

Western Balkans Regional R&D

Strategy for Innovation

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ABBREVIATIONS

AC	Approval Committee
EC	European Commission
EDIF	Enterprise Development and Innovation Facility
ERA	European Research Area
ERIC	European Research Infrastructure Consortium
ESFRI	European Strategy Forum on Research Infrastructures
EU	European Union
FDI	foreign direct investment
FP7	Framework Program 7
GDP	gross domestic product
GERD	gross expenditure on R&D
IP	intellectual property
M&E	monitoring and evaluation
NPO	national partner organization
OECD	Organization for Economic Co-operation and Development
PIU	Project Implementation Unit
R&D	research and development
R&I	research and innovation
SB	Supervisory Board
SEE 2020	Southeast Europe 2020
SMEs	small and medium enterprises
WBRIS-TA	Western Balkans Regional R&D Strategy for Innovation Technical Assistance
WISE	Western Balkans Research and Innovation Strategy Exercise

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INTRODUCTION

1. A coordinated effort to develop a regional research and development (R&D) strategy for innovation was launched by the Joint Statement of Sarajevo, signed on April 24, 2009, by the ministers from the Western Balkans responsible for science and research; the EU commissioner for science and research; and the Czech Republic Presidency of the Council of the European Union, under the auspices of the Regional Cooperation Council secretary general.
2. In June 2011, the World Bank signed an agreement with the European Commission (EC) to provide technical assistance for the development of the Western Balkans Regional R&D Strategy for Innovation (WBRIS-TA). The strategy aims to strengthen the region's research capacity, enhance intraregional cooperation, promote collaboration with business sectors, explore possibilities for financing R&D from EU funding schemes and other external sources, and help integrate the region into the European Research Area (ERA) and Innovation Union.
3. The WBRIS-TA was implemented between December 2011 and October 2013 under the joint coordination of the Regional Cooperation Council, the European Commission, and government officials from Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia (FYR Macedonia), Kosovo*, Montenegro, and Serbia (the Project Steering Committee). This team was joined by representatives of leading universities, research institutes, and the business sector (the Advisory Body; please see the annex for the list of participants) and met on four different occasions to discuss and develop the strategy and its corresponding action plan for regional cooperation.
4. In addition to the experience brought by the Advisory Body, discussions benefited from presentations by international and regional experts. After a review of the existing literature on research and innovation in the Western Balkans, four studies were commissioned, and a policy questionnaire was circulated to provide a thorough review of the region's policies, as well as existing challenges and opportunities in the research and innovation sectors. A report summarizing the main findings was prepared, and a summary version accompanies this strategy. Seven studies reviewing the key policies, institutions, and performance of the national research sectors were also prepared.
5. All the participant entities were visited by the World Bank team between January and June 2013 as part of a broader consensus-building effort. The results of that consultation process, which involved representatives of core policy-making organizations, were then incorporated into the current draft of the strategy. As a result, the strategy currently has the support of leading universities, research institutes, private sector executives, and ministries of science and education in the region, as well as the Regional Cooperation Council, European Commission (Directorate-General for Enlargement, Directorate-General for Research and Innovation), and the World Bank, among other regional organizations, individual scientists, and entrepreneurs.

*This designation is without prejudice to positions on status and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

STRATEGIC CONTEXT

6. Research and innovation are at the heart of the European Union’s (EU) strategy for growth and jobs—the *Europe 2020 Strategy*. More than 30 action points that represent a joint agenda for increasing the effectiveness and efficiency of Europe’s research and innovation sector are in place¹.

7. Public support for research and innovation is critical, particularly in the context of stagnant economies and potential economic downturns. Not surprisingly, the expansion of public support for research and innovation is a central priority of the stimulus packages adopted by most developed economies to promote economic recovery and job creation in recent years.²

8. This renewed emphasis on research and innovation is also pertinent to the Western Balkans. The global economic crisis hit the Western Balkans especially hard, revealing the structural limitations of a growth model based on the expansion of domestic consumption, stagnant productivity, and limited trade integration. The region continues to struggle toward recovery five years after the global financial crisis began, and unemployment levels are among the highest in the world. Youth unemployment is particularly dire—often more than double the overall national unemployment rate.³

Research and Innovation Matter for the Western Balkans

9. Sustaining economic growth and job creation in the Western Balkans will require a substantive shift toward a more productivity-based, export-oriented growth model. Macroeconomic stability and a market orientation remain important conditions for the development of such a model, but a strategy to unleash the region’s innovative potential will be critical, given the magnitude and complexity of the required adjustments in the region’s productivity structure.

10. Innovation is at the heart of creating and sustaining economies’ comparative advantages and of raising productivity and expanding employment opportunities. Simulations indicate that unleashing the Western Balkans’ innovative potential could generate important economic gains, such as better firm performance and increased productivity and exports (box 1). Firm investments in R&D are fundamental to enhancing the region’s “absorptive capacity”—that is, its ability to adapt and adopt foreign technology, to benefit from spillover effects from foreign direct investments (FDI), and to gain from other sources of knowledge transfer.

Box 1: The Impact of R&D and Innovation in the Western Balkans

According to a recent study, reaching the Lisbon Agenda target (3 percent of GDP for R&D) would generate a 6 percent permanent increase in GDP and a 13 percent increase in export levels in Croatia (World Bank 2009)

Results from a study using firm-level data for Western Balkan economies also provide additional evidence in this respect (Seker 2012): According to the study,

- Innovative firms grow 15 percent faster in sales and 8 percent faster in labor productivity than noninnovative firms.
- Firm R&D expenditures significantly contribute to sales (by 14 percent) and labor productivity growth (by 7 percent).
- When firm expenditures on R&D, training, and infrastructure services are compared, R&D is shown to have the highest correlation to sales growth.

Source: World Bank 2009; Seker 2012.

¹European Commission 2010a, 2010b.

²OECD 2010.

³World Bank 2012a.

11. The Western Balkans must also strengthen its research and innovation capacity to pave the way for full integration into the EU. Several countries are still completing the requirements for the negotiations of chapter 25 of the *EU Acquis Communautaire on Science and Research*. Better absorption of the EU research and innovation programs is part of the *acquis*. In view of the new program Horizon 2020 for 2014-20, the Western Balkans will need to strengthen their capacity at national and regional level to face new challenges. Improved regional research and innovation capacity would also help countries comply with EU requirements and standards in key industries (for example, energy efficiency and food security) and facilitate integration to the European Research Area (ERA).

12. More broadly, a renewed emphasis on research and innovation will enable the region to gradually converge with the R&D and policy targets set by the EU. Croatia, which joined the EU on July 1, 2013, as its 28th member, will have slightly different priorities, but the nature of existing structural challenges remains similar to those faced by the region.

The Performance of the Research and Innovation Sector⁴

13. The Western Balkans’ economic and political transition in the 1990s had serious, often negative consequences for the region’s research and innovation sectors. With economic reforms dominating the policy agenda, science, technology, and innovation policies became a secondary priority, research capacity deteriorated, and links with the productive sector disappeared.

14. Gross expenditure on R&D (GERD) in the Western Balkans has declined dramatically in the past two decades. The region is investing approximately €495 million in R&D per year, which corresponds to roughly the amount invested by the second-largest U.S. research university in 2011. In the same period, other emerging economies, such as China and Turkey, systematically raised investments in R&D and innovation. The variance of R&D intensity within the region is also worrisome, with the differences between the largest intensities (Croatia and Serbia) and the smallest (Bosnia and Herzegovina) reaching a magnitude of almost 30 times (box 2).

Box 2: The Western Balkans’ Investments in R&D

- The amount of R&D investments per capita, a proxy of the stock of R&D capital per worker, is close to that of China in 2000. China has since increased that amount fivefold.
- The region’s R&D intensity, 0.33 percent of GDP, is much lower than the levels shown by Bulgaria and Romania (about 0.5 percent) when they joined the EU in 2007.
- The Western Balkans seems to be investing in R&D less than would have been expected after controlling for development (income) levels.

Source: World Development Indicators; World Bank calculations.

15. Another structural limitation of the research and innovation sector in the Western Balkans is its level of economic efficiency—the creation of wealth from knowledge. As an illustration, consider the ratio between R&D expenditures and patents: a unit of Bosnia and Herzegovina’s or Croatia’s (triadic) patents has required, on average, almost three times more R&D expenditures than a U.S. (triadic) patent. This, in turn, results from weak academic and technology transfer

performances (box 3).

⁴ For a summary of the analysis of the underlying causes of the current performance of the Western Balkans Research sector, see World Bank 2013a.

16. The Western Balkans' scientific performance is, for the most part, substantially below that of the average EU country in both quantity (where some recent improvement is noticeable) and quality (measured as the normalized impact of publications, number of citations, and h-index).⁵ Technology transfer activities, such as technology licensing and spin-off companies, are also scarce, and collaboration with industry tends to be driven by occasional opportunities and short-term objectives rather than by strategic, long-term partnerships. For instance, the Western Balkans applied for 38 patents in the United States in 2012, compared to 27 patents, on average, for U.S. research universities.

17. In addition, the enterprise sector that emerged from the economic transition of recent decades has had a very low propensity to invest in research and innovation. The economic liberalization of the 1990s shifted the productive structure of the Western Balkans away from manufacturing—especially those industries that are more likely to invest in R&D, such as metal mechanics and pharmaceuticals—toward the service sector. Overall, the share of the manufacturing sector in GDP decreased until 2008, characterizing what some observers called a “de-industrialization” process. In addition, firms in the region seem much less integrated into global value chains than those in Central Europe, a situation that limits local firms' access to knowledge and market opportunities for innovation.⁶

Mainstreaming Research and Innovation⁷

18. Several attempts have been made to revamp the Western Balkans' research sector and to promote innovation in recent years. Measures have addressed a broad spectrum of issues, including the challenge of the regional “brain drain”; the modernization of research infrastructure; the support to technology transfer offices and technology parks; the development of early-stage financing programs; the improvement of the regulatory environment in which firms operate; and the enhancement of conditions for policy coordination, among others.

19. Despite some substantive results, most of the achievements so far have been essentially partial, small scale, and short-lived, with a strong influence from the political cycle. Fragmentation and limited coherence are sometimes observable characteristics even among initiatives supported by international donors. Several interventions have been redundant, having a similar focus and duplicating the services provided. Progress has thus been slow and uneven across the region.

20. Most important, those initiatives have so far failed to alter the structural deficiencies of the research and innovation sector in the Western Balkans⁸. Policy and institutional instability,

Box 3: Research and Technology Transfer in the Western Balkans

- The average number of citations per document in the Western Balkans (0.62) in 2003–10 was about half the EU-27 average (1.27).
- None of the Western Balkan countries surpassed the EU-27 or the world's “impact factor” average in the same period.
- In a science-industry collaboration ranking of 144 countries, the Western Balkans' average stands at the 88th position, compared to the 40th of the EU-27.

Source: SCIMAGO Research Group 2012; World Economic Forum 2012.

⁵ SCIMAGO Research Group 2012.

⁶ Radosevic 2013; Kutlaca 2013.

