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Workshop on Proof of Concept (PoC) in South Eastern Europe: best practices, challenges and opportunities for promoting technology transfer and innovation

Summary report

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Overview of the workshop

Proof of Concept (PoC) concerns the first phase of an innovation based project, and can help support the transfer of research results from the laboratory to the demonstration phase.

On 21-22 September 2017, the Intellectual Property and Technology Transfer Unit of the European Commission's Joint Research Centre (JRC) organised a workshop together with AREA Science Park to exchange best practices in the field of "proof of concept" with focus on the European macro-regions (Adriatic Ionian, Alpine and Danube) and, in particular, the Western Balkans.

A main objective of the workshop was to contribute to the design of a proof-of-concept instrument for the Western Balkan region which could be supported by the Western Balkans Enterprise Development & Innovation Facility (WB EDIF). A first proposal was made by the representative of the European Investment Bank (EIB). There was great interest in the subjects from all participants and very lively debates over the two days.

About 120 selected participants from all Balkan countries attended the event which was opened by Directorate-General for Neighbourhood and Enlargement Negotiations (DG NEAR) representatives and two members of the JRC Board of Governors (Bulgaria and the Former Yugoslav Republic of Macedonia (FYRoM)). The event was also broadcasted in streaming to the wider technology transfer community. The program included presentations from the authorities of different Western Balkan countries that have an existing or planned PoC activity (Serbia, Croatia and FYR of Macedonia). The South Eastern Europe – Regional Cooperation Council (RCC) actively contributed to the discussion.

Summary of individual speakers

Day 1

Session 1

Stephen Taylor, Director of Marketing, Communications and Business Development, AREA Science Park welcomed participants and made some introductory remarks.

Giancarlo Caratti, Head of Intellectual Property and Technology Transfer Unit, JRC emphasised that to create great instruments that function well, it requires those behind them to clearly understand their goals and to involve the community of innovation practitioners and stakeholders to take part in the setting up and in the implementation of an instrument. Innovation is high on the European Commission Agenda and access to instruments that support innovation is important for accession countries. PoC to support technology transfer is a key instrument for the innovation ecosystem and can play a role in national and regional innovation strategies, including Smart Specialisation. Technology transfer stays at the interface between markets, R&D, education and business.

Wolfgang Schlaeger DG NEAR, Head of Sector, IFIs, SME development and energy efficiency platforms (replacing Colin Wolfe, Head of Unit), highlighted the Western Balkans Enterprise Development & Innovation Facility (WB EDIF) was set up in 2012 in order to help improving the innovation ecosystem and to support SMEs in the region. The initiative supports SMEs in various stages of their development (from start-up to expansion/established company). In addition to the financial instruments, technical assistance is also available. To date, the program has made available 150m EUR of grants which has triggered total investments of 650m EUR (since 2012) into SMEs. The platform has contributed to the creation of approximately 20.000 jobs. PoC is seen as a very important tool that can help fill in a gap in the innovation process. Both the needs and challenges need to be discussed with stakeholders. The workshop is an opportunity to elaborate how a possible scheme for PoC support would look like, what its relevance and what the different situations in different countries are. DG NEAR is ready to look into potential financing options. The contributions of the participants and the workshop discussion would be helpful and relevant for DG NEAR (reflection and consideration). It is important for DG NEAR to find a mechanism to finance PoC for the region, in part because of the perspective for EU enlargement for the Western Balkan region and in particular with Serbia and Montenegro as frontrunner candidates for accession in 2025. Other countries are hoping to join the process, thus increased financing for the region becomes increasingly important.

Vanja Ivošević, Senior Expert on Skills and Mobility, Regional Cooperation Council (RCC) introduced the regional level initiatives, supported by RCC that act to maintain stability and foster coordination and co-operation for the benefit of all the countries in the region. RCC is a key organisation in the implementation of the South East Europe (SEE) 2020 strategy, including the framework of the Smart Growth pillar where RCC countries have committed to R&D investments which represents a very big challenge for the region. A recent development is the commitment to developing smart specialisation strategies that will support SEE2020. In addition, it is necessary to actively improve the cooperation with business and industry.

Increased investment in research infrastructure in the region and developing easier access to finance for both businesses and scale-ups and start-ups with an emphasis on SMEs were highlighted as two major goals that need to be tackled. Monitoring SEE 2020 strategy reveals that investments in R&D remain below 1% of GDP and the number of researchers is much lower in comparison to some EU

Member States. The transformation of industry in the past 20 years in the region resulted in the creation of a high number of SMEs. These factors should be taken into account when designing new instruments. It is also important to understand the differences in the current structure of the research system within the economies of the Western Balkan region and between the region and some of the most advanced EU Member States.

Albena Vutsova, Member of the JRC Board of Governors noted that Bulgaria will hold the **Presidency** of the Council of the **European Union** in the first six months of 2018 and will use that time to try to reach consensus on policies for competitiveness of SMEs and cohesion (the main priorities of the Bulgarian Presidency are cohesion, competitiveness and consensus). Consensus concerning support and European perspective for the Western Balkans, competitiveness concerning innovation, technology transfer, growth and jobs, cohesion concerning the Structural and Investment Funds. The focus will be on designing activities where R&D can be a driver for economic growth including a focus on increasing demand over supply to enable more generic product development. Effective instruments must be identified and new schemes developed for the next programming period. To help address these challenges a number of events will be organised, including a conference on innovation, technology transfer and smart specialisation strategies (Ministry of Economy of Bulgaria), as well as a competition for young researchers, which could welcome a discussion on a Seal of Excellence for the region.

Atanas Kochov, Member of the JRC Board of Governors, commented on the use of PoC in Mexico where some of the largest German automobile manufacturers are implementing Proof of Concept by establishing 25 spin-off companies in cooperation with a local university.

Mr Kochov outlined a number of issues to be considered in a PoC scheme for the region including unemployment, brain drain, weakness of SMEs and the presence of traditional universities that provide a highly protective environment for their researchers. In addition, there are challenges in establishing public-private partnerships at the universities. There is a need to develop a new structure or model for universities in the region but it is not yet clear what the optimum model would be. There are currently difficulties with the commercialisation of university intellectual property, as the researchers are increasingly doing their research outside of the university. Consequently one needs to stimulate entrepreneurial behaviour within the structure of the university.

Erasmus was highlighted as a successful example of a program that helps to change internal thinking in the universities. It was also noted that the FYROM Fund for Innovation and Technology Development has started to implement a PoC program, with an instrument for financing/grants being used for the creation of four spin-off companies located in the university incubators (as of 2017). The general innovation policy has been named TIGER (Technology Innovation for Greater Economic Revitalization). A Technology Transfer Office/centre (TTO, CIRCO) has been established in cooperation with GIZ and USAID and has grown significantly. Currently it is divided in eight different sections. The TTO involves professors from the university faculty and allows them to develop relations with the industry. The TTO is incorporated as a not-for-profit legal entity and can serve as a good example. The establishment of more than 50 start-up companies has been supported.

Stephen Taylor concluded the session by noting that 'adapt to adopt' is a good way to use the best practice programs. In order to adopt best practices it is necessary to identify them and to have metrics to judge what works and what does not. Challenges to successful technology transfer include the ability to adapt to differing legislation.

Session 2 Introductory discussion on how to learn from successful examples and adapt to local needs

Liduína Hammer, Fund Manager, UNIIQ, Netherlands.

