European Commission

JRC CONFERENCE AND WORKSHOP REPORT

Strengthening Technology Transfer in Europe

Focus on Western Balkans and South-East Europe

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Summary Report

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Table of Contents

Introduction

Successful transfer of valuable research results to the marketplace does not happen unless there are specialised measures that accompany the inventions through a process of maturation, in order to cross what is morbidly known as the "valley of death"; for this to happen several factors need to be in line: from measures, to conversations, mentoring and guidance, cross fertilization and market potential analysis.

Most universities, research and technology organisations, and science parks are hosting specialised units called Technology Transfer Offices (TTOs). These embrace diverse skills and instruments, including technology validation, proof of concept (PoC), intellectual property management, financial instruments, business intelligence, foresight and ecosystems integration, etc. In comparison to Western Europe, the deployment of TTOs in South-Eastern European research organisations is still at a very early stage.

Against this background the Joint Research Centre (JRC), the European Commission's science and knowledge service, has created in 2018 within its premises a Competence Centre on Technology Transfer (CCTT). Its main objective is to provide expertise and tools addressed to the needs of European policy makers as well as those of innovation practitioners particularly from the Danube, Western Balkans and South East European regions. In fact, over the last years, the JRC developed a network of 1000+ operators in the Regions through the organisation of workshops and trainings on specific aspects of technology transfer involving also experts from Western Europe.

Area Science Park, as the national public research organization responsible for the management of Area Science Park's campuses - the leading multi-sector Science and Technology Park - in Italy, pursues its mission to contribute to the development of the business sector through innovation and technological research. Area Science Park has developed and consolidated in 30+ years of activity methodologies to innovate enterprises (especially SMEs), to valorise research results, to create start-ups. They are now part of a coherent territorial model called "OIS - Open Innovation System aiming to create a permanent territorial open innovation system networking all the innovation players and stakeholders acting in a territory. Given its geographical position, Area Science Park is actively engaged in collaborations with the Western Balkans in the area of innovation and technology transfer.

This "hybrid" event, held online and on site in Trieste, included a public three-day conference with a combination of plenaries and round tables cutting across the various aspects of technology transfer. The first day provided a "technology transfer journey", including TT tools (e.g. IPR management, licences, etc.), patent & market intelligence including JRC's Innovation Monitoring (TIM) software tool for technology innovation monitoring dedicated to start ups and scale ups. The second day provided an "innovation ecosystems & entrepreneurship journey", including innovation ecosystem design (incl. research infrastructure and testbeds), considerations on early stage financing, how to get investor ready, among other topics. Finally, the third day provided a journey through a novel initiative from the European Commission aimed at facilitating the validation (prototype, demonstrator, etc.) and explore avenues for the commercialisation of technologies developed within Public Research Organisations (PROs) and SMEs in the Western Balkans. The journey "PoC support for the Western Balkans" was designed to assist local entrepreneurs and researchers in gaining practical experience in technology transfer and maximise the potential of successful technology transfer deals in the Region.

Summary and Conclusions

With its main focus on the Western Balkans (WB), the conference "Strengthening technology transfer in Europe" could not have come at a more appropriate time, i.e. just a few weeks after the EU Enlargement Summit of October 6th 2021 in Brdo, Slovenia, where the Prime Ministers of the EU countries and WB have reaffirmed that the European perspective for the WB remains the shared strategic choice. In the Summit's final declaration, the Prime Ministers also launched an "Agenda for Innovation for the WB" to be developed under the aegis of the European Commission. With this declaration, the EU confirms the strategic importance of building up innovation capacities in the WB, where similarly to other Eastern European countries formerly under communist regimes, science was regarded more as an instrument for intellectual leadership rather than a requirement for economic competitiveness. The European Innovation scoreboard provides evidence about the important innovation gap still existing today between the Western and Eastern sides of Europe.

With relatively high labour costs and scarce raw materials, research and innovation remain Europe's only tool for competitiveness. Moreover, innovation is not a zero-sum game, so all countries and regions can gain when their economies become more innovative. True, innovation can also be bought, e.g. from universities or companies in China or the US, but this will not lead to sustainable growth. With the shortening of the products' economic lifetime and increased pressure from globalisation, companies today have to continue to innovate to remain competitive in the marketplace.

The innovation process requires many different "cooks, recipes and ingredients" to be successful. Once research results become available, one needs to acquire the skills and financing and develop the ecosystem in order to bring them to fruition. The riskiest part of the process, where almost no private operators are present, is what is generally known as "technology transfer" or "knowledge transfer". Actors of the financial sector generally start to be involved in the "venture capital" phase, when there are already new companies having significant business traction. It is therefore the role of the public sector to bridge the gap between the research end and the venture capital end, in a space known as the Death Valley, where market forces are not working.

The main purpose of this conference was to present to hundreds of innovator practitioners and scholars from WB and Southern and Eastern Europe the best available tools and practices for technology transfer in the EU, along with the existing opportunities for innovative project funding and networking. Most of the countries or regions have launched initiatives to develop Smart Specialisation Strategies (S3), which aim at allocating public funds for research and innovation to the specific competitive advantages of their economic systems. S3 is also a tool for further differentiating the economies of neighbouring countries, thus stimulating regional trade and the internal market. The S3 example of the *Regione Autonoma Friuli-Venezia-Giulia (FVG)*, which was presented at the Conference, could become a role model and inspire regions in the WB. FVG has successfully deployed a significant effort to arrive at defining the strategic focus for R&I with the involvement of the four major actors of the local innovation systems, namely science, policy, industry, and society. As a bottom-up complement to S3, Area Science Park and FVG have launched the project ARGO, an initiative to provide hands-on innovation support to the SMEs of FVG in strategic areas: a successful project which will shortly be extended to other Italian regions.

Indeed, technology transfer is an essential tool for the practical implementation of S3, provided its deployment is tailored to S3's strategic areas. As was shown in first technical session (TT tools and strategies), all industrial sectors have different dynamics, actors and funding requirements, therefore their

deployment requires specific competences. The availability of many free-of-charge tools and databases for supporting technology transfer, which are still poorly known, was presented by several speakers including representatives from JRC, EPO, WIPO and EIC. An example in the climate area was given in the session technology transfer and the Green Deal, where the results of a recent JRC study were presented and commented on by relevant Commission services. This dealt with the main barriers and facilitators of the market uptake of promising green technologies, a process which will likely require decades to be impactful on the global scale.

The initiative to create a regional network of practitioners (TTO) in the WB was presented by the RCC representative in the policy round table of the last day. This could connect with the equivalent networks in other EU countries in the frame of ASTP, the European Association of Technology Transfer Professionals.

A prime requirement for successful innovative projects are research & technology infrastructures, without which innovative products from research cannot easily be tested and certified. Given that today most of scientific infrastructures are located in Western Europe, it is of utmost importance to enable access of researchers and SME to such infrastructures, as well as to federate the new ones in the WB and South-East Europe. The publicly-funded consortium CERIC-ERIC has exactly this purpose, while other programme at the EU level have calls specifically dedicated to the WB and South-East Europe including the EIT, JRC and the Widening Programme of Horizon Europe.

The Conference also dealt with the management of data, which are often called the "oil of the 21st century". The speakers from the Commission stressed the need to create a data governance system based on the FAIR principles (Findability, Accessibility, Interoperability and Reusability) taking into account also the different types of data: personal, non-personal, open, proprietary, public and private. The presentation from Area Science Park on their huge database capability for Genomic and Epigenomic data has provided a concrete example of the many challenges affecting the management of data in the health sector.

The last day of the Conference was perhaps for us the most original and inspiring part of the conference. After a high-level policy debate on the interplay between research, smart specialisation and technology transfer, the results of the EU4Tech project were presented. This project, which is funded by the IPA programme and (scientifically) coordinated by the JRC, is now in its second phase. While the focus of the first phase completed in 2020 was on raising WB's technology transfer capacities, in the ongoing second phase, 46 promising "proof of concept" projects in different areas have been selected through open calls. They are receiving support in the form of expertise and coaching from EU experts. This project complements those launched by some existing national innovation funds in the WB by adding the regional dimension and the technical expertise.

Finally, we wish to thank all the colleagues of Area Science Park in Trieste who helped with the organisation of the technical visit to the campuses in Padriciano and Basovizza including the living lab, HPC and genomic and epigenomics lab and the Java Biocolloid facility in Trieste.

Giancarlo Caratti and Stephen Taylor,
Chairpersons of the Conference

SUMMARY OF INDIVIDUAL SESSIONS

Day 1

Session 1.1 Technology Transfer tools and strategies

- Good use of IP is crucial for economics (and even more today for recovery)
- Overview of digital tools which offer new opportunities for innovators to facilitate TT
- Need for an ecosystem approach for better TT and knowledge valorisation policy

Session 1.2 Data use, access and control

- Informative overview of categorisation of data and their use, access & control
- Presentation of relevant EU initiatives like the Data Governance Act, the ongoing work for an Implementing act on high-value datasets and for a Data Act for fair distribution of data
- Case study of data use, access and control by Area Science Park (FAIR data)

Session 1.3 Technology Transfer and the Green Deal

- Presentation of JRC report on TT and commercialisation for the Green Deal
- Presentation of relevant initiatives e.g. the Fit for 55 package and new funds dedicated to MS for the green transition
- VC investments in EU climate technologies have exponentially increased over the past five years now there is a need to streamline
- How to exploit synergies across mechanisms, instruments and initiatives

Session 1.4 Smart Specialisation and Technology Transfer: the experience of the FVG Region

- FVG smart specialisation strategies to overcome innovation bottlenecks with extensive description of the projects SiS FVG and the ARGO system project
- Presentation of the Industry Platform for FVG (an asset of the ARGO system project) and of the transformation from DIH to EDIH
- Overview of regional cooperation for TT in the countries of the Central European Initiative.

Day 2

Session 2.1 How to build Innovation Ecosystems

- Need to acknowledge differences between the many IEs actors supporting businesses
- Sharing of best practices in developing Innovation Ecosystems (IEs)
- Area Science Park recipe for success: economic resources, excellent organisation and people, and taking the time to invest in young talent (even more important in the WB)

Session 2.2 Research Infrastructures and Technology Transfer

- There is no silver bullet to solve the gap between knowledge creation and innovation in Europe. Given the complexity of TT, several solutions need to be explored, including the variety of RIs (e.g. from distributed RIs to living labs, from international centres to open RIs)
- The key role of RIs as tools to enhance TT
- TT ensures accessible solutions to users

Session 2.3 Empowering entrepreneurs and innovators with EIT in the Western Balkans

- Practical information on EIT initiatives for the WBs: EIT KICs, EIT Jumpstarter, Cross-KIC on Green and Circular economy
- Testimonials of WB innovators benefiting from EIT

Session 2.4 How to get investor ready and accessing finance for innovation

- Overview of Fraunhofer TT Fund and Progress Tech Transfer Fund
- Shared success factors in accessing finance: a long term vision, a convincing business model, and a good and experienced team are crucial (EIC Accelerator provides coaching for this purpose)
- Importance of partnerships when starting a PoC

Session 2.5 Success stories in accessing finance for innovation

- Success stories of companies from SEE and WB
- Heterogeneous types of finance accessed: VC funds, research grants, EU funding, Business Angels, equity
- Tips: a convincing vision, a strong and cohesive team, building relationships with investors, and taking advantage of mentorship programmes

Day 3

R&D&I Policy Session

- Western Balkans are of strategic importance for the EU: need for convergence
- Western Balkans committed to S3 voluntarily
- Western Balkan's Agenda on Innovation has three axes:
  - Political (integration process evidence based policy)
  - Thematic (innovation ecosystems, twin transitions, green deal)
  - Regional
- It is crucial to ensure sustainability of innovation, even after EU funding ends

Session 3.1 Implementing Smart Specialisation Strategies in the WB: from theory to practice

- Overview of WB countries experiences with S3: currently at different stages of development/implementation

Session 3.2 Impact of the PoC scheme in the Western Balkans

- PoC project scheme reveals great potential in the region
- Main achievements, lessons learnt, challenges and strengths were shared

Session 3.3 Learning through PoC activities: how to move a project on the TRLs

- Perspectives from the beneficiaries of the PoC project scheme were provided, including challenges encountered and main benefits
- Main questions remaining: what will happened after the PoC support? Will there be TT support?

Opening Speeches

Matthew King (Deputy Director and Head of Unit, IPR and Technology Transfer, JRC, European Commission) and **Caterina Petrillo** (President of Area Science Park) kicked off the conference by welcoming the participants and introducing the following institutional representatives.

Simona Kustec, Minister of Education, Science and Sport, Slovenian Presidency of the Council of the EU 2021

Dear ladies and Gentlemen,

I am honoured to speak at this event, especially now that Slovenia is holding the Presidency of the Council of the European Union, and I am happy to see that the focus of the conference is to share best practices and foster the TT ecosystem in the WB and SEE. The WB have also been a horizontal priority of the Slovenian Presidency of the EU, and many different activities focussing on the WB were held.

In this respect, I would like to particularly emphasise the achievements in the area of research. The EU – WB Summit, which took place on 6th October, launched the WB Agenda on Innovation, Research, Education, Culture, Youth and Sport. The Agenda offers new opportunities for researchers and innovators, outlining a comprehensive long term strategy for cooperation with the region.

We are convinced that the WB belong in the EU and in the ERA, too. Currently, with the work of research, we are preparing for the implementation of the new reinforced ERA, a big umbrella priority for the European research space of the future. The new ERA may be crucial to ensure Covid-19 recovery and the green and digital transitions in Europe. To support its implementation, the ERA policy agenda is being prepared. This will be informed by the November 2021 Council Recommendation on the Pact for Research and Innovation in Europe. It will put forward tangible and concrete ERA actions identified by the Council, the Commission, MS and Associated Countries as well.

This concerns today's discussion on TT, as a very important action of the new ERA is maximizing the value of knowledge creation, validation, and uptake of research knowledge into practical applications. Through this action we can ensure research provides value for all, benefitting society as a whole. Research in a laboratory bubble only has so much impact, so we need to work together to ensure that this transfers into the real world.

There are already many channels for successful transformation of knowledge and tech transfer, such as the creation of innovative spinoffs and start-ups, effective IP management, citizen engagement, industry – academia collaboration. However, enhancing this and creating new sustainable forms of cooperation between different actors, alongside designing incentives, is something that we all need to commit to.

The importance of these matters was highlighted once again during the recent Slovenian Presidency conference on a New ERA held in October in Ljubljana. Boosting TT practices was one of the four focus areas. Stakeholders highlighted some key messages that I would like to share with you.

Fostering knowledge valorisation and TT has to be embedded in the strategies of research organisations. It must be promoted far and wide, within and outside the research community. We have to tailor our approaches to different actors and their needs in the innovation ecosystems. What works for a researcher may not work for SMEs, so we need to find a common language. It is essential that we build capacities, e.g. financial, staff, tools, and those capacities need to involve experts and professionals.

We need to provide stability for the implementation of tasks linked to TT and valorisation. By standardising practices, we can accelerate knowledge transfer and valorisation at EU and country level, taking into

account also associated countries. Furthermore, we have to think of new forms of shaping academia – business cooperation, the role of society and civil engagement has to be promoted — after all, it is citizens who can influence research and ensure industry interest in riskier, less mature technology. Societal interests are powerful and can also help encourage researchers to develop more advanced tech, such as the continuously improving computing technology. But this all relies on researchers' and industries' ability and appetite to work together.

A culture shift is needed here. Entrepreneurial upskilling of researchers is important, but goes only so far. This must be supported by research assessment: the value of commercialisation and knowledge transfer activities are under-recognised within research.

The same cultural shift goes for SMEs, start-ups, spinoffs and spinouts. We have to boost their innovation potential by capacity building and providing support to upskill. Different phases of their development require a tailored approach. Of course, we must take into account different regional innovation ecosystems as well.

We must also consider financial incentives for industry – academia cooperation. Within funding initiatives, we can help foster long term partnerships and support development through the difficult valley of death, which all too often hinders the development of mid-TRL technologies. We must incentivise industry to overcome their perceived higher risk. The reward can be exceptional.

Further on, synergies between funding should be leveraged at regional, national and EU level. For example, widening participation and spreading excellence is an important instrument of Horizon Europe. This instrument strengthens capacities of valorisation and TT for the WB. It enables sharing of best practices, skills development for knowledge valorisation, empowering researchers, engaging society, while developing regional innovation ecosystems. Within the widening instrument, there are many concrete measures, such as Twinning, Teaming, ERA chairs and Excellence Hubs. These are all aimed at increasing performance of R&I systems in widening countries, towards excellence in a pan European approach to cooperation and mutual knowledge sharing. Whilst we look to implement a supporting TT environment, we must still remember the basics: what is the content of knowledge valorisation and who are we doing this for? We must take an interdisciplinary approach, incorporating social sciences and humanities, understanding that we need to put emphasis on the applied sciences, without forgetting about the role of basic science. And we need to go from basic research to societal applications, of which we will be speaking during today's conference.

Allow me to conclude by thanking you for the attention and wishing you a fruitful and rich discussion.

Pierpaolo Roberti, Assessore of the Friuli-Venezia Giulia Region [translation from Italian]

Dear guests and distinguished authorities,

Welcome to Friuli-Venezia Giulia on my own personal behalf and on behalf of the President of the region, Mr Fedriga. Your presence in Trieste and especially this venue, the old port, is particularly important for the topics of this international conference.

For centuries the port of Trieste has been the heart of trade between Central Europe, the Balkans, Eastern Europe and the Mediterranean. Today, Trieste is once again playing a strategic role in the logistics of this area. I believe this is an added value for the whole area overlooking the upper Adriatic Sea and beyond.

Over the next few days, you will be discussing topical issues related to another field where Trieste has always played a prominent role, as in science and research.

FVG has been included by the EC among the regions of Europe considered to be strong innovators. It is the only one in Italy, so much so that it was called by the EC a niche of excellence.

In 2019 FVG was the 12th region in Europe in terms of number of applications submitted to the EUIPO with respect to the regional GDP. FVG also shows excellent results in terms of SMEs expenditure in innovative sectors not related to R&D, and also in the number pf SMEs doing in-house innovation.

The region believes in economic recovery as shown by the number of new companies: FVG is the second region with the largest percentage of innovative start-ups out of the total number of new companies: 5.19% against the national average of 3.58%.