⁷ The Western Balkans has adopted a variety of reforms and programs to improve the performance of the research and innovation sector. To document this large set of initiatives in a comparable and systematic way, a policy questionnaire was developed and implemented with the collaboration of national experts. Based on the information obtained and complementary data gathering, individual country reports (*the country paper series*) have been prepared.

⁸ SCIMAGO Research Group 2012; World Bank 2013a, 2013 b.

inadequate incentive frameworks, and resource constraints (human, infrastructure, and funding) are among the causes of the sluggish modernization of the region's research and innovation sector.

21. The result is a fragmented system, one that is unable to generate or adapt knowledge, to unleash innovation, or to help shift the region's growth model. As in the EU member states, the Western Balkans region needs to redefine the role of the sector in its future development strategy and mainstream innovation policy.

Deepening Regional Cooperation

22. The European Union and the Western Balkans have a solid history of bilateral cooperation in R&D (box 4). The experience of regional cooperation on R&D within the Western Balkans is comparatively more limited. Between 2005 and 2013, Western Balkans' governments were supported by EU funds (predominantly through the coordination and support actions of the Framework Program) in their intentions to integrate into the ERA and rebuild the once-strong cooperation in R&D within the region.⁹

23. In recent years, cooperation between the Western Balkans and the EU has increasingly focused on the role of R&D in promoting economic development. Financial support under the Instrument of Pre-Accession (IPAI) in the 2014–20 period is expected to evolve from a sector-wide approach based on a comprehensive view of reforms aimed at increasing the impact of the funds on economic development. As a result, the Western Balkans should actively design integrated research policies to support economic reform, while at the same time contributing to overall ERA objectives.

24. Apart from their common history and common heritage, economic factors also favor a deeper collaboration among the countries of the Western Balkans. The small size of the regional economies, which limits individual research and innovative potential, implies that pooling regional resources to create a regional critical mass might pay major economic dividends.

25. Factors related to economic geography are also relevant. For instance, a large coastal area shared by the region's many countries and their similar climate and soil conditions generate economic opportunities with potentially significant synergies among countries. Moreover, economic clusters that tend to evolve from knowledge spillovers—given their cumulative and tacit nature—are not necessarily consistent with political boundaries.

Box 4: EU -Western Balkans' Cooperation in R&D

Cooperation in R&D has been part of the Stabilization and Association Agreements negotiated by the EU and the Western Balkans within the framework of the Stabilization and Association Process.

These agreements have been concluded with all countries, and their implementation provides a natural framework for the progressive compliance with the *EU Acquis Communautaire* in the field of R&D (see chapter 25, "Science and Research").

The region participates in the Seventh Framework Program (FP7) and is actively involved in the European Research in COST and Eureka programs.

Upon joining the FP7, the region gained access to the EU's Joint Research Center and to the provision for capacity building and training on EU-related policies.

Source: European Commission 2010c

⁹ Two examples are the FP6 Southern European Research Area project, a networking project aimed at integrating EU member states and southeastern European countries into the ERA by linking research activities to existing national, bilateral, and regional research, technology, and development program, and the FP7 WBC-INCO.NET, a project aimed at coordinating research policies within the Western Balkans.

26. In that context, deepening regional collaboration is expected to (1) enable better use of available human capital and financial resources by avoiding fragmentation and redundancy; (2) increase the stability of sector institutions and programs through joint implementation; (3) create a political platform for continued promotion of policy reforms in the research and innovation systems in the Western Balkans; and (4) strengthen the capacity to mobilize external sources of funding for R&D and innovation.

THE REFORM PROGRAM

27. To unleash the innovative potential of the region and to address the EU-related opportunities and requirements in research and innovation, the Western Balkans needs to invest more, and more wisely, in research and innovation. Countries have suggested a target for R&D intensity corresponding to 1.5 percent of GDP by 2020 for the Western Balkans, on average. To improve the quality of public expenditures, the region proposes to adopt a two-pronged approach, in which long-term institutional and policy reforms are advanced and in which selected strategic investments are undertaken to address the structural bottlenecks that hinder the performance of the research and innovation sector. Four intermediate goals are considered:

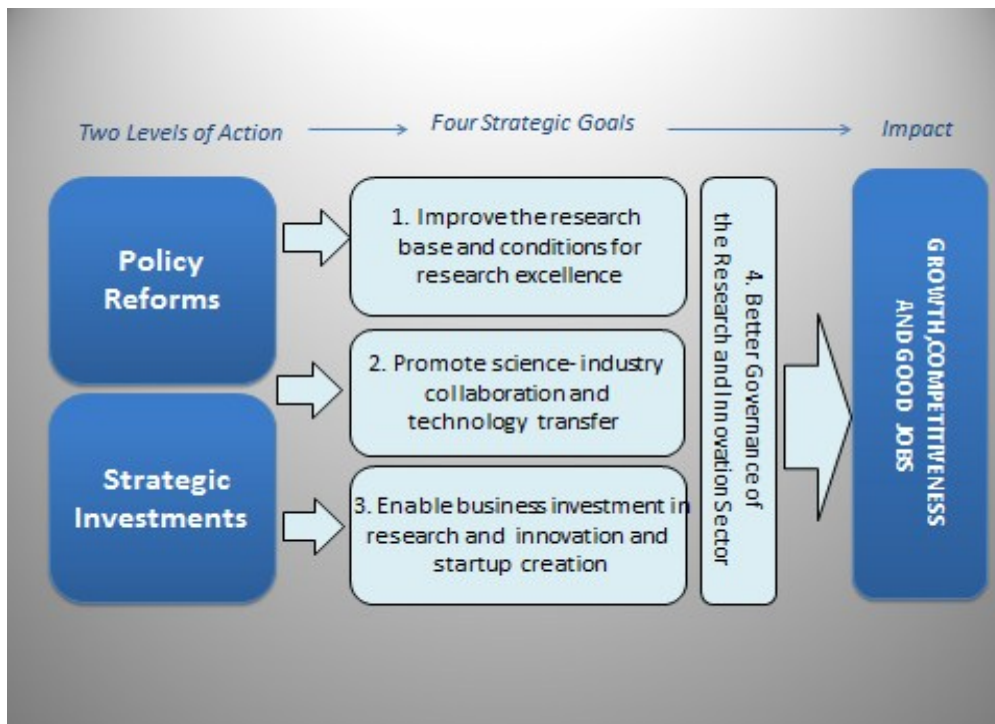
- Improve the research base and conditions for research excellence.
- Promote collaboration and technology transfer between research institutions and industry.
- Enable business innovation and innovative start-ups.
- Strengthen the governance of research and innovation policies.

28. The institutional and policy reforms necessary to reach these strategic goals are detailed below, together with possible milestones and measurable indicators to monitor progress. Overall, they represent a comprehensive agenda: a sectorwide reform program, aimed at raising the impact of public investments in research and innovation and catalyzing economic growth (figure 1).

29. The proposed measures build on existing reform initiatives and were selected by representatives from the region's research and innovation sector. Their final format (for example, as laws or as regulations) and their consequent implementation strategy and timing depend on specific institutional and political conditions.

30. The next section describes the structure of the proposed reform program, suggesting how the strategic goals can be taken in additional directions and describing some key policy actions. A broader set of short- and long-term measures is presented in table 1.

Figure 1: Results Framework for the Western Balkans R&D for Innovation Strategy



Improve the Research Base and Conditions for Research Excellence

31. Over the past two decades, the Western Balkans experienced a massive “brain drain” and a decay of its research infrastructure facilities. Coupled with inadequate recognition and promotion of scientific merit, these factors resulted in declining performance of research output. For research to become a meaningful input to economic growth and accelerated convergence with the EU, improving its quality is a necessary precondition.

32. The Western Balkans can improve its research base and conditions for research excellence by following three strategic directions:

- Slowing down the brain drain, supporting a “brain gain,” and investing in human capital.
- Improving access to modern research facilities and availability of research funding.
- Reforming the incentive regime for researchers’ performance.

33. While broad integration into the ERA and the global scientific community should always be encouraged, the Western Balkans should promote collaboration with the scientific diaspora as a short-term mechanism for increasing research productivity and research excellence.

34. The region needs to invest in the qualifications of its researchers and expand participation in tertiary education. Reforms promoting the mobility of researchers, within the region and between the region and other countries, both in Europe and elsewhere—such as adopting common PhD programs, diploma equivalence, and lower visa requirement for scientists—should be advanced.

- The Western Balkans could also review the policies and regulations of the research sector to eliminate any bias against young researchers that may exist, for example, in career development in comparison with the EU countries.¹⁰
- In the medium term, the Western Balkans could consider implementing policies to attract talented young scientists, the scientific diaspora, and “star scientists.”

35. Investment in and management of research infrastructure should be rationalized to avoid duplication and to ensure that public funds are not wasted. Common ownership should be encouraged on the basis, for example, of the Common Legal Framework for European Research Infrastructure Consortium (ERIC).¹¹

36. Investment planning should be based on “infrastructure roadmaps” to increase the selectivity of investments, in line with the priorities of national strategies.¹² The region should gradually increase the amount of public funds available for research and innovation. In the short term, attempts to mobilize resources from beyond the region could be made.

37. An important factor is the reduction of the cost-based allocation of funds for institutes and universities and the use of competitive mechanisms. Reforming the incentive regime for researchers’ performance also requires reviewing human resource policies.

38. Recruitment, career development, and remuneration should emphasize transparency and academic performance. Making science careers attractive through clear, transparent, and merit-based recruitment policies is also necessary.

- Career progress should be based on the assessment of research impact and, when pertinent, of technology transfer and teaching achievements.
- Examples of ways to make research careers more attractive can be found in the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.
- Another potential mechanism for enhancing the selection of scientific talent is posting, in English, research positions on EURAXESS.

Promote Research-Industry Collaboration and Technology Transfer

39. The sustainable impact of public R&D expenditures on economic development depends on how effectively the research results of public investment are commercialized. Yet commercialization and collaboration do not evolve effortlessly from the research stage to commercialization.

40. The issue is whether the conditions for massive and systemic (as opposed to rare and occasional) research commercialization are in place. Such conditions include an institutional framework that incentivizes economic agents (researchers, research organizations, and businesses) to engage in commercialization efforts and partnerships and that promotes the availability of intermediary organizations dedicated to commercialization, such as technology transfer offices and science and technology parks. The Western Balkans can promote research-industry collaboration and technology transfer by:

¹⁰ EC 2005.

¹¹ European Commission 2009.

¹² ESPRI 2008.

- Improving the incentive regime for collaboration between research institutes and the private sector.
- Providing “soft” support for collaboration and technology transfer.
- Rationalizing access to and enhancing the performance of science and technology parks and incubators.

29. To leverage the economic impact of publicly funded research, the Western Balkans region needs to take steps to simplify the legal requirements governing the interaction between public research organizations and the enterprise sector. Legislation regulating the management of intellectual property (IP) generated from publicly funded research is crucial, since uncertainty about the ownership of research results can limit the incentives of public research organizations (PROs), individual researchers, and businesses to generate and use research for commercial purposes.