UNIIQ is a 22m EUR PoC fund initiated by the regional development agency for the southwest of the Netherlands funded by the three universities in the region: TU Delft, Leiden University and Erasmus Medical Centre, each providing 2m EUR in addition to the EU Funding.

The fund will address a financing gap for innovative companies in the PoC stage. UNIIQ works to connect and transfer the scientific knowledge from the universities to the market. As an experienced venture capitalist she emphasised that a number of projects and concepts are not investment-ready and there is a need for a tool to fill this gap. Investment decisions are made by UNIIQ and not by universities. Investments are not only made in university spin-offs (35-40%) but also in other companies from the region (60-65%). UNIIQ focuses on what is essential for follow-on investments. The agreement with the investees is only about twelve pages text with a view to simplify their administrative work. Investments are made up to the amount of 300k EUR in the form of a convertible loan. UNIIQ provides the investments in tranches (first tranche on closing, second and third subject to the achievement of certain milestones). The interest rate is 8%, with no personal liability. Terms and conditions are the same for all applicants. UNIIQ opted for a convertible loan scheme in order to avoid making valuations in such an early stage. The funding is used both for technical and market validation. The focus is on making the company investor-ready. Companies are encouraged to identify follow-on funding and have the option to repay the loan or to convert it into equity. The fund invests exclusively in new companies in TRL 3-5 (no project financing for existing companies). UNIIQ is not focused on the SaaS industry but rather on hard-core technology and life sciences. The current investment portfolio consists of 15 companies (top sectors: life sciences, high tech, safety and security).

Maddalena Furlan, AREA Science Park, presented their experience with Technology Transfer (TT) and PoC. They perceive PoC funding as a means to bridge the existing gap in the TT process, but not as a stand-alone measure. PoC has to be part of a process managing all relevant aspects of the TT activities targeting exploitation, marketing and communication.

AREA currently has two initiatives. The first is the Proof of Concept Network, a pilot project that involves several universities and research bodies, aiming at the exploitation of research results. Up to 30k EUR grants are available to support co-development projects, moving the validation of research results from the lab into industrial context (real-life scenario testing within companies). The main phases for the selection are scouting (selection of results from all companies and research bodies involved – this is done with the assistance of the TTO of the university/public research institute), followed by an assessment of the results and a subsequent match-making. Thus, a main criterion for selecting projects is the involvement of a company, often identified through match-making sessions with industry. The grants are provided only after these phases have been passed. Even if the funding may not be sufficient to bring the project to the market, it will help reduce the risks/decrease the costs associated with PoC activities.

The PoC Network team conducts an analysis of the intellectual property status quo (whether a patent has been already granted or not) and possibilities in the concrete situation. In addition, the market potential is analysed through business intelligence tools. This is followed by an evaluation by industry experts.

AREA uses a web platform, one-to-one meetings and brokerage events to identify companies. If the companies submit a formal letter of interest, then AREA will identify a group of scientists that will work on the field of interest.

It would be beneficial for researchers to join the PoC Network in order to obtain a technological and commercial evaluation of the results.

Elena Andonova, Policy Officer, JRC

The experience of Oxford University in establishing their University Challenge Seed fund was presented. Launched 1999 with 4m GBP (1 Million from the UK Government). This was followed by another fund, based on donations, namely the Oxford Invention fund (raised around GBP 1.5 million) and in 2014 by the Oxford University ISIS Fund, started with a governmental fiscal initiative designed to increase private investments as a tax incentive. Other initiatives in Oxford included the establishment of the Angels Network of Oxford University Innovation, attracting individuals keen to invest in local technology development. Oxford funds are designed to be evergreen and investment decisions are made based on three main criteria comprised of Market potential, Technology potential, and the strength and complementarity of the Team.

Eladio Crego Gil, Fundación Barrié, Science Seed Fund for Galicia.

Fundación Barrié is a private but not-for-profit organisation that has invested more than 160m EUR in education and science in the region of Galicia since 1966. Activities of the organisation include, inter alia, the funding of individual research projects. A PoC fund was launched in 2009 in an effort to increase the very low existing level of technology transfer activities by reducing the risk to potential customers of the technology such as investors and licensors. It was necessary to create a new model to foster the translation of scientific results to the society. Activities funded include all those required to bring the research to the market, such as patentability studies, business model definition, etc. The program requires collaboration with a university or a research centre, formalised through a legal agreement. The monetary returns are reinvested into new projects. Fundación Barrié wants to avoid becoming seen as 'just another source of funding'; research teams should see them as a partner. In terms of funding rates, 100 projects typically generate 5 funded projects. In regards to the impact of the program, to date 5 projects have been funded, of which one failed. Further, 16 new jobs have been created in two spinoffs, which have raised 12m USD (including international VC). Of the lessons learned, the most important is the level of commitment to commercialisation required by the research team: the project must be identified as strategic. The PoC model has been used by other regional organisations and been integrated into the regional R&D plan.

Andrea Piccaluga, President of the Italian Network of Technology Transfer Offices of Universities and Public Research Organizations (NETVAL).

NETVAL is an Italian organisation that includes in its membership almost all TTOs of universities, public research organisations (PROs) as well as a few hospitals. The network is financed by its associates. Combined membership covers more than 80% of the students, 3.000 patents, 200 TT managers and 1.200 spin-off companies. Their main organisational objective is to share their experiences among the community of professors and TT managers.

For NETVAL, the valorisation of research results is an obligation, not an option. NETVAL believes that profit needs to be made, but not under all circumstances. Because of the significant differences within the Italian TT system, learning and adapting to local needs has been a key issue to be tackled by NETVAL: facilitating exchanges between more advanced and less experienced universities in technology transfer. NETVAL is a network allowing for learning (including from international best practices) and sharing experiences. In addition, mistakes as well as solutions and contacts are shared among the network associates; guidelines, rules and regulations, and practices are being exchanged.

Frank Tooley, Program Manager, High Growth Ventures at Scottish Enterprise Ltd.

Scottish Enterprise has about 3m EUR invested in a PoC fund every year to support spinning out companies from universities. Scottish universities receive about 400m EUR per year in research grants, producing a significant amount of exploitable research results. Between 1999 and 2007 it funded 200 projects, however these have created only 500 jobs and 38 spin out companies. Based on these results, the Scottish Enterprise changed its model in 2011. From 2011 it took the decision to invest into a much smaller number of projects, but more generously supported with the aim to create a large economic impact on the country. Furthermore, the funding decisions were outsourced to an external panel of expert practitioners such as successful serial entrepreneurs (also playing a role in the subsequent monitoring). Each project undergoes extensive due diligence as to the commercial and technical aspects before any funding is granted. The funding is given in two phases, firstly as a grant to the host institutions and secondly, as a convertible loan to the spinout company.

Each project now has a project manager, commercial advisor and a commercial champion (such as a serial entrepreneur who is in charge of the project, which is not a university professor). If a project misses a milestone or a deliverable, it is terminated immediately. As a result of the changes implemented 87m EUR investment was raised in the 2014-2017 period.

The main lesson learned with the PoC program is the need to focus on the people and the team and not merely on the technology. Projects that have failed have tended to come from principle investigators/professors who view the funding as just another research grant. Academic excellence and world-leading technology is not sufficient for successful commercialisation, but a team with solid commercial skills is needed.