This region is aware that innovation goes hand in hand with training, which is a concept present during people's whole working life cycle. The regional administration is promoting and facilitating a system where research, training, and work are interconnected.

This is why I believe that in this context you will find fertile ground for discussing TT and innovation ecosystems, entrepreneurship, start-ups and financing instruments, lifelong learning as well as new professions.

At this conference you will be speaking about the future, at a time when we are all called upon to believe in research and to overcome all together and quickly one of the most difficult times for Europe after the post-world war period.

So, enjoy your stay and I wish you all a fruitful conference.

Maria Cristina Messa, Italian Minister of University and Research (video message)

Dear all,

Thank you for inviting me to this interesting meeting. I am honoured to contribute to a discussion that is focused on TT between the WB and SEE.

With a true vocation for innovation, Trieste is a strong link between Italy and the Balkans, and it is a natural place to start from when it comes to structuring fruitful collaborations between Italy and the Balkan States — through the establishment of connections between research and business, the promotion of collaborations between the public and private sectors, and the acceleration of innovation processes.

Progress will be made with the adoption of the new Strategy on scientific and technological development for the period 2021-2025, and the Smart specialisation strategy was already implemented through recommendations in 2020. Further steps have been taken to deepen international cooperation and improve research and innovation capacities in private sectors.

In recent years, the development of TT ecosystems in the Balkans and SEE has been accelerated through several initiatives. Among these, the WB Steering Platform on research and innovation and the Central European Initiative. The results reached so far through these initiatives are interesting, but not enough.

It is important to establish bilateral relations between Italy and the Balkan States, in order to enhance the cross-fertilisation between research and industrial production. Only in this way will the scientific, technological, and industrial production of the Balkan area further progress into concrete benefits for the whole EU — for example, where local enterprises strive toward innovation and favour the spontaneous birth of collaboration between Italy research groups and private companies from the Balkan area. Such spontaneity and geographical proximity are leverage factors that must be capitalised to consolidate these processes.

In this regard, the role of research infrastructures operating in the Trieste area is fundamental. We have Area Science Park, the

International Centre for Theoretical Physics, Elettra Sincrotrone, CERIC-ERIC, and other centres as well that play an important role in fostering technology transfer in the Balkans and SEE.

The duty of this Ministry is, at least in part, to coordinate and work with research institutions and universities with the aim of increasing cooperation, and following projects currently underway between Italy and the Balkan States in the context of the national research programme as well. Thank you for your attention.

Mariya Gabriel, European Commissioner for Innovation, Research, Culture, Education and Youth (video message)

Ladies and gentlemen,

I am delighted to be able to address this conference on Technology Transfer and I would like to congratulate the organisers for making it happen.

Europe is the word leader in the production of knowledge, with a research and innovation community ranking very high in many fields of science and tech. The EU has the largest programme covering all these disciplines and providing stable support to research, from fundamental to applied science and technology.

Still, with such fertile ground, Europe has to do more to harvest the fruits of investments in science an innovation. A key question remains for us to give a response: what happens next? The challenge is how to turn these ideas into fully-fledged products and services. This is particularly important to accelerate the Green and Digital transitions. We need to provide the conditions for new entrepreneurs to jump in the scene and support more daring business strategies.

It is important to do this in Europe and beyond. Strong cooperation with the WB has always been at the core of my work, offering unparalleled opportunities. I am glad that the EU and the WB leaders launched just a few weeks ago my initiative for an ambitious WB Agenda, covering all policy areas of my portfolio. The EU – WB Agenda on Innovation, Research, Education, Culture, Youth and Sport will open new opportunities to students, researchers, innovators, and cultural operators so that they can access new markets, make them more competitive and build sustainable prosperity. Foresight, smart specialisation, TT, capacity building activities and evidence-based policy making will guide this agenda.

The Commission, with precious contribution from its Joint Research Centre, is accelerating the process of bringing the WB to the EU. The support to WB countries includes scientific and technical aspects of EU legislation in areas such as energy, environment, transport, and smart growth. These are important steps towards Smart Specialisation Strategies and TT activities, through capacity building initiatives focused on upskilling and improving organisational capacities. As part of the effort of bringing innovations in the WB closer to the market, we launched a dedicated action in support of PoC activities, which provided hands-on support to more than 40 projects from across the region. The experience of a selection of these projects will be presented and discussed on the last day of this conference.

We need to work together to see how to attract investment, develop human capital, support start-ups, and create the conditions to retain talent in the region.

Let me conclude by recalling that the WB are a priority region for this Commission, one to which I personally pay a lot of attention

I congratulate the organisers of this conference on such an important topic for our future. Thank you for your attention.

Summary of Scientific Talks

Day 1 Technology Transfer

Chairs for the day were **Giancarlo Caratti**, former Head of Unit, DG JRC.I.4 (IP & Technology Transfer) and **Stephen Taylor**, Director, Area Science Park.

Session 1.1 Technology Transfer tools and strategies

The moderator **Sheron Shamuilia** (Policy Officer, JRC, European Commission) introduced the session focussing on tools and strategies for Technology Transfer.

Yann Ménière (Chief Economist, European Patent Office (EPO)) explained that the European Patent Office (EPO) created the position of Chief Economist as it gives importance to the relation between use of IP and the Economy. The role of Patent Offices is to keep track of the use of patents and foresee their impact on the economy, as well as to monitor TT transformations so as to anticipate the need of users.

He explained that such was the underlying logic of the EPO study "Valorisation of scientific results — Patent commercialisation scoreboard: European universities and public research organisations" published in 2020, showcasing how patents have an impact on society. The study investigated how universities use patents, and revealed that 36% of university inventions of which an IP application has been filed are commercially exploited. Also, half of the overall partners helping to bring inventions to market are SMEs, mainly located in other EU countries: that's why European patents are so important.

Persistent challenges highlighted by the speaker include Proof of Concept, finding partners, lack of resources, and complexity of dealing with IP. To solve these issues, EPO has initiatives like the Patent Academy, providing training and also case studies that aim at highlighting best practices in IP valorisation and commercialisation

Two case study were covered during the presentation:

- Atlantic Therapeutics: a R&D collaboration between University College Dublin and Bio-medical research led to joint ownership of patented solution to an unmet clinical need. Importance of licensing arrangements recognising the interests and capabilities of all parties (both industry and academia).
- Oxeon (SE). In SE there is the professor privilege. This invention (3D weaving technology for composite textiles) stemmed from a PhD student at Chalmers. There was no TTO to support the exploitation, but a strong system with business angels, Chalmers Venture, and students joining the spinoff.

The speaker concluded mentioning that these EPO innovation case studies are collected in a platform, and are meant to provide policy insight and awareness on the IP topic, as well as to be used as training material and learning tools in IP strategy.

Andrea Basso (expert team lead of JRC study) presented the JRC study "TT knowledge management: mapping online resources for TT", exploring digital tools in support of TT and IP.

Firstly, he provided some key project results:

- Large survey reaching 15 K people (including TTOs and policy makers, TT professionals in EU) to understand the issues in digitalisation in TT;
- Scouting for online TT tools, uncovering more than 400 tools;
- First draft of a blueprint for an online platform.

He then pointed out the three main areas identified by the study in which digitalisation can speed up TT:

1. Scouting for technology, by accelerating the process;
2. Assessing the Tech and IP, by supporting the evaluation process;
3. Commercialising and fund raising, by facilitating first contact.

He continued noting that the study also provides a categorization of the 400 online resources for TT revealed, which proved that there are different TT models in different industry sectors. In particular, traditional industries are a closed environment, so they base TT on personal relationships; in life sciences there is an overabundance of tools; in ICT there are tools (e.g. repositories of software), but coming to an agreement can prove tricky.

The speaker proceeded to share some of the key findings of the study, such as that in the private sector there are more tools and more formalised processes in TT scouting, evaluation, commercialisation, as well as that awareness and trust on online tools is still quite low.

Some examples of tools for IP were provided: Patent Basic; Espacenet (130+ million patents and applications from 95 patent offices; it allows for bibliographic and full-text searches; it also indexes documents for Google Scholar and Google Books); Google Patents (it allows forms of prior arts; but less performant than Espacenet according to the speaker).

The speaker pointed out that all these databases are free and can be a very viable tool for researchers, who are encouraged to use such tools.

The main issue that such free tools present is that their usefulness depends on the user.

Finally, some suggestions were provided on:

- Trend Analysis: is very important for many reasons. Some free tools that can be used are JRC TIM analytics and Google trends;
- Idea Evaluation: the EPO IP Score can help in the evaluation in the fields of market, finance, legal status, tech, and provides a final report.
- Useful readings from WIPO: *Successful Technology Licensing; IP Toolkit for Universities and PRIs; Enterprising Ideas.*

Olivier Eulaerts (Team leader for Tools for Innovation Monitoring, JRC, European Commission) proceeded to illustrate the JRC's TIM technology mentioned by the previous speaker.

The speaker explained first the mission of JRC TIM analytics team which is to support evidence-based policy making by developing data analytics tools and methods and applying them to datasets to extract knowledge from data. He then provided examples of tools, in particular based on text mining, to support TT.

The process of Data to Knowledge is a complex one, going from data being collected and enriched through various text mining processes (e.g. geolocation of documents, document vectorisation, keyword extraction) then indexed. From these data indexes, users are able to operate queries.

The speaker then proceeded to explain how TIM tools can be used for Technology Transfer, providing a few examples:

- TIM news is a data visualisation tool that can is connected to the Europe Media Monitor, another JRC project, and allows to monitor the media. It allows for example to spot news related to companies active in a certain TT field.
- TIM technology helps also to find documents similar to each other: each document is transformed in a vector of terms, and the tool compares these

vectors. In that way, the tool can capture similarities between documents to for example retrieve patents, which is useful to understand if there are patents that are similar or related to a similar topic. It can also capture possible trends around a particular patent.

- Mapping of a particular field: the tool can be used for a semantic search related to patent documents, allowing to extrapolate the main actors active in a particular field, the regions involved etc.
- Identifying potential partners for exploitation of patents. The tool can generate a list of companies/universities working in the field, authors or inventors, knowing in which department they work. Although these tools allow quite elaborate searches, text mining cannot substitute TT officers, but it can support TT officers, e.g. with relation to the region they are operating in.
- Additional uses: the tool can find the most influential organization in the field, collaboration networks, the most influential authors, also in specific regions/countries; also providing an indication of essential patents (with citation analysis).

Kirsi Haavisto (Head of Unit Valorisation policies & Intellectual Property Rights, DG RTD, European Commission) then covered the EU initiatives in the field of Knowledge Valorisation policies.

The speaker acknowledged the new European Research Area, which has as one of its mandates to review the 2008 Recommendations on TT addressed to Universities and PROs, together with the new Code of Practice and Guiding Principles.

Some results of the EC stakeholders consultation held in spring and summer were shared. One element that came out was the need for a broader scope, meaning to go beyond traditional TT, including other ways to get out value from research (e.g. policy uptake of research, citizens engagement; increasing impact of research from SSH), as well as to expand the scope to more actors. Secondly, the consultation uncovered the need for recommendations to give more emphasis on certain topics, such as Industry-academia collaboration, how to widen knowledge asset management, beyond IP, provide support and skills development related to TT, adopting an overall ecosystem approach.

The speaker pointed out that the topic of access to results of Covid-related research was covered, leading to a discussion with stakeholders on licensing practices of Covid therapeutics, in particular on a manifesto for Covid research to improve and make faster the access to results needed to fight against the pandemic.

Another initiative mentioned by the speaker was the Knowledge Valorisation Week, organised with the Member States last year, and the Knowledge Valorisation Platform, aiming at facilitating the exchange of best practices and tools for better transformation of research.

Finally, she announced the upcoming launch of expression of interest for creating a Community of Practice that will be tasked with co-creating the new Code of Practice for smart use of IP.

Muriel Attané (Secretary General, European Association of Research and Technology Organisations (EARTO)) explained the role of EARTO as a European Association of Research and Technology Organisations and the importance of RTOs in TT, as they develop technology for the industry that will eventually be transferred. She focused in particular on

EARTO experience as part of the TTO Circle organised by the JRC.

The collaboration between EARTO and the JRC goes back almost fifteen years. The TTO circle has the crucial role of linking TTOs with industry, and has experts in all ventures, thus helping the circulation of best practices, uncovering new trends in IP management, setting up spinoffs, accessing investment platforms, etc.

The speaker then explained the double role of RTOs in TT:

- In an outside-in approach, when innovation actors look for EARTO tech, EARTO provides the relevant connections (need to manage correctly IP and contracting in different industries). In terms of policy, a good way to support TT is by supporting RTOs, which often provide relevant tools to the ecosystem.
- In an inside-out perspective, creating spinoffs.

The speaker concluded mentioning how every RTO has its own model, and that it can vary among regions.

Laura MacDonald (Chief Executive, Association of European Science and Technology Transfer Professionals (ASTP)) gave an overview of what ASTP as an association of TT professionals is doing to support TT, in Europe as well as in the WB.

ASTP has been active for twenty years, primarily within universities, but also in touch with members form the private sector. Its aim as a community of people is to share expertise and understand better the challenges in the TT sector. It provides formalised training offers, masterclasses, webinars (both free and for members) also in digital form, in line with the ongoing digitalisation process.

The speaker pointed out that as a Pan European association covering 50+ countries, ASTP brings together formal and informal national communities, also in Eastern Europe and the WB, connecting national networks to increase the impact of TT.

She concluded mentioning that ASTP also supports inter-sectoral networks of people within the community (e.g. connecting digital innovation experts and health experts).

Olga Spasic (Senior Programme Officer, Innovation and Technology Transfer section, World Intellectual Property Organization (WIPO)) pointed out WIPO's long tradition in supporting TT via various tools, such as the Tech Licensing Toolkit mentioned by Andrea Basso.

She carried on mentioning that in recent times, WIPO started providing more and more customised tools for specific areas/regions. It is now working on developing a section on TT via an Innovation Ecosystem approach, supporting all stakeholders (e.g. policymaking, human capital, access to market).

All WIPO tools focus on policy issues, such as how to create infrastructure to make more efficient TT, capacity building programs, valorisation and marketing. For PROs, there is a dedicated IPR management series of tools and manuals for IP evaluation.

Still, the speaker argued that there is a need to revise these tools, as the TT approaches are changing, especially in the field of public health in times of Covid (e.g. free-licensing, licensing deal between Pfizer and WHO). Right now, WIPO is developing a new tool (STL) in tech licensing that will include manufacturing licensing so that future producers of vaccines will be able to be partners in TT. A new IP evaluation tool is also being developed, with a general guide and booklets on specific issues (e.g. custom infringements; biotech; start-ups). Such tools also need to be made user-friendly, as there is a need to increase the capacity of SME to understand the role of IP.

Another WIPO initiative mentioned by the speaker was the new guide on incentives for researchers, focusing on how they can be rewarded if participate in free-licensing.

As WIPO is adapting to specific sectors (e.g. health, digital, environment) it is also preparing a special Covid package for all stakeholders that will participate in Covid solutions.

The speaker then pointed out that in the Western Balkans, there has been a program for fostering collaboration between industry and academia since 2019, which is still ongoing. WIPO also provides a brief synthesis of its tools adapted to the region.

Finally, the speaker announced that this year WIPO is launching the Young Fellow programme to identify 10 professionals per year form different countries to invest in their training, to create human resources worldwide, and especially in countries that are lacking these professionals.

Q&A

Q How can small research teams from the WB access investment for TT?

A Andrea Basso: two examples are the EU4tech capacity building and EU4tech PoC programmes.

Q What are the benefits of giving away know-how and innovation experience for the transferring regions, and what is the logic motivating them to do so?

A Laura MacDonald: formalising knowledge is an essential process, especially in collaborations with industry. There needs to be strategies to make research results visible and increase incentives for transferring know-how, so that the existing knowledge can go forward and have an impact.

A Olga Spasic: WB have a frustrating situation, as they have invested in awareness, there are a lot of bright people, but there is no ecosystem and no regulation (e.g. on the ownership issue, start-ups founding). At institutional level, there are investment funds for TT and recognition as incentives for researchers. However, the main interest is towards securing resources. EU projects create the structure. But they are not enough, as after the EU funding is over there is no sustainability. That is why a strong ecosystem is needed: to help in accessing finance, to provide guidance.

Session 1.2 Data use, access and control

The moderator **Giancarlo Caratti** introduced the panellists and the topic of data use, access and control.

Jean Paul Triaille (Legal Adviser, Central IP Service, JRC, European Commission) set the scene for the first session, clarifying the categorisation of data.

He introduced some key legal concepts regarding data ownership. There are different categories:

- Personal/non personal data: regarding personal data, with AI, IoT and similar technologies spreading, the quantity of data collected by devices is constantly increasing; therefore, the GDPR covering these situations will become even more important.
- Confidential/non confidential data: regarding confidential data, the Trade secret directive protects confidential data, but condition for it to be applicable is that you protect your data first, ensuring they are kept confidential.
- Data protected/non protected by IP.
- Public sector/private sector data: regarding the public sector, the Public Sector Information (PSI) Directive —

reviewed and relabelled Open Data Directive — requires that data owned by the public sector be made available as much as possible to the private sector; regarding the private sector, the new buzzword is data sharing B2B (business to business) and B2G (business to government).

— Regulated/non regulated sectors.

Clearly, often these categories overlap, generating complex situations.

The speaker then focussed specifically on the topic of data protected by IP.

He noted that there is no IP on raw data or information as such. However, there can be copyright for a database, on the condition that the selection or arrangement is original (i.e. specific to the person who prepared the database), otherwise, if you are not selective and include all the available data on the topic without being original, copyright will not benefit the work.

The speaker also added that the EU has come up with a new system that does not exist anywhere else: the *sui generis* right on the content of the database. In this case, the condition is the existence of a substantial investment in collecting, verifying or presenting the data. This rule is often criticised, and it must be said that the ECJ is interpreting this prerogative in a more and more restrictive manner. Now the question is if the data generated by machines could fall under the *sui generis* right (data belonging to the person who has made the substantial investments, and who is that person).

The speaker then provided a few other notions that can be useful when talking about data, namely that depending on the legal instrument the right that one will have will be different: DGPR covers access, control, use, deletion, correction; the Trade Secrets Directive gives the right to keep secret and prevent unauthorized use of data; Copyright to copy, adapt, distribute, and make available the data; the *sui generis* right to control the extraction and reutilisation of your data; the PSI Directive to reuse the data.