30. As illustrated by international experience, transferring IP management responsibilities to PROs is a crucial step. In parallel, revising the criteria for the career advancement of researchers to reward technology transfer activities would augment the flow of research susceptible to commercialization. Other important measures include devising effective mechanisms for financing research-industry collaboration (such as vouchers and matching grants) and facilitating the institutional provision of contract research.

31. The development of dedicated technology transfer organizations should be encouraged. These should have staffs skilled in managing IP, should encourage patenting and licensing, and should promote spin-off companies. The establishment of long-term consortia between the public sector (research providers) and the private sector (research users) can ensure financial sustainability and the long-term alignment between research output and the needs of the economy.

32. Investment in physical infrastructure (science and technology parks and incubators) is often wasteful. Before embarking on such large-scale investments, financial backers need to assess the regional demand for science and technology parks and incubation services and the current supply. The establishment of new science and technology parks and incubators should result from transparent criteria, such as an unmet demand from the private sector and a solid local research base. Once science and technology parks and incubators are established, their management should employ best practices, including private management and self-sufficiency targets. The regional dimension in infrastructures is particularly relevant and a first step could be to establish also a regional roadmap for infrastructure development.

Enable Business Investments in Research and Innovation and in the Creation of Start-Ups

33. Enabling the efficient reallocation of resources between declining and ascending sectors is critical for the development of an entrepreneurial economy. An expanding sector of “high-potential growth firms” can play a critical role in generating growth and job creation. The Western Balkans region could encourage business investments in research and innovation and start-up creation by:

- Reforming the investment climate factors particularly relevant to young and innovative start-ups.
- Improving access to innovation financing and mentoring services.
- Supporting the international integration of young and innovative firms.

34. While overall improvements would naturally help the emergence and expansion of those firms, young and innovative firms are particularly sensitive to particular aspects of the investment climate. For example, greater market competition (entry, exit, and rivalry conditions) could foster business investments in R&D and innovation when they reduce pre-innovation profits by more than they reduce post-innovation profits.

35. With structural reforms still under way, this differential may be relevant, and promoting competition (such as by reducing pre-innovation rents) may play an important role in transition economies. These measures would include better product market regulation (especially in the service sector) and a better bankruptcy regime.

36. Labor flexibility (and security) enables the efficient reallocation of labor from less to more competitive firms, a dynamic process for generating new products, and a process for achieving productivity gains. Appropriate contract enforcement and overall legal certainty are important for young firms, which are often less connected to informal networks and have less tolerance for uncertainty than incumbent firms.

37. Tax policy may also affect the propensity of individuals to engage in entrepreneurial activities, especially those with high risk and potentially high returns that could have a transformational impact. Assessing the effect of marginal taxation on entrepreneurship is another measure worth considering.

38. Moreover, it is widely recognized that a “funding gap” exists between available inventions and private investment in innovative projects. The reasons for this gap are related mainly to the difference between the external and the internal cost of capital in an R&D investment. This differential arises from the asymmetric information between inventor and investor and the moral hazard on the part of the inventor due to the separation of ownership and management.¹³

39. In the long term, continued improvements in access to finance (deepening local financial markets) would be beneficial for business innovation, especially in the context of the global financial crisis. Better access to credit for routine activities frees up internal resources for investment in riskier businesses, including R&D and innovation.

40. To improve financing for innovation, the Western Balkans could adopt the following measures, among others:

- Matching grant schemes for pre-seed financing (proof of concept and prototype development) for new small and medium enterprises (SMEs) and mentoring and nurturing services for project development and commercialization.
- Tax breaks for firms’ expenditures on R&D.

41. The region could promote legal reforms to promote the development of risk capital markets (particularly seed and venture capital):

- *Reviewing procurement legislation to encourage innovation and entrepreneurship.* Public procurement, while not directly relevant to mission-oriented research and innovation, has a great influence over the types of research on social challenges.

¹³Hall and Lerner 2009. In addition, the lack of collateral to secure bank loans makes R&D riskier than other types of investment, which turns debt financing into an inappropriate mechanism for this type of financing. As a result, retained earnings and equity tend to play an important role in financing private R&D investment. Moreover, business R&D and innovation tend to be procyclical, declining in periods of economic downturn.

42. Firm expansion requires connectivity with the rest of the economy, locally and internationally. Yet the integration of young innovative firms into local and global markets entails a number of challenges related to high “sunk costs,” in some cases, due to poor access to information. Measures to address this problem include:

- Reducing the cost of investments (the acquisition of capital goods), for example, through capital depreciation rules and reducing the cost of “knowledge” assets.
- Adopting managerial training and skills development programs, technology services, or, more broadly, manufacturing extension services.
- Continued promotion of FDI in industries with a global orientation.
- The promotion of R&D-intensive FDI.

Strengthen the Governance of Research and Innovation Policies

43. The EU and countries in the Organization for Economic Co-operation and Development (OECD) are increasingly strengthening their research and innovation sectors to promote better system performance, to reduce the leakage of R&D results to others for commercialization, to channel resources toward areas of current or potential national comparative advantage, to facilitate collaboration between research institutes and businesses on R&D, and to facilitate the private sector’s uptake of innovations in their own investments.

44. In the Western Balkans, steps toward a systemic view of national innovation systems are still tentative. Individual components of the systems are often affected by poor policy prioritization, limited implementation oversight, rigid budgeting processes, inflexible rules governing human resource management, and weak incentives for performance. The systems are further complicated by a confused legal framework and a plethora of actors who may or may not coordinate, who often compete for budget resources, who have different institutional priorities, and who do not readily adopt the vision of one ministry or another over a sustained period.

45. The governance of research and innovation systems can be improved by:

- Completing the institutional reforms of universities and research institutes.
- Enhancing institution building for efficient management of research and innovation policy.
- Deepening regional cooperation.

46. Universities throughout the Western Balkans (with the exception of Croatia, which has already completed the process) need to continue their process of integration into the European Higher Education Area and their implementation of the Bologna Process.¹⁴ The consolidation of research institutes also needs to be completed. Broader reforms of the education sector would further strengthen the research and innovation system. For instance, the introduction of performance-based contracts and greater autonomy in managing resource allocation and research results would enhance the quantity and quality of research outputs and their relevance to the economy.

¹⁴ A three-year Tempus project called “Modernisation and Reconstruction of University Management and Structures” (MOREMS) involving universities from Bosnia and Herzegovina, Croatia, FYR Macedonia, and Serbia, and together with higher education institutions from the EU, put a strong emphasis on improving the existing university management system and structure.

47. Improved system performance requires effective mechanisms for “horizontal” coordination, such as country-level research and innovation councils, as well as a fully institutional role for organizations focused on business innovation (“vertical” coordination). Improved coordination should be complemented by greater accountability of public policies, with the institutionalization of public consultation and feedback mechanisms.

48. On the funding side, investment in research should be made part of the overall budget planning process to ensure that the flow of funds will be consistent over time and that it will have the same priority as other items in the government budget. Monitoring and evaluation (and impact evaluation) of public programs should be made systematic, and the information gathered should inform policy formulation in a continuous feedback loop. In light of the data deficiencies outlined earlier, statistics on research and innovation should be automatically generated and updated.

49. A good balance between basic and applied research would also increase the impact of research on the economy.¹⁵ On a related issue, the allocation of resources could be defined according to a “smart specialization strategy,” which favors fields where scientific excellence meets the region’s economic potential.¹⁶

50. As a first approximation, four areas of research specialization seem to be relatively prominent in the Western Balkans: agricultural and biological sciences, environmental sciences, physics and astronomy, and chemistry.¹⁷ Knowledge generated in those fields could help develop some latent comparative advantages:

- The coastal area shared by several countries represents a large potential for aquaculture and marine biology.
- The regional climate and soil conditions create opportunities for the development of the wine industry and other segments of agribusiness.
- The Western Balkans could benefit from region-specific knowledge on reducing carbon emissions and energy intensity and enhancing energy efficiency.
- A small but growing number of start-up companies in the fields of “translation medicine,” new materials, biotechnology, and information technologies have potential in selected niches.

51. Some suggested measures for strengthening the governance of research and innovation policies include:

- Creating a regional facility to support the implementation of policy reforms and selected joint programs.
- Monitoring the implementation of the South East Europe 2020 Strategy’s research pillar.
- Supporting the implementation of the Enterprise Development and Innovation Facility (EDIF).

¹⁵ Arnold and Giarracca. 2012.

¹⁶ This specialization is a process through which research and innovation efforts are applied to enhance existing comparative advantages or the development of new firms or sectors through an entrepreneurial process of self-discovery (European Commission, 2011) A process of “smart specialization” might be better managed regionally as economies of agglomeration tend to go beyond national boundaries.

¹⁷ Based on SCIMAGO Research Group 2012.

ACTION PLAN FOR REGIONAL COOPERATION

52. This proposed Action Plan for Regional Cooperation complements, strengthens, and builds on national strategies, policies, and programs while recognizing the different levels of development of research systems and their contribution to development. It is meant to be firmly embedded in the national, regional, and local priorities in every one of the seven countries involved. Moreover, the strategy should inform every relevant policy area with politically stable, adequately financed support structures.

53. The proposal builds on the recent experience in regional cooperation on research and innovation among the Western Balkan countries through bilateral initiatives funded by the EU and other stakeholders and donors. The comprehensive, sector-wide approach adopted by the strategy complements the treatment of other regional initiatives, notably the Danube and Adriatic Ionic Strategies, neither of which addressing in a comprehensive way the entire chain from research to innovation in the Western Balkans.

54. It is envisioned that the proposed Regional Strategy and Action Plan will be integrated with the South East Europe (SEE) 2020 Strategy as its research pillar. Moreover, by focusing on research for innovation, the proposed action plan seeks to complement the Enterprise Development and Innovation Facility initiative—a project dedicated to improving access to finance by innovative firms in the Western Balkans.

55. The action plan, therefore, proposes five regional initiatives seeking to cover the whole spectrum of the research and innovation chain from laboratory to the marketplace, including both public and private sector actors. It emphasizes the importance of research performance, technology transfer and collaboration with the private sector. It includes the creation of a facility for capacity building for research and innovation and four regional programs. All five initiatives are detailed according to motivation, objective, operational procedures, estimated costs, outputs, and outcomes in the annex.

The WISE Facility

56. In order to support the implementation of country reforms, the Western Balkans proposes the creation of a regional technical assistance facility, the Western Balkans Research and Innovation Strategy Exercise (WISE) Facility

57. The facility will advocate for and advise on the implementation of reforms while serving as a platform for continued policy exchange, public policy dialogue, capacity building, and policy advocacy.

58. The facility aims to provide an enduring, long-term platform on which countries in the region can pursue efforts for their mutual benefit in research and innovation and through which they can continuously advance their policy agenda. Collaboration at the regional level (and possibly at the international level) will contribute to the stability of programs and policies that are jointly supported, help insulate research from political interference, and promote the needed economies of scale while avoiding unnecessary duplication of effort.