Laura Pontiggia, European Research Council (ERC) Executive Agency: Support to the Scientific Council presented the ERC experience with PoC. The Agency funds frontier research. The ERC funds academic breakthrough research and administers a PoC grant launched in 2011. The PoC grant is only available to researchers or research projects that have already benefited from an ERC grant for research. The objective is to maximise the value creation (through commercialisation or realisation of societal benefits) of the research results within the field of social sciences and humanities. The amount of the grant is maximum 150k EUR for a period of 18 months, with a total budget of 20m EUR for 2017. The evaluation of projects is done by an expert panel considering factors such as the feasibility of the plan. The experts are technology transfer professionals, but not investors nor entrepreneurs. There is one call per year with three application deadlines. An ex-post analysis is carried out by independent external experts to determine the impact of the PoC program, including a comparison with projects that have not received PoC funding. It is necessary to stimulate academics to consider opportunities for commercialisation. The rates of start-up creation are high. It is important to not leave projects in the 'valley of death' but to provide the necessary additional funding.

Mattias Dinnetz, Joint Research Centre, European Commission

Researchers employed at the JRC occasionally generate intellectual property relevant to actors in the market place and/or to society at large. The JRC Proof of Concept programme has been effectively operating since the year 2000, with the aim to incentivise innovative activities of JRC scientific and technical staff, mainly for the benefit of society. The current fund is 400k EUR per year, with 5-8 project funded. Activities funded include, inter alia, prototype development and market studies. The main selection criteria include novelty, the potential to create IP and follow-on inventions as well as the expected impact in society, the feasibility, methods and staff competence. One main challenge is the prevention of IP leakage until the IP is protected, and continuous follow up is imperative for the maximising of positive project outcomes.

Dragan Šoljan, European Investment Bank (EIB) presented the Western Balkan EDIF (Enterprise Development and Innovation Facility) focusing on Proof of Concept. Mr Šoljan elaborated on the structure of the EDIF platform – an investment platform specifically targeting SMEs in the Western Balkan region. It consists mostly of funding instruments in four pillars (equity, guarantee, lending instruments, and advisory services).

The first pillar, equity, is provided by the Enterprise Innovation Fund, the first regional VC fund in the Western Balkans. The Enterprise Expansion Fund (ENEF) provides equity to SMEs in later stages of development. The second pillar containing the Guarantee facility aims to provide loans to final beneficiaries that are better than market conditions. The third pillar comprising of the Competitiveness Program, is a new instrument providing loans to SMEs for projects, which would help bring them to align with EU legislation.

The fourth pillar is Advisory services. The World Bank is operating a consultancy program provided directly to governments, as well as a program called REPARIS that aims to build SME investment readiness by providing capacity building to local SMEs targeting CFOs and auditors. In addition, the EBRD has a program called Advise to Small Businesses. EBRD consult companies on market research, business plan preparation, etc. The role of the EIB is to manage and coordinate these activities.

Besides coordination, the EIB is also entrusted to identify possible refinement of needs and to conduct a gap assessment of the program. An assessment is conducted throughout the region identifying the SMEs financing needs and funding gaps not only by country but also by financial product. The report is available on the EIB website and concludes that the countries in the region are not completely similar when it comes to funding.

An ex ante assessment was requested by the Serbian government to conduct a deeper analysis of the funding gap. The outcome of this assessment proposes three instruments that would be most effective in tackling these gaps (a portfolio guarantee instrument, microfinance capital enhancements requiring a change in legislation, an early state equity/technology transfer fund accompanied by a technical assistance and support service).

There are three ongoing projects in various stages of completion. One of them is a study on IP valuation in the Western Balkans. The study offered a toolkit for managers and established IP valuation criteria. In addition, the project provided mentoring services to selected SMEs, an activity that EIB would like to continue. The second activity is a feasibility study for a regional centre of excellence. At the moment a workable model is finalised together with recommendations for a self-sustainable centre of excellence. Currently the leading candidate projects are based in Novi Sad, Belgrade, Sarajevo and Skopje. The project usually consist of partnerships between universities and private companies (or serial entrepreneurs) offering contract research to industry.

It can be observed that most of the support provided does not cover the early or pre-seed stages of company development. A dedicated Proof of Concept instrument would address the funding gap in the 'valley of death'. The scope of support of a possible new instrument would include market analysis, IP protection, feasibility studies, business plan development, etc. The right size of the grant is to be defined as well as the eligibility criteria and other technical factors.

It is important that the ex-ante analysis has confirmed the existence of a significant funding gap (just in Serbia estimated at approx. 1bn EUR (part of it is for proof of concept)). The study recommends the creation of an acceleration providing mentorship and funding for product development. The IP valuation report recommended setting up a fund to cover patenting costs. There is a need for a discussion to understand the specificities of each country and to assess what should be done at national, regional and international level. There are some examples from Croatia, Serbia and the Former Yugoslav Republic of Macedonia. It can be concluded that an instrument that targets both SMEs and public research organisations (PROs) would work better, considering past experience and best practices. In addition, a future instrument should not only include a grant scheme but also some effective mentoring services.

Judit Hegedus from EIT Health InnoStars, presented her experience from European Institute of Technology Health.

EIT Health is a knowledge and innovation scheme of the EIT. EIT Health is headquartered in Munich, Germany with its Budapest office covering predominantly Eastern and South-Eastern Europe. The Regional Innovation Scheme of EIT has funding available to support innovation in countries considered to have modest to moderate innovation, which includes the Western Balkan countries.

InnoStars is headquartered in Budapest and is very active in Poland, Hungary, Italy and Portugal. In the near future the Western Balkans will also be covered. EIT Health would like to support knowledge triangle integration – bringing together industrial players – corporation, SMEs, research entities and universities to produce innovation. EIT Health is an implementation mechanism of the EIT, which is close to industry and universities and which funds start-ups. EIT Health agrees that the pre-seed funding is not readily available in the region. In addition to start-up support, EIT Health believes that education is an important part. EIT Health funds business case writing and bootcamps. They try to engage and support the 'idea holders'. A major problem in the region is the brain drain – to support the idea holders to reach commercially available funding as soon as possible as well as to stay in the region and develop their ideas there. EIT Health provides grants of about 1000 EUR to idea holders to submit their business plan after participating in a boot camp.

The creation of entrepreneurial universities is a key prerequisite for an effective knowledge triangle. Universities still do not have enough incentives to commercialise and they fail to realise that they might be sitting on something valuable.

The EIT Health runs a Proof of Concept competition each year with about 20 supported projects from the eligible countries in the Eastern and South-Eastern Europe with 7000 EUR each combined with mentorship.

Lisa Cowey, Key Expert, project Capacity Building for Technology Transfer in the Western Balkans (EU4TECH, <https://eu4tech.eu/>) presented the concept paper that the project has developed on a PoC for the region including specific challenges and design issues.

The EU4TECH project is three years long and consists of five components. One of them (Component 4) is a policy platform to investigate and advise on what kind of funding instrument would be the most beneficial for the region. One possible proposal would be a potential Proof of Concept scheme.

Meetings with stakeholders from the region provided a starting point for discussion. An overall objective would be to increase technology transfer from Public Research Organisations to the private sector. The supported projects would be at Technology Readiness Level (TRL) 3 to 4. It is suggested to make a broad range of activities eligible for funding. The program would also help build capacities in researchers and intermediaries.