However, even if there is an abundant set of rules on data, it can be said that that IP and law is not all. Contracts are often even more important, as tools for regulating the use of your data: licensing (commercial licensing), cross-licensing (sharing), open data licensing. On top of contracts, there is a *de facto* possession of data, that guarantees a de facto monopoly on access, for example to exploit it but not licensing at all, not sharing (just another way to extract value form data)

The speaker finally noted that there is currently a debate on whether it makes sense at all to talk about data ownership. He commented that rules on access (access by competitors, governments, researchers, etc.) are as, or even more, important than discussions on ownership, and that will be one of the main topics up for discussion in the future.

Maria Rosaria Coduti (Policy Officer, DG CNECT, European Commission) introduced some of the initiatives currently pursued by the European Commission on data, such as the ongoing work on the Data Act, a major initiative under the Data Strategy.

The speaker noted the central position currently held by data and the importance of data driven innovation (e.g. in smart mobility, achieving the objectives of the Green Deal), as data is more and more at the centre of the digital revolution. Sharing data is crucial, also for the developing potential of AI applications. The amount of industrial and private data is very high and expected to exponentially increase: it can be a driver in job creation and support the economic activity in EU, at least when the COVID pandemic will be behind us.

However, the speaker also stressed the need to ensure that companies and individuals have more control on the data they generate, which is one of the aims of the EU Data Strategy, which is the response to many data-related EU

issues (e.g. not enough of data for the EU, not enough data processing and storing solutions, no user empowerment, no comprehensive data policy, fragmentation of the single market). The Data Strategy thus aims to create a single market of data, helping creating value.

The Data strategy also aims at strengthening the political position of the EU globally by making better use of data-driven innovation.

The speaker then proceeded to illustrate in detail the main EC initiatives under the Data Strategy.

She explained how the European Commission adopted in 2020 the proposal for a Data Governance Act to improve trust and data availability (the conditions allowing those who are willing to share date to do so more easily), as well as strengthen data sharing mechanisms. Its aim is to foster the availability of data by increasing trust and strengthening data policy mechanisms in EU. The intervention areas covered by the Act are: reuse of public access information that cannot be treated as open data, regulating private data intermediary, data donation, obligation to keep non personal data safe in international contests. This framework offers an alternative model and a safe environment for those willing to share data. Sector specific data spaces (finance, manufacturing, agriculture, energy, mobility, health, media) will also be created to facilitate sharing of data in these sectors.

The speaker then mentioned the EC ongoing work on an Implementing Act on high-value datasets, answering to the Data Strategy objective to make more high quality public sector data available for reuse, especially for the potential they held for SMEs. The implementing Act will make them available in EU for free.

Finally, she illustrated the EC work on a Data Act for fair distribution of the value of data, which will specify who can have access to, and who can use, data. It will have an impact on relationships between actors on the use of data. It will cover issues like trust in sharing data, providing legal certainties for companies and other entities generating data, how public bodies can access private data in certain circumstances. It will also allow cloud users to switch more easily between providers. This will bring huge benefits and new business opportunities; business and consumers will see a reduction in cost for switching to alternative market services.

Stefano Cozzini (Director, Institute for Research and Technologies, Area Science Park) presented a case study and shared Area's experience in dealing with great amounts of data.

He started by introducing the objectives pursued by the Research and technology Institute at Area Science Park, namely to manage research platforms and Research Infrastructures (RIs) — giving access to both industry and researchers — and to create a virtual ecosystem.

He then outlined the elements of the Ecosystem:

1. Hardware: producer of data (e.g. the Genomic and Epigenomic platform);
2. Software: code and data produced by the infrastructure;
3. Brainware: researchers, individuals.

The speaker then proceeded to illustrate the case study of the Genomic and Epigenomic platform, providing some information on it hardware components (the laboratory and the data centre), the specifics of machines used (i.e. Novaseq 6000, Promethion 24), and stressing the huge amount of data they produce. He then stressed the importance of dealing with data, and that the best way to do so without causing a data mess in such situations is to use the FAIR data principles (findable, accessible, interoperable, reusable data), that can help saving time in dealing with data and making data available to users and researchers.

Therefore, he stressed the importance in genomic data science of a scientific data management, in particular to guarantee FAIR

access to genomic data (which is problematic). Once the data is collected and well-organised, advanced data analysis services can be provided (machine learning).

The speaker noted that they are now looking for new maps for data representation. For that goal, they are developing new approaches. Certainly, open data is the key, in particular in research, where open data is mandatory. One could say that the ownership of the data produced actually belongs to the taxpayers, who helped setting up the infrastructure: for that reason, they deserve to have access to it.

Finally, he synthetized the Institute's approach to data as follows:

- Compliance with data-related laws and internal policies (in particular, genomic data is problematic, for ethics and privacy issues: there are tools to deal with that, but it is still a problematic topic).
- More data deposited, properly documented: data must have a licence, and researchers need to choose the right one. In addition, they try to adopt the FAIR by design approach.
- Better planning: data management plans should be made mandatory for all projects involving (especially personal) data, giving all the information on what/how data are collected, shared with whom, etc., from the very beginning

The speaker concluded by stressing how crucial it is to share, manage and use data in the right way.

Q&A

Q Are there practical tools for implementing all the legislations developed by the EC on data?

A Maria Rosaria Coduti: DG CNECT provides the regulatory tools, the legal basis, so that there can be increased access and use of data. Then there are funding programmes (H2020, Digital Europe Programme), funding new research for new technology.

Q How are private companies' data managed when they collaborate with The Genomic Platform?

A Stefano Cozzini: Companies that just wish to buy the service (e.g. sequencing of genome) pay the full price and can have their own data kept private. If they want to do research, they can use the platform and the data can be protected for the time needed for the research to be published (embargo period), but then they need to be made open.

Q What is the data policy adopted by JRC Research Infrastructures?

A Fabio Taucer (JRC): There is an Open Access policy to JRC RIs. An IP document was developed on how data are shared and made open. There are two access options to JRC RIs: i) in the *relevance driven access*, which is free or a very small fee is charged (destined to universities, SMEs), there is an embargo period of 18 months after which the data needs to be made publicly available; ii) in the *market driven access*, where a full fee is charged (industry, SMEs, companies), the data remains property of those accessing the RIs, and is not being disclosed (JRC can keep a right to use the data for their own purposes, without disclosing them).

Q What is the state of discussion on ownership of data generated by machines?

A Jean Paul Triaille: On the basis of the existing rules (especially applying the *sui generis rule*), there is a big debate on whether the owner of the data is the user/owner of

machine, or producer/manufacturer of the machine (e.g. of a car). As there is no clarity, perhaps specific regulations addressing this situation are in order.

A Maria Rosaria Coduti: DG CNECT is thinking of exploring this aspect in the Data Act, but she is not able to disclose more.

Session 1.3 Technology Transfer and the Green Deal

The moderator **Margot Möslinger** (Policy Officer, JRC, European Commission) introduced the session, focussing on technology transfer (TT) and the Green Deal The objective of the Green Deal is to make Europe carbon-neutral by 2050. This requires cleaner energy and cutting-edge green technological innovation for all sectors of industry to reduce resource consumption, pollution and GHG emissions.

The moderator pointed out how TT can play a vital role in bringing innovative green technologies to the market. To achieve the Green Deal there needs to be a very fast and large-scale transition of society with large investments in technological innovation and a change towards low carbon systems, including energy production, transport, construction and many other sectors. It is vital to find a way to transfer green and innovative technologies from research institutions to the market and determine the best way to use and upscale them.

Finally, she kicked off the session anticipating the JRC study on "Technology Transfer and Commercialisation for the European Green Deal", conducted to determine the main barriers in the transfer of green technologies to the market as well as potential facilitators, particularly focussing on hydrogen, batteries, carbon capture and storage, and AI.

Stefano Sarris (Policy Officer, International Relations, DG CLIMA, European Commission) and **Gergely Gáthy** (Policy Officer, DG ECFIN, European Commission) presented the JRC report "Technology Transfer and Commercialisation for the European Green Deal", mentioning the authors Raoul Dorr, Stefano Sarris, Gergely Gáthy and Lenka Vysoká under the project sponsorship of the JRC. The project was carried out throughout 2020 with the final report being published in early 2021.

The speakers explained that the focus on green technologies is motivated by the unfolding global climate and environmental challenges. The large number of citizens taking to the streets to protest and to make their voices heard on the current course of direction for the climate and environment demonstrates that there is need for more action and more green policy. This vision is the one adopted by the EU Green Deal, which establishes a sustainable path for all sectors in the EU. This vision is integrated into the recovery from the Covid-19 pandemic (for example, with the new Multiannual Financial Framework or the Next Generation EU having a climate spending target of 30% for the 7-year budget cycle.) The entry into force of the European Climate Law enshrines this vision.

The speakers noted that to carry out this vision of Europe, all parts of society need to undergo a transformation. Green technologies have a fundamental role in this process. The study looked at barriers and facilitators to investigate what is supporting and what is preventing green technologies from being developed in research institutions and from successfully passing all the technology transfer commercialization processes.

Their methodology entailed a mixed approach (e.g. desk research, interviews, a survey, conferences, experts). The project followed a cross-cutting approach: covering the policy angle, IP, finance, Legal and other aspects.

The speakers proceeded to present the four case studies carried out: carbon capture & storage; batteries; artificial intelligence; and hydrogen technology.

Regarding TT and commercialization, the authors looked at TT as a process that brings innovation from the university environment to real world market. This process involves researchers, businesses and tech commercialization. The bridges between these actors are often the technology transfer offices at the diverse universities (TTOs). TTOs help researchers with patent application filing. At the same time, TTOs can help with searching for the right business partner and helping to develop technology transfer strategies and commercialisation.

The speakers added that, unfortunately, research for the green transition is not always translated into marketable products. Sometimes these great innovations only remain within the confines of scientific journals — a phenomenon called the European paradox. This paradox shows the importance of focussing on commercialization.

Another idea presented was that successful TT and commercialization strongly depend not only on the market and on innovation but on people: the commercialization team, having the right partners, as well as management continuity during the entire process.

Regarding IP, the speakers mentioned that about the focus is often on patents, but there are also trade secrets involved, general know-how, etc. that are influencing general commercialization. Certain businesses prefer to already be involved in early stages of the research process (university) rather than being engaged when projects are mature enough to be commercialized to the market. Technological innovation often emerges from collaboration between universities and businesses joint research schemes and networks. TT and commercialization is not always a linear process.

Moving to the commercialization phase, the speakers highlighted that this process does not always end when innovations leave the university environment. They require further development and scaling-up towards a fully mature technology. Currently, the commercialization process might take up to decades (e.g. in the case of batteries developed in the 80s and being commercialized now).

The next point focussed on the financial environment and the public policy framework. The study authors highlighted the need to understand the risks for investors. When composing the report, the authors talked with several stakeholders from the financial sector, which stated they do not see IP as a barrier. Despite the fragmentation of the market, they are able and capable of having their own network and find potential innovative projects.

However, one of the main issues for stakeholders is that they do not have the necessary data to evaluate the associated risks of these new technologies. It is vital for them to acquire more data and data models that they can build in into their risk-assessment models. Policy-makers can place a wider role in disseminating the available data in order to speed up this process. Once investors understand the related risks to the investments, they also need to be convinced that the start-up or SMEs developing the particular green technologies has the sufficient capability, financial and management skills to go forward and make this project a success.

The consulted stakeholders within the financial sector also stated that Europe is lagging behind and there is room for improvements to equip the European SMEs, start-ups and spin-offs with better managerial skills.

Policy makers need to show a clear path for innovative technologies and access to finance throughout the commercialization process. One aspect is to start providing funding for technologies still at a low Technology Readiness Level (TRL), as the financial stakeholders stated they are less willing to invest in such technologies because of the low risk appetite of European investors. Thus, Policy makers need to help create viable business cases.

The speakers noted that there are many different types of public funding and resources at European, national and regional level; all of them need to be aligned instead of remaining fragmented.

Moving forward to the policy choices over the investment horizon, the authors highlighted that green technologies can be very time-consuming in terms of commercialization. It can take decades to make the investments profitable for investors. Risk does not only exist over the time horizon but also over the value chain. There are many actors working along the entire value chain but they are not necessarily coordinated or complemented. When thinking about policymaking, one also needs to think about coordination along the value chain.

The design of the public policy must not only create certainty over a long time horizon but also for the technologies developed (for instance, as highlighted in the case study of hydrogen).

What is very important is to have a clear vision of the objective to achieve. For instance, in case of carbon capture and storage, at the beginning of the 90s-2000s there was a huge enthusiasm about this technology that faded shortly after.

Last but not least, a holistic and integrated approach to policy-making should be provided, looking at the policy-making process as a whole. The study authors highlighted initiatives such as the batteries or hydrogen alliances, which are coordination networks with private stakeholders. These cannot replace the role of the public institutions, especially at low TRLs, for which public policies are vital to leverage non-mature developments into more mature ones.

To sum up, in the study the authors included three different sections of recommendations, based on the technology transfer process itself, the financial environment and the public policy framework:

1. Technology transfer: Technology Transfer Offices (TTOs) need to have sufficient resources in terms of both human capital and financial support in order to conduct their activities. They also need the public support and the link to the available support.
2. Financial environment: Financial instruments are needed that help reduce the costs for first movers. A high level of coordination between the different financial instruments (European, national and regional) is needed.
3. Public policy framework: A holistic approach is needed to create a strong narrative for the green transition.

Stefano Soro (Head of Unit, Circular and Green Economy, DG GROW, European Commission) explained that the Circular and Green Economy Unit at DG GROW is a new Unit that tries to scope the green transition of the business ecosystem.

The Climate Law and the commitment of emissions' reductions with the 13 regulatory proposals adopted in July by the Commission (the Fitfor55 package) are at the heart of the new DG GROW strategy for Europe. It requires the commitment of all industrial ecosystems, especially energy intensive, transport, and construction and renewables industries.

The Unit is in general responsible for ensuring a level of coherence in the green transition of these ecosystems, and especially responsible for the renewables ecosystem.

The speaker explained how this Fitfor55 package will create opportunities for European businesses, notably in renewable energies, building renovation, integrated infrastructure, batteries, transport systems, hydrogen and digital space application. To fulfil this ambition, dynamics rather than stable frameworks are needed. This requires institutional innovation around the

coordination of the ecosystems at EU level (e.g. infrastructure, innovation prototyping lines, public funding and demand) at all societal levels.

The speaker pointed out that in May, the European Commission adopted an update of the industrial strategy. It offers green transition pathways containing different transition activities in industrial ecosystems to achieve the main takeaways of the European Green Deal in a coherent global approach. The design of green packages started for the sectors of tourism, construction, industry, renewables and textiles. These pathways will be based on business cases for the green transition.

Decarbonisation and a transition to renewable energy sources as well as developing the capacities, knowledge and skills needed are vital in this respect.

In terms of TT, the EU has built a diverse ecosystem of programs and initiatives that support technology transfer. In the green transition, this is a vital aspect for further development of SMEs.

The speaker then highlighted the fact the EU has the greatest share of green inventions in climate mitigation technologies in comparison to other major global economies. Europe leads when it comes to renewables and AI technologies. This trend can help to translate the Green Deal into successful growth strategies. The new Horizon Europe Program, which is the EU framework program for research and innovation, is focused on creating marketable innovation. The speaker strongly recommends citizens to participate.

Finally, beyond the classical research and innovation funding the speaker mentioned new options like the Green Technology Flagship program, the cohesion and regional funds, and the NextGen funds. These resources are being put at the disposal of the different Member States and they are dedicated to the green transition.

Giulia Serra (Policy Officer, DG ENER, European Commission) focused her presentation on the key findings from the Progress Report on Competitiveness of Clean Energy Technologies, in particular the aspects related to the climate tech funding landscape in the EU. The report focussed on seven technologies based on policy priorities.

The speaker shared the main highlights of the report:

- VC investments in EU-based climate tech start-ups and scale-ups have been 11 times higher over the past 5 years than they were between 2009 and 2014, reaching about EUR 2.2 billion in 2020.
- In 2020, EU start-ups captured 16% of global VC funding in the climate tech domain compared to only 8% of overall VC funding. Early stage investments in the EU climate tech start-ups were higher than those in the US and China.

However, EU climate tech start-ups still trail their global counterparts in their ability to scale. This also sometimes prevents inventors to move to major economies to rescale.

The speaker also pointed out the challenges that still need to be tackled in the EU, such as the EU's market and regulatory fragmentation that hinders growth and leads to different maturity of VC ecosystems. There is also a difficulty in translating a strong EU research performance into innovation, there is a lack of patient capital and there is a need a) to develop a clear pathway from early-stage funding to growth-stage investment, b) to mobilize private investors, and c) to develop international partnerships and cross-border funds.

European public funding institutions have shown they can bring innovation excellence. There are plenty of mechanisms and initiatives that complement each other in terms of funding.

The speaker then listed some of the Funding Programmes for R&I green innovation ecosystems in Europe:

- HEU Pillar III: Innovative Europe (EIC, EIT and its KICs, European Innovation Ecosystem)
- InvestEU (EIB, EIF)
- Cohesion Policy
- Innovation Fund, Modernisation Fund, Social Climate Fund

The speaker also mentioned some policy initiatives to support green investments, such as the EU Taxonomy for sustainable activities, the 2020 European Industrial Strategy Package, the 2021 European Sustainable Finance Strategy and the Digital Innovation and Scale-up Initiative, among others.

She then pointed out that filling the gap between the EU and other major economies when it comes to scale-ups requires mobilising private investors, developing international partnerships, and cross-border funding.

She concluded with a set of recommendations:

- Streamline and make use of synergies across mechanisms, instruments and initiatives, at EU and MS level
- Strengthen the link between technological innovation and market launch
- Mobilise private investors to participate more actively in the European VC market
- Explore further the new generation of venture capital and supplement funding solutions

Massimiliano Rudella (Director, Institute for Innovation and Projects, Area Science Park) presented a concrete case from Area Science Park — SISTEMA ARGO, which showcases their technology transfer and innovation program, especially with regards to green technologies.

Area Science Park, a national research institution, has two different campuses with more than 70 companies divided into nanotechnology and biotechnology and 8 national and international institutions.

SISTEMA ARGO was born in 2018 with three financing partners: the Ministry of University and Research, the Ministry of Economic Development, and the Friuli-Venezia Giulia Region (FVG) with an initial allocation of € 8.8 million (2018-2021). The protocol was renewed until 2023 with another € 6 million and an additional € 33 million for its extension.