59. It is envisaged that WISE will also function as a technical secretariat for the coordinating team responsible for the implementation of the research and innovation pillar of the SEE 2020. The facility will also promote capacity building for local entities, including training.

WISE Programs

60. In addition, the proposed WISE Facility would promote the development and monitor and evaluate the implementation of selected regional support programs. Four programs, building on the recent experience of the region along with its strengths and weaknesses, have been proposed so far:

- *A research excellence fund* to promote collaboration between local scientists and the scientific diaspora, along with the development of young scientists toward further integration with the ERA.
- A program to encourage the development of “*networks of excellence*” in areas consistent with the “smart specialization” of the region, increasing the rationalization in resource use, and focusing research on areas with greater economic impact.
- A *technology transfer* program for public research organizations to facilitate collaboration between research and industry in its different formats, including joint and contract research, technical assistance, training, technology licensing, and the creation of spin-offs from public research organizations.
- An *early-stage start-up* program to provide pre-seed (proof of concept and prototype development) financing and business incubation and mentoring programs to help bridge the “valley of death”¹⁸ in the process of bringing an idea to the marketplace and to help develop a pipeline for venture capital investors.

Implementation Issues

61. The following are envisioned as the implementation issues:

- *Regional asymmetries*. In the implementation of the regional programs, asymmetry in each of the research and innovation systems in the Western Balkans should be considered. The strategy should contribute to making countries’ capabilities less asymmetric across the region. Operating procedures should seek to provide further assistance and capacity building to lagging countries to ensure their involvement. A methodology for proportional distribution of the overall resources among beneficiary countries shall be defined.
- *Governance structure*. The WISE Facility is expected to be supervised by representatives of each beneficiary country (supervisory body). A small professional team will be responsible for the daily activities.
- *Program implementation*. The regional programs will be implemented and supervised at the country level to help build local capacity in designing, managing, and implementing research and innovation programs.

Expected Outputs, Outcomes, and Costs

62. Table 2 summarizes the expected impact of each program, the corresponding costs, and the expected contribution to the four intermediate goals described in the strategy (expected outcomes) within a seven-year period.

¹⁸ The “valley of death” is a term referring to the difficulty of covering the negative cash flow in the early stages of a startup, before their new product or service is bringing in revenue from customers.

- To improve the research base and conditions for research excellence, the Research Excellence Fund Program will start funding 80 research collaboration projects between the region and the diaspora, 50 young researchers, and 200 PhDs in science from leading universities, while the Network of Excellence Program aims to promote the development of four networks of excellence.
- To promote research-industry collaboration and technology transfer, the Technology Transfer Program will support the development of 10 technology transfer organizations, train 100 staff, cofund the restructuring and development of six science parks, and fund 100 joint science-industry projects.
- To enable business investments and start-up creation, the Early-Stage Start-Up Program will finance the preparation of 300 proofs of concept and prototypes, 100 business plans, and 20 consultations with foreign and local investors.

63. The cost of the above programs is estimated at €200 million. The Western Balkans is committed to mobilizing also funding from outside the region to fund those programs. Because the action plan can be implemented gradually, the region intends to start with feasible initiatives and pilot projects that can show quick results and that require fewer resources in the short term.¹⁹

¹⁹ This amount does not represent any type of financial commitment from any of the parties involved in preparing or endorsing this document.

Table 1: A Framework for Coordinated Policy Action: The Western Balkans Regional R&D for Innovation Strategy

KEY POLICY REFORMS AND STRATEGIC INVESTMENTS		
STRATEGIC GOAL/ METRICS	SHORT-TERM OUTPUTS	LONG-TERM OUTPUTS
<p>1. Improve the research base and conditions for research excellence Metrics: Citations and citation impact; copublications within the region and with external partners; share of young researchers employed; participation in Horizon 2020.</p>		
<p>1.1. Slowing down brain drain and supporting “brain gain”; investing in human capital</p>	<ul style="list-style-type: none"> Promote the collaboration of local scientists and the scientific diaspora (with full return of scientists as an open possibility rather than a target). Advance the reforms to promote mobility of researchers within the region and between the region and foreign countries (brain circulation). Continue investing in the qualifications of scientists and researchers (capacity building, especially in those countries in earlier stages of development). 	<ul style="list-style-type: none"> Eliminate any bias against young researchers that may exist in the research system in comparison to EU member countries (for example, in career opportunities). Consider implementing policies to promote young, talented scientists, the scientific diaspora, and “star-scientists.” Continue enhancing participation in tertiary education. Encourage collaboration within the ERA, especially Horizon 2020.
<p>1.2. Improving access to modern research facilities and availability of research funding</p>	<ul style="list-style-type: none"> Enable the common use of large research facilities, optimizing the use of available equipment. Deepen coordination among research organizations for better planning of investments in research infrastructure (avoiding duplication of public investments in expensive equipment). Mobilize funding outside the region for research and innovation 	<ul style="list-style-type: none"> Prepare and systematically update “infrastructure roadmaps” to increase selectivity in aligning investments with the priorities of the national research and innovation strategies. Gradually increase the amount of public funds available for research and innovation. Consider earmarking funds for research.
<p>1.3. Reforming the incentive regime for researchers’ performance</p>	<ul style="list-style-type: none"> Progressively reduce the use of cost-based noncompetitive funds for research institutes and increase the use of competitive funds. Review career development rules and remuneration policy, emphasizing transparency and academic performance, including by encouraging research with a high impact factor. 	<ul style="list-style-type: none"> Improve career selection through clear, transparent, and merit-based recruitment policies as illustrated by the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

2. Promote Research-Industry Collaboration and Technology Transfer

Metrics: Patenting and copatenting activity locally and internationally; licensing and spin-off companies (number and value); volume of joint research projects; share of services provided to the business sector in total revenues; share of innovative firms collaborating with public research organizations (as measured by the Community Innovation Survey).

<p>2.1. Improving the incentive regime for collaboration between research institutes and the private sector</p>	<ul style="list-style-type: none"> • Simplify the legal requirements for collaboration among public universities, research centers, and the enterprise sector. • Undertake “awareness” campaigns about the benefits and potential of collaboration between research and industry. 	<ul style="list-style-type: none"> • Develop and unify the regulation on ownership and management of IP from publicly funded research performed by PROs to eliminate uncertainties in ownership, incentivize collaboration of researchers with innovation-related activities, and transfer the responsibility of IP management to the universities. • Review criteria for career development to reward technology transfer activities (such as the equivalence of patents and papers or sabbaticals for development of research-based businesses).
<p>2.2. Providing “soft” support for collaboration and technology transfer</p>	<ul style="list-style-type: none"> • Provide updated, systematic, and technically sound information on existing research programs, research capabilities, and industry needs. • Encourage the institutional provision of training, technical consultancy, and related services by public research organizations. • Finance collaboration between research organizations and industry (such as vouchers or matching grant) and facilitate the institutional provision of contract research. 	<ul style="list-style-type: none"> • Support and develop technology transfer organizations, providing a long-term planning horizon. • Enable efficient management of IP by PROs, encouraging patenting and licensing and the development of spin-off companies • Encourage the establishment of long-term consortia between the public and the private sectors in selected areas. • Allow for research-industry mobility.
<p>2.3. Rationalizing access to and enhancing the performance of science and technology parks and incubators</p>	<ul style="list-style-type: none"> • Assess the regional demand for and supply of science parks and incubation services. • Evaluate the need for science and technology parks and incubators in the Western Balkans region. • Develop criteria for the establishment of new science and technology parks; including the identification of clear demand from the private sector and a solid local research base. 	<ul style="list-style-type: none"> • Adopt best practices in the management of science and technology parks, including private management and self-sufficiency targets. • Define mechanisms for public-private partnerships, including different levels of the public administration for sharing investments costs. • Coordinate the development of such facilities with other countries; seek an open-access policy.

3. Enable business investments in research and innovation and start-up creation

Metrics: Share of innovative companies (as measured by the Community Innovation Survey), Business Expenditures on Research and Development (Eurostat); trademarks and ISO certifications; volume of venture capital markets.

<p>3.1. Reforming the investment climate to favor young innovative start-ups</p>	<ul style="list-style-type: none"> • Simplify access to public funds for research and innovation by private firms, especially young and knowledge-based start-ups. • Reduce the time required to open a business by simplifying registry requirements. • Minimize the visits of public officials to companies and expand on-line services. 	<ul style="list-style-type: none"> • Improve the competition environment to enable entry and exit, in particular: product market regulation (especially in service sectors) and the bankruptcy regime. • Improve labor flexibility and security to improve the mobility of labor from declining sectors to new start-up and growing sectors. • Strengthen contract enforcement, especially for young, micro, and small firms. • Consider reviewing marginal taxation to encourage entrepreneurship.
<p>3.2. Improving access to innovation finance (pre-seed capital) and mentoring services</p>	<ul style="list-style-type: none"> • Develop matching grant schemes for pre-seed financing (proof of concept and prototype development) and the provision of mentoring services for new enterprises and SMEs. • Develop the legal environment and incentives for the risk capital market (particularly seed and venture capital). • Support the development of angel investors and connection to global start-up networks. • Introduce tax breaks for business investments in R&D. 	<ul style="list-style-type: none"> • Promote the development of the seed and venture capital industry. • Review procurement legislation to encourage innovation and entrepreneurship. • Continue to improve access to finance (deepening the local financial markets).
<p>3.3. Supporting the integration of young innovative firms into the local and global economies</p>	<ul style="list-style-type: none"> • Reduce the cost of investment (acquisition of capital goods for SMEs) and knowledge assets. • Develop manufacturing extension services (focused on the provision of managerial and skills training and technology services for SMEs). 	<ul style="list-style-type: none"> • Consider the promotion of R&D-intensive FDI to help integrate national research sectors into the global R&D industry. • Continue promoting FDI in industries with global orientation

4. Strengthen the governance of national research and innovation policies

Metrics: Volume of R&D (GERD); distribution between basic and applied research; distribution between mission-related and curiosity driven research; share of public research organization costs financed through competitive funding; indicators related to the productivity of the system (patent/GERD, for example).

4.1. Completing the institutional reforms of universities and research institutes	<ul style="list-style-type: none"> • Consolidate research institutes. Reform management of public research institutes by increasing the use of performance-based contracts and allowing more autonomy in management of resource allocation and research results, including over the long term. 	<ul style="list-style-type: none"> • Further integrate local universities into the European Higher Education Area and advance the implementation of the Bologna Process. • Promote independent and competitive selection for key positions in public research organizations.
4.2. Enhancing institutional building for efficient management of research and innovation policy	<ul style="list-style-type: none"> • Generate and systematically update R&D statistics in line with standard practices established by the Oslo manual and consistent with EUROSTAT data, including data related to the scientific diaspora, the Community Innovation Surveys, and other EU indicators. • Promote a balance between basic and applied research, and curiosity-driven and mission-orientation research. • Consider the selection of agriculture (marine included), nanotechnology, and renewable energy as priority sectors for the allocation of public funds. • Implement a monitoring and evaluation system enabling the assessment of public expenditures in research and innovation. 	<ul style="list-style-type: none"> • Develop a “smart specialization strategy” to help define priorities for the use of public resources in research and innovation. • Promote effective mechanisms for improved “horizontal” coordination, such as national research and innovation councils. • Strengthen research and development and innovation funding organizations (such as the National Science Foundation) and institutionalize organizations focused on business innovation for improved vertical coordination. • Establish appropriate mechanisms for accountability of public policies, including public consultation and feedback mechanisms.
4.3. Deepen regional cooperation	<ul style="list-style-type: none"> • Support the implementation of EDIF. • Create a regional facility to support the implementation of the policy reforms and the implementation of selected joint programs. 	<ul style="list-style-type: none"> • Monitor the implementation of the SEE 2020 research pillar. • Integrate the implementation of the research components of the Danube Strategy.