An equity gap is identified where public financing has ended while the private capital is not being invested due to the high risks (between proof of concept and first product). As also identified by other guest speakers, there is a need for a technology pipeline funded by governments. The investment in R&D in the Western Balkan countries expressed in % of GDP is particularly low, especially compared to the EU average.

An analysis has been done of the existing funding instruments across the region. On the one side, there are grants for collaborative research (not necessarily resulting in a product or service) and for innovation in SMEs, as well as innovation voucher schemes. A gap has been identified in the lack of grants for supporting technology transfer from PROs. At present, similar forms of PoC initiatives are only available in Croatia and in Serbia.

It is important that a potential PoC scheme does not fund science but focus on projects that have already reached, as a minimum, level TRL 3.

An example for a successful PoC (combined with a follow-on Seed investment fund) on sub-national level is the one developed by Oxford Brookes University involving 13 partners and 8 universities. It allowed mentoring, market intelligence from clusters, as well as business support and training.

A few questions to agree upon are, for example, who should be the final beneficiaries – only PROs or also SMEs? What would be the size of the grants – between 20k and 50k EUR? What would be the grant period? Which sectors should be considered? Which activities should be eligible for funding? What kind of supporting organisation is needed (in addition to TT Offices)? There must be an agreement as to what results would be expected. A PoC fund could be used to develop an entrepreneurial university and change the ecosystem. The consultation process is ongoing and interested stakeholders are encouraged to express their opinion.

Day 2

Session 1: Regional initiatives – examples and possible models for Proof of Concept structures

Mlađan Stojanović, Technology Transfer Facility (TTF), Innovation Fund (IF), Serbia.

The Innovation Fund targets both private sector companies and public sector research organisations. Both the Innovation Fund and the Ministry of Education, Science and Technological Development fund activities in the PoC space in Serbia. The IF uses 'mini' (for startups) and 'matching' (for larger companies) grant schemes to support innovation in SMEs, and a collaborative grant scheme to foster linkages between SMEs and PROs by way of joint projects. The TTF is a combination of technical assistance and funding grants with the aim to support commercialisation of research from PROs. PROs can apply directly to the TTF for PoC grants. It must be noted that all programs implemented by the IF allow for PoC activities but none of them are specifically designed to meet the needs of the market. In general, projects that are closer to the market are welcome, including projects focused on prototype/MVP development.

To date the TTF has received 20 applications for funding, has approved 10 grants and seen one licensing deal emerge. An issue is that the submitted proposals are in the very early stage of development.

The initial support was between 10k and 20k EUR without any foreseen follow-on investment. The program was modified and thereby allowed grants of up to 50k EUR with the condition that an interested private partner can co-finance 30% of the costs. This is a way to validate the genuine interest of the private sector partner. With regard to issues in establishing PoC for the region, it would be beneficial if a new fund is well integrated with existing programs and the sustainability of the fund is crucial. Based on existing and planned activities in the region, a focus on PROs would be more valuable than more funding for SMEs.

Grants in the range of 20k to 50k EUR is a useful amount, yet securing any co-financing from public organisations would be a significant challenge. With regard to evaluation of applications for a regional fund, it is important that this can be centralised and carried out by external experts to ensure that it is transparent and impartial.

Mislav Jurišić, Advisor, Croatian Agency for SMEs, Innovations and Investments (HAMAG-BICRO)

Croatia has seen significant improvement of their innovation ecosystem from the Science and Technology Project (STP1 and STP 2) funded by the World Bank. In particular, STP1 helped to develop the capacity of intermediary organisations while the PoC fund acted to connect the various groups in the ecosystem and stimulated a project pipeline.

HAMAG-BICRO is currently involved in the operation, running and monitoring and participating in some parts of the selection process.

The PoC scheme has three main activities eligible for financing: development of a functional prototype; technical demonstration; and IP protection. The applicant has to finance at least one of the two: functional prototype or technical demonstration. The grantee can use up to 10% of the financing for market analysis and preparation of a commercial plan. The amount of funding is between 5k and 50k EUR with a project duration up to 12 months. Applicants can be individual persons, who would have to set up their own business if selected. Applications from SMEs and PROs are evaluated in the same way and are ranked together. The intensity of financing is 60% for medium companies, 70% for small companies and 90% for PROs. The element of technical risk is to be considered – there is no guarantee that the solution proposed is going to work. The projects financed are around TRL 3 and TRL 4.

Business support organisations play an important role and participate in the whole process. The application process consists of two stages. Both projects and partners are critical for absorption of the funds and measurable impact. In particular, partners help with the pre-selection (filtering) of projects and preparation of applications that reflect the selection criteria: level of innovation, commercial potential and project quality. The second stage of selection is being conducted by two external experts with the participation of a representative of HAMAG-BICRO. Projected financial return is no longer included in the assessment criteria. The program has been evaluated and has emerged as a strong knowledge development tool for both technology and networks. A key lesson is the need to ensure that a fund can be sustained for multiple years and provide for continuity. HAMAG-BICRO conducts an ex-post evaluation of the impact and results of the program.

Jelena Petrović, Business Support Coordinator, Science Technology Park Belgrade, Serbia

A science and technology park can play an important role in the innovation ecosystem by helping entrepreneurs to overcome the many challenges they face, including ownership of IPR, mind sets of people and a lack of relevant skills. The Belgrade STP has an excellent collaboration with the Innovation Fund, which helps them to provide the necessary services to their beneficiaries (such as coaching, specific advisory, mentorship).

One of the business support programs developed by STP Belgrade can be related to the PoC phase (it was developed in cooperation with STP Ljubljana). STP aims to support projects in defining reaching and communicating with potential customers. There is a need for support in the preparation of applications but also in the implementation phase.

Prof. Albena Vutsova, Sofia University, Bulgaria

There are four main instruments operating in the Bulgarian innovation ecosystem: National Innovation Fund; National Research Fund; Operational Programme (OP) “Innovation and Competitiveness”; and new financial instruments.

All the instruments are aligned with the two relevant strategies, smart specialisation and the national strategy for research.

The National Innovation Fund started functioning in 2000. Current instruments that cover the PoC phase are only available to SMEs as a direct beneficiary although PROs can be involved in carrying out the work. A positive aspect of the present system is that evaluation of applications is made by both academics and business people. This would be further improved by the inclusion of international independent assessors. A current major drawback is the high level of administration which leads to a prolonged evaluation process and the lack of a clear ex post evaluation or impact assessment. The success rate is around 20%.

The current Operational Program incorporates a new PoC instrument – a special scheme for supporting IPR-related activities.

Session 2: How to fill the PoC gaps in the region

Elena Andonova, Policy Officer, JRC

There is clear gap between research funding and equity investment in the region. The size of the gap varies between countries but it cannot be spanned with a single instrument. Existing instruments for the region e.g. from EDIF do not cover this gap. Instruments from the EU are not always available or appropriate for the region.

Funding may be found through DG NEAR to establish a PoC fund that would draw on the expertise of Business Angels and local mentors as well as experience accrued in Croatia and Serbia. The objective of such a fund would be to increase the technology readiness level (TRL) of projects, increase capacity of researchers and intermediaries, encourage knowledge exchange and bring social benefits.

