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Workshop on Investment Vehicles and Financial Instruments supporting Technology Transfer and Innovation

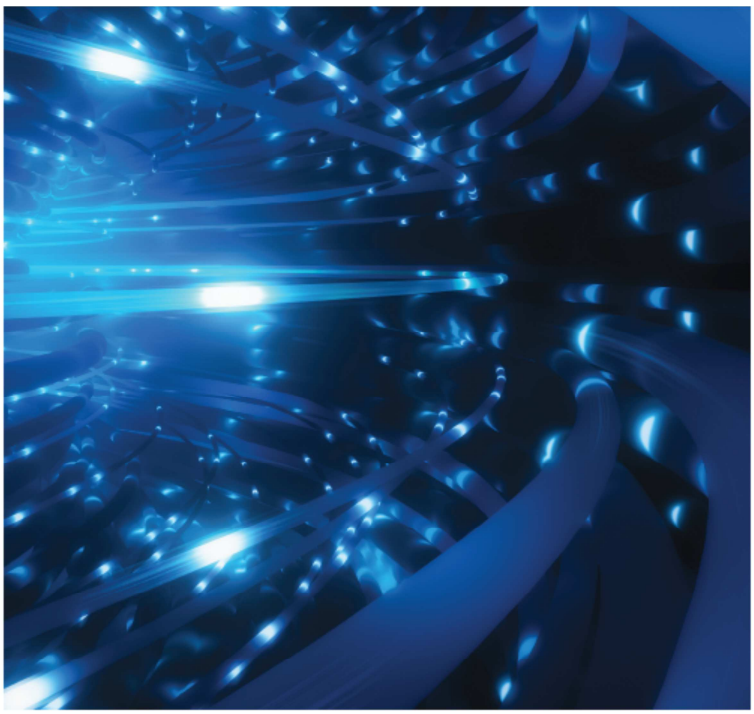
focus on the Danube Region and the Western Balkan countries

1-2 March 2017

Belgrade, Serbia

Željka BABIĆ

2017



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Introduction

The workshop was organised by the European Commission's Joint Research Centre (JRC) in collaboration with the European Investment Bank (EIB), European Investment Fund (EIF), World Bank, the EU Delegation in Serbia, University of Belgrade and the Science and Technology Park of Belgrade.

The objectives of the workshop were to identify existing financial instruments to support innovation and technology transfer activities in the Danube Region and the Western Balkan countries, to explore where the evident gaps exist and discuss ways to address currently unmet demand with synergistic solutions. The workshop aimed to strengthen and cement an emerging community of practice on these issues that should help to maximise impact on regional innovation.

The workshop stimulated exchange and discussion on the nature, features and the general suitability of existing financial instruments for the financing of different innovation and tech transfer projects (including start-up creation, joint ventures, licensing transactions etc.). The final results are a definition of the type of financing instruments necessary for the region (in the form of vouchers, financial products, enhancements of features of existing innovation funds etc.) and a plan to accelerate their creation.

The two days were attended by about 250 participants and additional 350 through the streaming link, including 40 speakers, from the European Commission (Directorate-General for Research & Innovation and the JRC), the EU Delegation in Serbia, EIB, EIF, World Bank, United Nations Industrial Development Organization (UNIDO), Organisation for Economic Co-operation and Development (OECD), World Intellectual Property Organization (WIPO), Regional Cooperation Council (RCC), regional chambers of commerce, funding organisations, science parks, public authorities, industries and academia.

While the first day was devoted to presentations of the existing programmes and funding opportunities, the second day focussed on the needs of priority sectors for the region, namely innovation for rural development, eco-innovation, biotech-innovation, and innovation in the creative industry.

Far from being an isolated event, the workshop is part of a process that the JRC Unit Intellectual Property and Technology Transfer has started in order to develop a community of innovators in the region with the support of Directorate-General for Neighbourhood and Enlargement Negotiations (DG NEAR) and Directorate-General for Regional and Urban Policy (DG REGIO). This culminated in the Macro-Regional Innovation Week held in September 2016 in Trieste.

This work is backed by a DG NEAR/JRC project EU4Tech Western Balkans[1] carried out by EY led consortium and senior consultants who will map the large number of available instruments and place them in a strategy and action plan to be possibly adopted at the Western Balkans Summit in July 2017.

The workshop was supported by the Enlargement and Integration Action (E&IA) of the JRC.

[1] Technology transfer capacity building in the Western Balkans, EuropeAid/137885/DH/SER/Multi

Acknowledgements

The lead author of this report is **Ms Lisa Cowey**, IPR and Innovation Expert and Key Expert 2 for EU4TECH Western Balkans. Other authors include **Ms Željka Babić**, **Mr Mattias Dinnetz**, both Policy Analysts in the European Commission's Joint Research Centre IPR and Technology Transfer Unit, **Ms Michela Magaš**, Founder of Stromatolite, a Design Innovation Lab, **Mr Massimiliano Rudella**, Coordinator of the working group on innovation and rural development in the AREA Science Park, **Ms Jelena Plavanski**, Head of the Centre for Ecology in the Chamber of Commerce and Industry of Serbia (Belgrade office) and **Mr Christophe Yvetot**, Head of the Liaison Office to the European Union of the United Nations Industrial Development Organization (UNIDO).

The Workshop on Investment Vehicles and Financial Instruments supporting Technology Transfer and Innovation had a significant organisational support and was hosted by the Belgrade University and its Centre for Technology Transfer and the Science and Technology Park of Belgrade.

The Centre for Technology Transfer of the Belgrade University was founded by the decision of the University Council in 2010, with the purpose of identifying, protecting and commercialising the results of scientific, research and expert work and the protection of intellectual property of the University of Belgrade. The primary goals and tasks of the Centre are:

- improving the possibilities for efficient and effective implementation of scientific and research results achieved at the University, with the goal of developing the economy and the society,
- encouraging the transfer of knowledge between the University and the economy,
- support for the placement of new technologies and innovations,
- linking relevant subjects, establishing a network and collaboration with the aim of intensifying the technology transfer,
- developing knowledge and skill in the protection and use of patents and other forms of intellectual property in the process of technology transfer,
- strengthening the awareness about intellectual property and the capacity for technology transfer at the University,
- providing general information on intellectual property,
- expertise and support in drafting feasibility studies in the fields of economy and technology, as well as the assessment of the value and total potential in the use of patents,
- help in establishing new innovation centres, incubators and business and technology parks which are founded by the University and the faculties that are part of the University.

The Science and Technology Park (STP) of Belgrade is established by the Government of Republic of Serbia (represented by the Ministry of Education, Science and Technological Development), the City of Belgrade and the University of Belgrade, with the aim to create a favourable environment for developing links between industry and science and research organisations and universities, knowledge transfer, new technology development, innovation commercialisation, networking and stimulating growth in the knowledge-based economy.

STP Belgrade is becoming a new technology core of the city that brings together domestic and foreign high-tech development companies and promotes start-ups by creating a favourable environment to innovation, technology development and competitiveness.

The 16,446 m^2 complex covers the land area of 6.6 hectares and is located in a peaceful environment of Zvezdara forest, 4.5 km away from the city centre. The proximity of relevant institutions, technical faculties and Mihajlo Pupin Institute in the immediate vicinity, is of key importance for technological development and innovation.

STP Belgrade is primarily intended for growing high-tech development companies, small businesses and start-ups. STP Belgrade offers an attractive service package of infrastructure and a business support services to its tenant companies, helping them accelerate their growth and provides the ideal environment for all businesses wishing to be part of a dynamic and interactive community, which creates value-added development through the exchange of ideas, contacts and business opportunities.

We would like to thank very warmly **all participants and speakers** of the workshop and the experts who contributed to drafting this report.

In conclusion, we hope that this report will be perceived by all those who participated as a fruitful rendition of the work performed together.

Joint Research Centre

The Joint Research Centre (JRC) is the European Commission's science and knowledge service which employs scientists to carry out research in order to provide independent scientific advice and support to EU policy.

As the European Commission's science and knowledge service, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle. Its work has a direct impact on the lives of citizens by contributing with its research outcomes to a healthy and safe environment, secure energy supplies, sustainable mobility and consumer health and safety.

The JRC draws on over 50 years of scientific experience and continually builds its expertise. Located across five different countries, the JRC hosts specialist laboratories and unique research facilities and is home to thousands of scientists working to support EU policy.

While most of our scientific work serves the policy Directorates-General of the European Commission, we address key societal challenges while stimulating innovation and developing new methods, tools and standards. We share know-how with the Member States, the scientific community and international partners. The JRC collaborates with over a thousand organisations worldwide whose scientists have access to many JRC facilities through various collaboration agreements. The JRC is a key player in supporting successful investment in knowledge and innovation foreseen by the Horizon 2020 Work Programme, the EU's programme for research and innovation.

The JRC is supporting EU cohesion policies – such as macro-regional and regional development, pre-accession and enlargement – with a set of instruments and competences including a smart specialisation platform, research and innovation, monitoring and training on intellectual property and technology transfer.

The JRC Directorate Competences aspires to put on centre stage and under the same roof a set of practical competences and experiences that have been developed and matured within the JRC.

Two JRC units have contributed to the organisation of the workshop:

- Intellectual Property and Technology Transfer Unit which is in possession of operational and technical expertise in the domains of Technology and Knowledge Transfer and whose flagship activities and tools (training, capacity building, studies) are highly relevant to the harmonisation and development of research and innovation in the Western Balkans, and
- Interinstitutional, International Relations and Outreach Unit which supported the workshop in the framework of the JRC's Enlargement and Integration Action. This Unit is coordinating, among other, all JRC activities in support of macro-regional strategies.