Table 2: Summary of the Action Plan for Regional Cooperation

	Expected Outputs	Expected Outcomes	Total cost (€ million)
Research Excellence Fund	<ul style="list-style-type: none"> 80 international collaboration research projects funded 50 young researchers' projects funded 200 PhDs in science from leading universities 	<ul style="list-style-type: none"> Contributed to improving the research base and conditions for research excellence (strategic objective 1) Slowed brain drain; supported brain gain and investing in human capital 	55
Networks of Excellence Program	<ul style="list-style-type: none"> Larger number of joint publications in high-impact journals Increased mobility of researchers Better use and supply of research infrastructure Increased number of postgraduate students in the field Increased collaboration with the business sector through joint research, licensing, training, and technical assistance 	<ul style="list-style-type: none"> Improved research base and conditions for research excellence Invested in human capital Improved access to modern research facilities and availability of research funding 	55
Technology Transfer Program	<ul style="list-style-type: none"> 10 technology transfer organizations developed and 100 staff trained 100 joint projects between research and industry supported; 3 technology parks restructured 3 new parks created 	<ul style="list-style-type: none"> Promoted research-industry collaboration and technology transfer Provided soft support for collaboration and technology transfer Improved access to and performance of technology and science Improved technology parks 	40
Early-Stage Start-Up Program	<ul style="list-style-type: none"> 300 proofs of concept and prototypes tested 100 business plans and bankable projects prepared 20 consultations with foreign and local investors 	<ul style="list-style-type: none"> Enabled business investments in research and innovation and start-up creation Created more knowledge-based start-ups Increased investments in start-up companies Increased investments in R&D by the business sector Increased number of innovative SMEs (as described in the Community Innovation Surveys). 	40
Regional Technical Assistance Facility	<ul style="list-style-type: none"> Coordination of regional policy dialogue and promotion of reforms Technical advice for the R&D pillar of the SEE 2020 Capacity building activities (technical assistance and training) provided 	<ul style="list-style-type: none"> Strengthened the governance of research and innovation policies in the Western Balkans Improved public expenditures in R&D 	10
Total	—	<ul style="list-style-type: none"> Improved research Increased innovation for growth and job creation 	200

REFERENCES

- Arnold, E., and F. Giarracca. 2012. *Getting the Balance Right: Basic Research, Missions and Governance for Horizon 2020*. Brighton: Technopolis Group.
- EC (European Commission). 2003. *FP6 Instruments Task Force Speaking Notes: Introduction to the Instruments Available for Implementing the FP6 Priority Thematic Areas*. Brussels: EC.
- . 2005. *The European Charter for Researchers: The Code of Conduct for the Recruitment of Researchers*. Brussels: EC
- . 2009. *Council Regulation (EC) No. 723/2009 (2009)*. Brussels: EC.
- . 2010a. *Communication from the Commission Europe 2020: A Strategy for Smart, sustainable and Inclusive Growth. COM(2010) 2020*. Brussels: EC.
- . 2010b. *Europe 2020 Flagship Initiative 'Innovation Union'*. Brussels: Council of the European Union.
- . 2010c. *Research Cooperation with the Western Balkans: A Tool to Facilitate Integration*. Brussels: EC.
- . 2011. *Research and Innovation Policies for Smart Specialization: Cohesion Policy 2014-2020*. Brussels: EC.
- Enterprise Surveys (database). World Bank, Washington, DC, <http://www.enterprisesurveys.org>.
- ESFRI (European Strategy Forum on Research Infrastructures). 2008. *European Roadmap for Research Infrastructures: Roadmap 2008*. Luxembourg: Office for Official Publications of the European Communities.
- . 2012. *State of Play of the Implementation of the Projects of the ESFRI Roadmap 2010: Report of the Implementation Group to the ESFRI Forum*. Luxembourg: ESFRI.
- European Research Council. 2009. *Towards a World Class Frontier Research Organization: Review of the European Research Council's Structures and Mechanisms*. Brussels: European Research Council.
- Hall, B., and J. Lerner. 2009. "The Financing of R&D and Innovation." NBER Working Paper 15325, National Bureau of Economic Research, Cambridge, MA.
- Kutlaca D., 2013. "A Critical Review of the History of Research and Innovation Policy Practice in the Western Balkan Countries. Background Paper for Western Balkans Regional R&D Strategy for Innovation Technical Assistance Project. World Bank, Washington DC.
- OECD (Organisation for Economic Co-operation and Development). 2010. *The OECD Innovation Strategy: Getting a Head Start on Tomorrow*. Paris: OECD.
- Radosevic, S. 2013. "From Spurt in Economic Growth towards Technology Upgrading and Innovation Based Growth in the Western Balkans: Issues and Policy Options." Background Paper for Western Balkans Regional R&D Strategy for Innovation Technical Assistance Project, World Bank, Washington DC.
- SCIMAGO Research Group. 2012. "The State of Scientific Performance in the Western Balkan Countries." Background Paper for Western Balkans Regional R&D Strategy for Innovation Technical Assistance. World Bank, Washington DC.
- Seker, M. 2012. "An Evaluation of Innovation Activities in West Balkans." Background Paper for Western Balkans Regional R&D Strategy for Innovation Technical Assistance Project, World Bank, Washington DC.

- World Bank. 2009. *Croatia's EU Convergence Report: Reaching and Sustaining Higher Rates of Economic Growth*. Washington, DC: World Bank.
- . 2012a. *South East Europe Regular Economic Report: From Double-Dip Recession to Accelerated Reforms*. Washington, DC: World Bank.
- . 2012b. “An Assessment of R&D Infrastructure and Technology Transfer Activities in Research Institutions in the Western Balkans.” Background Paper for the Western Balkans regional R&D Strategy for Innovation Technical Assistance Project, World Bank, Washington, DC.
- . 2013a. *The Status of the Western Balkans Research and Innovation Sector: An Overview: Summary Report for the Western Balkans Regional R&D Strategy for Innovation Technical Assistance Project*. Washington, DC: World Bank.
- . 2013b. *The Status of the Western Balkans Research and Innovation Sector: Report for the Western Balkans Regional R&D Strategy for Innovation Technical Assistance Project*. Washington, DC: World Bank.
- World Bank- OECD Innovation Policy Platform (IPP), *Voucher for Collaboration Science-Industry*, Briefing Note. June 2013, <http://uat-ipp-wb.reisys.com/>.
- World Development Indicators (database). World Bank, Washington, DC, <http://data.worldbank.org/data-catalog/world-development-indicators>.
- World Economic Forum. 2012. *The Global Competitiveness Report 2012–2013*. Full data edition. Davos: World Economic Forum.

PROPOSED PROGRAMS

The Western Balkans Innovation Strategy Exercise Facility (WISE)

1. **Motivation:** Policy stability and continuity of reform are critical challenges faced by Western Balkan countries in improving the quality of public expenditures on research and innovation. In addition, the sector also needs to address the governance-related obstacles common to developed economies. The Western Balkans Regional R&D Strategy for Innovation identified a number of strategic objectives and policy reforms that—if implemented—could significantly increase the impact of the research and innovation sector on the region’s economic growth and job creation.

2. The regional strategy complements and strengthens national strategies, policies, and programs. It adds to a number of regional initiatives and serves, in particular, as the core of the research and innovation (R&I) pillar for the South East Europe 2020 Strategy. It also develops the research and technology transfer segments of the “innovation chain” in the region, aiming to leverage other innovation-centric initiatives such as the Enterprise Development and Innovation Facility.

3. **Objective:** The objective of the Western Balkans Research and Innovation Strategy Exercise Facility (WISE Facility) is to promote policy stability and continuity of reform in the Western Balkans’ research and innovation sector. This sectorwide approach will ultimately help improve the quality of public expenditures on research and innovation and thereby increase the sector’s contribution to economic growth and job creation.

4. The WISE Facility will (1) advocate for the implementation of the policy reform agenda for the research and innovation sector and (2) manage the implementation of the four proposed regional programs in collaboration with national partners. In addition, the WISE Facility will provide a platform for the coordination, monitoring, and evaluation of donors’ support to research and innovation in the region, including serving as a “technical secretariat” for the discussions under the R&I pillar of the SEE 2020.

5. **Description:** Conceived as a small and agile not-for-profit organization with a strong emphasis on results orientation and rigorous evaluation, the WISE Facility will concentrate on two main components (see figure 1):

- *Technical assistance and capacity building.* The technical assistance and capacity building component will perform the following functions: (1) facilitate policy dialogue among policy makers in the region in which the WISE Facility will play an enabling role;²¹ (2) provide analysis and advisory services, which will consist of studies on technology and policy trends, international good practices, and the like, according to the reform and program needed; (3) conduct monitoring and evaluation (M&E), including monitoring the implementation of the policy reform, measuring progress, and evaluating its impact; and (4) providing a data infrastructure²²
- *Program design, monitoring, and evaluation.* This component will consist of the design, monitoring, and evaluation of the four proposed programs: the Research Excellence Fund, the Networks of Excellence Program, the Technology Transfer

²¹ Activities will include the coordination of periodic regional meetings, the advocacy of policy reforms, and the dissemination of good practices and policy guidelines.

²² Not only to collect and process relevant data for policy dialogue and advice but also to help the country address the data needs of its R&D systems. In this task, close collaboration with UNESCO and EUROSTAT will be sought.

Program, and the Early-Stage Start-Up Program. All four are detailed in separate project proposals.

6. **Structure and Governance:** A Supervisory Board (SB) for the WISE Facility composed of one representative from each beneficiary country will be appointed. The SB will be responsible for overseeing and guiding the operations of the facility. The structure of the facility will include an executive director, two directors (one for technical assistance and one for program design, monitoring, and evaluation), and eight sector or program managers, corresponding to each of the activities described in figure 2.

- The SB will choose the executive director and the two directors. Program managers will be selected by the three directors in consultation with the SB.
- All 11 managerial positions will be chosen through an internationally competitive selection process, for a defined period of time (three years, for example) that can be renewed, based on performance.
- To the extent possible, performance contracts will be signed with all 11 managerial positions.

7. In collaboration with necessary consultants, the director-general will be responsible for the preparation of the legal and non-legal documents for the development of the facility. A business plan for the first two years will be presented and approved by the SB.