It is proposed that the facility should be centrally managed for all WB countries and funding would be in grants or convertible loans (equity based). This approach would allow the involvement of business angels in the scheme. Grant size would be in the range 20—100 kEUR, to be released in tranches. Possible eligible activities could include prototype development, access to specialised laboratories, demonstration of technical feasibility, investigation and protection of IPR, market analysis, and feasibility studies, concept design and development strategy, creation of commercialisation plan. The duration of the pilot project might be 2-3 years. The programs should have synergies with existing activities, access to a deep community of practice and open opportunity for technology transfer equity facility.

Andreea Sava, Project Manager, AREA Science Park.

In the beginning of 2018 a new initiative called OIS-AIR Project will be run by AREA Science Park and funded by the ADRION Cooperation Programme. The objective of the project is the establishment of a Hub & Spoke Network connecting innovation support structures in the Adriatic-Ionian Region. The project has a number of partners and supporters from across the region, including ministries and science parks. As an initial step the project is coordinating the strengths of the region and building initiatives around these strengths. This will act as a pilot to build smart specialisation for the macro region.

Overall, the initiative is designed to connect the Western Balkan region with Italy in order to stimulate knowledge transfer from more developed countries to countries and regions that still have to develop their innovation potential.

ADRION will implement a pilot transnational PoC from 2019 that will involve all partners from the project. If this is successful there will be an attempt to secure longer term sustainability.

The project will implement a web platform open to all partners and other stakeholders from the region. It will also develop support activities that can be offered to SMEs locally in each country with services delivered at a transnational level. The whole scheme will be coordinated by AREA Science Park.

Robert Bush, Venture Capitalist and Local Investor

Having reviewed different types of innovation from the demand side, including sustaining innovation or replacing existing products with better ones; efficiency-driven or producing more with less; and market-creating innovation which is hardest to prove, Mr Bush said the harder each type of innovation is to prove, the more challenging the likelihood of investability becomes.

Each innovation type creates a different impact, appealing to different investor types. Sustaining innovation offers low risk to investors in return for moderate to high returns. However, the economic

impact is concentrated in those who have invested in a particular business. This type of innovation attracts most investors.

Efficiency-driven innovation usually offers low to moderate return for taking low to moderate risks. The economic impact often requires outsourcing or displacing resources. Many investors are interested in this type.

The market-creating innovation offers the potential for very high return but in exchange for undetermined risk. The economic and social impact is very high – even transformative. Due to the risks only certain investor types would be interested.

It could therefore be argued that there is no funding gap but rather a knowledge gap problem. Researchers need to better understand the difference between science and craft. This is the so-called knowing vs. showing problem. Usually for the crafts the required skill is persuasiveness while in the sciences the required skill is methodical rigor.

It must be noted that certain investor types are missing out on assets that are in alignment with their mission and suitable for portfolio diversification.

Grants should be distinguished by their commercial appeal and marketed to appropriate investor types. The potential financial impact of grants can in fact be determined, for example with the support of a methodology. Academics and stakeholders must be integrated earlier into the valuation stage. To achieve the above, a different metric is necessary: the old methods of peer citations and reviews have its value but a new metric would address how to quantify and score an element [value] of interdisciplinary collaboration. This means that the earlier you bring a holistic approach the more likely it becomes that you will end up with something that the market wants. Patents would be replaced by testbeds, and sequential research with a consequential research.

The idea is not to distort research but to allow the market to speak earlier in the process.

Milena Kostadinović, Operations Manager, Innovation Fund, Serbia

The Innovation Fund provides support to innovative new companies and entrepreneurs as well as to already established ones. It also supports collaborations between R&D institutions and the private sector. Four programmes have been developed so far. The funding comes both from national budgets and through IPA/World Bank programs.

Two programmes are available to innovative companies: 'mini' grants programme (directed to supporting early stage projects and start-ups, providing grants of up to 80k EUR with obligation for beneficiaries to co-finance 15% of the total project costs) and 'matching' grants programme. A 2-stage evaluation process is applied for the mini and matching grant schemes involving the use of external evaluation and evaluators. The success rate for the projects funded by the mini grants programme is 90%. All the existing programmes have some aspects of PoC support.

The matching grants programmes are directed to established SMEs to further develop existing projects or to develop new ones. The grant amount is maximum 300k EUR with obligatory co-financing of 30%.

Katarina Kreceva, Policy Officer, State Fund for Innovation and Technological Development, the Former Yugoslav Republic of Macedonia

The main goal of the State Fund is to fund SMEs as opposed to projects from PROs and to provide access to funding to interested stakeholders in the private sector. The first instrument is similar to the Serbian mini grants programme and the second one is similar to the Serbian matching grant /commercialisation of innovations. There are two more instruments in preparation: one for technology extension and the other to establish accelerators in the country. These latter programs are in the preparatory phase. The funding is provided through a loan from the World Bank. The

future plan is to support more cycles of the innovation process and perhaps to finance projects from PROs; this is under discussion at this moment.

Biljana Vojvodić, Assistant Minister for Technology, Republika Srpska, Bosnia and Herzegovina (BiH)

It must be clarified that according to the constitution of Bosnia and Herzegovina the competence for education, science and technology is delegated to the level of cantons and entities. There is an Innovation Centre in Banja Luka (ICBL, Drago Bejić, Director), established in 2010; ICBL provides incubation services and training to companies. There is also a technology transfer centre at the University of Banja Luka, the BIT Centre Tuzla which cooperates with the University of Tuzla, and also the TERA Technology Park in Mostar. Recently, the new strategy for the scientific and technological development was developed prioritising research quality, improving cooperation with industry, creating condition for increased investment in science and innovation, among others. Smart specialisation strategies have been elaborated as well.

Darko Petrušić, Ministry of Science, Montenegro

The Ministry of Science had adopted the triple helix model to encourage cooperation with industry. There are a number of initiatives, including funding of proof of concept projects and development of prototypes. At present a science and technology park is being built with IPA funds. An innovation centre is operating in Nikšić. On the national level they see a need to support PoC since international funding supports TRL 6+.

Jeta Zagragja, Chief Business Development Officer, CACTTUS, Kosovo^{1*}

The company is an SME which specialises in ICT consulting, software development and testing, telecommunication and networking solutions. The company has one spin-off, the creation of a two-year ICT vocational school.

¹ * 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

Conclusions from the workshop:

Proof of concept (PoC) is the first phase of an innovation project, which supports the transfer of research results from the laboratory to the demonstration phase.