Abbreviations

BA	Business Angel
BDS	Business Development Service
DG	Directorate-General
E&IA	Enlargement and Integration Action
EBRD	European Bank for Reconstruction and Development
EDIF	Enterprise Development and Innovation Facility
EIB	European Investment Bank
EIF	European Investment Fund
EIP	Eco Industrial Park
ENIF	Enterprise Innovation Fund
ERDF	European Regional Development Fund
(I)FI	(International) Financial Institution
HEI	Higher Education Institution
HGIE	High Growth Innovative Enterprise
IP	Intellectual Property
IPA	Instrument for Pre-Accession Assistance
IPARD	Instrument for Pre-Accession Assistance in Rural Development
IPR	Intellectual Property Rights
IR	Investment Readiness
JRC	Joint Research Centre
(DG)NEAR	(Directorate-General for) Neighbourhood and Enlargement Negotiations
OECD	Organisation for Economic Co-operation and Development
PoC	Proof of Concept
PRO	Public Research Organisation
Q&A	Questions and Answers
R&D	Research and Development
RCC	Regional Cooperation Council
(DG)REGIO	(Directorate-General for) Regional and Urban Policy
S3	Smart Specialisation Strategy
SME	Small and Medium Enterprise
STP	Science and Technology Park
TRL	Technology Readiness Level
TTF	Technology Transfer Facility
TTO	Technology Transfer Office
UNIDO	United Nations Industrial Development Organization
VC	Venture Capital
WB	Western Balkans
WBIF	Western Balkans Investment Framework
WIPO	World Intellectual Property Organization

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Figure 1 Typology of Innovation Policy Instruments

Figure 2 Bulgaria's Fund of Funds

Figure 3 EIB Financing and InnovFin

Figure 4 EIF support initiatives and instruments

Figure 5 EIB Financing and InnovFin

1 Status and challenges in the region and Good Practice examples and solutions

Contributions to this area came mainly from the following speakers:

- **Viktor Nedović,** Assistant Minister for International Relations and European Integrations, Ministry of Education, Science and Technological Development, Serbia
- **Clément Brenot**, Economist and Team Leader, Organisation for Economic Co-operation and Development (OECD)
- **Giovanni Nicola Pes**, Deputy Secretary General of the Italian National Government Agency for Microcredit
- **Lisa Cowey,** IPR and Innovation Expert/ Key Expert 2 for EU4TECH Western Balkans
- **Paulo Guilherme Correa,** Practice Manager, Trade and Competitiveness, World Bank
- **Nedeljko Milosavljević,** Director, Centre for Technology Transfer, University of Belgrade, Serbia
- **Anwar Aridi,** Innovation Specialist, World Bank
- **Ljiljana Ršumović,** Project Coordinator, Science and Technology Park of Belgrade
- **Blagoy Stamenov,** Policy Analyst, Knowledge for Finance, Innovation & Growth Unit, Joint Research Centre (JRC), European Commission
- **Ivan Rakonjac,** Interim Managing Director, Innovation Fund, Serbia
- **Aleksandar Tasev,** Managing Director, Balkan Unlimited Foundation
- **Jasmina Popovska,** Director, State Fund for Innovation and Technological Development, the Former Yugoslav Republic of Macedonia
- **Mariyana Hamanova,** Co-Founder and Director Cleantech Bulgaria
- **Luigi Amati,** President, CEO & Co-Founder of META
- **Boris Golob,** CEO at STEP RI Science & Technology Park, University of Rijeka

1.1 Status and Challenges

The introduction to this session and others that followed on day 2 highlighted the progress that **Serbia** in particular has made in developing its national innovation ecosystem and introducing funding support using Instrument for Pre-Accession Assistance (IPA) funds. Particularly notable are early stage funds (mini and matching innovation grant schemes for Small and Medium Size Enterprises (SMEs)), the recently launched Technology Transfer Facility (TTF) targeting Universities and other public research organisation (PROs) with Proof of Concept (PoC) level support, and the sector focused collaborative grant scheme. The different schemes are showing measurable results and impact and will be continued using further IPA funding. Use of traditional venture capital (VC) is established and active in Serbia as well as interest in new forms of financing e.g. reward and equity based crowdfunding.

Good progress in **the Former Yugoslav Republic of Macedonia** to develop venture capital and policy frameworks and infrastructure for innovation was also highlighted by international organisations as well as the national Innovation Fund themselves.

This progress in Serbia and the Former Yugoslav Republic of Macedonia and emerging activity in Montenegro, combined with established activity in new EU Member State Croatia, is very encouraging as the countries of the Western Balkans share a past history and face many of the same challenges.

The challenge of poor linkages in the region between industry and PROs was highlighted by several speakers. Platforms and Technology Transfer Offices in **Montenegro** and **the Former Yugoslav Republic of Macedonia** to promote co-operation between SMEs and research institutions were noted as well as the role of the Science and Technology Park of Serbia in supporting start-ups and researchers to overcome common problems in bringing technology to the commercial market. Other recommendations to address these challenges in the region include a need for more flexible financing that is presently available and improvement to the legal and regulatory framework that would make collaboration more attractive for both parties.

Some challenges to public-private technology transfer are very specific to the region e.g. issues related to the lack of a clear regulation of the employer/ employee relationship relating to IP ownership and the role and responsibilities of both parties. Such a lack of clear regulation can inhibit

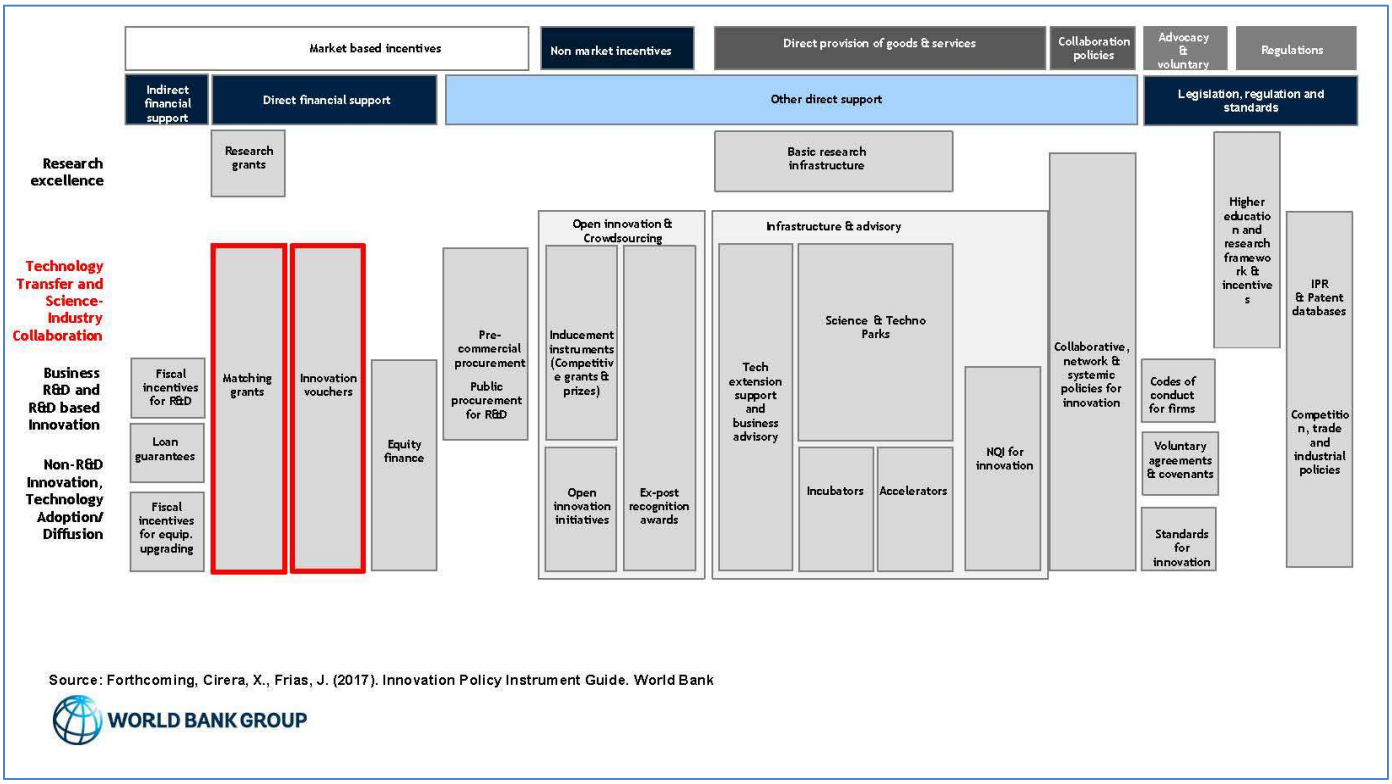
the use of early stage funds for technology transfer from publicly funded research institutions. This situation persists despite the lead taken by the EC in requiring clear action as a requirement to access H2020 funding.

Recent work by **OECD** related to access to finance for SMEs in the Western Balkans highlighted the following main challenges and recommendations

- Lack of alternative financing instruments.
- Even though various financial instruments are technically available, instruments like factoring could benefit from clearer legal frameworks;
- Lack of policies for an accessible funding and limited availability of credit information;
- Governments should encourage the establishment of private information bureaus or consider hybrids between private bureaus and public credit registries to help boost the scope and depth of credit information;
- Weak formal monitoring & evaluation mechanisms for financial literacy programmes;
- While financial literacy programmes exist in some form in all WB economies, formalised monitoring and evaluation frameworks can boost the performance of existing programmes.

Complimentary work by the **World Bank Group** looked at the challenges in stimulating more technology transfer from public research organisations in the region. A clear typography of instruments to support innovation policy was presented (see the Figure 1).