8. **Operational procedures.** The WISE Facility will design, monitor, and evaluate the four proposed programs. The implementation and supervision of selected projects will be handled at the national level either through a country-level partner organization (NPO) to be appointed by the corresponding government or a Project Implementation Unit (PIU), also to be created by the beneficiary country -- depending on the government's preference during implementation. The call for proposals will be issued jointly by the facility and the NPOs/PIUs.

- An Approval Committee (AC) for each program comprising regional and international experts (a maximum of five) will select the project proposals through a public, transparent, and cost-effective process based on the recommendations of an international peer review panel (see figure 2 (detail)).
- A peer review panel will be established by the AC for each call for proposals. Members of the WISE Facility or the NPO/PIU will not participate in the selection of projects (as peer reviewers or as AC members).
- Each program will set up, at the outset, the process for gathering the information necessary for implementing a rigorous impact evaluation in collaboration with the corresponding sector units of the facility (Data Infrastructure and M&E).

9. **Access to information.** As a general rule, aggregate information about the facility should be publicly available. Procedures will preferably be carried out electronically. To the extent possible, monitoring of the application process and project implementation will also be available online. The facility will provide public annual reports and be submitted to annual auditing.

10. Table 3 describes a proposed allocation of resources among the activities and the expected outputs and outcomes as well as the link to the overall strategy.

Table 3: General Budget for the WISE Facility

PROGRAM	ESTIMATED COST (€ MILLION)	FUNCTION	EXPECTED OUTCOMES
General administration Supervisory board Executive director (administrative team)	2.0	Salaries: 14 Semi-annual meetings of SB for the executive director plus financial, procurement specialist; Information technology specialist; assistant	<p>Technical advice for the R&D pillar of the SEE 2020</p> <p>Capacity building activities (technical assistance and training) provided</p> <p>Coordination of regional policy dialogue and promotion of reforms</p> <p>Strengthening the governance of research and innovation policies in the Western Balkans</p> <p>Improved public expenditures in R&D</p>
Technical Assistance Department	2.0	Salaries (4 persons) Consultancy services	
Program Supervision Department	2.0	Salaries of 4 persons Administrative Costs for calls and approval process	
Operational costs	3.0		
Equipment	1.0		
Total cost	10	--	

Figure 2: Overall Framework of the WISE Facility

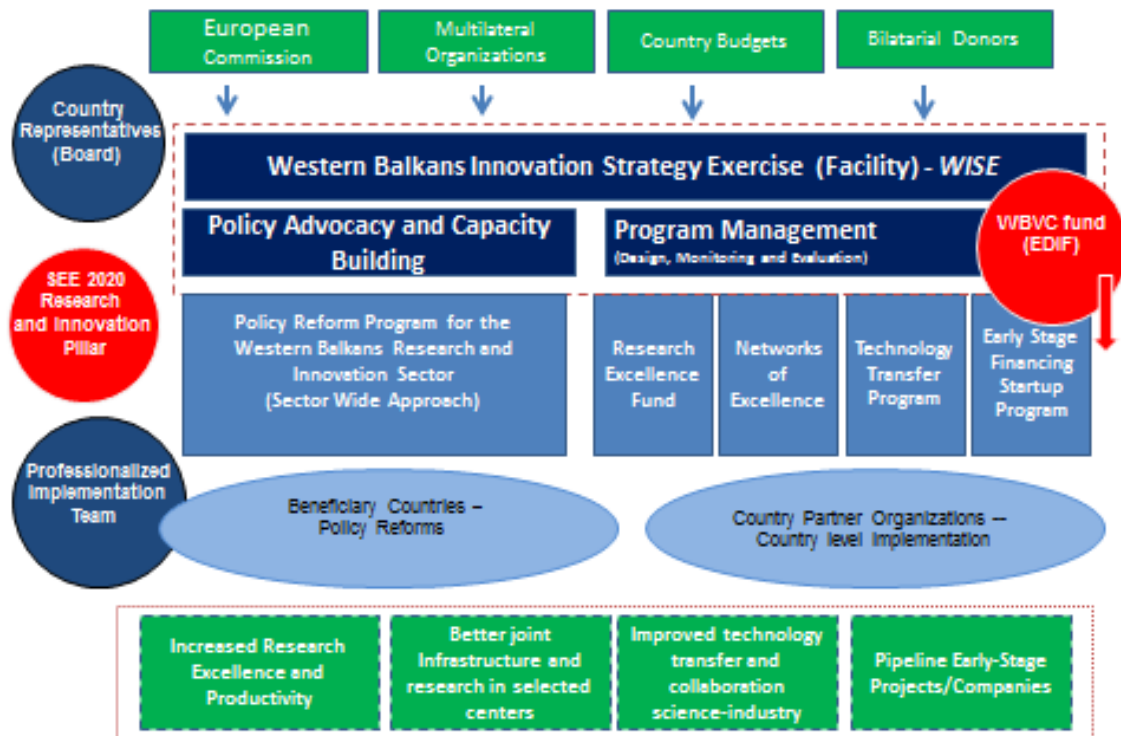
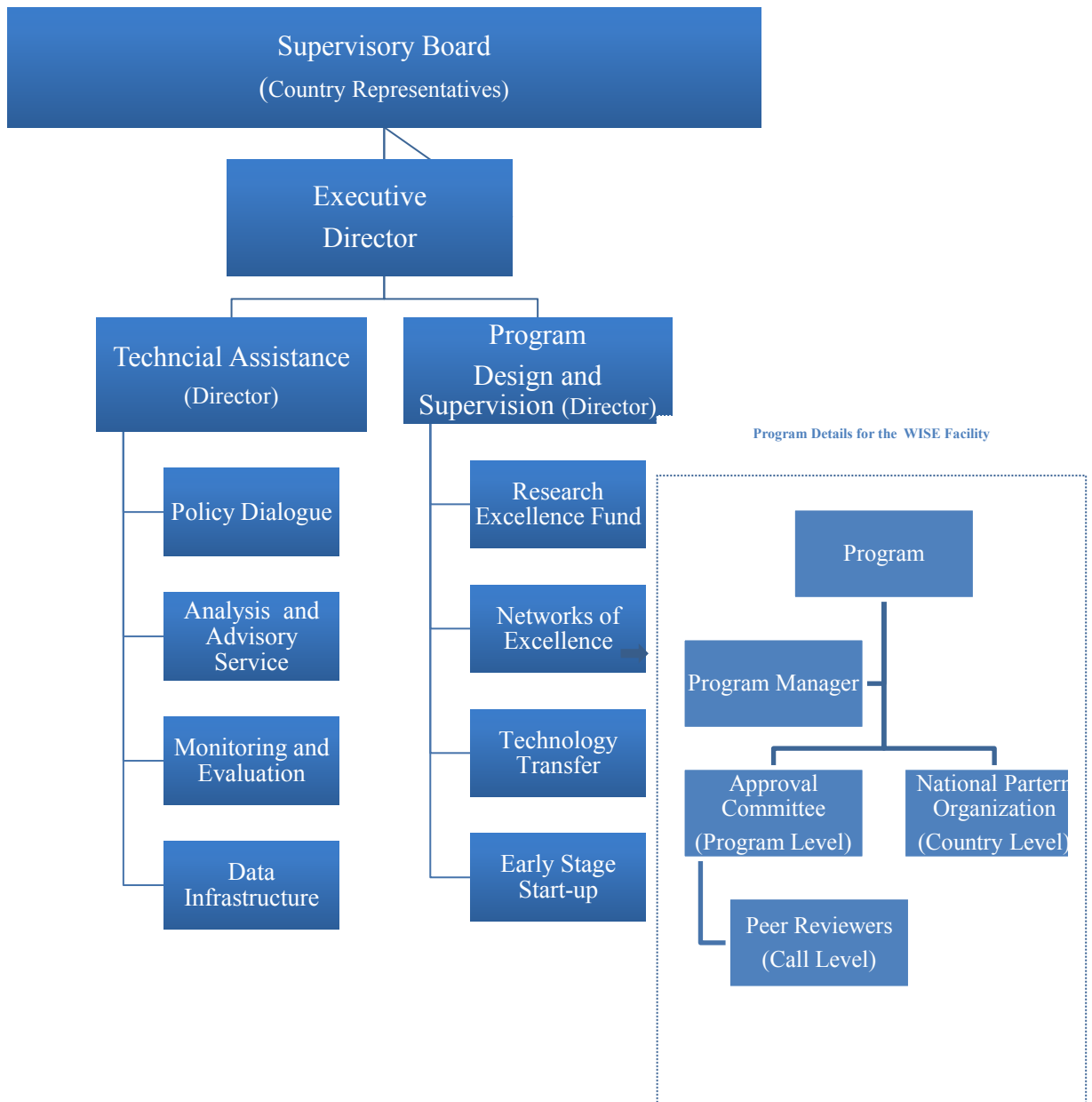


Figure 3: Institutional Structure of the WISE Facility



Project No. 1: Research Excellence Fund

1. **Motivation:** Western Balkan countries face profound challenges in building a research base, which is a precondition for innovation and competitiveness and a fundamental pillar of national innovation systems. Increasing scientific collaboration within the region and with the scientific diaspora and retaining young talents by expanding opportunities for careers in research are part of a strategy for achieving research excellence in the region.

2. **Objective:** The Research Excellence Fund will strengthen research capabilities in the Western Balkan countries and promote excellence by providing stable, transparent, and merit-based support for research. More specifically, it aims to:

- Improve the quality of research in the region by fostering collaboration between scientists from Western Balkan countries and the region's scientific diaspora as well as integration into the European Research Area.
- Provide support to young scientists.

3. The fund would foster competition for research grants beyond the national markets while leaving room to build capacity before exposure to international grant competition (such as Europe-wide competition). By providing regional funding and scaling up resources, it would help avoid fragmentation across countries and focus financial, human capital, and infrastructure resources on scientific areas with the largest benefits for regional competitiveness and development.

4. **Description:** The fund will promote research projects as a basic instrument of cooperation between scientists and experts from the region and the diaspora. The fund will run three programs: the International Collaboration in Research Program, the Young Researchers Grant Program, and the Training Grants Program.

- *International Collaboration in Research Program.* This program will provide research grants to finance regional and potentially international research collaboration and scientific collaboration with the diaspora. Research proposals should involve at least two Western Balkan countries and at least one researcher from the scientific diaspora (that is, a national of any of the Western Balkan countries). Researchers will be encouraged to apply to ERA (FP7) and other sources of funds.²³ Amounts could be up to €1,000,000 (per project for a maximum period of three years).
- *Young Researchers Grant Program.* This program will provide research grants to fund fellowships for young researchers at the doctorate and postdoctorate levels. Support for these research projects will require candidates to have completed their PhD or MSC in the sciences or engineering within a five-year period prior to their application and to be no older than 35.²⁴ Amounts could be up to €100,000 (per individual for a maximum period of two years).
- *Training Grants Program.* Financial support will be offered for doctoral training. Support may also be given for participation in technical courses and the improvement of proposals that have not qualified in framework programs and in other regional research

²³ This program will be built on the experience of Croatia's Unity through Knowledge Fund Connectivity Program. See <http://www.ukf.hr/>.