Taking into consideration the Green Deal and the National Recovery and Resilience Plan for Italy, the priorities that emerged focus on the specializations of Area Science Park and other actors in the area. The project is based on four pillars:

- Eco-innovative industrial facilities (circular economy system)
- Business creation: generation of start-ups and lab for tech
- Process innovation: industry platform 4 (digital and innovation hub)
- Open lab & technology platforms

These four pillars were created in the FVG Region for a duration of three years as case studies; then they moved to four additional regions with the same methodology.

The speaker focused on the Open lab and technology platforms, explaining that the high-level laboratories and infrastructures are already open to research centres and universities but need to be opened to the industrial sector. This is challenging in Italy because of a lack of legislation and a lack of timing. The lab has a focus on basic research and applied research. There are more than 12 partners, 3 platforms, over 20 research institutions and more than 70 SMEs involved.

In particular, SISTEMA ARGO consists of three different platforms: innovative materials, genomics and epigenomics and structural biology (in coordination with private and public partners).

The speaker noted that as a public institution, they bought all the facilities and key equipment and made it available for free to the industrial sector. The facilities contain a transmission holographic electron microscopy, mass spectrometry imaging, next generation sequencing and a data centre for artificial intelligence. Everything is managed from an open lab perspective, available for the private sector.

The research facility for epigenomics, ORFEO, contains tools for sequencing and is at the same time a data centre.

The speaker then moved on to the Digital Innovation Hub, considered the second asset of the Area Science Park, financed through research contributions. The Hub has four physical points in the region focused on four different sectors of digital technology: the internet of things, data analytics and artificial intelligence, data optimization and simulation and advanced manufacturing solutions. While 100% comes from public investment, the beneficiaries are 100% private. Each hub has two main roles: act as an access point to services for local companies and as a go-to specialist in a specific domain. The next step will be to expand technology development in the areas of environment, life sciences, manufacturing and building.

The speaker mentioned that all these pillars have been developed in collaboration with a public-private partnership (PPP). He considered a PPP a beautiful but challenging idea, especially in its management, due to a lack of legislation on private and public collaborations.

For the third pillar, innovative industrial facilities, they created instruments such as a regional industrial symbiosis platform.

With regards to the last pillar, business creation, the speaker stressed that the critical point is not the incubation phase but the post-incubation phase.

Session 1.4 Smart Specialisation and Technology Transfer: the experience of the Friuli-Venezia Giulia (FVG) Region

The Moderator **Elisabetta Reja** (Friuli-Venezia Giulia Autonomous Region) kicked off the session by thanking the JRC and Area Science Park for organising the event. FVG signed an agreement with JRC to make it easier for Research Infrastructures to cooperate with JRC itself and to promote the cooperation among researchers as well.

She pointed out that although FVG is a strong innovator, according to the European Innovation Scoreboard, the majority of SMEs composing the system of production still find it difficult to collaborate with companies as well as with scientific and research bodies. More can be done to increase collaboration between research and industry.

Annalisa Viezzoli (Friuli-Venezia Giulia Autonomous Region), presented FVG, a small region at the heart of the enlarged Europe. One of the distinguishing feature of this area is that it represents an important science and technology hub. The territory is a favourable asset for innovation and the percentage of researchers per population is quite high.

She proceeded to provide an overview of the FVG Smart Specialisation Strategy 2021-2027 in connection with regional strategies to overcome innovation bottlenecks.

In describing the main characteristics of the Entrepreneurial Discovery Process, she highlighted the revision of the S3 governance that took place in 2019, aiming at including more actors (from research, industry, public administration and civil society — the quadruple helix) and optimising activities. The

chosen coordinator is a regional agency, which is receiving scientific support from Area Science Park. Eight workgroups were set up, taking into account regional, national and European interests and strategic orientations, and an online consultation and three public events were organised to involve stakeholders and civil society.

This formed the basis for the 2030 FVG vision, aiming for a new productive system: more innovative, resilient and sustainable — both environmentally and socially. Therefore, the strategy was upgraded from S3 to S4 (adding Sustainability).

The process brought to choosing an integrated scenario, proposing five areas of specialisation (aggregating 24 trajectories) in line with the National S3, the Areas of R&I of the National and Recovery & Resilience Plan, the European industrial ecosystems, and the UN SDGs.

The speaker then listed the five areas of specialisation chosen: Energetic transition, circular economy and environmental sustainability; Smart factory, sustainable development of the Made in Italy label; Maritime technologies – sustainable waterborne mobility and its land connections; Health, quality of life, agrifood and bioeconomy; Cultural heritage, design, creativity and tourism. She stressed the presence of the twin transitions.

At the end of June 2021, the regional government approved the updated version of the strategy, now under discussion with the EC[1].

She then moved on to the regional strategies to overcome innovation bottlenecks. The S3 SWOT analysis performed revealed a set of intrinsic characteristics of the productive system (e.g. limited attitude to cooperate with other companies or universities, limited number of companies able to drive the innovation), external problems (e.g. Covid, climate change) as well as internal problems. With regard to the latter, the speaker noted that the main issues identified were a mismatch between innovation supply and demand, and a lack of STEM graduates. On the other hand, opportunities pointed out by the analysis were a high level of regional R&D offers and cooperation models between science and production already available.

She then mentioned a specific study on innovation bottlenecks carried out by the OECD (Centre for Local Development, Trento) within the scope of a larger project implemented in collaboration with the regional administration. The main findings were, again, a mismatch between innovation supply and demand, an innovation supply of high quality (improvable from a quantitative point of view), and the necessity of implementing an effective innovation ecosystem.

The speaker then proceeded to provide an overview of the regional strategies adopted to overcome innovation bottlenecks. Two main initiatives were envisaged for these strategic objectives, designed in a medium/long-term perspective: SiS FVG and ARGO. The initiatives are complementary: SiS FVG aims at creating an effective system among scientific institutions and innovation players in the region, ARGO to implement an innovation ecosystem to increase the regional competitiveness.

Both initiatives grew from agreements between the regional administration and national ministries.

She then provided a more detailed description of SiS FVG (the Scientific and Innovation System of FVG), a networking initiative of research institutions, gathering 17 partners (incl. STPs, national and international research institutes, universities, conservatories). Its main goals are:

- to create an Excellence Science Network, first of all through infrastructural investments (e.g. High

[1] In December 2021, in the framework of the informal negotiation with the EC, the Region received a positive feedback regarding the updated Strategy; consequently, the Regional Administration approved the final version of the Strategy.

Performance Computing; 100G network; LAMA FVG which is an advanced mechatronic lab; Bionica; Open Lab, which enables companies to set up experimental activities; Quantum FVG; Labic; Labs Village; Departmental Laboratories for research and teaching; Equipment for laboratories; Genomics and an epigenomics platforms). It also aims to build international networks (e.g. agreement FVG-JRC and framework agreement MIT-FVG; programme AAL (Active&Assisted living); European Research Networks)

- Rationalisation of facilities and TT, through two main projects (Argo; Open Innovation System FVG).
- Enhancement of internationalisation services: improvement of the Welcome Office FVG, for assistance to international students and researchers; yearly publishing of the report "The mobility of knowledge".
- Popularisation and communication of Science: hosted and helped coordinate ESOF 2020

She concluded mentioning some future areas of activities.

For more information about the network, she invited to visit the dedicated website www.sisfvg.it (a data visualization portal).

Stefano Salvador and **Paolo Panjek** (Area Science Park) continued on the topic of innovation in the FVG region by detailing some elements of the ARGO System project, and in particular, its asset dedicated to digitalization: the Industry Platform for FVG (IP4FVG).

Stefano Salvador briefly introduced Area Science Park, a national public research body, whose mission is to help developing the economic system and especially SMEs through R&I. Area operates at different levels: mainly at regional level, where its headquarters are located (e.g. coordinating ARGO), but also at national level (supporting territorial development models based on R&I) and international level (partners in many international projects).

He then briefly outlined ARGO's governance structure, consisting of an executive secretariat and an implementing operative body (Area). Argo is structured in four thematic pillars: Eco-innovative industrial facilities, Business creation, Process Innovation, Open Lab and Technology Platforms.

In particular, the speaker focused on the Process Innovation – digitalisation pillar.

He illustrated how the Digital Innovation Hub was developed from the beginning as a Regional Digital Innovation Hub with the aim to reach a critical mass. It involves 30 private and public partners and is coordinated by a control board bringing together all relevant actors (e.g. FVG region, Competence Centre, regional ICT cluster). The system is based upon a hub and spoke model, providing four specialised nodes that serve as access points for local SMEs and as demo Living Labs.

The four nodes were chosen with reference to the main digital enabling technologies (Advanced manufacturing, Internet of things, Data Analytics and Artificial Intelligence, Optimization and Simulation technologies) The future goal is to enhance thematic, vertical specialisation areas (smart manufacturing; smart building; smart health; smart mountain).

Finally, he concluded by focusing on some results obtained during the year 2019-20, such as digital maturity assessment and SME project support and training activities.IP4FVG was identified as a best practice on European level.

Paolo Panjek then proceeded to explain the international dimension of the Regional Digital Innovation Hub IP4FVG EDIH.

He presented the development from DIH to EDIH, which entailed passing from 500+ DIHs to 210 EDIHs, forming one single European

network. In this way, the European Commission will have one EDIH per region (NUTS2) as interface. That is what is happening now with the Digital Europe Programme (DEP): the restricted call launched on 17/11/2021 for the selection of EDIHs has as main objective the development of the capacities of these entities and their networking at EU level, promoting the circulation of know-how.

IP4FVG was selected at national level as EDIH Candidate (2020), but this did not entail any major changes in its focus as, in practice, it was already acting as a regional DIH since 2018.

He then explained the specialisation principle underlying the EDIH model. The EDIH has two main functions:

- At local level, it serves as a one-stop shop for digital transformation, providing support services to SMEs, developing the regional market of digital transformation. The objective is to support competitiveness and resilience of the region.
- In an EU-local approach, it would: act as an access point to the European network of EDIHs for local companies/organisations, actively networking with other hubs, connecting companies and similar value chains, and seeking synergies and business opportunities. The objective is to ensure to be in line with DEP specific objectives, respecting the complementarity principle and avoiding duplication of investments.

As candidate, IP4FVG EDIH proposed three Lighthouse Specialisations: AI, HPC, Sensor systems.

The speaker then pointed out the two levels at which IP4FVG EDIH wishes to cooperate:

- Lighthouse specialisation, based on top-end technologies;
- Territorial proximity (with a more Cohesion policy perspective): to develop cooperation based on geographical proximity exploiting complementarities and similarities not just in top-end, but also in a midrange know-how, exploiting synergies with bordering EDIHs (nearby Italian regions, Austria, Slovenia, nearby SEE countries).

He also suggested some tips for proximity cooperation in four main fields (test before invest, by providing access to demo infrastructures and sharing methodological tools; access to finance; ecosystem and networking; skills and training, by supporting capacity building, "training the trainers"), noting how Territorial Cooperation Programmes can further support this Proximity Cooperation, so as to exploit synergies and develop transnational ecosystems.

He concluded by pointing out the main opportunities represented by EDIHs, such as giving industry and research better access to European markets, producing economies of scale and increasing expertise in interregional collaborations, and circulating use cases to inspire innovation and collaboration.

Alessandro Lombardo (Central European Initiative - CEI) introduced the CEI, an intergovernmental forum established in 1989. It includes 17 states, of which 9 from the EU, 5 enlargement countries, 3 Eastern neighbours. Its mission is to promote European integration and sustainable development in Central, and South-Eastern Europe. Its Executive Secretariat is based in Trieste.

The speaker then provided some information on CEI's structure and governance (structured in four dimensions: Governmental, Parliamentary, Economic, Local), noting that as intergovernmental body, its main objective is to promote policy dialogue on topics of common interest through regular diplomatic

exchange. Currently, the agreed upon priorities include Green Growth and Just Societies.

He pointed out how the CEI also pursues other objectives, like fostering TT and strengthening innovation ecosystems. In particular, it facilitates the interaction between the WB and knowledge intensive regions (like strong innovators) within their membership.

An example of these practices is the CEI Know-how Exchange Programme, a tool to promote the transfer of technology, skills, expertise, and practices from organisations in the EU to non EU-countries within the CEI. Next call will be in spring 2022: applicants can be public and private institutions (not individuals); the grants amount up to 40k.

An example of projects supported is a TTO in a CEI/EU country that is transferring good practices to other bodies through soft measures such as training and workshops.

Another tool to increase TT is testing innovative solutions/methodologies with transferability potentials in the WB. This is done through a pilot action to test the Living Labs methodology in the sector of health and care, in order to experience user-centred, demand-driven innovations first-hand.

The speaker concluded by summarising the two levels on which regional organisations, such as CEI, can contribute to the strengthening of TT in the WB:

- facilitating interactions (exchange of practices, competences, etc.) with innovative regions (e.g. through the KEP instrument);
- Testing innovative solutions with transferability potential (e.g. Interreg Europe ACSELL Pilot Action), then supporting their transfer to interested regions or innovation ecosystems.

Q&A

Q What is the balance between Lighthouse specialisation and support to the digital transformation initiative?

A Paolo Panjek: there is no prescription in this kind of balance. Lighthouse is mostly for bigger/ top-end companies.

A Stefano Salvador: Balance comes from the market; it depends on the technical level of companies requesting services.

Q Is there a concreate role of vocational training and education in FVG's S3?

A Annalisa Viezzoli: Vocational training and education have an important role in FVG's S3. The operative programme envisages competences. As the S3 is a multi-fund strategy, in the FVG policy mix, different kind of funds will contribute to the implementation of the strategy; the European Social Fund in particular will be very important (as far as envisaged in the 2014-2020 programming period). Based on different needs of different groups, a variety of vocational trainings will be developed. After the approval of the strategy, a deepening of these competence needs has been developing.

Q How to attract business and SMEs to research labs?

A Stefano Salvador: the Digital Innovation Hub (IP4FVG) is a good example of how to be more attractive for companies. Key is to be present, contact directly both sides of the match, show them facilities, and explain them technologies; in IP4FVG they also interviewed the ICT providers of the region, seeing if offering and demand matched.

A Alessandro Lombardo: drawing form the Living Lab experience of CEI in the context of Interreg Europe ACSELL project, it is important to include all the players of the innovation ecosystem, focusing on end users of Living

Labs from the beginning; they support and facilitate the link between the company and the researchers.

Day 2 Innovation Ecosystems and entrepreneurship

The Chair for the day was **Martina De Sole**, Director of the European Network of Living Labs (ENoLL)

Session 2.1 How to build innovation ecosystems

The moderator **Alessandro Fazio** (Head of Competence Centre of Technology Transfer - CCTT, JRC, European Commission) introduced the session by presenting the role of innovation ecosystems in tackling current challenges such as the twin transitions and the pandemic, which in turn represent opportunities for innovating. In particular, he stressed the need for new technologies and innovations, regardless of whether they are developed inside or outside laboratories. What is crucial is that those innovations occur in places where they are connected to local production, as innovation ecosystems have an important geographical dimension to them.

He also reminded that successful innovation ecosystems are much more than just real estate projects, or even connecting universities and research centres: they are a combination of connections to local people, entrepreneurs, attracting investments, and being attractive to citizens (e.g. by providing affordable housing, education). They are not just about infrastructure: they do not get off the ground without engaging stakeholders and good management.

The question posed by the moderator was: is there an off the shelf recipe for innovation ecosystems to be replicated, and if yes, what does it entail, and what are the challenges? The following panellists addressed this topic.

Ebba Lund (CEO, International Association of Science Parks and Areas of Innovation (IASP)) started by presenting IASP, a network of Science and Technology Parks (STPs) that has been active since 1994. It is one of the biggest networks for science parks and similar institutions in the world, representing high tech companies, SMEs, start-ups and stakeholders of innovation. IASP also works as an observatory to its members to connect science parks management and help them promote a sustainable environment.

Encouraged by the moderator to comment on the various labels commonly used when talking about innovation, the speaker then proceeded to provide some insight derived from IASP experience, sharing the definitions of STP and Areas of Innovation (AoI) developed by the organisation.

Areas of Innovation and STPs all embrace the same mission: supporting businesses by providing spaces for innovation support. However, they differ in dimension and components; although admittedly some STPs can be considered AoI in their own right, as they check all the boxes, like including a wider variety of stakeholders. Again, STPs are usually set on a clearly defined piece of land, are managed by a team and have a CEO. Also, they are based on a predefined plan. On the contrary, AoI are born out of a more spontaneous process of accumulation or aggregation. As an aggregation, an AoI is more scattered throughout the region, with independent management bodies, and when a certain level of coordination is reached there is orchestration of an AoI. Ultimately, IEs happen when a certain critical mass is reached.

Finally, examples of AoIs provided by the speaker were Gothenburg, bringing together three parks in the same city (mobility, life science, energy and urban solutions), and Area Science Park, which has evolved into an AoI.

Stephen Taylor (Deputy Director General, Area Science Park) briefly introduced himself, pointing out his decennial experience in the field, of which the last 12 years gained in Area Science Park, one of the first STPs to be founded in Europe and the largest one in Italy, hosting more than 60 organizations doing research.

Picking up from where the previous panellist left, he explained how Area Science Park, established more than forty years ago, is an example of a STP that has evolved into an AoI, aspiring to be a true aggregator of innovation.

He then proceeded to explain the main success factors of Area Science Park.

First, it is crucial to secure *economic resources* form the very beginning: mostly through government funding (as Area is a National Research Organisation, it is operated by the Ministry of University and Research), through regional funding; by applying for EU funding and developing a collaboration with the JRC (strategic partner); and through own commercial activities (renting).

One of Areas' strongest values are the resident organisations hosted inside the park, and providing an attractive location because of the quality of the people who are there.

Most importantly, it is crucial to have excellent *Human Resources*, talented people doing the good work, making the STP attractive. An advice to the WB colleagues could be to adopt a simple interpretation of the golden triangle rule: quality, cost, time. Things can be done better, faster and cheaper: if you emphasise two of these aspects, it will be at the detriment of the third. Therefore, hiring experts is going to be fast but expensive; training new talents is time consuming but less costly. Both these approaches ensure a high level of quality in the pool of human resources. A third approach he would advise against is doing things quickly, cheep, and at low quality.