Figure 1 Typology of Innovation Policy Instruments



Source: Forthcoming, Cirera, X., Frias, J. (2017). Innovation Policy Instrument Guide. World Bank

WORLD BANK GROUP

The following main challenges and recommendations were made by the World Bank based on lessons learned in similar countries and regions:

- A strong Research System is a precondition for Technology Transfer policies
  - *Centrality of the scientific research reform agenda*
- Technology Transfer is more than establishing Technology Transfer Offices (TTOs)
  - *Informal knowledge transfer is as important, and not captured in metrics*
- Adopt an ecosystem approach
  - *Transactionally: intelligent public interventions should address bottlenecks on the supply and the demand sides*
  - *Institutionally: sustainable, long-term funding, targeting strategic specialisation areas*
- Do not underestimate the culture
  - *Time to build institutions' capacity and learning by doing*

The World Bank expanded on these more general finding with those emulating directly from work in the Western Balkan countries, noting that technology transfer requires more than finance and in particular broader reforms and a holistic approach including:

- Research excellence;
- Better definition of IPR and IP management capacity;
- Different regime for TTOs (not standard public sector organisations);
- Simplification of rules for collaboration science-industry and getting the incentives rights for the behaviour of key agents (researchers, TTO officers etc.);
- Bridging the "value of death" for PoC, Prototype and early stage/VC funding.

This approach was originally reflected in the four programmes proposed in the **Action Plan for the Western Balkans R&D Strategy for Innovation**[2].

The need for a very holistic and eco-system approach to innovation was reiterated by the **Innovation Fund in the Former Yugoslav Republic of Macedonia** who made the following 4 recommendations:

- Inclusion of all relevant actors in the eco-system through measures and support instruments targeted at start-ups, spin-offs, innovative SMEs, large companies, universities, incubators, accelerators, science and technology parks, TTO, etc.;
- Support for all phases in the product development cycle;
- Support for all phases in the business development cycle;
- Financial support together with capacity building and raising awareness.

The value of blending instruments was demonstrated through recent research in the region by the World Bank on **investment readiness** (IR). Companies that received intensive IR mentoring and training support were judged to performed much more highly on 6 key aspects of gaining access to finance than those that received more basic support.

1.2 Good Practice Examples

Possible approaches to improving the situation were introduced including the approach taken by the **Italian Government Agency for Microcredit**. The Agency has developed an integrated offer of microfinance products that allow the Agency to address the various needs of people experiencing difficulties in accessing conventional finance. These include:

- Microcredit;
- Micro leasing;
- Micro insurance;
- Housing microfinance.

All products are always combined with Business Development Services (BDS). These services are seen as a fundamental component of microcredit operations and include technical assistance, tutoring and monitoring. They are provided both remotely and face-to-face to the beneficiary both before the provision of microcredit, and during the repayment phase.

Transfer of the model to other countries and regions e.g. the Western Balkans, require study and analysis of the market and existing regulations followed by a proposal for changes to legislation before launch and piloting of support.

Policy instruments to support high growth for innovative enterprises were proposed by the **High Growth Innovative Enterprises (HGIE) team,** (JRC Unit Knowledge for Finance, Innovation and Growth). These are shown below.

[2] https://openknowledge.worldbank.org/handle/10986/16626

Types of policy instruments

	Public funding	Facilitation	Regulation
Direct support	• Direct grants for HGIE	• Networking platforms	
Equity	• Public VC funds • Fund-of-funds • Equity guarantees	• Support for accelerators	• Stock market entry regulation • VC tax treatment • Crowdfunding regulation
Debt	• Direct loans for HGIE • Loan guarantees		• Crowdfunding regulation

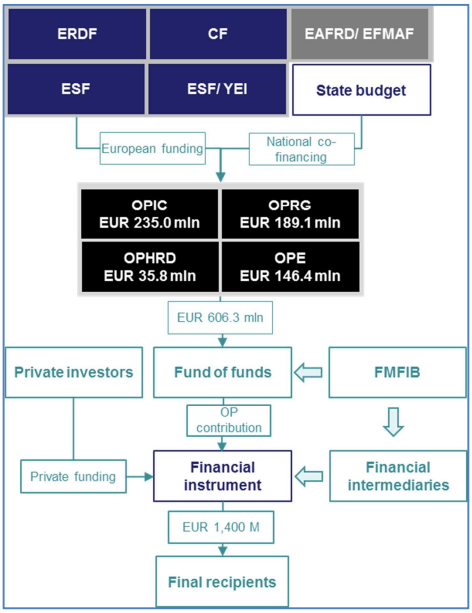
I

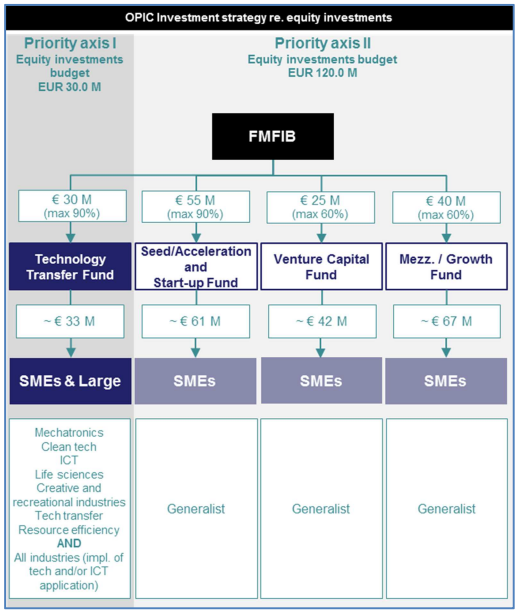
It was noted that:

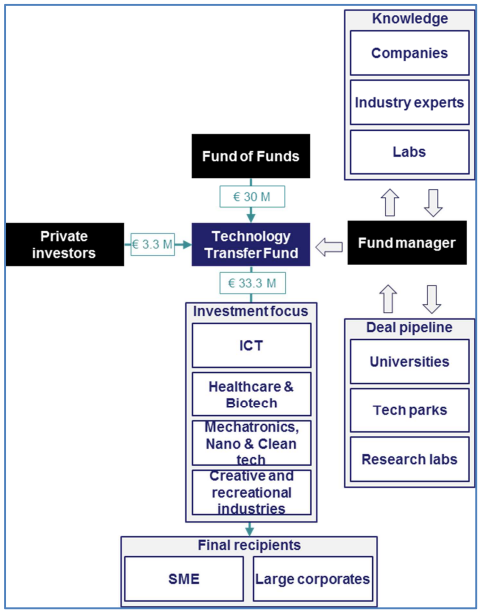
- Equity instruments appear to have a stronger effect on HGIE than debt and tax instruments;
- Co-funding accelerators: low cost, no regret policy option to complement financial instruments;
- Coaching and networking supplements increase scheme efficiency.

Other approaches to holistic funding for technology transfer and innovation were presented including the case of **Bulgaria** where EU Financial Institutions (FIs) are being implemented under the operational programmes via a national investment vehicle structured as a **"Fund of Funds"**. This approach is shown below.

Figure 2 Bulgaria's Fund of Funds







EIB also presented their approach and experience in managing Structural Funds in an innovative manner e.g. JESSICA[3]. Aimed at promoting integrated, sustainable urban-renewal projects in urban areas, the EIB has so far created under this programme EU-wide 18 Holding Funds (funds of funds), which were invested into 41 Urban Development Funds and 2 Technical Assistance Funds, with a total of EUR 1.8 billion under management. A good practice examples presented was MIUR (Italy).

While such "fund of funds" funds can be a strong tool, the EIB also emphasised that their development and use is a complex process.

European Regional Development Fund (ERDF) and "off the shelf" instruments

Off the shelf instruments to support technology transfer and innovation were also praised including the **co-investment facility** to provide funding to start-ups and SMEs. This support enables them to develop their business models and attract additional funding through a collective investment scheme managed by one main financial intermediary. Total investment combining public and private resources can amount to up to EUR 15 million per SME.

In the 2007-2013 period, SAS JEREMIE in the French region of Languedoc-Roussillon was an example of such a co-investment facility, using ERDF resources to attract private capital and invest in high-tech SMEs in the region.

The following lessons learned were linked to use of the **co-investment facility:**

- A deal by deal co-investment approach at seed level is key to leverage at its best the contribution of the private sector;
- Co-investment facility (not only the fund but also services) may include grants and advice to improve impact (investment readiness and scouting activities);
- Commercially driven fund manager is necessary to align interests, take the necessary risk and build the adequate portfolio;
- The co-investment instrument attracts more private investors (Business Angels (BAs), VCs) and contributes to professionalisation of the local community of business angels.

[3] http://www.eib.europa.eu/products/blending/jessica/index.htm

2 International financial instruments active in the region – approach, target groups, experience

Contributions to this area came mainly from the following speakers:

Day 1:

- **Alessandro Fazio,** Policy Officer, Joint Research Centre (JRC), European Commission
- **Patrick McCutcheon,** Policy Officer, Directorate-General for Research and Innovation, European Commission
- **Jean-Luc Revereault,** Head of Strategy - Advisory Services Department, EIB
- **Dragan Šoljan,** Advisor, Western Balkan Enterprise Development & Innovation Facility (WB EDIF), EIB
- **Andrea Bua**, Head of Unit, Financial Instruments Adriatic Sea Department, EIB
- **Piyush Unalkat**, Head of Technology Transfer Investments, EIF
- **Marco Giuliani**, Mandate Manager, EIF
- **Fabio Serri**, Regional Head for SME Finance and Development in the Western Balkans, European Bank for Reconstruction and Development (EBRD)
- **Christophe Yvetot**, Head, Liaison Office to the European Union, UNIDO

European Investment Bank (EIB)

The EIB is the leading international financier in the Western Balkans and has been active in the region since 1977. Over the past 10 years, the Bank has financed projects totalling EUR 6.8 billion. Last year the EIB signed financing contracts amounting to EUR 380 million in the Western Balkans. Total disbursements were EUR 520 million.

