential to grow
- Existence of larger companies with good position on EU/world market and R&D-capacity,
- Relatively high contribution of medium & high tech products to trade balance (compared to peer countries and EU average) – visible positive trends (their contribution is growing)
- Tradition in invention, high number of individual inventors (prize winning) as starting basis for innovation
- Existence of competitiveness clusters which enables inter-company communication and cooperation within triple-helix in specific economic areas
- Existing human resources base/skills from traditional strong industries that could serve the other sectors
- Natural resources all over country (especially water, sea, wood) – potentials for comparative advantages of natural resource-dependent economic activities

### PUBLIC SECTOR SCIENCE AND TECHNOLOGY

- Pockets of strengths - Good performance of research institutions - good comparative performance in some groups, excellence in few groups in topics relevant to competitiveness of Croatia
- Existence of universities and R&D capacities in and around the main cities across the country
- Ability of researchers to participate in international science networks, in particular European Framework Programmes
- Experience in science and innovation policy design and implementation

## CONTEXT AND APPROACH – S3 CROATIA

The Smart Specialisation Strategy (S3) has been developed by the Croatian government in response to the European Commission's Europe 2020 strategy and as ex-ante conditionality for usage of ESI Funds intended through thematic objective 1 – Strengthening research, technological development and innovation.

The key objectives of the Croatian S3 are to foster economic growth and jobs through the three mutually reinforcing Europe2020 priorities. By doing so, Croatia will contribute to making Europe a smarter, more sustainable and more inclusive place to live.

***One sentence description: The Croatian government has elected to prepare a Smart Specialisation Strategy on a national level. The S3-Croatia focuses on those economic***

***sectors and S&T areas where Croatia has strongest prospects for smart, inclusive and sustainable growth, building on its strengths, comparative advantages and potential for excellence.***

S3 Croatia has been based on **4 general principles (“4 C’s”): Choices and Critical mass, Competitive Advantage, Connectivity and Clusters, and Collaborative leadership.**

Croatia has sought to make clear choices for specialization based on achieving critical mass (“C1”). This is a particular issue for the country as it has a high proportion of micro and small businesses and a low population compared to most other MS.

S3 Croatia builds on clearly identified and verifiable competitive advantages and excellence (“C2”). Substantial analysis has been undertaken for the purposes of developing the S3 using robust economic and innovation indicators and including an analysis of KET deployment in Croatia.

Policy is directed towards cooperation and synergy in both a national and international context (“C3”). Building national and international networks for both firms and research institutions, including through initiatives such as the HORIZON 2020 Teaming activity is at the heart of the S3 strategy for Croatia.

Finally, the proposed actions for Croatia are based on achieving close collaboration between the private business sector, the government, and the publically funded science & technology (S&T) sector (“C4”). This ‘triple helix’ model of innovation is widely embraced across Europe and is centrally addressed in the emerging National Innovation System (NIS) of Croatia.

Based on the proposed methodology for S3 design and on the basis of the identified strengths and potentials in the economic sector, R&D and innovation through gathered analytical data, **Croatia has identified four thematic priority fields to be further developed and specialized at National level:**

- a) **health,**
- b) **sustainable energy and environment,**
- c) **engineering,**
- d) **biotechnology and bio economy.**

Additionally, as one of the most crucial *issues* of the *smart specialization* process, Croatia has identified the *cross-cutting* themes able to create the biggest added value and foster the emergence of new economic activities, raising of the productivity of the Croatian economy and the creation of new and sustainable job opportunities. These cross-cutting themes are: **Key Enabling Technologies (KET), Information and Communication Technologies (ICT), Tourism, Creative & cultural industry, Green growth and Societal challenges.** These are issues that can generate an impact in more than one field of Croatian economy and are of major importance for the country’s development either by themselves or integrated into one or more thematic priority areas

### S3 DELIVERY MECHANISMS

In order to pursue the principles of smart, sustainable and inclusive growth, Croatia will set up a National RIS3 Strategy paving the plans for investing in R&D and achieving its National Europe 2020 headline targets for RDI investments of 1.4 %. For the RIS3 implementation and achievement of planned objectives, Croatia plans to use a variety of mechanisms. These are, in order of significance:

- 1. Strengthening infrastructural capacities for scientific excellence;** In order to achieve the goals of the Smart specialization strategy it is needed firstly to invest into the construction of new, renovation and development of existing R&D infrastructure and modern research equipment which presents precondition for strengthening research performance and research excellence.
- 2. Enhancing scientific excellence through national centres of scientific excellence;** Centres of Excellence present scientific organizations or the integral part of certain scientific organization or group of scientists that according to the originality, importance and actuality of results of specific scientific work can be qualified and rated amongst the most respected scientific organizations or groups in the World. It is expected that spill-over of conducted research results will influence and boost the Croatian economy.
- 3. Strengthening capacities of research organizations to conduct research that is directed towards practical application of scientific results;** The aim is to support projects such as research conducted by research organizations to serve the needs of economy in respect of enhancing the impact of R&D on economic growth by improving the R&D productivity and technological dissemination and collaboration projects between R&D organizations and industry which are user-driven and aim at solving practical problems for industry and society to speed up the market uptake of new knowledge and technologies at national levels.
- 4. Innovation friendly business environments for SMEs;** The objective of this mechanism is to create a nurturing environment for the growth of innovative business, strengthen the relationships between academia and industry, incentivise the flow of knowledge and technology, and increase the ability of enterprises to develop, use, adapt and commercialize new technologies and innovative products. Increased technological base and strengthened linkages between RDIs, scientific community and industry will help enterprises compete more effectively and facilitate Croatia's economic integration with the global markets.
- 5. Financial engineering instruments;** The main objective is to develop and modernize market of financial instruments in Croatia with introducing VC funds as the leverage effect of supply and demand on capital market to generate a support for establishment of new SMEs based on knowledge.
- 6. Establishment of Technology Network for Industry (TNI) and development of thematic technological platforms;** TNI shall act as an Umbrella network with the main goal of supporting Croatian industry through fostering networking activities with scientific and research institutions in order to identify current capabilities and needs (infrastructure and HR potentials) in R&D&I public institutions and private sector, enable efficient synergies between academic community and business sector, defining industrial needs and targets with regards to technology and innovation

capacities and finally provide focused cooperation with EU and regional technology platforms and Knowledge Innovation Communities (KICs).

- 7. Support to competitiveness cluster initiative;** Competitiveness clusters will contribute to implementing thematic-based strategies addressing new society challenges and creating new competitive advantages through social innovation projects and streamline funding resources to support joint projects between clusters working in different industries.
- 8. Creation of centres of competence;** Centres of Competence are planned to be the main place for industrial research and experimental development for SMEs and for collaborative projects between large enterprise and SMEs and scientific community. Centres of competence will be organized in line with the Smart Specialization Strategy and the Strategy for R&D&I of one or more thematic technological platforms and their function will be to enhance capacities for innovation for the business sector (especially for SMEs) in areas which do not have adequately developed R&D infrastructure, and/or need a greater concentration of expertise in one or more priority thematic areas.
- 9. Support to R&D&I (business sector);** This instrument will allow large enterprises and SMEs to be more innovative and to foster their current capacities for R&D&I with aim to raise their productivity, competitiveness and export activity by supporting them in developing new products, new services and innovative process and business models as well as supporting their R&D&I potential by development, modernization and upgrading of R&D&I infrastructure as an intention to increase R&D&I potential of private sector and to support main stakeholders of industrial development in Croatia.
- 10. Social Innovation;** This mechanism will support social innovation through aid to collaborative projects between public sector, private companies and R&D&I institutions. Main beneficiaries of this support will be regional and local government which aim to respond to solution of one or more global challenges through innovative actions, product or services.
- 11. Building skills for smart specialisation;** The mechanism is intended to permanently assess skill needs driven by development and competitiveness strategies and use mechanisms such as the Annual Survey on Occupational Standards to assess competencies which need to be acquired through the lifelong learning training provision. It is planned to use domestic and foreign sources (primarily the ESF) to fuel the mechanism through a series of projects which will define occupational and qualification standards as well as tender for training programmes in line with these standards.