He then stressed again the importance of investing in young talent and growing it.

The speaker suggested investing in monitoring the impact, the progress and the achievements of the park00. By doing so, STPs are able to focus on the things that work better and show stakeholders and the government the success of the Park Confirmation of Area's success provided by the spea0ker is that the returns for its private investors are multiples of their original investments (from 3 to 5).

Finally, he mentioned the importance of Public Private Partnerships in these endeavours.

Gordana Danilovic Grkovic (Acting Director, Science Technology Park Belgrade) gave an overview of the situation in Serbia, drawing form her extensive experience gathered by working in incubators and support and accelerating programmes, and introduced the relatively young STP of Belgrade.

She explained that creating a STP needs long-term planning, as well as sufficient results to present to the government to secure its support. It also needs expertise, which in countries like Serbia is severely lacking; that is why it is crucial to find young people and cultivate their talent, to help develop the innovation structure and services.

She argued that Serbia has a lot of potential; however, the crisis hindered that progress. That is why there is a big need for incubators.

The speaker then emphasised that a STP's role is not just its own development, but also to change the system, and in particular that of Belgrade STP was to prove it can be done in a WB country. Belgrade STP used current best practices by adapting them to the local needs: building upon university potential and creating partnerships, by working with the private sector, the government and the administration.

She stressed again the importance of adapting models to local conditions. That approach in Belgrade has had a big impact, showing that it is possible to bring support for different

players, and create community and trust, which are key factors for a STP's success.

The speaker then described the main challenges faced in developing the Belgrade Park, which have been different at various stages: initially, no one believed the project was possible in the WBs; then, they experienced lack of funds for start-ups in early stages, so it was difficult to encourage young people, while needing to train them. Therefore, they started negotiating with the government for a new acceleration programme, which started last year: a very risky move during the COVID pandemic. The experience proved nonetheless successful and delivered good results (almost 200 hundred applicants for innovation application for only 50 grants), confirming the need for more programmes. The speaker then anticipated that there are in fact other two accelerator programmes being developed.

Finally, she concluded by noting that in WB countries there is a great need to find experts, but sometimes that can prove difficult. That is why it is crucial to recruit young talents and help them to grow and develop some important ideas.

Filippo Addarii (CEO, PlusValue) said a few words about its advisory company, PlusValue, focused on sustainable development driven by innovation.

He then passed on to introducing the Milan Innovation District (MIND), a visionary project born out of a € 5 billion public-private investment, where the R&I was fully integrated in the city environment. MIND is considered the legacy of the Milan Expo 2015 in Italy. The total population that MIND will be able to host at completion by 2031 goes from 60 to 70 000, including students, researchers, personnel of major hospitals, as well as companies and multinational corporations (e.g. AstraZeneca).

The moderator asked the speaker to provide some insight on how to build an ecosystem at an accelerated pace and what it means for private investors to participate in these endeavours, both as investors and contributors.

The speaker provided the example of MIND, noting how the multi-layered governance — a component that is usually undervalued — is the back of this complex project. Specifically, MIND has a governance for the real estate component (development, construction), one gathering the public and private partners in the site (currently growing in number), as well as a dedicated programme with its own governance for the companies that do innovation. The speaker then explained how the PPP constructed, developed and managed the project: the first year there was a consultancy between the private company and the public actors (national, regional, local), and then the private side took over the management. The contract was drawn by a concession of services model, but it is more complicated as it concerns long term management.

The speaker continued by outlining the main issues encountered along the path to develop MIND, namely the shifting of interests in time and the inconstant political commitment due to changing governments. That is why having a private partner involved is crucial.

MIND has a steering group gathering private and public actors, driving the innovation ecosystem. It is good because it is flexible and inclusive. The main issue was encountered when switching from an informal to a formal governance with fixed roles. In the long run, the informal governance needs to consolidate in something more formal, where all partners need to make long-term investments.

The speaker highlighted MIND's open innovation programme to bring together research institutions and companies, which is a difficult job, both for the private developer and the public partners. The main challenge is the organization phase in terms of mutual trust, focus and results.

Finally, he stressed two main necessary things in planning an innovation ecosystem: including society and citizens, by adopting an urban innovation approach; and keeping in mind the digital dimension, although the data dimension of governance is still difficult, and would need new answers.

Paris Kokorotsikos (CEO, Euroconsultants) closed the session by providing the example of the Thessaloniki ecosystem, which was born as a spin-off of the research institute of Greece in 1991 and grew with the ecosystem, creating an incubator. The work is focused on the ecosystem in Thessaloniki as well as towards supporting other countries and regions (especially in the Gulf) to build their own innovation ecosystems.

Answering to the moderator's request to provide some tips to people who wish to embark in similar projects, the speaker suggested to adopt a strategical approach.

In particular, he described the overall approach adopted in Thessaloniki as first starting with the inside potential, and subsequently trying to attract the outsiders. He stressed the fact that the STP/AoI is the continuation of 30 years of continued construction of incubators, capital funds and similar, only five years ago beginning the transformation into something more coordinated.

The speaker noted that the Thessaloniki ecosystem was developed following what in hindsight could be considered a five-step blueprint, which he then briefly summarised as follows:

1. Create an orchestrator, involving all relevant actors (from business, academia close to the government) and attracting the investors;
2. Building the network structure and attracting those research centres and industries that already working together, convincing them to relocate their activities inside the park.
3. Secure government support, pointing out the potential of the city in terms of research, talents obtained, land; in Thessaloniki a PPP - non-for-profit company was created, and some preferential laws were passed to allow donations; this was when the first nucleus was created.
4. Then engage partners abroad who understand the merit of that ecosystem, in particular those who were spin-offs of that same ecosystem (re-attracting diaspora), growing the multinational presence in the park;
5. Attract international investors, by providing an attractive view of the benefits of investing in that innovation ecosystems (e.g. Israelis).

Session 2.2 Research Infrastructures and Technology Transfer

The moderator **Patricia Postigo McLaughlin** (Policy Officer, Research Infrastructures, DG RTD, European Commission) introduced the session, explaining how research infrastructures *are* research ecosystems, but of a particular nature in the way they interact with industry.

Indeed, RIs are a special source of TT, and interact with industry in two ways:

- Industry as user: it is typical TT from basic science: however, there is a small percentage of RIs use; to increase that, there should be an improvement of the understanding of the services available (through e.g. CatRIS – Catalogue of Research Infrastructure Services) and some changes in the organisational culture;
- Industry as supplier (co-development): RIs need to be built and updated. There is a dialogue between the industrial supplier and the researcher at the lab,

where a new profile emerges: a research technologist (industry liaison officers, industry contact officers (ILOs & ICOs – ENRIITC). There is also a dedicated initiative supported by the EC, ATTRACT, which the following speaker will present.

Sergio Bertolucci (Professor, University of Bologna & former scientific director at CERN) then proceeded to illustrate ATTRACT, an initiative to better connect research to innovation, which still remains one of EU problems: EU scores high in knowledge production, but not high enough in innovation production. The full innovation potential in the EU is not exploited. Although there is not one single silver bullet to solve this problem, ATTRACT tries to approach this issue.

The speaker explained the main features of the project. It aims at creating a novel ecosystem focusing on breakthrough detection and imaging technologies.

The key pillars of ATTRACT presented were:

- Public funding: an example is that of the components of smartphones;
- Phase approach to funding: breakthrough technologies are very risky to invest upon for private capital. So they have to be de-risked with public funding: in the risk-absorption stage, where ideas and concepts could reach a prototype level and technology concept validation; in the risk-mitigation stage, where most promising concepts are further helped rising towards pre-market products. The riskier stages need to be brought under the public support, bringing in the industry when the situation is de-risked and closer to market.
- Creating trust and shared know how: co-innovation, bring together research and industry, is a difficult job.
- The Young Innovators Projects: ATTRACT launched a call for exploring a technology in the field of detection and imaging, open to very short projects, to be evaluated by an independent scientific committee (TRL 2 to 4)

Currently, the results of Phase 1 are being measured and a phase 2 of ATTRACT was launched, aiming to bring the selected technologies towards industrial deployment (5 to 9).

Finally, the speaker concluded showing some of the results of the project (e.g. more than 30% of the projects got financial support already at phase 1).

Jana Kolar (Executive Director, CERIC-ERIC) introduced herself as CEO of CERIC-ERIC and then presented the organisation.

CERIC-ERIC is a distributed, open access Research Infrastructure for advanced materials, biomaterials and nanotechnology. It was established in 2014 through a EC implementing decision and is active across eight Member Countries.

It offers merit-based access to over 50 techniques, through 2 calls per year, and a rolling fast track.

It provides free access for researchers and users (including travel and lodging) and has a particular business model that does not require participation fees for the members.

CERIC-ERIC's TT and industrial activities are mandated by its statutes. The main issues faced are that the path from invention to innovation is a complex one, with many issues in setting up a proper system. In trying to identify the means to produce innovation, some possibilities were selected: technical development, services or joint development with industry, internal research, and acquisition from users. In the latter case, innovations would be owned by users' institutions; despite that, they still screened

the results, provided help with TT if requested, and looked for possible further co-development.

CERIC is developing a support structure to support all of these routes.

Finally, the speaker explained CERIC'S approach: to build on the critical mass, visibility and knowledge. This enables to enhance TT and industrial activities of its members (training, marketing), to increase visibility of CERIC's offer to industry (training, events), and to act as a single point of access for industry. CERIC also wishes to work on the integration into a European Innovation Ecosystem (still under development). They are looking for opportunities for potential innovations, and are working on access to funding.

Natasa Skoko (Group Leader, Biotechnology Development, ICGEB) provided the example of the new pharma-compliant laboratory for biologics development and TT and the ICGEB (International Centre for Genetic Engineering and Biotechnology) in Trieste.

She explained how TT has been identified as a mean of enabling local pharma production, promoting innovation, building capacity and improving medicines access. ICGEB believes TT ensures that technological developments are accessible to a wider range of users who can then further develop and exploit the technology into new products, processes, applications or services.

In particular, ICGEB has recognised many years ago the need for training TT professionals. Thus, they developed their own TT training platform, to help speed up the biopharma ecosystem. Its model of transfer of know-how helps accelerate discovery and development.

The speaker then presented the specific steps in TT and training ICGEB follows: finalisation of TT agreement; up to 6 weeks in ICGEB lab are offered to industrial partners' employees to gain hands-on expertise in production; protocols for the downstream, upstream an QC procedures; assistance to the industrial partners in establishing the process in their own facility. Not being able to host partners form non-EU countries due to the Covid pandemic, they developed the idea to offer video-based training (e.g. for South Africa, Bangladesh and Iran).

Finally, the speaker mentioned how some grants from the FVG region allowed to build (in a record time of 11 months) new infrastructures. She shared a video to provide a testimony of the results of this project.

Fabio Taucer (Scientific Officer, JRC, European Commission) explained that JRC hosts 39 physical research infrastructures in various fields (Euratom, Chemistry, Bio and Life sciences, ICT, Physical sciences) located all over EU, with a potential of opening to external users (out of a total of 56 facilities).

He then deep dived into the Open Access programme to JRC RIs. JRC allows access to its RIs based on the Charter of Access to RIs of DG RTD, which sets out the principles and guidelines when defining access policies to RIs. In particular, he outlined the two access models envisaged:

- Relevance-driven: it is low-cost for users, who are charged only additional costs, in exchange for making the results open, after an embargo period of 18 months. It is mainly targeting academia and research institutions, but is also open to SMEs.
- Market-driven (full-cost; data cannot be disclosed beyond JRC use): there is a selection by the JRC, and users (mainly industry), are charged the full cost. In this case, the data is not disseminated via open schemes.

These calls are open to EU members and Associated Countries.

The speaker then provided some statistics: the open access policy begun in 2017, 49 calls were launched and 138 proposals were selected; it involved around 500 users in 27 countries. Of the 202 institutions participating, only the 5% were SMEs: this number is too low to ensure a satisfactory TT, it needs to be increased.

JRC RIs also provide training and capacity building activities to prepare prospective users. The programme is addressed to groups of users from universities, research or public institutions, or from SME (preferably with existing or under construction/upgrading RIs similar or complementary to those of JRC, or planning to use JRC RIs in the future). The stay at the JRC comprises a full week, with the participation of groups from several institutions and countries.

On the topic of the WB, JRC is supporting Widening Participation and Spreading Excellence Countries, which include the newest EU Member States and Associated Countries (e.g. the WBs). In particular, JRC covers travel and permanence of users from Institutions located in countries associated to Horizon Europe from the RTD Spreading Excellence and Widening Participation list. It also waives the access costs in the relevance-driven mode to proposals where the Lead User Institution, and at least 2/3 of the Users Institutions are from the Widening Participation and Spreading Excellence list of countries. The calls are in competition with EU Member States.

An exception is made in case of nuclear RIs, where JRC covers the travel and accommodation of users as part of the pilot Action in the field of nuclear safety, limited to a narrower set of countries.

The speaker then noted that they are looking forward to receive more proposals form the WBs, which at the moment amount only to three (from Serbia and North Macedonia).

The speaker provided some examples of TT in JRC RIs, in particular form the European Laboratory for Structural Assessment: hybrid testing method (numerical + physical); load cells in columns (from lab to monitoring real buildings); control system in hydraulic actuators (with industry - licensing); pre-normative research; Training and Capacity Building, e.g. use and adoption of the Eurocodes (European standards for construction) in the Balkan Region.

He also explained how putting science into standards is a crucial mean to support TT.

Finally, the speaker stressed the need to build awareness of TT in the labs and help them to find partners, involving industry and SMEs. This can be achieved by providing clarity on IP, sharing data (FAIR), publications and Pre-normative research, and having access to TT Offices as One-stop-shops.

Kaia Kert (Policy Officer, JRC, European Commission) concluded the session with a presentation of living labs as a tool for technology transfer at research infrastructures, focusing particularly on the JRC Living Labs initiative.

She outlined the key features of living labs. They are innovation laboratories for testing products but with two peculiarities, namely:

- Adopting open innovation and user innovation approaches: LL involve different actors that share an interest in a technology or a solution, thus creating value with users and stakeholders and shortening technology development cycles.
- The testing and demonstration happen in a complex (close to) real-life environment: the testbed approach allows technology and solutions to be tested interoperating with other devices, systems and infrastructures.

She then provided an overview of the JRC Living Labs, hosted in Ispra (Italy) and Petten (the Netherlands), aiming at co-creating smart city solutions. The research sites offer an environment for JRC scientists, together with external partners and JRC staff, to co-create in

real-life settings innovative technologies and applications. The particular feature of the JRC Living Labs is that they are designed to provide feedback for policy (societal and environmental impact, regulatory implications etc.).

She then described the open call for expression of interest for participating in this project: the call addresses EU Member States and countries associated to Horizon Europe, and focuses on developing and testing future mobility and digital energy solutions. SMEs and start-ups in particular are encouraged to apply. Applicants benefit from various assets and services offered by the JRC on an in-kind basis (e.g. city-like test environment, laboratories, technical and scientific support).

Finally, she provided some examples of collaboration projects, such as the electric autonomous vehicle platform; automated droid for last-mile delivery services; and smart charging system for electric vehicles.

Session 2.3 Empowering entrepreneurs and innovators with EIT in the Western Balkans

The moderator **Sheron Samuilia** introduced the session, which focussed on EIT and on what it offers to the WB, and provided some testimonials of innovation in WB.

Luke Incorvaja (Strategy Officer, European Institute of Innovation and Technology (EIT)) introduced the EIT.

He argued that the EU has some of the best research infrastructures and produces great research. However, it lags behind in commercialisation of those results and bringing new ideas to the market: that is the aim of EIT from its inception in 2008, to increase EU innovation capacity, competitiveness and quality of life, by helping building innovation ecosystems which bring together businesses, education and research, all the while addressing societal challenges.

In practice, EIT does all this through eight Knowledge and Innovation Communities (KICs): each community targets a key societal challenge that the world is facing today, e.g. climate, energy, food, manufacturing. KICs are all independent entities, as they proceed in a bottom-up manner, and are provided with strategic guidance by the EIT. A new KIC will join in 2022 focussing on culture and creativity (the call will be open until March 2022; after that selection process based on the applications received, there will be the official launch). By 2026, an additional KIC on water, marine, maritime ecosystems will be set up.

The speaker explained how KICs work and generate innovation. Each of them undertakes 3 activities:

- Entrepreneurship education, in particular higher-education courses which teach both the technical and entrepreneurial skills;
- Business creation and acceleration services: tailored support for entrepreneurs and ventures;
- Innovation driven research projects, supporting bringing innovative ideas to market.

The speaker provided some figures showing KICs impressive presence on the EU territory.

He then mentioned that EIT is already active in the Western Balkans (WB) and in the programming period has channelled more than € 1 million to the region, supporting 13 local partner organisations working on innovation projects. They also have four different hubs in the WB, physical offices which spearhead EIT activities in the region.

The speaker then explained how the EIT means to work in the WB through three main tools:

- EIT RIS: Regional Innovation Scheme, specifically targeted to moderate and

modest EU innovators as defined by the EU innovation scoreboard. Countries that are not yet listed in the Innovation Scoreboard cannot participate. It has a capacity building approach, but it is also a gateway to the broader EIT activities.

- EIT Cross-KIC WB: it is specific for WBs. KICs come together to jointly address common EU policy priorities, in this instance the WBs. From 2022 it will be closely linked with RIS.
- HEIs Initiative: innovation and entrepreneurship capacity building for Higher Education Institutions (HEIs): it is not targeting only universities, but also to help universities teach innovation. A first call was launched last May (now closed) and implementation has started; a new call is now open.

The speaker stressed that EIT is not about funding, but mostly support, in particular it gives access to its network, of which the WBs can greatly benefit due to the identified needs for more expertise and connectedness.

He then provided some examples of success stories: start-ups form the WB have been supported through the EIT Jumpstarter, including three that have gone on to win prizes in the programme's Grand Final.

He concluded by stressing that all actors can benefit from EIT: government, researchers, and entrepreneurs.

Q The moderator asked the speaker to talk about the organisations with whom the EIT is working to support the WBs.

A (Luke Incorvaja): Tackling innovation is not something EIT can do alone. We need to join together, interlock with other entities working to support innovation in the WB. In particular, EIT is working with EIC and Enterprise Europe Network; with DG NEAR to exploit synergies with the IPA III funding; with other non-EU organisations, e.g. the RCC, World Economic Forum, EIF and EIB.