Western Balkans Enterprise Development and Innovation Facility (WB EDIF)

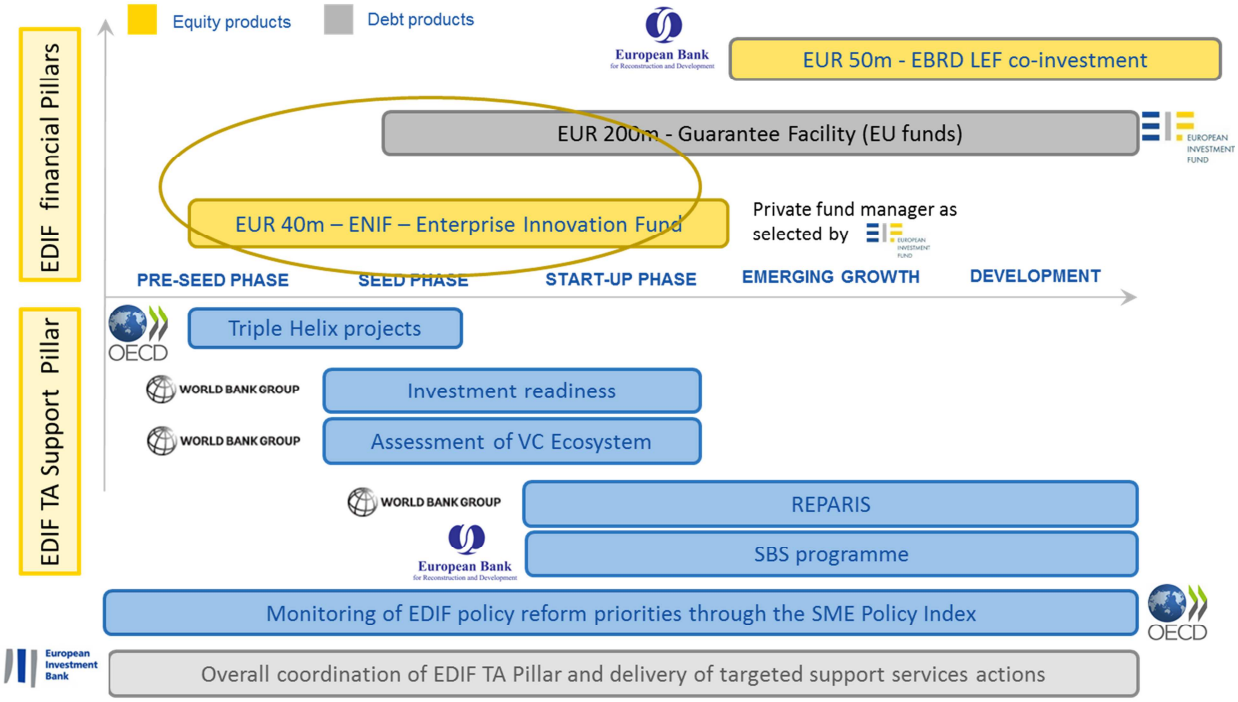
The Western Balkans Enterprise Development and Innovation Facility (EDIF) was launched in December 2012 at the initiative of the EIB Group and the EBRD and with the support of the Western Balkans Investment Framework (WBIF) as a new complementary measure for improving access to finance for SMEs and supporting economic development in the region. This platform, coordinated by the EIF, the EIB's arm specialised in supporting Europe's micro, small and medium-sized businesses, was created with the aim of promoting the emergence and growth of innovative and high-potential SMEs as well as the creation of a regional venture capital market. The initial capital is EUR 145 million, provided under this facility by the EU, International Financial Institutions (IFIs), beneficiaries and bilateral donors. This amount will effectively translate into over EUR 300 million of direct financing for high-growth and innovative SMEs in the region. The EDIF will complete the EIB's supporting activity in the Western Balkans (lending with traditional loans, assistance via the WBIF and private equity and venture capital via the EDIF) and thus promote the development of the Western Balkans' economic base, an essential precondition for reducing the region's dependence on assistance from abroad.

There are four pillars in the EDIF:

- Enterprise Innovation Fund (ENIF), a venture capital fund managed by a fund manager selected by the EIF;
- Enterprise Expansion Fund (ENEF), an expansion fund managed by EBRD;
- Guarantee Facility, managed by the EIF;
- Support Services, managed by the EIB Group.

2014 saw a fast take up of the guarantee activities with most of the budget available already committed, while the equity funds entered into their operational phase. The activities under the Support Services pillar also started to be rolled out in partnership with the Implementing Organisations (OECD, World Bank and EBRD) as shown below.

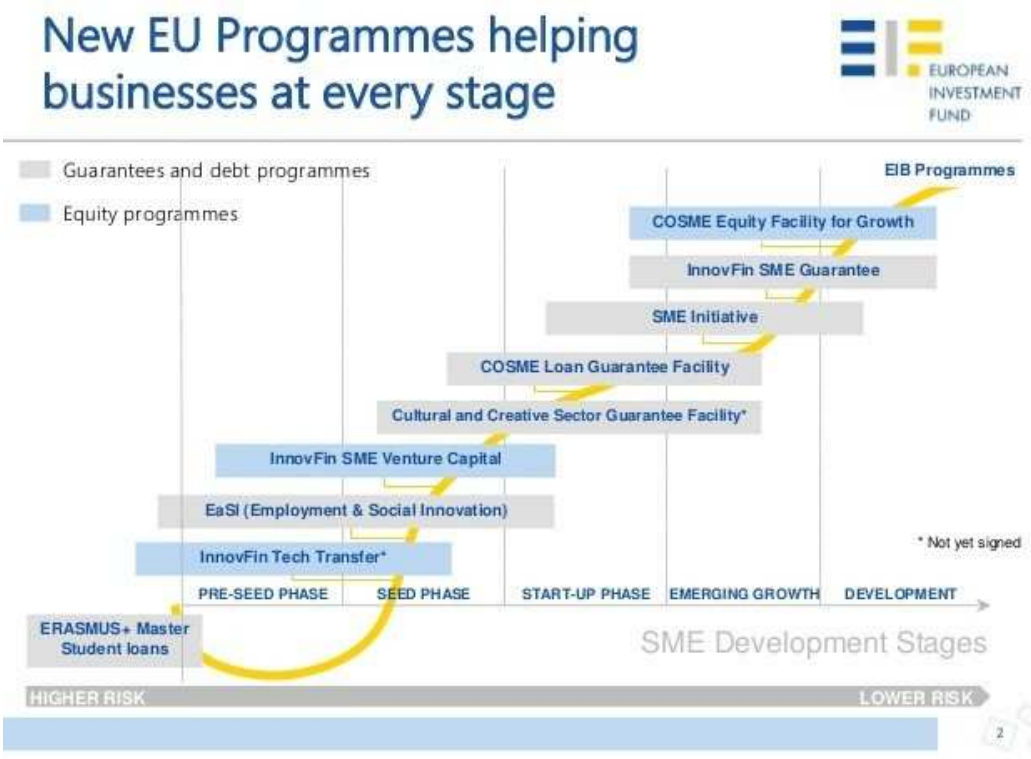
Figure 3 EIB Financing and InnovFin



The European Investment Fund (EIF)

A number of financial instruments have been developed by the **EIF** to cover all stages of enterprise development. The full portfolio is shown below.

Figure 4 EIF support initiatives and instruments



However, only some of these are available for the Western Balkans region. These include the European Investment Fund's **InnovFin** (shown in detail in the Figure 5 below) and in particular **InnovFin Technology Transfer** part of the InnovFin Equity financial instruments supported by Horizon 2020 ("Access to risk finance" programme).

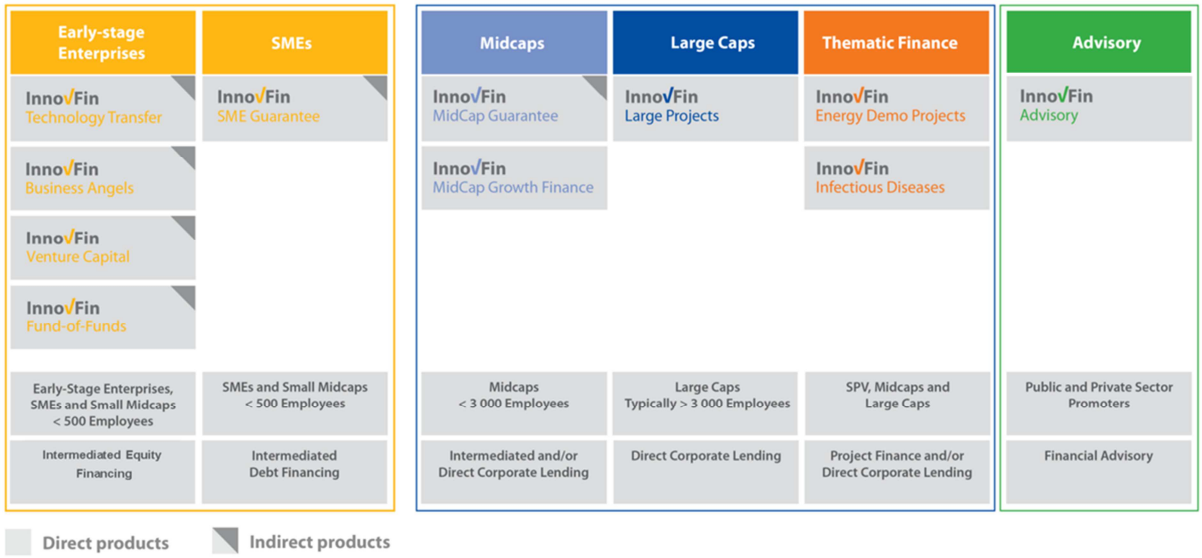
While the InnovFin family are designed to cover the full spectrum of SME development, InnovFin Technology Transfer targets the PoC stage of Technology Readiness Level (TRL3).

An InnovFin Technology Transfer Accompanying measure has been established (PROGRESS-TT) to build capacity in TTOs to make use of the funds in the future.

Also available is the SME instrument, targeting TRL6 and above.