²⁴ This program will follow closely the experience of the European Research Council Starting Grants. See <http://erc.europa.eu/funding-schemes>.

programs. The objective is to provide local researchers with the necessary competence and knowledge to enable them to participate in competitive calls for proposals from the European and international scientific communities.²⁵ Amounts could be €30,000–40,000 (per candidate for a maximum period of four years).

5. **Governance:** The Supervisory Board of the WISE Facility will supervise and guide the operations of the fund. The WISE Facility will prepare detailed operational manuals and guidelines, design the calls for proposals, and monitor and evaluate the program. The WISE Supervisory Board will appoint an Approval Committee, with a maximum of five persons, composed of members of the regional and international scientific community and the private sector; individuals will serve for a limited period of time (for example, two years). The Approval Committee will have the final responsibility for project selection.

6. **Operational procedures:** Implementation and supervision of projects will be conducted at country level through a partner organization or PIU to be appointed by the corresponding government. In collaboration with the NPOs/PIUs, the WISE Facility will issue a regional call for proposals. The AC will select the project proposals through a public, transparent, and cost-effective process based on the recommendations of an international peer review panel appointed for the specific call for proposals and following standard international best practices for the selection of scientific research projects, in line with the general and program-specific funding objectives.

7. The operational manual for the research funds and the guidelines for the operation of each program will detail its functions. Procedures will be established based on, among others, the experience of the European Research Council and regional experiences such as the SEE-ERA.NET PLUS.²⁶ A balanced approach between curiosity-driven and mission-driven research, integration into broader research projects, and provision of cofinancing, including with or from the business sector, and world-class research excellence are envisioned as key components of those documents.

8. Table 4 describes a proposed allocation of resources among the three lines of support, the expected outputs and outcomes, and the link to the overall strategy.

²⁵ See the update note on EU policy initiatives for universities and researchers (28/11/2012), a set of best practice based principles for innovative doctoral training has been identified. Their wider uptake will be explored through Marie Curie Action grant support in 2012–14.

²⁶ European Research Council 2009. Following the commission's decision of March 11, 2009 (C(2009) 1871), to create "a panel of independent experts for the review of the structures and mechanisms of the ERC," July 23, 2009. For instance, the Research Excellence Fund could build on the program's experience in launching a joint call for European research projects. Moreover, the Research Excellence Fund programs could take advantage of already created evaluators' database under SEE-ERA.NET that comprises over 1,000 international project evaluators. Another example is the Swiss Regional Research Promotion Program in the Western Balkans (2008–11), particularly the component related to strengthening regional interaction and cooperation through research projects.

Table 4: Estimated Costs, Expected Outputs, and Expected Outcomes of the Research Excellence Fund

PROGRAM	ESTIMATED COST (€ MILLION)	EXPECTED OUTPUTS	EXPECTED OUTCOMES (POSSIBLE INDICATORS)
International Collaboration in Research Program	40	80 research projects funded	<ul style="list-style-type: none"> • Increased scientific output, as reflected by a larger number of scientific publications in high-impact journals • Increased number of copublications with international partners in high-impact journals • Better integration with ERA as reflected by a larger number of applications and approvals for Horizon 2020 and related programs
Young Researchers Grant Program	3	50 research projects funded	<ul style="list-style-type: none"> • A larger number of publications by young researchers in high-impact journals • Increased share of young researchers participating in research teams • Increased inflow of young researchers (“returnees”)
Training Grants Program	12	200 PhDs in science from leading universities	<ul style="list-style-type: none"> • Increased number of PhDs in science
Total Cost	55	--	<p>Contributed to improving the research base and conditions for research excellence (Strategic Objective 1)</p> <p>Slowed brain drain and supported brain gain and investing in human capital</p>

Project No. 2: Networks of Excellence

1. **Motivation:** Western Balkan countries face profound challenges in building a research base, which is a precondition for innovation and competitiveness and a fundamental pillar of innovation systems. Improving access to modern research facilities and the availability of funds for mission-driven research are critical needs. In addition, countries need to better coordinate their investments in research and optimize the use of resources, which, in turn, requires avoiding fragmentation and improving specialization in order to generate a “critical mass” in the research sector.

2. **Objective:** The objective is to strengthen the quality of research by creating the critical mass of resources (human, physical, and financial) needed for generating world-class research in selected fields. The program will promote the concentration of resources in core research groups capable of achieving international standards of excellence. In addition, the program will encourage research mobility within the region, the training of young scientists, and doctorates and master’s degrees in selected sectors.

3. This critical mass will be formed through a joint program of activities aimed primarily at integrating the research capacities of the network participants while, at the same time, advancing knowledge on the topic. The Network of Excellence is therefore an instrument for strengthening quality by tackling the fragmentation of European research and for structuring and shaping the way that research is carried out.²⁷

4. **Description:** The program will finance selected Joint Programs of Activities. These will consist of a set of integrated activities that describes how partners will work to enhance complementarity and develop mutual specialization, building on strengths and reducing their weaknesses. The Joint Program of Activities will include (1) the joint management of the participants’ knowledge portfolio and research activities on the network topic (research proposal); (2) a human resources and physical infrastructure strategy for the network, including the sharing of research facilities, tools, and platforms and a common strategy for modernizing existing equipment and for increasing staff mobility and exchanges; and (3) the proposed training activities for the network (Training Program), consisting of providing PhD and specialization courses for a significant number of students, including their involvement with research.

5. Research fields to be prioritized must combine a strong regional research capacity with immediate economic potential, consistent with the notion of smart specialization. These attributes seem present in the renewable energy, aquaculture, and marine culture fields; in applications of general purpose technologies (nanotechnology and biotechnology) to specific fields of economic activity (such as agriculture and health); and some fields of biological sciences and chemistry in which the region shows a higher scientific performance.

6. **Governance:** The Supervisory Board of the WISE Facility will be responsible for the design, implementation, monitoring, and evaluation of the Networks of Excellence Program. The Supervisory Board will prepare detailed guidelines and an operational manual. design the call for proposals, and monitor and evaluate the program. The WISE Facility will also supervise the implementation of the program. The WISE Supervisory Board will appoint an Approval Committee, with a maximum of five persons, composed of members of the regional and international scientific community and the private sector with expertise in the selected field; individuals will serve for a limited period of time (for example, two years). The Approval Committee will have final responsibility for project selection. The AC will select the project proposals through a public, transparent, and cost-effective process based on the recommendations of an international peer review panel appointed for the specific call for proposals and following

²⁷ European Commission 2003.

standard international best practices for the selection of scientific research projects, in line with the general and program-specific funding objectives.

7. **Operational procedures.** The operational manual for the Networks of Excellence Program will detail its functions. Procedures will be established based on the experience of the European Research Infrastructure Consortium (ERIC), including its legal format (partnership or consortium), which will provide for the joint establishment and operation of research infrastructures.²⁸ Operational procedures will elaborate on the following, among other issues: (1) international orientation (including integration with international consortia); (2) collective access to knowledge and physical infrastructure; (3) effective integration of education, training, and research; (4) the scale of the critical mass and excellence of participants; and (5) dynamic turnover of researchers with equal opportunities for participating countries.

8. In addition, through its selection criteria the program is expected to promote the following: (1) the level of training provided, including the possibility of a bonus for postgraduate students; (2) the amount of cofinancing from the private sector; and (3) the possible impact of the project in developing the economic potential of a region, especially the effect of so-called smart specialization

9. Table 5 describes a proposed allocation of resources among the four lines of support, along with the expected outputs, outcomes, and link to the overall strategy.

²⁸ The proposed program will follow closely the experience of ERIC. It will also build on the experience of the European Strategy Forum on Research Infrastructures (see ESFRI 2012.)

Table 5: Estimated Costs, Expected Outputs, and Expected Outcomes for the Networks of Excellence Program

FIELD OF EXPERTISE	ESTIMATED COST (€ MILLION)	EXPECTED OUTPUTS	EXPECTED OUTCOMES
Network of Excellence in Marine Research (aquaculture)	10	<ul style="list-style-type: none"> 10 publications in high impact factor journals in co-authorship between Western Balkan's authors and foreign collaborators in the supported fields of research 	<ul style="list-style-type: none"> Increased productivity; EU environmental and safety standards achieved for selected economic activities (such as the shellfish industry)
Network of Excellence in Agricultural Research	15	<ul style="list-style-type: none"> 15 new PhDs completed in the supported fields of research 	<ul style="list-style-type: none"> Increased productivity of selected agricultural activities (such as wine production and organic products)
Network of Excellence on Renewable Energy (energy efficiency, etc.)	15	<ul style="list-style-type: none"> 4 region-wide agreement between public research organizations rationalizing the use of research resources through joint planning and execution of research activities in the supported fields 	<ul style="list-style-type: none"> Increased local provision of energy - efficiency solutions for the Western Balkan region
Network of Excellence on Nanotechnology for Health Care	15	<ul style="list-style-type: none"> 4 joint research agreements signed between researchers from the Western Balkans and the enterprise sector in the supported fields 	<ul style="list-style-type: none"> More efficient health care and medical services
Total	55	--	<ul style="list-style-type: none"> Improved research base and conditions for research excellence <ol style="list-style-type: none"> 1.1. Investing in human capital 1.2. Improving access to modern research facilities and availability of research funding

Project No. 3: Technology Transfer Program

1. **Motivation:** The impact of publicly funded research on innovation and economic development in the countries of the Western Balkans remains very limited. One barrier is the lack of links between research institutions and the private sector in most of the region. In addition, the development of supportive intermediation services and infrastructure for technology transfer, which are generally only in their initial stages, differs widely across countries.

2. According to the Survey on Research Infrastructure and Technology Transfer conducted by the World Bank, only 16 entities (26 percent of total responding firms; 18 percent of the total surveyed) stated that they have a technology transfer unit. All these units are quite young (less than 10 years old), and the funding allocated for their activities is quite limited (less than €50,000 per year). The lack of management skills for technology transfer between research and industry is also a serious handicap.²⁹

3. **Objective:** To make better use of the knowledge base for regional economic development through more extensive research-industry collaboration, marketable research, and value creation. The regional Technology Transfer Program will facilitate knowledge transfer from research to industry and spur new business potential by assisting research institutions in the deployment of technology transfer capabilities and the management and economic valorization of the regional research pool. It will complement ongoing initiatives in the area and look for formal interaction and synergies to enhance the transfer of knowledge and technology from research institutions to industry in the region.

4. **Description:** The Technology Transfer Program will undertake three types of activity: (1) technical assistance to technology transfer organizations operating at the country level, including help in creating them when needed; (2) matching grants for research-industry collaboration; and (3) advisory services and cofinancing for the development of science and technology parks.