Mila Krivokapic (Developer, Western Balkans, EIT Climate-KIC) is working on the Cross-KIC WB and collaborating with the Climate KIC to ensure synergies. She covered the topic of boosting green and circular economy in the WB.

The speaker provided an overview of the Cross-KIC WB journey, started in 2021: this is the first time the KICs joined together to create bigger impact in the region. After reviewing some of the key documents for the region (e.g. Economic Investments Plan for the WBs), circular economy was chosen as umbrella approach to the region, but seen as a tool and not the end goal, to enhance job creation, eco development and innovation.

The speaker then listed the specific activities that the Cross-KIC WB carried out in 2021:

- System mapping and policy co-creation: the goal was to avoid duplicating something already existing, to see what the ecosystem offers and how the KIC can have an added value. The mapping allowed to know the main stakeholders and their role, and will be used to explore collaborations further. They are also exploring the possibility to have a platform for circular and green economy.
- Capacity building for HEIs pilots, namely the HE Innovate tool trainings and the Circular economy Meet Up: 2 HEInnovate workshops were completed in September, with 43 participants from 5 universities from the region, and 2 universities were selected for the Circular economy Meetups with experts to be held next month.
- Communication, dissemination and outreach: initiatives are Citizens and

Consumer Engagement (e.g. consumers will help to develop more environmentally friendly packaging for delivery, especially important in time of Covid, as deliveries have increased), and Information campaigns.

— Pre-Jumpstarter training programme: Jumpstarter is a pre-accelerator programme operating since 2017, offering training and encouraging talents in starting their own companies. It has a vast network thanks to the KICs, which is its added value for the participants. Specifically in the WBs, there is a Pre-Jumpstarter training programme, as applications from the WB region were very few. The result is that now there are 10 teams form the WB joining this year, with an increase in applications. The activities will be fitted to the local needs.

The speaker concluded by encouraging the interested parties to reach out to EIT WB.

Q How the research is done on the demand from the industry, and how does it ensure the knowledge is not lost?

A Luke Incorvaja: any potential that comes out of the research can be scaled up by EIT for commercialisation, in a bottom up approach. However, EIT does not fund research activities: for that there are more appropriate instruments under Horizon Europe.

Following, two testimonies of innovators in the WB were provided.

Sofija Bogeva (Programme Coordinator at Smart-Up -Social Innovation Lab, Skopje, North Macedonia) shared the experience of Smart-Up, an innovation Lab founded in 2014, working on activities that impact the citizens, such as education, climate change and public sector innovation. By adopting an interdisciplinary approach, the organisation aims to create spaces, provide tools and facilitate processes for stakeholders to jointly co-design and co-create solutions.

One of their biggest achievements was the establishment of the first City innovation lab in Skopje "Skopje Lab" in 2017.

Regarding the relationship with EIT, the speaker mentioned that Smart Up's journey started in 2019, with the establishment of a consortium with other cities from South East Europe for the implementation of the initiative "Future Cities of SEE". Then, in 2021 Smart Up got involved in another project, as part of the Cross-KIC WB programme focusing on circular economy.

The speaker shared some of the key learnings from the KIC community:

— The importance of adopting a mission-oriented approach;

— Collaboration for community transformation is key to drive more radical change benefitting the society;

— The importance of co-creation of innovation, by using different tools and methods, to ensure that relevant solutions are developed and that there is quality engagement with key stakeholders and users;

— The role of the governance structure: building a team dedicated to the mission is crucial for sustaining the mission-oriented approach and achieving goals.

According to the speaker, the project made a difference by being the first systemic approach to transformation, and helped to understand how the system worked; it showed that a mission-led approach drives community engagement to do what needs to be done; it helped key stakeholders understand what is needed and how to work with different enablers, organisations, and approaches to deliver the desired transformation.

She also mentioned that the added value of EIT lay in providing capacity building, giving access to a wide local and international community of experts and best practices, and showing the way to get other funding opportunities.

The main achievements mentioned by the speaker were: formally establishing a team structure, attracting additional funding to scale up their initiatives, and gaining more local and national interest and support.

Finally, the speaker suggested that further support needed would be to promote the thriving community work, so that it can attract more attention and thus support and funding for mission-oriented community development.

Q What are the key factors that make you a successful innovator, especially a female innovator?

A Sofia Bogeva: there is no difference in being a female entrepreneur in my community. Very important is to have persistence and passion, to get people to follow you in the mission, and being a good communicator to get into communities and networks that can be helpful to scale the work. The network is crucial to have support and succeed.

Milan Veselinov (Founder and Director at CirEkon, Belgrade, Serbia) is the founder of a start-up focussed on circular economy, with a mission to be a catalyst of a systemic circular economy development and implementation. He noted that CirEkon is not focussing much on process development, but mostly on a systemic way of doing things.

CirEkon aims to be implementer and promoter in the system. It is collaborating with companies, NGOs, and is now trying to expand its reach to institutional level, such as ministries and chambers of commerce.

According to the speaker, the secret for success and to create the best possible impact is co-creating projects and having a dedicated team.

He then provided a summary of the journey of the partnership with EIT.

It started by jointly creating in 2018 an Academy of Circular Economy (ACE), to make business understand what circular economy is. The initiative was repeated in 2019. There were at least three start-up initiatives that stemmed from the ACE.

Then, they thought about creating a macro regional network to share all this experience, so the CEBB (Circular Economy Balkans Beacon) was created.

As of now, they wish to establish an ecosystem of experts in circular economy in the macro region of the Balkans.

In 2021 they have continued to develop the CEBB and founded a Hub in Serbia to answer society's needs for sustainability, and conducted a partial WB mapping.

Finally, the speaker concluded providing CirEkon plans for the future, namely aiming to transition from project to programme, to promote adaptability in its own business, to connect more efficiently with investors and take part in job negotiations more actively.

Session 2.4 How to get investor ready and accessing finance for innovation

The moderator **Elena Andonova** (Policy Officer, JRC, European Commission) introduced the panellists.

Verónica Beneitez Pinero (Deputy Head of Unit, EIC Transition Activities and Business Accelerator Services, European Innovation Council and SMEs Executive Agency (EISMEA)) presented what the EIC does on the topic of how to get investor ready.

She highlighted one of the main issues related to innovation in the EU, i.e. the factors that are holding back European innovation:

— European performance: EU has a strong research performance that is not translated into innovation, and lacks breakthrough and disruptive innovations that create new markets;

— Lack of funding for innovation: there are financing gaps, e.g. for the transition from the lab to enterprise and for scaling-up of high-risk innovative start-ups;

— Innovation ecosystem: there is a high fragmentation at European level. Need to include all regions and talents;

The speaker noted how EIC was created to tackle these issues. In particular, she listed some targeted EIC initiatives:

— Pathfinder: supporting the exploration of bold ideas of radical and new technologies. The grants have a value of 3-4 million euros to support early stage development and future technologies;

— Transition scheme: aims at building on promising research results by maturing novel technologies into disruptive innovations;

— Accelerator: supports start-ups or SMEs to scale up high impact innovation. Scale the innovation.

The Transition call is open, and the open funding supports all technologies and innovations. Its challenges are predefined.

The speaker concluded noting one particularity of this transition call, namely that now it is restricted to applications based on results generated by Horizon financing. Now such innovation can be taken to the market.

Joerg Wamser (Managing Partner, Fraunhofer Technology Transfer Fund) introduced himself. He began his professional career in 2002. He was cofounder of a few deep-tech companies and later on, in 2019, he became one of the four founders of the Fraunhofer Technology Transfer Fund (FTTF), which is Germany's first tech-transfer fund. The fund is operational since almost three years now.

The speaker explained that what brought him to work at FTTF is a profound spin out experience, where he worked and cofounded three spin outs: one together with the Max Plank Institute, one together with the German Centre of Aerospace (producing high ceramic materials) and a third with Max plank in the field of macro molecular proteins. This was what led him to move onto the side of investments.

He mentioned that the fund focuses on very early state pre-seed capital funds (scientific start-ups). They start in the pre-seed phase, normally as the main investor. The standard ticket is of € 250.000, but they also has some further capacity of investing if the project is successful — up to € 5 million.

Team wise, at FTTF they are a team of four people from the technology transfer and venture capital sectors. They have experience within Fraunhofer, Max Plank and other scientific organizations. The team tries to adopt a very accelerated process, trying to be able to make an investment decision within weeks, as companies in early stages run out of capital very quickly. At the same time, they try to provide smart capital, working a lot with a company on the issues to be addressed.

He then went on to describe FTTF's two main shareholders:

— Fraunhofer itself (Europe's largest institution for applied research). It is the leading organization for applied research and a driver for innovation and strategic initiatives, helping to tackle current and future challenges. It includes more than 29.000 employees, and 75 institutes & research centres across Germany.

— The European Investment Fund (EIF). It helps in the entire process of

investment (business angels, TT, normal VC funds, to private equity investments, social impact funds). In the last years EIF put an emphasis in the TT phase.

The speaker then noted that the main mission of the fund is closing the gap between research spin-offs and venture capital. The fund has good connections across Europe with other technology transfer centres.

There are some internal programs at Fraunhofer, incubators where the teams are still at the institute. They learn what it means to create a spinoff company, and other ways of commercialisations. If spinoffs are created and have scaling progress, they can become interesting for the Fund. The Fund supports scientists and researchers in the scope of coaching and mentoring, working very close to the program management. When scientists spin-off, they are normally not ready to do it by themselves. The Fund tries to bridge this gap so scientists can work around twelve or fifteen months around these issues.

The current portfolio is composed by 24 companies (coming from various geographic and scientific areas), of which 22 are early investment companies.

The speaker then listed a few key success factors for deep-tech start-ups:

- Access to technology: freedom-to operate, acceptable license fees, call option to take over IP or at least to start negotiations
- Founding team: tech competence within the start-up, founders at 100% at start-up, founders are the main shareholders
- Business model: must have some scalable potentials, deep understanding of the market. Need to the business model from the start

The moderator mentioned that is good that now there are instruments and tools to fill the funding gap and that there are successful stories to share.

Andrea Basso (Advisor, Progress Tech Transfer Fund) presents the Progress tech transfer (TT), the Venture Capital Fund for Sustainable Technologies, which is one of the five funds structured in Italy in 2019. It is based in Luxemburg. It is mainly focused on sustainability, valorisation and TT of Italian research. It has a similar structure to the Fraunhofer fund.

In terms of investment, the speaker illustrated the two verticals of the Fund, namely PoCs and early-stage start-ups., mainly focusing on projects or spin-offs from Italian universities and research institutions in Italy or with strong links to Italy. They invest in technology that has an impact in sustainability.

The typical ticket for the PoC vertical is around 200k, with a TRL that is typically 4.5 (technology just out of the lab, and that has already had support). Tickets are raised to prove the technology and to push the technology. The length of this PoC is typically 6-8 months. At the end, if the PoC is successful they might decide to do follow on to a second (€ 1/1.5 million) and eventually a third investment (€ 4.5 million). This TT fund really focuses on getting the business started: then the company needs to move on to more complex rounds.

The areas covered by the Fund are traditional (food; agri-tech; materials and processes, energy, water, resources as large categories), with more specific areas in which they are active (e.g. chemistry, membranes). They do not invest only in sustainable projects, but also on technology that is behind sustainability (e.g. ICT, AI, data), which can support the sustainability cause.

The speaker then provided an overview of the strategy of the Progress Tech Transfer Fund:

- One of the most important elements for the Fund is the quality of the

technology: they like to get involved and work together with the team, going deep into the technology aspect.

- Their selection criteria focus mostly on IP quality, TRL level above 4, a market pull approach, and market and team dynamics increasing the chances of exit.
- Finally, he repeated that they generally invest in Italy, and they adopt a B2B model (very rarely B2C).

The speaker then explained that the ideal target of their deal-flow process is people with ambition and motivation, and opportunities whose time to market is compatible to the fund and that have a near-time revenue. Their preference is on technology platforms, which can have broad areas of application.

The team is also very important: they look at least for one profile who has the right motivation and strength to bring the opportunity to the market.

In terms of the use of the ticket, the first 200k are used for the development (e.g pay consumables, materials, services, analysis) and partially for the personnel that typically is hired to do the PoC.

He noted that if the university team has IP, the Fund usually takes an option that might be exercised at the end of the PoC. Typically there is a contract with the TTO and with the department that is doing the PoC.

Finally, the speaker stressed the importance of establishing partnerships with the key players in the industrial sector. When a PoC is set up, they immediately associate with industrial partners than can participate in the next steps or be investors. This is a very important aspect because even though at the end of the PoC you can have a very good project, it can be an issue if you do not have a complete process to put it in the market

Shiva Loccisano (Head of Technology Transfer, Politecnico di Torino) provided a different perspective, as he is not managing funds, but working at the TT of a university.

At Polito there are about 2500 researchers, between professors and junior profiles, and approximately 37k students; 11 research departments organized in four main areas (industrial engineering, information technologies, industrial engineering and management and mathematics for engineering, civil, and environmental architecture and design). They organize their activities and themselves in 13 interdepartmental thematic centres, which try to address the most recent issues about technology and scientific issues.

The speaker then pointed out how in the Polito4impact strategy, the third mission is one of the key pillars. They have some very precise and quantitative goals in terms of TT, like improving the number of patents by 15% (this was 4 years ago).

Looking into the strategy for TT, they do it by assessing these four main areas:

- Impact on the local ecosystem through the attraction of strategic investments and dissemination strategies, regarding the importance of universities;
- Increase long-term strategic relationships with companies (bigger companies and SMEs);
- Protect and transfer researcher's results – sublicensing. Patenting, licensing and innovative start-up creations in order to exploit research results;
- Trying to spread the entrepreneurial culture among students.

The speaker then went on to explain the organisation of their TT system, structured around three main pillars:

- Administrative and legal structure: TTOs
- Technical and management: the interdepartmental laboratory on TT
- Policy and methodology: a research centre that is dedicated to do research on TT.

He then provided a schematic overview of Polito journey from idea to market, following three stages of execution (based on TRL levels):

1. Knowledge generation: research and education
2. Technology development: Proof of Concept
3. Business development: market delivery and knowledge sharing

The speaker specifically focused on the Proof of Concept (PoC) stage, as it is really a good tool for financing the evolution of a product. It is intended to give evidence of the function of the technology so that they can be more easily transferred later on.

Q&A

Q Which are the preconditions to access the pertinent funding?

A Verónica Beneitez Pinero: Meet the long-term plan when asking for finance. The European Innovation Council (EIC) offers, especially for the accelerator part, coaching schemes that are a very important service that can help to identify how to present your technology. It is important also to invest time on the presentation of the team. This is key when they are assessing the investment and the feasibility.

Joerg Wamser: He fully agrees on the importance of the team: the first impression on that is key. At Fraunhofer, if they like the team, they invite them to write an executive summary. Very important is whether the team is able to be very clear in their plans. Of course there is a need to consider IP, licensing, etc. but without the team it is not worth any discussion.

Andrea Basso: He also agrees on the need to emphasise the role of the team. There should of course be a good idea and a promising business model, but sometimes the turning point is the team, especially at the beginning in a TRL 4/5, where there are a lot of candidates.

Shiva Loccisano: He agrees on the team but he adds that it is not easy. There is a need to work together to figure out how to accompany researchers to create a process and a path to make them more conscious and to make them more willing to start this entrepreneurial process.

Andrea Basso argues that, however, the role of the researchers should not be changed to make them to become entrepreneurs. They should be nudged to take an advisory role in a potential start-up. To give continuity is different than to make researchers CEOs, which is a very rare occurrence.

Q What about financial intermediaries, and how do you deal with State Aid issues?

A Joerg Wamser: FTTF is not concerned by State Aid as a fund, as they are a completely independent entity. This issue is more for the research institution itself.

The session was closed with a few last remarks:

Verónica Beneitez Pinero: It is the first time EIC is giving this kind of funding. It is not only about funding, it is also about adding another kind of services focused on the interaction, creation and facilitating the exchange with investors in order to have success in the venture.

Joerg Wamser: FTTF does not have many competitors: there is a need for more of these funds. The education of professionals working in this field should also be addressed. New ecosystems and clusters are needed, to attract

money and tools; in Aachen, these clusters are very successful.

Andrea Basso: A lot of steps forward are being done with all the initiatives around TT, but there is still the need to think about the long term of the chain in order to increase the success of the local actors.

Session 2.5 Success stories in accessing finance for innovation

The moderator **Stoyan Kaymaktchiyski** (Project Officer, JRC, European Commission) introduced the panellists, innovators coming from countries in SEE and the WB. They all have already succeeded in accessing some type of financing (either as grants, loans, or equity) and shared their experience on how to do that in order to advance their technology and businesses.

Claudio Sponchioni ((Co-founder & CEO, Jobiri.com, Italy) presented Jobiri.com, the first AI-based digital career advisor, supporting job seekers to accelerate their job search as well as institutional organisations like universities, employment services, schools, municipalities, etc. to digitalise their career supporting services. They operate in Italy, collaborate with partners in Montenegro and launched activities also there.

The first financial investment came from Area Science Park and two business angels in Montenegro. The most important tip for receiving investment shared by the speaker is to develop metrics and build a strong team with different expertise.

Bojan Blažica (Co-founder, Tomappo, Slovenia) explained how the idea for Tomappo, a personal gardening assistant, was born during a start-up event. Initially it grew as a hobby project, then they decided to apply for funding: they first received a cascade grant given by a research project to smaller companies to develop the idea further, and later on accessed the Erasmus for Young Entrepreneurs programme, where they started to collaborate with another partner that was developing a sensor to help gardeners. Finally, they received a convertible loan from the Slovenia Enterprise Fund.

The speaker pointed out how there is a difference in applying for research oriented grants or for VC funds: in the latter case, it is crucial to provide some metrics and have a good team, whereas research grants focus more on the technology and the idea.

Tatyana Mitkova (Co-founder & CEO, Claimcompass, Bulgaria) explained the idea at the base of Claimcompass, a flight delay or disruption compensation platform. All the founders are from Bulgaria, but they were all scattered around the world when the endeavour first started. First it was a hobby, then customers started to seek assistance and show interest, so they had traction.