It is notable that this family of funds is aimed at enterprises and it is not of use to PROs and Higher Education Institutions (HEIs) directly. However, InnovFin Technology Transfer instrument is designed to invest on pari-passu terms through co-investor/TT fund. This decentralised approach would enable the fund to invest in accredited TT funds. This may make its use/ take up limited in the Western Balkans where no such dedicated funds exist and capacity to manage them is presently low.

Figure 5 EIB Financing and InnovFin



United Nations Industrial Development Organization (UNIDO)

UNIDO is supporting sector specific activities in the Western Balkans and in particular:

- Building eco-industries for a circular economy (Albania, Bosnia and Herzegovina, the Former Yugoslav Republic of Macedonia, Montenegro and Serbia);
- Supporting agro-industry, creative industries and entrepreneurship;

Examples on ongoing activities in this second sector include:

- **Bosnia and Herzegovina**
  - *Strengthening the quality system of technology and industrial products and services.*
- **the Former Yugoslav Republic of Macedonia**
  - *Fostering sustainable linkages and cluster development in the national tourism industry.*
- **Montenegro**
  - *Enhancing the competitiveness of local SMEs in Montenegro through cluster development.*
- **Serbia**
  - *Facilitating international market access for manufacturing suppliers in the automotive component industry in Serbia.*

UNIDO strongly support cluster formation and development including those in the creative industries. This is still in its early stages in the Western Balkans but a project is planned in Albania under the Country Programme.

3 Regional ecosystem and actors – experience exchanged

Strong presentations were made by the Science and Technology Park / Incubator Belgrade (Serbia), the Centre for Technology Transfer, University of Belgrade, and the Innovation Fund, Serbia. The region was more widely represented by the State Fund for Innovation and Technological Development, the Former Yugoslav Republic of Macedonia and the STP Rijeka (Croatia).

Considerable experience exchange took place during the networking events with time for formal Q&A session somewhat short due to the number of presentations.

One important issue was raised by a member of the audience who noted the need to involve more entrepreneurs in the policy making process. This is an approach promoted during formulation of a Smart Specialisation (S3) (the process of *entrepreneurial discovery*) and as the economies of the Western Balkans are now starting the process of the S3, this comment is worth noting.

4 Sector specific challenges in access to finance

4.1 Agri-food industry – with focus on rural development and social innovation

Rural development in the IPA region is strongly inhibited by specific barriers to gaining access to existing IPA funds. A working paper has been developed that identifies these barriers and purposed actions to overcome them. This would then release more funding for the region. The initiative is being led by the AREA Science Park who coordinates a working group on innovation and rural development.

The round table aimed to present an innovative model in the rural development sector, based on a coordination between traditional sectors of rural areas (agriculture, agro-food industry, rural tourism) with new management methods (Technology Parks - Research institutions together with the Local Action Groups and the classic actors of rural development) and innovative technologies suited to strengthen and develop the traditional rural activities (electronic noses, electronic identity cards for agro-products, genetic mapping and certifications etc.).

In terms of new financial instruments, an innovative model was proposed based on the optimization of two already existing funds as Rural Development Programme - LEADER (Instrument for Pre-Accession Assistance in Rural Development (IPARD) for pre-accession countries) and the funds for innovation (e.g. The Innovation Fund), in the context of the Smart Specialisation Strategy (Agro Industry).

This model was contextualised from a detailed analysis of the WB countries situation related to the EU Pre-Accession (IPARD funds and assistance to policy makers in order to complete their strategic programs in the sector in order to unlock the financial resources to replicate this model in WB).

A key outcome of this sessions was that representatives at the roundtable (Bosnia and Herzegovina, Serbia, Montenegro, Albania, the Former Yugoslav Republic of Macedonia, Moldova and Ukraine) agreed to join together to try and develop an integrated program of technical assistance in the field of "innovation in rural development" starting from the document presented. The first activity will be focused in a workshop to be organized in the next few months focused on IPARD Policies - S3 and Innovation.

This initiative does exclude Croatia as it is no longer eligible for IPA funding.

4.2 Biotech industry - focusing on medical and life sciences projects and innovation

The key take-home messages from the roundtable on Biotech industry were:

A need to

- Protect results, prior to entering into discussion with industry;
- Avoiding adopting a restrictive approach at the outset e.g. keep options open, discoveries are often serendipitous;
- Make wider use of research, identify target markets and get skilled labour;
- A need to upgrade/ internationalise activities and funding e.g. WIPO, EIF, EIB, European Commission.

The communal nature of TT:

- Collaborate to integrate necessary knowhow, legal, technical, regulatory, TT related – a lot is available;
- Boosting of university-industry collaboration;
- Charge properly for your R&D and new products;
- Innovation can only happen with education.

4.3 Creative industries – focusing on social entrepreneurship and social innovation

The main aspects covered during the discussion were:

- Policy and policy reform;
- Entrepreneurship ecosystem;
- Access to funding;
- The importance of networking.

The most important takeaways from the meeting were:

- There is a need to introduce intelligent support structures to manage Innovation IP and early market adoption where currently regulations or bureaucracy are providing barriers and inhibitors. Such new support structures would help to stimulate the Innovation ecosystem;
- Project scale-up is being inhibited by a lack of early stage funds;
- Process development and implementation is being inhibited by a lack of experience and/or administrative burden;
- STPs have a critical facilitation role to play for start-up including logistic and administrative support, networking and sharing of know-how;
- Regarding securing funding from EU funds, the main issue raised, beside the "usual" Eurocratic burden, is a need to make feedback from the Commission more constructive;
- Mentoring is extremely important and useful;
- It is important to take an informative guess when trying to attract investors; to explore the market readiness; to collect data beforehand informing investors whether public or private, as the data is equivalent to cash value;
- It is very important to build up partnerships between large companies and start-ups;
- For start-ups whose business model is oriented towards government/public sector the problem is the bureaucracy and slow administration;
- Start-ups in the region are very often blocked with incapacity to get a loan for their businesses as they usually do not have any guarantees. One of the solutions is that the state helps during this early stage of financing.

4.4 Eco-industry – innovation with environmental impact in the region

- **Training (skills) for entrepreneurs**

One of the main issues that came out after a discussion with the participants of the round table was that there is a lack of entrepreneurial skills in education in order to commercialise their innovation. A lot of innovation stay in laboratories, or the owners do not make good agreement with buyer just because they lack skills and knowledge.

There are various programs and trainings for developing missing skills already available. The trainings on entrepreneurship can also be organised in any company, faculty or Chambers of Commerce by local experienced/successful entrepreneurs.

- **Eco-industrial parks – circular economy**

As mentioned in the UNIDO Global Assessment of Eco-Industrial Parks, "Industrial Parks in emerging and developing countries provide an institutional framework, modern services and a physical and often social infrastructure, which might not be available in the rest of the country. The concentration of companies can foster innovation, technological learning and company growth. Economies of scale of the supply of services and facilities reduce the costs for companies, thus successful Industrial Parks contribute to high growth regions and national economic development. However the economic gains often come at a loss of environmental quality within and around industrial estates. Environmental issues have often not been fully considered and integrated into the planning and construction of Industrial Parks (UNEP/SEPA, 2001).

There is a difference between creating green industries and the global process of the greening industries (UNIDO, 2011).

An industrial park in which companies cooperate with each other and with the local community trying to reduce waste and pollution, efficiently share resources and help to achieve sustainable development, with the intention to augment economic gains and improve environmental quality, can be called an Eco-Industrial Park (EIP).

A key lesson is that EIPs simultaneously require innovations in business relations, between companies, and resource flows (Van Berkel in UNIDO, 2012). The benefits for all involved enterprises include reduced net waste generation and/or resource consumption; the adoption of new technologies towards resource conservation; the creation of new products and the provision of environmental services to urbanized areas. The identification, evaluation and eventual realization of such innovations involve both the assessment of industrial processes and their resource consumption and by-product generation, as well as synergies and networking among enterprises. Third party facilitation is critical for such eco-innovation and can contribute to embedding environmental awareness and action at the level of enterprises and their staff."4

As proposed by UNIDO, the identification of existing Industrial Parks in the Western Balkans and their transformation into Eco-Industrial Parks could accelerate the implementation of the circular economy objectives and stimulate innovation, public-private investments and job creation. Some Industrial Parks could be selected for a pilot phase that could then be deployed to other in a second phase.

- **Circular economy**

Every day we are facing with a lot of environmental problems like climate change, water pollution and others. Almost every day there is less and less raw materials. 5 Till the end of this century, some materials will disappear and air will be more polluted, climate change will increase even more. The European Commission is making some steps in order to respond to those challenges. There are many new initiatives, such as a new initiative on raw materials, 6 Circular Economy Strategy, 7 Circular Economy Action plan and others.

Western Balkans countries are at very beginning of thinking of, developing and implementing the circular economy concept. The main common problem for the WB countries is a low economic development. On the other side, one of the main Circular Economy benefits is creating new business that could boost the country's economy.

In this moment, Serbia is in preparation process of adopting its Strategy for Circular Economy. The results will not be immediate, but it is important to start working on this. In each WB country there are a few companies that already work under the Circular Economy concept and they can be used as good example for others. Their existence and operation mean that at any level of economic development, this concept is possible.

The regional Chambers of Commerce already have information about these companies and they should, together with European Commission and other stakeholders, start promoting the benefits of this economic concept.

It could be useful to create a Regional Strategy for Circular Economy for the Western Balkan countries. The UNIDO project "Transition to a circular economy in the Western Balkans" could serve as a base in order to enable the Strategy to have a long term impact.