A main objective of the workshop was the design of a Proof of Concept instrument for the Western Balkan region which could be supported by the EDIF facility for innovation. A first proposal was made by the representative of the EIB. There was great interest in the subjects from all participants and very lively debates. The main recommendations of the workshops regarding the possible inclusions of such instrument are the following:

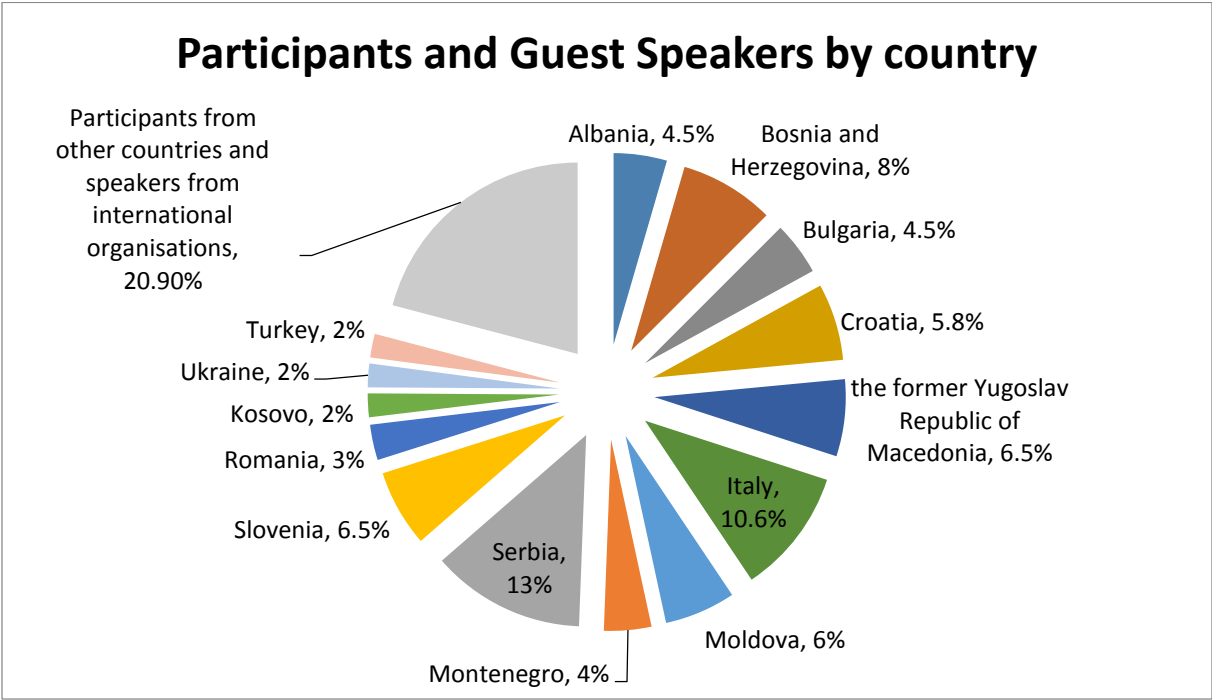
1. The main targets should be universities and research organisations (public and private), where there is a clear funding gap, since SMEs are already sufficiently covered by similar instruments (at least in Serbia and the Former Yugoslav Republic of Macedonia). A new instrument must be carefully designed so there is no significant overlap/competition with current programs available in some countries in the region, but rather the new instruments should be complementary. The added value of such regional program over national programs should be clear to avoid competition.
2. Providing funding is not sufficient, it must be complemented by technology-transfer expertise, possibly mentoring and coaching throughout the process (e.g. via business angels and/or TTO experts) and stimulation of demand in universities.
3. The instrument should be flexible to adapt to the different degrees of development of each country with the possible involvement of local innovation agencies.
4. A multi-stage funding should be considered, as well as a two stage proposal-evaluation process with the involvement of international independent experts. The evaluation should be centralised and possibly involve international experts.
5. Administrative procedures should be as simple and as transparent as possible.
6. A proposed new instrument should possibly be opened to SMEs from other countries.
7. The possible link with the smart specialisation strategy should be explored, which related to the focus field/industries which would be supported in each country.
8. An adequate pipeline of projects is necessary for the effective functioning of a PoC scheme, meaning sufficient funding and capacity for R&D in PROs and sufficient demand on the market.
9. Collaboration is an important aspect, between research institutions, between PROs and business support organisation, as well as between PROs and SMEs and start-ups.

Annex I – Results of the online questionnaire

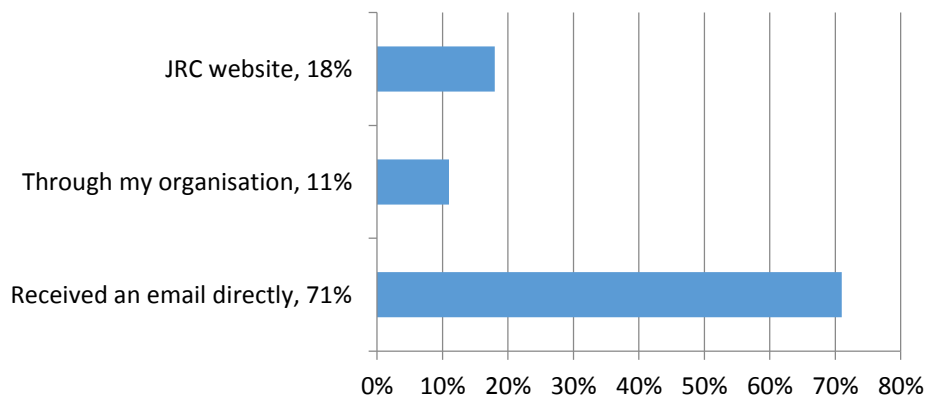
Number of respondents: 28

Questions:

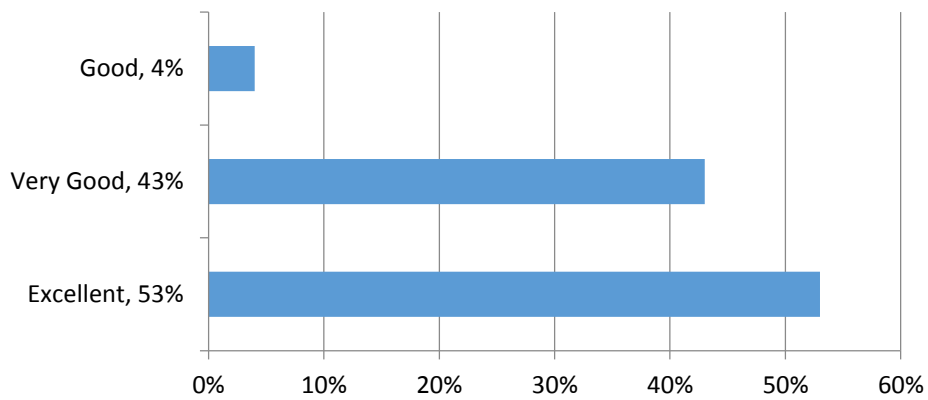
- Q1: From which country do you come from?
- Q2: How did you learn about the workshop?
- Q3: Overall, how would you rate the workshop?
- Q4: What is your opinion on the general organisation and the quality of the facilities of the workshop?
- Q5: What do you think of the overall quality of the speakers?
- 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: In your opinion, why is it important to have support for Proof of Concept activities and what kind of support would you like to have if available?
- Q9: What was the most valuable practice/information shared at the workshop?
- Q10: Please share your suggestions, comments, ideas for the future on the topic Proof of Concept (PoC).