The speaker pointed out that when the project started, in Bulgaria there were just two VC funds, and very few options for funding. So they started talking with firms outside Bulgaria; but as their idea was very early stages, they ultimately considered an incubator. They applied for one of the programmes for start-ups in the Silicon Valley, California: it was an amazing and highly valuable experience, providing access to a network of 40 start-ups sharing their experience. Then they have received [further] VC funds. The speaker suggested to learn well what VCs expect from start-ups, to develop a strong idea, market strategy and vision.

Ognjen Kurtić (Co-founder & CTO, Finspot, Serbia) explained that Finspot started with the idea to help SMEs solve liquidity problems, and give to retail investors more opportunities to invest. They achieve that by using technology but also innovative financial products. As of now they have two main tools: the Online

digital factoring platform (SMEs can access finance in less than 1 day if they have solid records. Now portfolio is more than 1 mill €); and they are working on a tokenisation module, for SMEs to tokenise their assets and offer it to the public so to gain some capital Then they secured the first grant from HE for the tokenisation module. In 2020 they secured VC investment and convertible loans, allowing them to get into production with the factoring platform.

The main tip provided by the speaker was to dedicate a specific person on the team for fundraising, as it is a full time job, crucial to build the image of the company (e.g. through networking, social media) and attract investors.

Marius Mitroi (Co-founder & CEO, Ridesafe, Romania) pointed out that Ridesafe is a hardware start-up, providing IoT devices dedicated to motorcycle riders (e.g. tracking the performance of the rider, provide a smart alarm when the motorcycle is parked). Their journey started in an Innovation Lab, and later they managed to secure equity from a local VC fund, as well as a convertible loan.

He noted that although the team and the business plan are important, the most important thing is the trust that people can put on you and your idea. He as well suggested to have a dedicated person for fundraising.

Q&A

Q The importance of the team emerged often, also in the previous session. How to create a team where all members complement each other?

A The speakers expressed that the team needs to be created in incremental steps. Adding a member in a team is an important step. Founders should try to find people that bring a fresh view on the product. It is important to have trust in other members, but also having complementarity in the team helps. At the same time the core members shall also be compatible. An advice is to start from yourself and try to find what expertise you are missing. Also engage with the outside world as soon as possible, as feedback is very important to improve. Founders usually share the same vision for the product. Very important is that new team members share that same vision.

Q There are different ways of approaching investors: how to do that? Through direct contact, or formal application?

A The panellists expressed that European grants are very straightforward, as they require an application. On the contrary, VC funds require direct contact, relationships.

Q How to build the trust with the funding institution/investors?

A Some of the speakers expressed that they already had [built] connections in the local ecosystem, so they pitched ideas but also had discussions with VC managers, to understand if they were on the right course. Building relations is very important for success.

Q Mentoring programmes and advice: how important are they?

A The panellists expressed that having mentorships is extremely important, as this helps clarify all the complexities that a first-time entrepreneur has to face; they also give access to a lot of opportunities. However, not all mentorships will be useful for an idea, so it is best to investigate what they offer, so as to save money and time.

Q Are metrics more important than traction? (question from the audience)

A They are both important. However, metrics are crucial to provide a bigger picture to investors.

Q **W**hat are the main challenges experienced from the moment when you started fundraising to the moment when you started spending received money?

A Some of the panellists expressed that they had experienced complexities and costs of the legal process. Others shared that getting rejected by many investors can be quite mentally taxing.

Q How important is technology maturity when pitching to investors?

A One of the panellists expressed that when they started, they had just their business plan, albeit strong (market assessment, competitive assessment and go to market strategy were very well done), and also a very precise timeline. This work is important also for future stages: as you progress, it is going to improve. Another panellist believes that business is a set of assumptions and therefore it is best to have at least a Proof of Concept (PoC), something physical (tangible) to add to the business plan.

Q Were there limitations in spending the secured funding?

A The speakers expressed that the funding received is normally spent to develop virtually all aspects of the business (including marketing, sales, business development). An important element for some was the fact that by the time you get to spend the received funds, often you have already agreed on how and for what goals and activities, so there may not be that much flexibility.

Q How to pitch well to get the attention of investors?

A This is also a cultural thing, e.g. US and EU have very different styles: in US you have just one minute or two, whereas in EU you normally have longer discussions. So there is a need to adopt (or adapt to) the local approach and this might include an element of "social engineering". In general, have a short presentation, highlighting strong suits and traction.

Q Advice to early stage teams that have not yet received funding?

A Have a dedicated person to raise funding, and treat investors like they are your clients, get to know what they want.

Keep trying, perseverance is key. Also try to be as tailored as possible in customising the message for investors, and understand if they are the right fit for you.

Q Is having a plan for IP protection important?

A IP can be very important, as it allows to generate new streams of revenue — especially for hardware start-ups. Also, IP is easily scalable: you can sell it (e.g. license it), and thus generate more revenues.

Day 3 Proof of Concepts and the Western Balkans

The Chair for the day was **Giancarlo Caratti**.

Policy Dialogue on R&D&I

The moderator **Miroslav Veskovic** (Scientific Expert, JRC, European Commission) introduced this high-level policy dialogue on R&D&I, covering tools, actions and funding, as well as policy implication to enable TT in the region. These tools were discussed in the following

sessions. He recognised that the WB are of strategic importance for the EU. That is why there is a need for convergence. The EC is working in that direction through various initiatives, such as the adoption of the Economic and investment Plan for WB (2020) and of the Innovation Agenda for the WB (2021).

Adrienn Kiraly (Advisor for Wester Balkans, DG NEAR, European Commission) addressed the importance of the implementation of the Economic and Investment Plan for the WBs, focussing on the development of innovative and competitive sectors, which is crucial. It aims to unleash the untapped economic potential of the region.

She also mentioned the Innovation Agenda for the WBs, to foster collaboration on research and innovation. The speaker emphasised the importance of innovation, stressing the need for implementing the Green Deal and pursuing the digital transformation. These political priorities need to be translated in actions.

Currently at the Commission they are planning the activities for the coming years in that region, working in close collaboration with other partners and organisations, such as OECD, the WB CiF and IFI. One of the main instruments in place is the WB EDIF (Enterprise Development and Innovation Facility), which proved very important in supporting the economy, SMEs and creating jobs in the region.

The speaker also stressed the importance of Smart Specialisation, which will help in identifying the innovation potential of the WB economies and prioritise the investments. They are also supporting the mobility of students and researchers.

Finally she mentioned that the WBs will of course be participating in the Horizon Europe Programme.

Monika Matiusak (Head of Sector, Smart Specialisation – Global Outreach, JRC, European Commission) explained the Smart Specialisation Strategy in the WB, for whom it does not constitute a conditionality for accessing ESIF. Nonetheless, WB have wanted to commit to S3 voluntarily. This is a joint process: a great part of the effort lies with the countries, the EC and JRC just provide support and guidance. She proceeded to explain at which stage the S3 is in the WBs.

S3 is transforming R&I and the culture in innovation policy making.

The speaker then provided an overview of the journey of WB towards S3. It began in 2016 in the context of macro-regional cooperation (Danube), focussing on how S3 could work in the region. Shortly after, JRC decided to launch a pilot project involving Ukraine, Moldova, Serbia, where the S3 had to be operationalised and adapted from the EU countries (which need it to receive ESIF funding) to the needs of this region. This S3 framework for the region was adopted in 2017 and applied starting from 2019. Thanks to the growing commitment of WBs, DG RTD and DG NEAR, S3 started being discussed in policy dialogues. It also started to be applied in national policy and strategic frameworks. The next important step was a small financing received from DG REGIO and NEAR, and currently this concept and the resulting potential investments are included in policy and programming documents. At the moment, there is a Smart Specialisation Implementation Framework about to be published.

Then the speaker pointed out the difficulties of changing R&I systems. The work of the EC in this regard is intersectoral. She also pointed out that an added value of S3 is that it forces different Ministries to communicate and collaborate, in order to coordinate all the instruments needed to implement it, another example of a changing culture in R&I.

She then gave an overview of the changes that innovation policy and S3 went through: from a linear process (innovation for growth), to national systems of innovation (systemic approach), and then to a place based approach

(regional level). Now, there is a need to look even further: that is why a S3 for sustainability (S4) is being developed in MS, and WBs want to take it up as well (e.g. good practice of Serbia S3 for SDGs).

Finally, she mentioned that all these efforts will be finalised in 2022 when all these experiences will be put together in the knowledge hub for enlargement and neighbourhood.

Ruta Zarnauskaite (Head of Unit, Horizon Europe Association, DG RTD, European Commission) talked about the WBs Innovation Agenda. The agenda is to help achieve two main goals for the WBs: reforms and bringing the region closer to the EU. It is also meant to reach three aims: helping develop human capital in the region, support sustainable economic growth, and support institutional setting-up (interaction between stakeholders and authorities) in the county.

She highlighted the fact that even if the agenda has been initially put together by various DGs of the EC, it was then developed as a common project with the WB and EU MS, which participated in its formulation and endorsed it. It is a joint EU-WB agenda. Furthermore, the agenda will involve all stakeholders and imply multiple levels of instruments.

She outlined the structure of the agenda, built on three main axes:

- Political: it reflects the strategic importance of the region and supports its integration process in the EU; it also advocates the need to nurture knowledge-based societies and evidence-informed policy making. A key tool is considered the WB association to all EU programmes covering R&I, education, culture, youth and sport; and to support the implementation of systemic changes and reforms.
- Thematic: pushing for an alignment with the EU strategic priorities, such as transforming the national R&I ecosystem, counteract climate change and support the digital transformation, fighting the Covid Pandemic, the Cancer mission, and promoting the implementation of the Green Deal in the WB.
- Regional: making sure to improve the regional economic integration through planned investments in human capital development and digital transformation, e.g. enhancing the quality of education and training, boosting human capital, improving mobility and connectivity.

The speaker then gave an overview of the results achieved in WB participation in EU programmes, which are overall very promising. The participation provides insight in areas where WB are stronger and have greater competitive advantage (helpful in S3).

Complementary to the Innovation Agenda, there are other instruments, such a specific Widening measures to support Western Balkans (Twinning and Policy Support).

She then described how the EC will continue to support the WB, namely with other capacity building activities, as well as by supporting the Steering Platforms on R&I and on Education and Training (very useful to take stock and discuss specific topics), looking at SMEs support facilities and how to further advance the academia-business cooperation and technology transfer.

With regard to TT, the speaker highlighted the continuous support for the Regional Network of Technology Transfer Offices, and stressed the importance of linking the Smart Specialisation Strategies with technology transfer actions, and the importance of technology transfer offices for the economy.

Finally, she provided some figures on the participation of WBs in Horizon 2020, pointing

out the multiple sectors in which potential was shown.

Jelena Begovic (Institute of Molecular Genetics and Genetic Engineering, University of Belgrade & Member S3 working group, University of Belgrade, Serbia) shared the best practice of Serbia S3, stressing the linkages between S3 and TT. In March 2020, Serbia adopted the S3, with an Action Plan for three years. She explained the process of identifying the potential priority areas through the Entrepreneurial Discover Process (EDP), pointing out the disruptive effect of Covid. She also mentioned the continuous Entrepreneurial Discovering Communication.

With the S3 methodology, Serbia defined four vertical pillars (ICT; Creative Industries; Future Machines and Manufacturing Processes; Food for Future, as well as two horizontal pillars (energy efficient end eco-smart solutions, and KET and emerging technologies). The aim is now to make the reality out of this S3. The speaker argued that what she considers most important, as someone coming from the sciences and communicating a lot with the private sector and industry, is the change of how S3 is perceived, as it is about RD&I: the main point was to see where these activities are focused in Serbia.

She then provided a definition of TT: "TT refers to the process of conveying results stemming from scientific research to the marketplace and to wider society, along with associated procedures, and is as such an intrinsic part of the technological process". However, although it seems a straightforward process, in the real world of business and government the process is far more interactive and nonlinear and complex.

In Serbia during their continuous EDP they found some TT models in the country, but saw that results are not sufficient. Main players in R&D are in academia, whereas in industry it is still underdeveloped. At the moment they are working on this, in particular to develop a model that can give results.

However they have some flourishing start-up ecosystems, currently numbering 200-400 companies, showing particular potential in gaming, blockchain, agritech (e.g. in Belgrade) – supported by the government.

The speaker also noted that when talking about TT it should be acknowledged that TT is not all the same, but there are differences among fields, e.g. between software development ($ 50 million investment per-project, carried out in maximum 2 years-time) and pharmacy ($ 1 billion in 10-12 years-time, with 10-20% of success rate).

She the mentioned the government's crucial role in interacting with all stakeholders: it worked to motivate the private sector and promote R&D (industrial, subcontracts, academia); with academia to create programmes that can push new tech into TT towards the market; with the civil sector through different partnerships to promote and implement innovation (the role of the civil society is to provide structure and incentivise the market so that innovators can sell their product and gain market share). It's a quadruple helix model as in S3.

Those programmes implemented also had the support of the regulatory ecosystem, which needs to be clear: in our society academia has a pivotal role in this process as TT is currently happening there.

the speaker then stressed the fact that due to the TT process complexity, copy paste models from other countries are not working in Serbia: they need to create their own model for TT, using what has been learned in S3 (e.g. communication with all stakeholders) and build their own expertise, training human capital.

Finally, she concluded mentioning a national project: BIO4 campus on bio-medicine, technology, informatics, diversity; it aims at recognising that this area is very important globally. It will encompass scientific institutes,

faculties, biotech extensions of STP Belgrade, R&D centres, and production facilities in the field.

Tanja Miščević (Deputy Secretary General, Regional Cooperation Council (RCC)) explained the role of regional cooperation with an emphasis on TT and R&I recent developments in the WB.

She started by noting that a good development in the R&I area is an outcome of the dedication shown to the regional cooperation, dating back to the beginning of this century. In 2017 the region had the first Multiannual Action Plan for an Economic Area under the auspices of the Berlin Process. Innovation growth was considered critically important for the development of the region. At the end of 2020, the Common Regional Market Action Plan was introduced aiming to support regional cooperation and integration aiming towards the EU common market. It is structured around the four EU freedoms of the common market, but covers also digital, industrial and innovation policy. The RCC's role is to facilitate and support the implementation of the AP. The most recent development is the Green Agenda for the WB, which tried to align the WB with the EU Green Deal, to reach the big goal of 2050 carbon-free economies.

Furthermore, the goal of integration in the ERA is reiterated in the WB Innovation Agenda of 2021, as well as the association of WB in Horizon Europe.

The speaker pointed out that the regional innovation ecosystem is in the early stage in the WB: some features do not exist at all, because they were never developed. Hence the need for the measures developed to support the integration of the WB innovation ecosystem into the new ERA (e.g. financial and human resources, innovation infrastructure, developing DIHs and TTOs, focussing on women in STEM fields, tapping into the potential of the diaspora).

She also mentioned that RCC is supporting the first regional innovation and research infrastructure roadmap, which will allow the region to focus on strategic sectors for investments, and to boost commercialisation of knowledge (now in the preparatory phase).

The speaker also stressed that there are a few TTOs around the region officially, they remain underfunded, institutionally side-lined, and poorly supported. So, TT activities remain at a low level, despite some improvements in recent years. For this reason, several TT capacity-building projects have been implemented in the region, especially thanks to the EC and JRC, of which the most relevant have been the EU4Tech project and the ongoing PoC project.

The speaker highlighted the fact that despite providing important assistance, once these projects end, such activities tend to end too. That is why there is a need to focus on sustainable models.

Supporting these developments, RCC introduced TT support programmes in WB, to encourage practices and strengthen TTOs in the region. By the end of the year, RCC is aiming to reach important milestones.

The speaker reiterated the importance of finding sustainable TTO structures and providing more incentives to TTOs for sharing knowledge with the community.

She then concluded by stating the need for WB's institutions to increase investments towards TT (like the EU or US), without having excessive expectations, building first strong foundations.

Session 3.1 Implementing Smart Specialisation in the Western Balkans: from theory to practice

The moderator **Monika Matusiak** (Head of Sector, Smart Specialisation – Global Outreach, JRC, European Commission) introduced the session stressing the need to

have a variety of tools and instruments in TT. She invited the speakers to provide a brief overview of the state of design and implementation of S3 in their respective economies

Marijeta Barjaktarovic (Head of Directorate for Digital Economy and Technological Development, Ministry of Economic Development, Montenegro) kicked off the session by providing on overview of Montenegro's experience, the first economy in the WB to adopt a S3, now in the process of implementation. She said that they prepared the S3 in early 2017, which with the help of JRC was completed in 2019. After the mapping of the potential, other analyses, and the EDP they identified 4 domains (e.g. ICT also as a cross-sectoral field). After that, they faced some challenges, such as the Covid pandemic and organisational changes in the government. Now the institution for S3 implementation in Montenegro is the Ministry of Economic Development, but other relevant ministries have been involved as well, in an interministerial group. However, they had to move forward with these government changes, thus 50% of the group (members of previous S3 group, designed it) and including some new members.

The speaker proceeded to illustrate the two main directions currently undertaken in the implementation of S3:

- The creation of the efficient implementation framework: despite the difficulties encountered in relation to the governance of S3 and coordination, following JRC recommendations they reached a draft of the implementation framework, and are now planning to establish a working group on the continuous EDP.
- The implementation body (Innovation Fund of Montenegro); they also improved the programme framework (adopted the programme for innovation 2021-24, which is the main leverage of the Operational Program for implementation of S3) and are in the final phase of finalising the OP for implementation of S3.

The speaker then provided an example of Montenegro good practices, as suggested by JRC, namely using all relevant funds and help: national, JRC and projects financed by DG NEAR, donors support.

She concluded by anticipating that 60% of measures of the previous plan have been finalised and EUR 27 million have been spent for the plan implementation.

Viktor Nedovic (Director of Serbia Accelerating Innovation and Growth Entrepreneurship (SAIGE) Project — head of S3 in Serbia since the beginning of the macro regional cooperation — explained that in applying the smart specialisation approach, Serbia spotted four vertical areas with various sub priorities, as well as two horizontal fields of expertise. In particular, during the design phase they conducted several interviews and organised EDP workshops, in a quadruple helix approach.

The S3 was adopted in 2020 and the Action plan in 2021. Right now Serbia is in the implementation phase, for which there are € 150 million of funding available, and an additional € 2 million from donors. The measures identified are of various types: incentives, information and education, provision of services, regulatory. There is coordination among the relevant ministries, led by the Ministry for Education, Science, and Technological development.