The transition to a more circular economy in the Western Balkan countries, where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised, is an essential contribution to the EU's efforts to develop a sustainable, low carbon, resource efficient and competitive economy. The circular economy will boost the competitiveness in the countries by protecting businesses against scarcity of resources and volatile prices, helping to create new business

[4] "Global Assessment of Eco-Industrial Parks", United Nations Industrial Development Organization (UNIDO), November 2016. Available here: https://www.unido.org/fileadmin/user_media_upgrade/Resources/Publications/Envionment/2016_Unido_Global_Assessment_of_Eco-Industrial_Parks_in_Developing_Countries-Global_RECP_programme.pdf

[5] Raw material database: https://ec.europa.eu/growth/tools-databases/eip-raw-materials/sites/rawmaterials/files/4-EIT_Raw%20Materials_Supporting%20creation%20of%20new%20business%20and%20entrepreneurs_K.Hanghoj.pdf

[6] http://www.reecover.eu/wp-content/uploads/2016/10/Karen-Hanghoj_EIT-RawMaterials_presentation.pdf

[7] http://ec.europa.eu/environment/circular-economy/index_en.htm

opportunities and innovative, more efficient ways of producing and consuming. It will create local jobs at all skills levels and opportunities for social integration and cohesion. At the same time, it will save energy and help avoid the irreversible damages caused by using up resources.

- **Dual education**

Dual education system was present in Yugoslavia and it had a lot of success. By time this system almost completely disappeared in all new countries in the Balkans. Today there are efforts to re-establish the dual education which, inter alia, would increase the entrepreneurial spirit in science.

However, there is a need to analyse and identify the industry needs. Based on the results the reforms in education systems will be possible and this would help the graduates to start their own business or get a job in a company of their interest.

The regional Chambers of Commerce could be very useful in implementing dual education trough trainings, funding companies, analyses and researches.

- **Regional strategy**

A Regional Strategy could be one of the crucial documents and inputs to the Danube Region and Western Balkan countries. If we take a look on industry sector in each WB country, we will see that most of them are looking for expanding their jobs across their country borders. The similar situation is with Universities, Faculties, Technology Transfer Centres and all other stakeholders. Working as a regional team, it would be possible to make better and more quality results.

A good example could be the Four Asian Tigers (the economies of Hong Kong, Singapore, South Korea and Taiwan). One of the crucial elements for their economies' success is education, good environment for investors allowing other countries to develop ideas using the local knowledge and sources, and specialisation in areas of competitive advantage (smart specialisation). After those pioneer steps, those four countries became independent, innovative economies and maintained exceptionally high growth rates.

The EU has its own Strategy with the same goal – the European Semester which provides a framework for the coordination of economic policies across the European Union. It allows EU countries to discuss their economic and budget plans and monitor progress at specific times throughout the year.

- **Mentoring or coaching programme**

In WB countries there are no national programs for mentoring or coaching. Slovenia has it and the programme shows great results. The main takeaway is that researchers and entrepreneurs need to work together in order to optimise the commercialisation of innovation.

A regional pilot project would be useful for all WB countries in order to identify main problems and needs, and according to the results to make a proposal for a mentoring program for each country.

- **Coordinating activities and networking**

Involving all relevant stakeholders, lack of cooperation and communication are usual problems in all sectors in all WB countries. Networking and awareness raising events, databases, single coordinating body are some of the proposed solutions.

- **Financial innovation**

The lack of an instrument for financing the early stage innovation was identified as the main problem also at this round table.

- **Involvement of chambers of commerce**

The Chambers of Commerce should be more involved as business representatives in making instruments and conditions of calls for projects. There are some local calls that are not adapted to current economy environment. The Chambers of Commerce could serve as a mediator between the Governments and their institutions and the industry, as they have a clearer view of possibilities and industrial needs. The bigger involvement of Chambers of Commerce in making instruments and conditions of calls for projects could be crucial for success of future calls for projects.

The main identified problems here are lack of data from industry, limited resources, transparency, administration.

5 Conclusions

The Workshop on Investment Vehicles and Financial Instruments supporting Technology Transfer and Innovation was a well-attended meeting with a wide variety of participants and presenters. Both number of participants and their levels of interaction with each other and the speakers indicated how engaged and relevant they find the present topic.

Distilling the comments and questions from both Day 1 and Day 2 leads to the conclusions that despite one or two examples, **the region is largely missing early stage support instruments for Technology Transfer**. However, it is also clear that any intervention needs to be highly holistic, supporting development across the full eco-system and able to address or accommodate the present level of development of framework conditions, quality of R&D and maturity of the pipeline of projects, structure of the R&D sector, existence and maturity of external support organisations and services and capacity to both manage and adobe funds.

Herewith we present some of our specific observations:

1. **Improvement of regulatory framework** (e.g. tax system, education, skills and IPR regulation at universities and PROs) **is a precondition for successful implementation of financial instruments**. The impression from the meeting and many presentations was that there is a strong pressure to put more money in the system, but without a strong commitment to improve the system itself.

2. **New instruments**, especially PoC or any other early stage financial instruments, **should fit well to the existing system**, supporting all phases of product/company development, and should not be implemented as a stand-alone instrument. **Any instrument to be successful needs an appropriate ecosystem.** The ecosystem predefines the need and concept for new instruments.
3. Solid **demand analysis** in close dialog with business stakeholders (incl. young entrepreneurs, entrepreneurial researchers, etc.) should be prepared before new instruments are being designed and implemented.

4. Countries in the region should not overestimate **the role of the innovation infrastructure** (e.g. Science Technology Parks, Technology Transfer Offices, Incubators, etc.). Parallel efforts should be invested in the development of a project pipeline (mentoring, coaching, idea development and acceleration).

5. The **regional (supranational) approach** should be strongly supported due to limited national project pipeline and critical mass necessary to achieve high level and competitive results through region-wide financial instruments.

6. Money is important, but in underdeveloped markets (countries), **the cultural contexts** (e.g. lack of trust, corruption risks, etc.) are important and should be taken into account in designing new instruments.

7. **Combination of capacity building and PoC or other early stage financing in one instrument should be taken into account** (e.g. instrument with grant component for selection of projects, investment readiness activity and feasibility studies combined with early stage investment instrument run by Science and Technology Park or incubators). There are ample good practices available.

8. There are few coordinated instruments that aim at linking (closing the gap) **R&D with business**. This link missing would always be an impediment to both sides, the research and the business; for the former to commercialise, for the latter to become more innovative.

9. In addition to many instruments presented, there is hardly evaluation of their performance. For some, which are young, this may be understandable. **Monitoring the performance of financial instruments** is essential nowadays

Annex – Results of the online questionnaire

Number of respondents: 57

Questions:

Q1: From which country do you come from?

Q2: How did you learn about the workshop?

Q3: Overall, how would you rate the workshop?

Q4: What is your opinion on the general organisation and the quality of the facilities of the workshop?

Q5: What do you think of the overall quality of the speakers?

Q6: How helpful and applicable to your job was the content presented at the workshop?

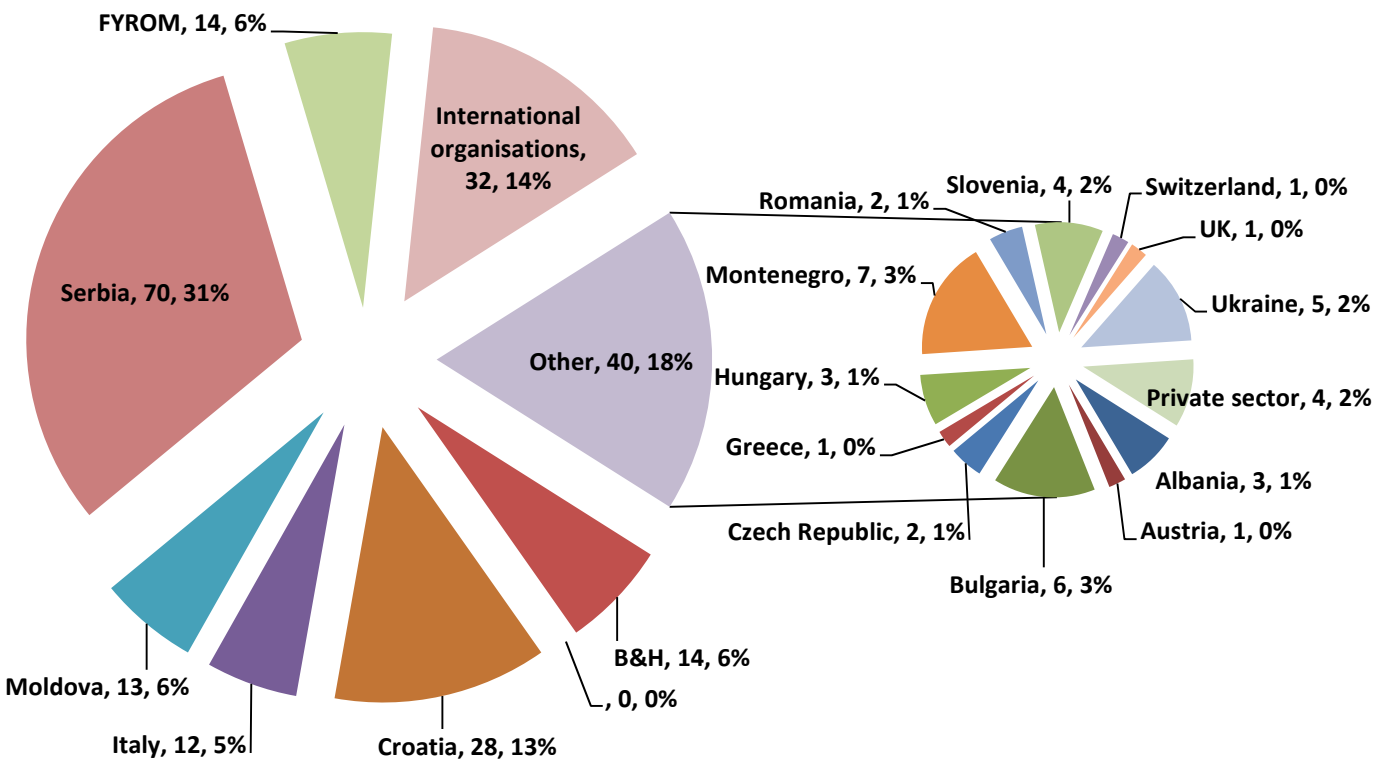
Q7: How valuable were the networking opportunities at the event?