- *Technical assistance activities* include training in technology transfer management, mentoring technology transfer activities, and transplanting best practices, including assistance in the creation and management of intellectual property rights (licensing and spin-offs, for example). Activities will be supported as part of a broader, medium-term capacity building plan to be agreed on with the program. Financial commitments from beneficiary entities are expected. An initial grant to establish the office and to make investments in intellectual property may be considered.
- *Matching grants for research-industry collaboration* will provide up to 50 percent of the funds needed for the joint research. (Alternatively, a maximum of 25 percent would be provided by the program with the additional 25 percent coming from the local governments.) The private sector will provide the remaining 50 percent. Applicants can come from either the academic or the business sector. The support provided by the program will be a maximum of €200,000 for a period of two years.³⁰
- *Technology parks for research-industry collaboration* will help governments identify the need for the technology park, develop its design, select its management, and supervise and monitor its implementation. When needed, cofinancing for the investment may be provided. The program will also assist in the restructuring of existing science and technology parks for better performance.

²⁹ Of 45 entities that do not have a unit for knowledge transfer or commercialization, only 4 declared that they employ people responsible for this activity.

³⁰ The program will be based on the experience of “voucher” programs. For a review on the that subject, see World Bank-OECD 2013.

5. Other mechanisms for financing the collaboration between research and industry may be considered based on demand and the experience with the proposed activities. These include a matching grant to foster business sector demand for knowledge services and an entrepreneurship program targeting young scientists and engineers.

6. **Governance:** The Supervisory Board of the WISE Facility will be responsible for supervising and guiding the operations of the program. The WISE Facility will prepare a detailed operational manual and guidelines, design the calls for proposals, and conduct monitoring and evaluation. The WISE Supervisory Board will appoint an Approval Committee, with a maximum of five persons, composed of members of the regional and international scientific community and the private sector; individuals will serve for a limited period of time (two years, for example). The Approval Committee will have final responsibility for project selection.

7. **Operational procedures:** Implementation and supervision of projects will be handled at the country level through a partner organization or PIU to be appointed by the corresponding government. In collaboration with the NPOs/PIUs, the WISE Facility will issue a regional call for proposals. The AC will select the project proposals through a public, transparent, and cost-effective process based on the recommendations of an international peer review panel appointed for the specific call for proposals and following standard international best practices for the selection of scientific research projects, in line with the general and program-specific funding objectives.

8. The operational manual for the research funds and the guidelines for the operation of each subprogram will provide the details of their functioning. Procedures will be established based on, among others, the experience of the World Intellectual Property Organization, the Association of European Science and Technology Transfer Professionals, and the EC-Joint Research Center's Technology Transfer Circle.

9. Table 6 describes a proposed allocation of resources among the three lines of support, the expected outputs and outcomes, and the link to the overall strategy.

Table 6: Estimated Costs, Expected Outputs, and Expected Outcomes for the Technology Transfer Program

PROGRAM	ESTIMATED COST (€ MILLION)	EXPECTED OUTPUTS	EXPECTED OUTCOMES
Technical Assistance	10	<ul style="list-style-type: none"> • 10 TT organizations developed • Staff trained 	<ul style="list-style-type: none"> • Research-industry collaboration increased as indicated by the rise in research organizations' share of income from coming from the business sector (through technical consultancy, training, contract research, and joint research) • Larger (triadic) patenting activity by Western Balkan countries • Technology licensing from the academy to the business sector and spin-off companies increased • Firms' graduation from technology parks increased
Matching Grants for Research-Industry Collaboration	20	<ul style="list-style-type: none"> • 100 joint projects between research and industry supported 	
Technology Parks	10	<ul style="list-style-type: none"> • 3 technology parks restructured • 3 new parks created 	
Total	40	--	<p>2. Research-Industry Collaboration and Technology Transfer promoted</p> <p>2.2. Soft support for collaboration and technology transfer provided</p> <p>2.3. Access and performance of technology and science and technology parks improved</p>

Project No. 4: Early-Stage Start-Up Program

1. **Motivation:** As discussed in the European Investment Fund study of November 2010, early-stage financing is almost nonexistent in the Western Balkans region. Angel investors and venture capitalists are a source not only of funding for potentially dynamic companies but also of business skills that are often missing in the region and a powerful mechanism for selecting projects with high growth potential.

2. A number of initiatives undertaken by the Enterprise Development and Innovation Facility will help improve access to finance by SMEs in the region, including a guarantee facility and a private equity fund dedicated to financing SME growth. A third initiative, the Western Balkans Enterprise Innovation Fund (a venture capital fund) will help improve the innovation financing in the region. Yet, a financial gap between research and the Enterprise Innovation Fund is noticeable, particularly in financing proofs of concept and prototypes (pre-seed and seed capital).

3. **Objective:** The Early-Stage Start-Up Program will provide business development services along with a select group of financial instruments (pre-seed and seed financing) to nurture growth in technology-based start-ups in coordination with national initiatives and serve as a pipeline to the Western Balkans's Enterprise Innovation Fund, other EDIF initiatives, and regional investors interested in later-stage financing.³¹

- In particular, the program will seek to attract and develop a network of investors in the Western Balkan countries and strengthen connectivity by establishing a network platform between local companies and local and international investors. The network should have local connections, be well integrated into the innovation cycle, and provide a global outlook.
- It will also support the consolidation of the deal flow across the region and the development of a potentially attractive pipeline of companies by providing business development services. In the longer run, this initiative should promote a healthy investment environment linked to foreign capital markets.

4. **Description:** The program will use both nonfinancial and financial instruments to support a viable long-term market for innovation finance. Existing activities will be leveraged through a series of instruments that promote funding for more companies alongside a syndicate of local, regional, and international investors and entities. The facility will deploy programs to train local investors as well as managers and help start-ups develop stronger business plans.

- *Matching grants for proofs of concept and prototypes.* This activity will involve the provision of matching grants to finance proofs of concept from SMEs and public research organizations. It is envisaged that the program will provide up to 80 percent of the funds needed for the project, in line with international best practices.³² The remaining 20 percent will come from the private sector. The support provided by the program will be a maximum of €200,000 for a period of two years.³³

³¹ The program should complement local efforts and secure connectivity of the investment space. Actual financial instruments should be further discussed and coordinated with relevant stakeholders in the Western Balkan countries as well as the European Investment Fund, the European Bank for Reconstruction and Development, and EDIF.

³² Israel funds 85 percent, and in Finland, government programs fund 75 percent of the costs of developing proofs of concept and prototypes.

³³ This activity will take into account the experience of Serbia's Innovation Fund and Croatia's BICRO programs.

- *Mentoring and business development services.* Business development services and mentoring (such as business plans and network platforms) will enhance the investment readiness of companies across the region in coordination with national entities.
- *Advisory services to investors.* This activity will include developing a one-stop shop for local and foreign investors who are looking to invest in companies and start-ups, will support capacity building on the investment side by establishing a knowledge base, and will provide training for local investors and companies.

5. The program will differentiate between proof of concept and prototype development projects; companies and public research organizations may be taken into consideration and different levels of support may be assigned to each type.

6. Based on experience with the initiatives described above, the program will consider the need to deploy other risk-mitigation instruments to attract potential investors, such as first-loss mechanisms.

7. **Governance:** The Supervisory Board of the WISE Facility will be responsible for supervising and guiding the operations of the program. The WISE Facility will prepare a detailed operational manual and guidelines, design the calls for proposals, and monitor and evaluate the program. The WISE Supervisory Board will appoint an Approval Committee composed of members of the regional and international scientific community and the private sector, with a maximum of five persons; individuals will serve for a limited period of time (for example, two years). The Approval Committee will have final responsibility for project selection.

8. **Operational procedures:** Implementation and supervision of projects will be handled at the country level through a National Partner Organization (NPO) or Project Implementation Unit (PIU) to be appointed by the corresponding government. In collaboration with the NPOs/PIUs, the WISE Facility will issue a regional call for proposals. The AC will select the project proposals through a public, transparent, and cost-effective process based on the recommendations of an international peer review panel appointed for the specific call for proposals and following standard international best practices for the selection of scientific research projects, in line with the general and program-specific funding objectives.

9. Table 7 describes a proposed allocation of resources among the three lines of support, the expected outputs and outcomes, and the link to the overall strategy.

Table 7: Estimated Costs, Expected Outputs, and Expected Outcomes for the Early-Stage Start-Up-Program

Program	Estimated Cost (€ million)	Expected Outputs	Expected Outcomes
Matching Grants for Proof of Concept and Prototype Development	30	<ul style="list-style-type: none"> • 300 proof of concepts and prototypes tested 	<ul style="list-style-type: none"> • More knowledge-based start-ups created • Investments in start-up companies increased • Investments in R&D by the business sector increased • Number of “innovative” SMEs increased (as described by the Community Innovation Surveys)
Mentoring and Business Development Services	5	<ul style="list-style-type: none"> • 100 business plans or bankable projects prepared 	
Advisory Services	5	<ul style="list-style-type: none"> • 20 consultations with foreign and local investors 	
Total Cost	40	--	Promote business investments in research and innovation and start-up creation

ANNEXES

List of Participants

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Dusan Vujovic
Economic Advisor

Consensus Building Activities

Workshops

Zagreb, Croatia

July 11, 2011

Preparatory meeting for the Launching Event of the Western Balkans Regional R&D Strategy for Innovation

Belgrade, Serbia

November 23-25, 2011

1st Quarterly Workshop – Advisory Body Meeting, Meeting of the Steering Committee

Sarajevo, BiH

March 27-28, 2012

2nd Quarterly Workshop – Advisory Body Meeting, Meeting of the Steering Committee

Dubrovnik, Croatia

June 18-19, 2012

3rd Quarterly Workshop – Advisory Body Meeting, Meeting of the Steering Committee

Tirana, Albania

November 19-20, 2012

4th Quarterly Workshop – Advisory Body Meeting, Meeting of the Steering Committee

Vienna, Austria

April 9, 2013

Meeting of the Steering Committee

Skopje, FYR of Macedonia

July 11-12, 2013

Meeting of the Steering Committee

Zagreb, Croatia

October 24-25, 2013

Ministerial Meeting (Endorsement of the Strategy and Action Plan, signing of the Declaration)

Meeting of the Steering Committee

Study Tours

Belgrade, Serbia

November 26, 2011

Study tour to the Institute of Molecular Genetics and Genetic Engineering.

Ston, Croatia

June 20, 2012

Study tour to the Mariculture Business Innovation Center (MARIBIC)

Outreach Missions

Brussels, Belgium

January 25, 2013

IPA 2013 Conference

Albania

January 28-30, 2013

Kosovo*

April 1-4, 2013

FYR Macedonia

April 4-6, 2013

Vienna, Austria

April 8, 2013

Meeting with WBC.INCO.NET and CEI

Vienna, Austria

April 10, 2013

Meeting on SEE 2020 Strategy – Smart Growth

Serbia

April 11-12, 2013

Montenegro

May 22-25, 2013

Bosnia and Herzegovina

June 24-27, 2013

Kosovo*

June 27 – 28, 2013

Follow up on the mission from April, 2013

Bosnia and Herzegovina

September 1-4, 2013

Follow up on the first outreach meetings in April, 2013

Croatia

September 5-8, 2013

Albania

September 9-10, 2013

Serbia

September 10-12, 2013

Meetings with the new Government Officials

Croatia

September 16-20, 2013

Ministerial Conference Preparatory Meetings