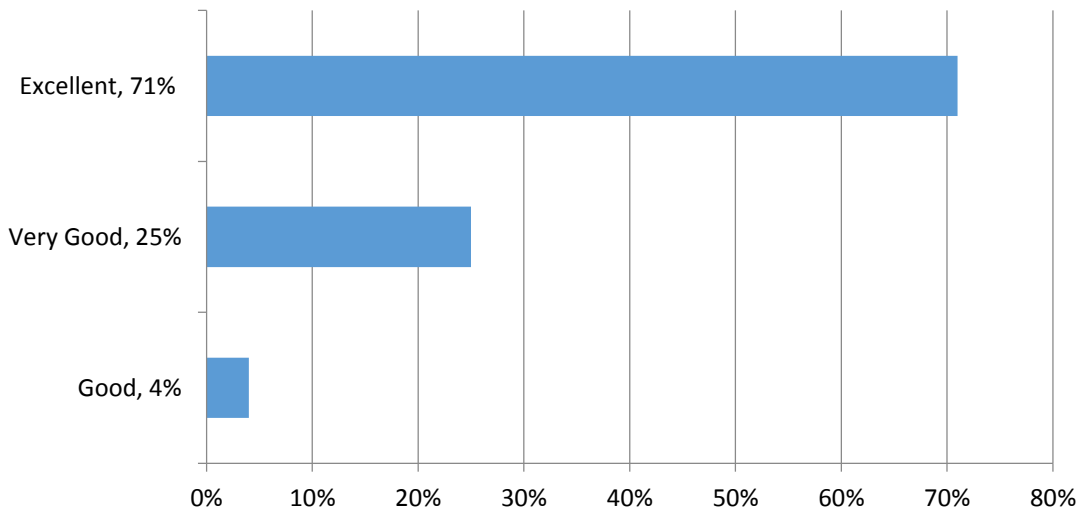
How did you learn about the workshop?



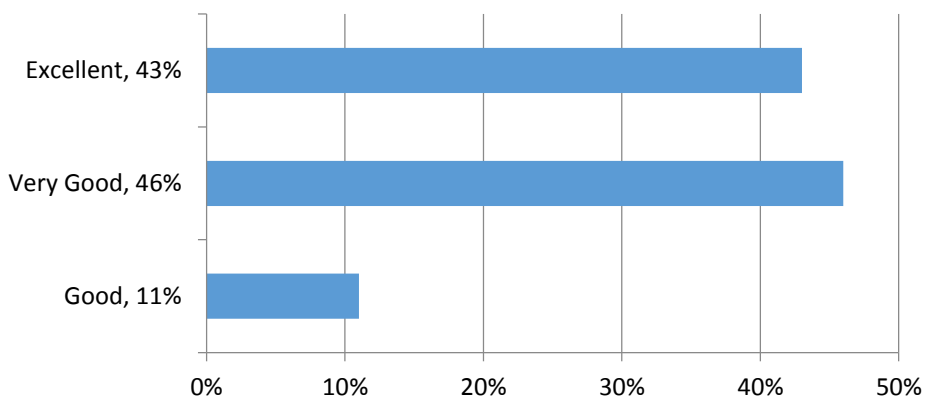
Overall, how would you rate the Workshop?



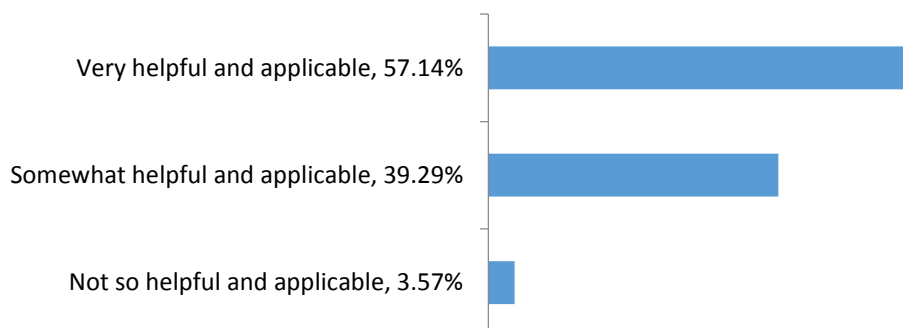
What is your opinion on the general organisation and the quality of the facilities of the workshop?



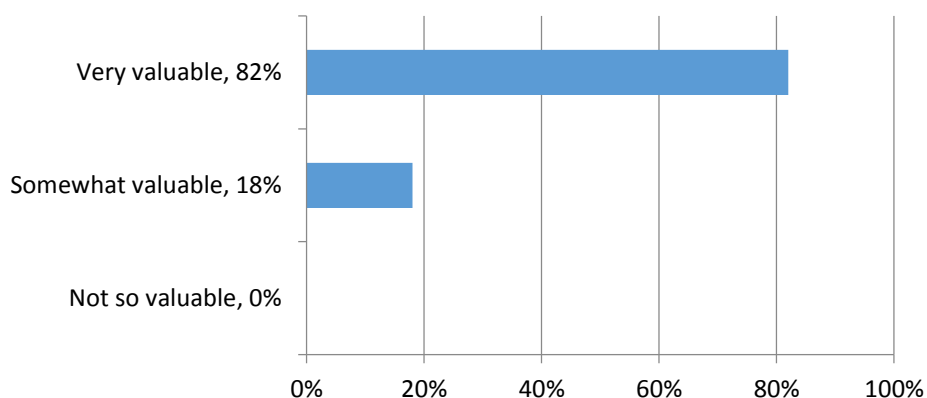
What do you think of the overall quality of the speakers?



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



How valuable were the networking opportunities at the event?



Q8: In your opinion, why is it important to have support for Proof of Concept activities and what kind of support would you like to have if available? Answers in original:

JRC recommendations in structuring European research area in the regional, local levels of administrations (funding) in EaP countries.

It is very important because of knowledge transfer, community networking and share of experiences. I would like to have support from my peers in Technology Transfer.

In FYROM investment in R&D is under 0.3% which makes innovation activities almost impossible on University level. In addition, triple helix should be driven by Entrepreneurial Universities of the future, thus producing knowledge relevant for local, regional and global industries.

-PoC stage is one of the most valuable milestones for a start-up if done right -To encourage knowledge exchange and technology transfer across and beyond the Region - PoC fund should have a sectoral approach related to smart specialisation strategy.

The PoC activities are extremely important for bridging the gap between academia and industry. For us it would be very important if we could get funds related to S3.

Network activities and cooperation!

On one of the workshops I mentioned that some financial vehicle for early stage teams and start-ups that have PoC, working on fast growing technologies is more than needed. This is how countries from West Balkans will keep the most talented people in their respective countries.

It is important to realise that you need large market for PoC and that regional initiatives are more likely to success.

POC support is very important as it's bridging the gap in the readiness level of emerging knowledge and technology to be feasible for any kind of commercialisation. Measures to fill this gap should be developed bottom up for each country to have real impact, as WB countries are very different. It should not be just financing, but smart money package (+coaching, mentoring, networking, constant supervision) that would resemble investing, not just mere distribution of public money. The measures should be implemented as pilots in close collaboration with local innovation support institutions, supported by TA from EU experts.

This is needed because at the early stage of product/service based on research we might not know whether our prototype/MVP brings profitable value or not. It might also not be ready/attractive for investments yet. For such cases of proving the concept of the innovation and its suitability to the market, additional support is needed. For our needs we would love to benefit from: + Network of other innovators and researchers in the domain of environment, sustainable development, and Green Tech; + Funding for research, experimentation, prototyping, and testing; + Funds/in-kind support with presenting our prototype/innovation at the relevant exhibitions, conferences, and other events; + Mentoring support from researchers, investors, entrepreneurs in our domain of activity.

In my opinion, it is important to have support for Proof of Concept activities. I like to have support in obtaining finance are particularly prevalent for R&D for innovation.