The speaker then provided some examples of the progress made, listing a few measures already implemented or about to be rolled out (2021), e.g. innovation vouchers, Collaborative Grant Scheme and Matching Grant Scheme Programmes, Investment in physical assets of agricultural holdings, Promotion of

innovations, innovators and Serbia as an investment destination.

He concluded noting that they are now going to the next step, as in early 2022 they will start to develop the new Action Plan for 2023.

Florensa Haxhi (Director General, Unit for Development Programs and Cooperation, Prime Minister Office, Albania) then proceeded to illustrate the progress made in Albania. She was involved in S3 from the beginning 2017. In the process they had some up and downs, and a major setback with the pandemic, but overall they made a lot of progress. As of now, they have finished the mapping and the report of smart specialisation.

The main challenge according to the speaker was that not everybody at institutional level and in the national government understood what S3 is. It is a new concept, something that needed a lot of work to understand the results it will have. Therefore a lot of work was required to make people understand its importance, and to find the right people among all stakeholders that had the information and were willing to cooperate.

The speaker added that currently Albania started the qualitative analysis (interviews and survey), and is at the last stages of the report. Hopefully by Q1 2022 they will start the EDP phase, which is a very important stage — in that respect, it was good to hear from other panellists coming from more experienced WB. During the qualitative stage a lot of actors were engaged: academia, NGO, the private sector, as they will be involved also in later stages. She pointed out that there were also extensive discussions with the different levels of government (central and local). The priority domains identified are those areas that are the most important, with growth potential for the economy.

She also mentioned that during the first stage (quantitative analysis) the areas that emerged were agriculture, fishing, manufacturing of food products and metals, tourism, support services, ICT, and other service activities (business support), energy. Now that they have finished the qualitative stage, they will have some more information on those areas and it will be possible to go more in depth to understand which areas have more potential.

Regarding the partners, the speaker added that they are working with many stakeholders: there is a lot of attention from their side to be part of the project, they want to be part of the EDP but mostly implementation.

Finally, she concluded by mentioning that in the next phase, EDP, they plan to include as many actors as possible, also through pilot projects that will anticipate the implementation phase. In this, JRC help was crucial for them.

Jasmina Majstoroska (Head of Unit, Ministry of Economy, North Macedonia) explained that the development of S3 in North Macedonia started in 2018. From the beginning, they benefitted from the collaboration with JRC and by following their methodology. The whole process is led by the Ministry of Education and Science and the Ministry of Economy, coordinating the group. They are current about to launch the EDP.

The speaker then listed the domains identified as those with the most potential after the quantitative and qualitative analysis: smart agriculture, ICT, smart sustainable buildings and material, electrical equipment and machinery; the horizontal domains are energy for the future, and sustainable tourism and catering.

She also mentioned that EDP was opened in all these domains, bringing to fruitful discussions. The EDP should enhance and stimulate networking for innovation and R&D from all stakeholders, and is supposed to be a continuous process.

She concluded noting that Covid posed a major challenge, and that because of that most of discussions for the EDP will happen online. She

thanked again the JRC for providing the support and new models for S3.

Adnan Ahmeti (Senior Strategic Planning Officer, Government of Kosovo*) retraced the main steps Kosovo has taken in the process of developing the S3, starting from 2018. In July 2020 there was the approval of the decision establishing a national team for S3, including all stakeholders of the quadruple-helix. The first phase of qualitative analysis has been done, involving all relevant stakeholders. The qualitative analysis will soon follow, and a few meetings with stakeholders have already been organised.

He then listed the priority domains, emerged after consultations with JRC: ICT, processing, agrifood and energy.

The speaker also pointed out that right now Kosovo is undergoing an important process, i.e. completing the national development strategy 2030, to which the priority domains will be linked; therefore, S3 will be placed in policy planning documents at the highest level.

Currently, they are about to start the qualitative analysis, probably to be completed by next April, after which they will move on to the EDP.

He concluded mentioning that an online platform for S3, SmartKosovo, was created.

Tanja Lucic (Head of Department, Directorate for Economic planning, Bosnia and Herzegovina) explained that Bosnia and Herzegovina is at the very beginning of the process. For now, they have only formed the working group involving all relevant stakeholders, and held several meetings — but they still have not begun the mapping process.

She mentioned that the main challenges they are facing are related to the Covid pandemic, which has slowed them down, and some internal doubts about the territorial approach to adopt. They now looking forward to make progress in the following months.

Finally, she thanked the other panellists for providing very useful best practices on S3.

Session 3.2 Impact of the PoC project scheme in the Western Balkans

The moderator **Elena Andonova** (Policy Officer, JRC, European Commission) introduced the session, during which the EU4TECH PoC project team presented major findings and policy recommendations from the implementation and progress of the PoC project.

Iztok Lesjak and **Davorka Moslavac Forjan** (EU4TECH PoC Key experts) focused on the main achievements of the EU4TECH PoC Scheme and lessons learnt. First, the speakers gave an overview of the EU4TECH PoC project, which ran for 2 years and provided hands-on technical support to two cohorts of projects, totalling 48 teams. The applicants came from both universities and companies.

The speakers then shared the main achievements of the PoC Scheme and lessons learnt.

Firstly, regional prototyping centres were set up enabling the project to be developed regionally and the participants to get quickly the best support for their activity from across the region. Prototyping was an attractive service and was provided to all teams. The speakers stated that such activity should be put at the centre of any future PoC activity and clear guidance should be offered for its financing.

**This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.*

Secondly, mentoring activities were carried out, including 20 workshops, with on average 44 people per workshop, where tools and methods were presented, which were then put into practice in more than 200 mentoring sessions. The sessions provided hands on support by experts and mentors with topics such as IP strategy, marketing analysis and business model canvas.

The PoC focused also on IPR management: all 48 projects developed IP strategies. With legal expert assistance, support was provided to draft legal templates for resolving IP ownership issues, invention capture documents, and eco patent drafting. The lesson learnt was that classical IP strategies did not work for most teams, because of their specific situations. The speakers mentioned that it would be beneficial to look at alternative strategies.

Furthermore, market analysis was provided to 12 teams by Deloitte, using commercial data platforms. At the outset, the applicants did not understand benchmarking, did not know how to compare they product or service to the competition. According to the speakers, it was beneficial for the applicants to focus first on the local market before considering the global market, as most are rooted in the local community, and the benchmarking was a good basis for attracting further funding, including from banks.

Then, business model development was provided to 11 projects, including business/lean canvas development. According to the speakers, the teams mainly focused on local markets and were unaware of wider competition in the EU and globally. This support helped teams to adjust their business model when moving from local to EU to global markets.

Finally, support to find funding sources was provided to 23 projects. This support led to 4 successful Jumpstarter projects by EIT. A lesson learnt shared by the speakers was that equity is not a trusted vehicle in the region and therefore more appreciation of local norms should be taken into account.

Mr Lesjak mentioned that the project revealed a huge potential in the region. There was a lot of interest to participate in the project, more than the project could accommodate. The project contributed to standardising the methodology and data preparation for moving up the TRL levels. With the access to international experts, expertise and good practice were shared with the local ecosystems. The collaboration with the local institutions helped the PoC scheme to identify good projects and demonstrate to the local/regional authorities the value of the technical assistance.

Concluding, Mr Lesjak emphasised the importance of identifying and supporting entrepreneurial potential for the region to flourish.

From the perspective of Members of the Advisory board and local key stakeholders, **Katarina Kreceva** (Head of Department for Development of programs, Fund for Innovation and Technology Department (FITD) and **Mladjan Stojanovic** (Enterprise accelerator project officer, Innovation Fund, Serbia) evaluated the EU4TECH PoC scheme, how it fit existing programmes for support and its value-added to the local ecosystems.

Ms Kreceva noted that one of the main concerns by the local actors was the fit of the scheme in the overall innovation ecosystem. The main challenge was to harmonise the activities of the project, as the six participating countries had different dynamics and were at different stages of ecosystem development. In North Macedonia, the concern was a potential overlap with technical assistance provided by other support programmes.

The POC was a missing piece of the jigsaw, as it provided complementary services: mentoring/acceleration programme, technical assistance in prototyping (which is unique in the country), and access to data for market

analysis and IPR advice for tech-based innovations. The strength of the PoC scheme lay also in the involvement of local actors in the implementation: it strengthened their capacities with the added value that they may become the main driver of sustainability of such programmes. The scheme also helped gain experience in implementing regional projects that bring different dynamics. The speaker pointed out that as regional projects are likely to become more common, lessons learnt from this scheme can be integrated in future projects.
Mr Stojanovic pointed to coordination as the key to the success of the PoC scheme. Good coordination of the involved teams allowed for compatibility of projects, as opposed to competing projects. In Serbia, there was a previous program with limited success, as the majority of projects faced weaknesses such as lack of IP ownership (i.e. researchers did not know who owned their IP, especially in cases with multiple organisations involved) and limited understanding of the purpose and target market of the projects. Therefore, a dedicated PoC programme was welcome. The speaker mentioned that there were 8 projects that received funding from Serbia and technical assistance from the PoC. He also noted that the services offered by the PoC would have been very difficult to procure in university settings, due to the complex procurement rules.

Enzo Damiani (EU Delegation, Albania) described the recent programmes that support innovation ecosystems and entrepreneurship development in Albania and looked at how to increase the synergies between bilateral and multilateral actions.

He pointed out that that the PoC scheme was hooked onto major regional programmes and reforms (e.g. innovation agenda). On the ground, there was no foundation for this programme: there were organisational silos and few support programmes. The speaker remarked the fact that such support programmes were not sustainable and could run only with grant funding.

The speaker explained how the PoC programme was funded with co-financing from EU member states (e.g. Germany, Sweden). The main directions of the programme were: (1) capacity-building, (2) networking, (3) funding on the ground, and (4) putting innovation high on the political agenda. The project was a success and has been extended beyond March 2022, with co-financing from other member states. For the capacity-building component, they aimed to create a foundation for young talents from across the country to have an entry point to the ecosystem, get quality support, and network with the regional ecosystem. Connections were made also with ecosystems in other countries (e.g. Netherlands, Denmark). One of the lessons learned according to the speaker was that universities need to change in how they operate and talk to each other. There was also the idea of a multi-location incubator, which prepared the resources and ground for deciding the actors and activities of the programme.

On the current status of the innovation ecosystem in Albania, the speaker noted that the enabling conditions are not there yet, i.e. policy/regulatory/institutional frameworks. However, he also stressed that it is important to prepare the ground so that once the public sector has picked up, it can plug into the ecosystem. Mr Damiani also addressed the problem of brain drain and presented the Albanian diaspora as an asset that can be attracted back to mentor the local ecosystem.

Finally, the speaker concluded by pointing out how at the start of the project, there was little understanding of innovation in Albania. Now, innovation is high on the political agenda and there are many start-ups, accelerator and incubator programmes.

Alan Barrell (Professor, Cambridge Learning Gateway) offered lessons from relevant projects in the Baltics.

He pointed out that for success and scale-up, internationalisation is key. He also explained that mature innovation ecosystems like Cambridge took a long time to achieve their success and expressed his admiration for the achievements of the WB countries in the short amount of time. Based on this experience, PoC is the right approach to prepare for investments.

The speaker finally stressed that there comes a time when international connections become crucial and advised WB ecosystems to reach out to experienced ecosystems for support and knowledge transfer in order to get finance and grow internationally.

Session 3.3 Learning through PoC activities: how to move a project on the technology readiness levels (TRLs)

The moderator **Lisa Cowey** (Team Lead, EU4TECH PoC) introduced the PoC beneficiaries that would share their experience in participating in the PoC support scheme and their advancements in commercialisation in the Western Balkans.

Elva Leka (Project: BT-CertAL, Polytechnic University of Tirana, Albania) explained the concept behind the BT-CertAL project. The team observed problems in the management of academic degrees and certificates in the education sector (including corruption, falsification, system flaws, illegal distribution, manual operation, reliance on third parties). The team offers a blockchain solution to the problems with verification and monitoring of certificates, i.e. storing, distribution and management of academic degree with blockchain to ensure security, validity and confidentiality.

The speaker then explained how the system works. The idea is to implement three interfaces: an accreditation interface, a university interface, and a verification interface. The accreditation body verifies and monitors the certificates, as well as the universities, which are responsible for validating and issuing the certificates. After a certificate has been issued, a serial code is sent to the student, which can in turn use it to apply to a new university course or for a new job. Finally, the potential stakeholder can verify the certificate checking the serial code in the blockchain network.

The speaker noted that in the EU4TECH PoC, the team benefited from prototyping, mentoring, and legal, technical and market analysis expertise, trainings, IP management and business modelling. Furthermore, they learned how to share responsibilities in the team and improved communication with stakeholders and experts. The two most useful branches of technical support for them were (1) development of prototype and interfaces, and writing code for smart contracts, (2) market analysis: developing questionnaires for students and businesses. The speaker explained that the prototype is now ready and that they are prepared to focus to networking and identifying more opportunities for product development.

In terms of changes in the way EU4TECH supports projects, the speaker proposed to improve the experience-sharing process between teams during and after the project and to support the matching of teams with possible stakeholders.

Finally, the speaker shared the main challenges, as perceived by her team, in making the product available to the market, namely (1) finding support for further interaction with potential stakeholders in Albania or internationally, (2) Finding funding from investors or through projects, and (3) developing more international contacts. Their next steps after PoC will be: (1) complete market analysis; (2) more networking with stakeholders and businesses; (3) complete

business analysis; (4) continue developing the final product.

Filip Kostadinoski (Project InnoPod, Fixigo DOO) and his team developed an innovative universal platform to address key challenges in any major industry. To prove the concept of the platform, the team decided to conduct the PoC in the agriculture sector, as it is a major industry in North Macedonia and is facing many challenges. The sector is managed in an unsustainable way, i.e. natural resources are not efficiently used and diseases are not traceable due to lack of continuous monitoring. The team aims to offer services for companies for the continuous monitoring of soil parameters, notify about critical situations and give recommendations, as well as the option to buy fertilisers from proposed strategic partners. The data collected in the process can be shared with other stakeholders to support further development of the sector.

The project InnoPod is developing a universal, energetically self-sustainable sensor network, consisting of a hardware and software platform that will monitor soil parameters; the data will be stored in a cloud, where big data aggregation and analysis will be performed with the aid of AI and machine learning.

With EU4TECH support, serious development of the project's business aspects started. The training and mentoring helped the team fill gaps and get ideas for improvement. With the prototyping service and financial support, the team could procure material for the MVP. Market and competitor analysis and the business canvas were important as foundation to develop a viable business model. EU4TECH also contracted an agronomy expert for the project.

The team also reached the Grand finale of Jumpstarter 2021 by EIT, and managed to raise funds up to 25 000 from EIT Jumpstarter, EU4Tech and the Employment Agency from North Macedonia.

The speaker explained how the PoC scheme triggered a learning experience, where the team developed entrepreneurial skills, accessed online courses and materials, and participated in workshops. Advice from the mentors was much appreciated, in particular in that it was not overly prescriptive. The team also developed a strategy to apply for more programmes and accelerators.

In terms of further development, the team is going to conduct market interviews and research to achieve a better market-fit of the product and make the product more user-friendly. They are also developing an application. However, as farmers have low trust in these types of digital solutions, the team is looking for ambassadors that will promote the product and raise awareness of the problems afflicting the sector. They intend to participate in more workshops to discuss with mentors, and get feedback and advice.

Concerning their experience with strengths and weaknesses of innovation support in North Macedonia, the situation is constantly improving. Organisations dealing with start-ups and students are implementing more workshops with mentors from North Macedonia and the region, which is important for students who lack entrepreneurial skills.

The speaker concluded sharing the next steps after the PoC: (1) organising a workshop to raise awareness of the problem as stakeholders do not know understand the impact of the problem and have no skills to work on this problem; (2) educating young people about this problem; (3) work toward the next milestone of covering 100 ha of agricultural fields with their solution and extending to other sectors in 5-10 years.

Arbnor Pajaziti (Project: Mechanical Ventilator, Univeristy of Prishtina, Kosovo)

During the Covid-19 pandemic, Professor Pajaziti, together with a colleague and six students, developed a low-cost mechanical ventilator (Mech-Vent), which can be

manufactured with available components in a short timeframe and has a feedback control system. Professor Pajaziti emphasised the diversity of the team as key to the project.

The team received prototyping support from EU4TECH, especially in the PoC of the Mech-Vent's ability to control the breathing cycle; they also went through the IPR, with prior art search, invention capture, and an IPC draft. Right now they are covering investigating technology, adopters and market, and certification requirements.

The current status is that the simulations show results to be comparable with commercial ventilators. Next steps include the continuation of prototyping (challenge of securing high quality parts), ordering hardware parts, preparation for testing in hospital environments, and EPC patent preparation. Thanks to the programme, the team hopes to try their solution in different environments.

According to the speaker, wider benefits of the PoC scheme include: (1) opportunity to engage problem solving skills and new knowledge; (2) gain experience from other participants in the region; (3) experience in patents and trademarks.

In terms of developing the PoC programme further, the team proposed (1) support to identify different forms of finance beyond the PoC stage; (2) support to identify partners from industry; (3) tools to become investment ready.

Finally, the speaker shared the next steps after the PoC, namely to (1) find support from the government to obtain patent protection and (2) obtain funding from the government to strengthen and develop existing invention.

Silvana Andric (Project: Mito-Fert-Signature, Faculty of Sciences, University of Novi Sad, Serbia) concluded the session by presenting the work of her team in the Mito-Fert-Signature project.

The group works in the reproductive field. In particular, the project aims at offering an integrative approach to detect male infertility, which is a growing problem among the young population. The speaker explained that the solution developed by the team is new, accurate, and cheaper than existing ones in the Artificial Reproduction Technologies market.

She went on by mentioning that the team received a range of technical assistance from the EU4TECH project that helped to focus their work.

The speaker considered the support in Serbia through innovation funds to be good, highlighting in particular good communication of open calls via universities, progressive marketing, and very professional support services. She highlighted Mini-grants as a programme with quick and easy application process and professional evaluation. She pointed out that the main challenge is to go from the PoC to tech transfer.

Finally, the moderator, Lisa Cowey, concluded by sharing a few key messages:

- After the PoC, finding tech transfer support can be a challenge.
- The most valuable impact of the PoC project was the individual and team development, which will ensure that these talents will keep coming back with more technology.
- Experienced mentors and steering is key to innovation activities, as education and scientific activities at universities do not suffice.

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