Q8: Which round table on 2 March did you attend?

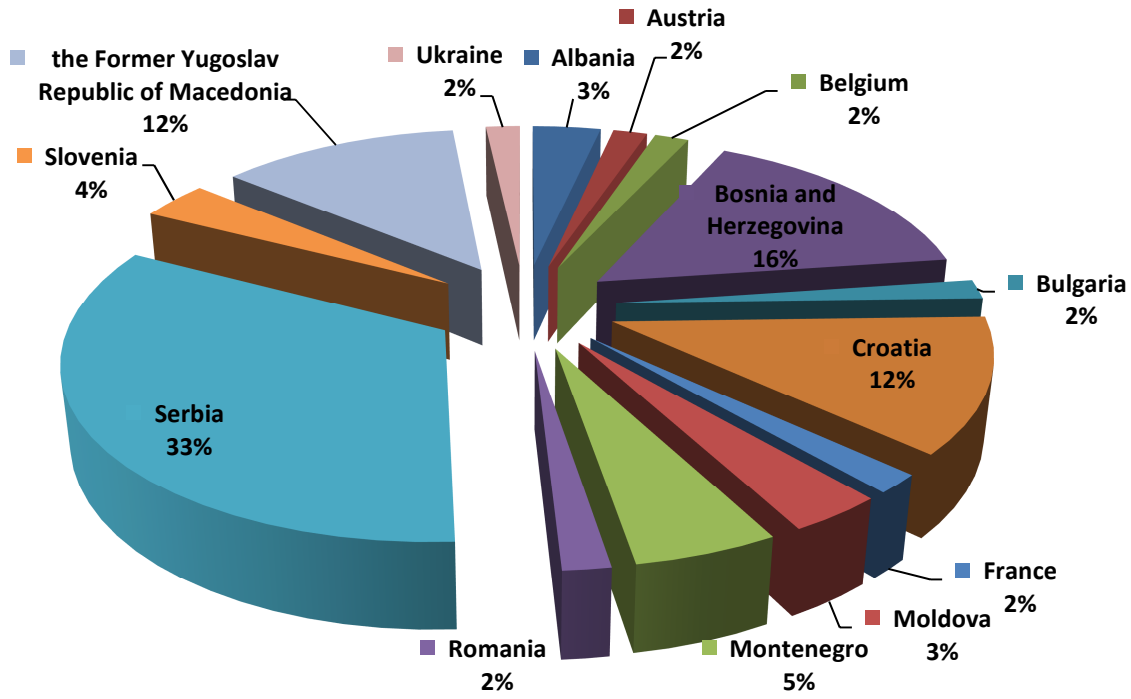
Q9: Please rate how relevant the round table you attended was to you.

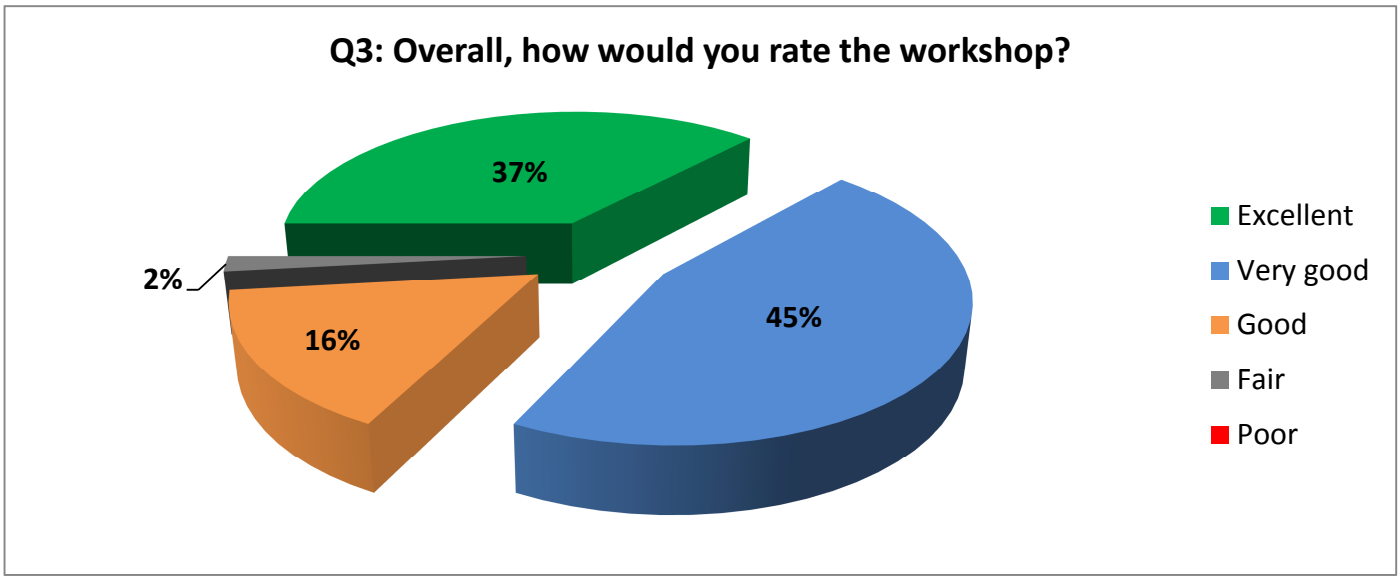
Q10: What was the single most valuable thing you learned at the workshop? Please also share your suggestions, comments, ideas for the future. (some replies)

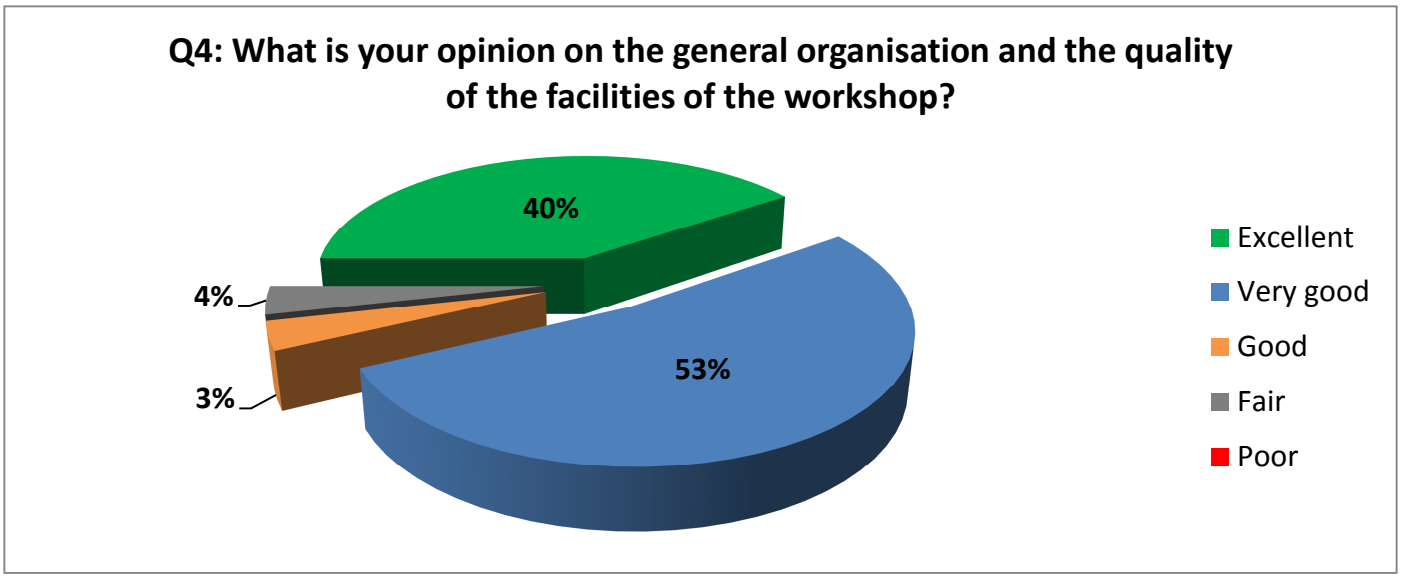
172 participants from the Western Balkans and Danube regions (70% of the total number of participants)

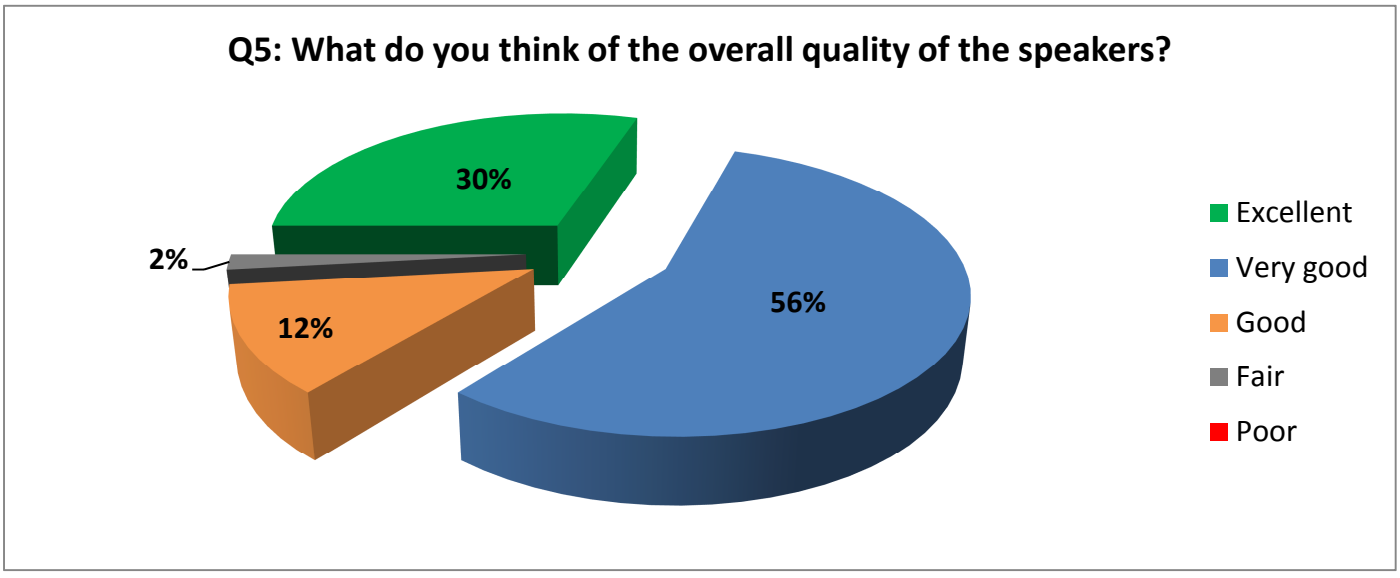


Q1: From which country do you come from? (questionnaire respondents)