- Proof of Concept financing (PoC); - problems and possibilities to provide PoC to support researchers to help them in successfully converting good research into good business.

Presentation of good practice for implementing scheme regarding the activities for Proof of Concept.

Research work and researchers from Western Balkan Countries, especially from Albania, need two kinds of support: 1: being trained and get knowledge on Proof of Concept, and, 2: being supported to organise their knowledge working individually based to the Proof of Concept program.

There are some limitations related to the access to the funding opportunities for researchers at earlier stages of career (PostDocs) in research organisations in Serbia. However, ideas are mainly coming from this part of research community. Transparency of the decision process is crucial (as in projects supported through Innovation fund and similar bodies) and it is important to proceed with this kind of funding. Also, workshops like this were of great importance for me, first time I participated I had difficulties to understand the terminology and relations between all stakeholder but now it is really useful and it is helping to think about all aspects of commercialisation from very

early stages of research process. I think it is important to maybe include successful scientist to share their experiences through the process of commercialisation.

It is a new way for developing a project. The technical aspects have to be well designed and described. So, the assistance is useful. Also, the support is necessary for the communication process inside the organisation.

Good knowledge of business environment, market, commercialisation, and a ways of financial instruments usage. Skilled people in business and commerce to support entrepreneurship.

It is very much important, because we have an overview of the problems and very often even possible to find a solution among the presentations or during the individual conversations.

It is important to have a PoC support in the WB because the national R&D spending of WB countries is very low. It results in fewer opportunities for the national economies to benefit from the new technologies; it limits the opportunities for researchers to engage in meaningful work and results in brain drain, and creates regional disparities. As WB countries are de facto Europe in terms of territory, it creates gaps in R&D development which cannot be easily bridged once these countries enter the EU. Therefore, WB countries need support for the PoC activities at this stage of the pre-accession negotiations.

More networking and mentoring opportunities + more diverse funding schemes.

It is important because the support it gives to the innovative ideas and we would like to have more supportive projects to the Proof of Concept activities dedicated to Western Balkan countries.

Q9: What was the most valuable practice/information shared at the workshop? Answers:

NETVAL - Italian Network of Technology Transfer Offices of Universities and Public Research Organization.

The most valuable practice shared were the presentations regarding the different projects and initiatives at the level of EU and the Western Balkans region.

Introduction of new funding and networking initiatives for WB as a key prospect for creating relevant innovation.

Regional funding related to S3.

The one related to the Regional initiatives for PoC structures, best practices and examples of possible models.

Experience of efficiency of cooperation! Model of organisation and function!

The most valuable information for me is the fact that the EU and JRC have good overview of all the issues that teams and SMEs in Western Balkans are facing.

It is not possible to monetise IP rights in Western Balkans today. Scale it up.

High Growth Ventures at Scottish Enterprise

It was mostly about a "menu" of different opportunities for financing research, proof of concept, and prototypes. Although they were mostly for the Balkan countries, I have made notice of some potentially good options for us, in Moldova, as well.

I wanted to mention interesting presentations in my opinion: Dr Julia Djarova "From R&D to innovation: The choice of financial support" Mattias Dinnetz "Joint Research Centre Proof of Concept Programme"

-Typical funds for PoC; - PoC and role in triple helix model;

The most important information is the possibility of application on different calls for projects.

How it works

Research work and industry can cooperate together, research work can have priorities and find the possibilities to work more efficiently.

Networking opportunities

The presentation of Frank Tooley, from Scottish Enterprise - High Growth Spinout Programme (HGSP). It was very straight forward, this type of information from people deeply involved in the process are the most valuable for me. Also, it is important to provide and hear scientists who are at the beginning of the process.

Financial instruments

Various approaches and best practice of PoC in the region and abroad. Review of programs guided by EC (H2020), and ERC were also interesting to me.

I found the whole event very useful and it opened a new perspective in research of financial solutions. It was also important that were given practical advice.

Every piece of information was very useful. Thank you all for the excellent organisation and valuable information. At this point we discussed all possibilities, and I am looking forward to see how the support for the PoC will evolve.

Know-how and experiences from some of the successful PoC practitioners.

The most valuable information was the importance institutions like Universities and Enterprises are dedicating in Western European countries to Proof of Concept activities and their support to have it as part of their management philosophy.

Q10: Please share your suggestions, comments, ideas for the future on the topic Proof of Concept (PoC): Answers:

One session of Workshops, dedicate to regional strategies of adaptation tools introduction of innovations in the Newly Associated Countries EU (EaP).

Bridging Science and Technology for Proof of Concept investments and innovation in the Western Balkans.

Introduction of virtual event management platform which will enable participants' wider interaction with the speakers, but most importantly among themselves.

PoC grants, development of a PoC from the very starting point to its finalisation.

Make easy model of cooperation and creation project for: individual innovators, University, SME, trade agency, Research Institute ... not only for developing innovation than for testing, production, use, trade...

I think the JRC is on the right track in getting the right players in Western Balkans in one room at least for couple of days per year. This practice should continue with many.

Give more practice examples, both good and bad.

Thank you very much for this opportunity! It will be great to have a bit longer programme (3 days, for ex.) with an "opportunities mini-expo", more time for networking, and domain-focused separate workshops. MEGA best wishes!

The future on the topic Proof of Concept: 1. Promote the transfer of scientific results to society as a basis for social and economic development. 2. Supporting international technology transfer networking events 3. Obtain a technological and commercial evaluation of the results.

More information about: - Market analysis, testing and competitors' analysis; - Product commercialisation study/plan - Better presentation of the Science parks where the events were held with special attention with PoC - case studies from Parks (Thessaloniki and Trieste SP).

Maybe to organise workshop in my country related to these topics.

Providing support programmes and possibilities for the creation of additional PoC support schemes in the specific countries; to provide financial support to researchers to help them in successfully converting good research into good business; to add some practical visits in the site/organisations.

I think it is important to maybe include scientists who successfully commercialised to share their experiences through the process of commercialisation.

These are my suggestion: a) The algorithm of the implementation of PoC in the organisations. b) What kind of support is offered by EC and how to access it? c) How to develop financial instruments and what role the EC is playing?

Information about knowledge of how to approach and how to be successful in collecting and usage of financial instruments of PoC, will be helpful.

In my opinion the project financing options are very important topics and it is important to share the new information on the upcoming events regardless of the main topics of the event.

At this moment in time, the discussion is comprehensive. The focus is placed on developing mechanisms which will create opportunities for R&D impact. As an expert who is working in development issues, I believe the WB region will also benefit from a stronger support in technology transfer to SMEs. Developing countries have the opportunity to grow faster if they are good in absorbing the technology from the developed nations. WB countries are well positioned for this, have good ties with Europe, and hold the potential of contributing to a stronger, more balanced EU. I know this was not the focus of the PoC workshop, due to the technology readiness levels, but maybe we should consider it within this, or other programs.

Organisation of regional/smaller meetings on regular basis in order to share knowledge and experience; setting up a mentorship network; maybe even setting up an information-sharing network to keep in touch with all the latest news, including funding opportunities.

As new ideas and new initiatives in different sectors are not missing in Balkan Countries, a much more intensive and dynamic presence of EU support should be dedicated to this very rich region in natural and human resources. We are looking forward to this support because there are very few Calls or possibilities for Proof of Concept activities to find the implementation and to be beneficial for different target markets in the region.



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