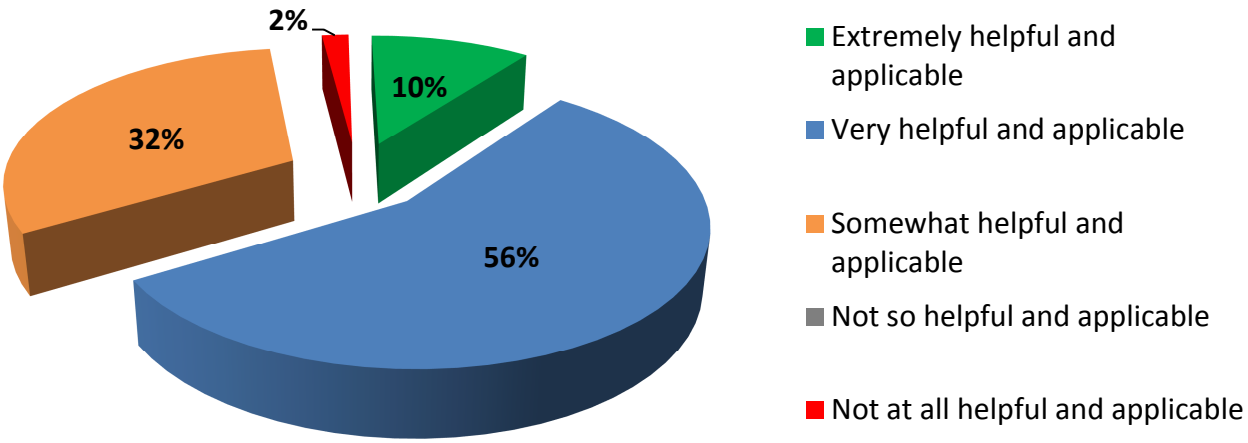



Q3: Overall, how would you rate the workshop?
37%
45%
16%
2%
Excellent
Very good
Good
Fair
Poor

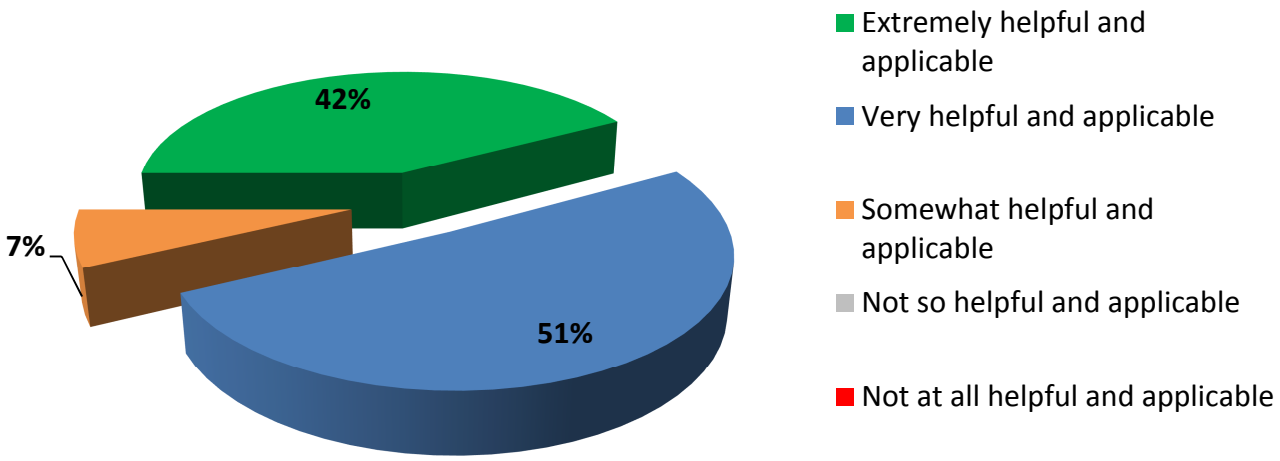

Q4: What is your opinion on the general organisation and the quality of the facilities of the workshop?
40%
53%
4%
3%
Excellent
Very good
Good
Fair
Poor


Q5: What do you think of the overall quality of the speakers?
30%
56%
12%
2%
Excellent
Very good
Good
Fair
Poor

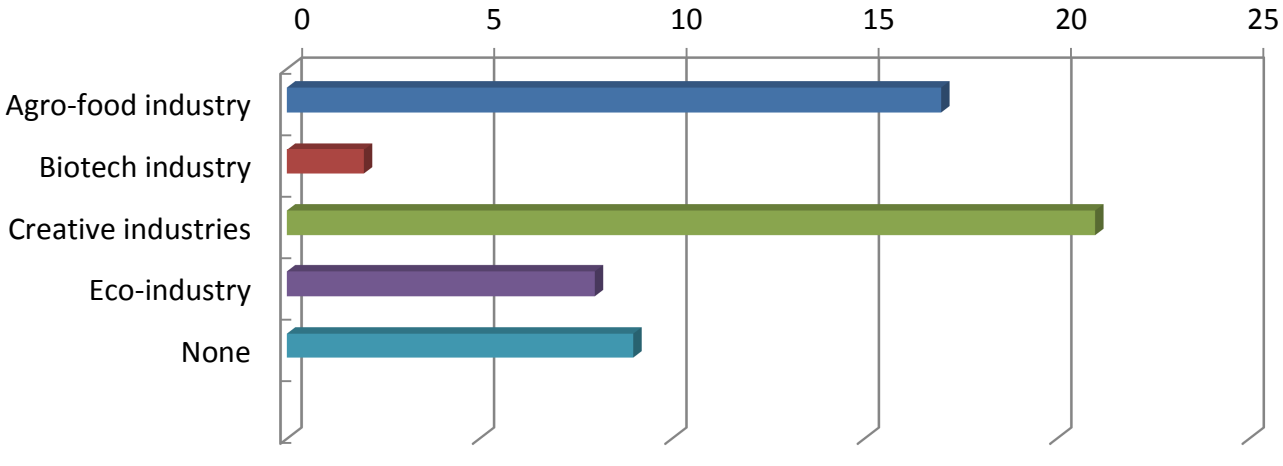
Q6: How helpful and applicable to your job was the content presented at the workshop?



Q7: How valuable were the networking opportunities at the event?



Q8: Which round table on 2 March did you attend?



Q9: Please rate how relevant the round table you attended was to you.							
	1	2	3	4	5	Total	**Average**
Agro-food	1	1	2	6	7	17	**4**
Biotech				2		2	**4**
Creative		2	9	6	4	21	**3.57**
Eco			2	4	2	8	**4**

Q10: What was the single most valuable thing you learned at the workshop? Please also share your suggestions, comments, ideas for the future. *(citations)*

Status of various financial funds in the countries of the region, including the funds planned in near future. Second day was more relevant to the most of participants.

That innovation support in WB is done merely on high policy level, but there is a big lack of real-life applications with knowledge and research organisations.

Share of experiences and networking; Learning opportunities; Opportunities are created and meeting people in person makes them.

About the diversity of the available financial instruments; Existence of EU-wide initiatives and organisations that provide innovation funding; Information about national investment funds; The financial instrument from EIB and EBIF; Experience in implementation of financial instruments in EU countries.

The most valuable was learning that innovation should be commercialised and that there is capable people in the region experienced with this issue. I will appreciate regional initiative on the whole process of innovation from creation to commercialisation.

Situation about IPARD program and why it is not active yet, how we could contribute and be involved. Organise more workshops with bottom up approach.

I would suggest that in future events you organise round tables according to the professions - e.g. TT staff, government organisations, technology parks staff roundtable etc.

Funds are not easily accessible to laboratories.

World Bank activities in R&I field in the WB region. Smaller number of participants for some future workshop and more strict selection of participants.

As some of the challenges in the area of TT and Innovation are common to many countries, there is a need for a joint approach at the regional level. The event was really interesting and useful, the fact that some of the participants were attending also the Trieste meeting, lead to a continuity of the discussions.

Information sharing was essential. I wasn't aware about various types of support that are present in the region; There is a need for coordination of all initiatives regionally and locally.

Using technologies in creative industries can bring new opportunities to people with disabilities.

The work for R&I is extremely linked with knowledge transfer, networking, know how experiences, getting financial support and investments. Considerable part of being successful is self-investment and entrepreneurship to transfer your ideas into creative industries that work for the well-being of the people in need. Only the concrete creative industries concerned with the needs of the people and their environment can be financially supported or invested for today.

Issues of the legal regulation of intellectual property in the science parks could be one of the future topics.

Different models of financing; ongoing projects and studies; young practitioners and challenges they are facing; overall very useful event offering lot of practical aspects and networking opportunities

Importance of diffusion of innovation policies between (macro) regions; An initiative and persistence combined with investment can give good result.

Different opportunities for cooperation and applications for projects; Financial instruments are just a tool, one has to have system in place to use it.

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