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Financing Options for Technology Transfer Projects, Internalisation and Opening Up Research Infrastructures & Co-Creation with External Users

*10th TTO CIRCLE plenary
meeting, Oxford (UK)
22nd & 23rd June 2017*

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Foreword

The European TTO CIRCLE network was established in 2011. It brings together European Public Research Organisations committed to advancing Technology Transfer in Europe and beyond. The TTO CIRCLE has 28 members, which includes the JRC of the European Commission, acting as coordinator and managing its secretariat. The network operates in close collaboration with other Directorates General of the European Commission and with EARTO, the European Association of Research and Technology Organisations.

The TTO CIRCLE organises its activities around annual plenary meetings that offer its members the opportunity to discuss important and strategic technology transfer related issues. More technical meetings are also organised regularly to cover specific technical issues and to provide thought leadership on emerging issues.

This report summarises the key conclusions, proceedings and evaluation of the 10th TTO circle plenary meeting held in Oxford (UK) on 22 & 23 June 2017.

This meeting was organised by JRC in collaboration with Oxford Innovation University and the main topics were related with internationalisation and technology transfer, technology transfer financing, opening of research infrastructures in cooperation with industry and technology transfer in the creative industries.

All materials pertaining to this event, including speakers' presentations and background papers, are available at <https://ec.europa.eu/jrc/communities/community/european-tto-circle/event/10th-plenary-meeting-european-tto-circle>

Acknowledgements

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Introduction

The 10th Plenary Meeting of the European Technology Transfer Offices (TTO) took place at the Pembroke College in Oxford (UK) on 22 and 23 June 2017. This event was organised by the Joint Research Centre (JRC) in collaboration with Oxford Innovation University.

The 2 days meeting was structured in the following 3 main sessions:

- The first session "**Financing options for Technology Transfer projects, trends and opportunities**" explored existing funding schemes for technology transfer projects and the perspectives of early stage investment funds, such as Proof of Concept funds and venture capital when raising cash for early stage companies. The session will also touch upon the Commission's initiatives related to bridging the 'valley of death' and relevant technical assistance;
- The second session "**Opening Up Research Infrastructures & Co-Creation with External Users**" focused on identifying various aspects relating to the opening up of RIs for external users, e.g. companies, universities and publicly funded institutes, for the development of innovative products, services and processes. Issues to be discussed involve opportunities, such as access to international excellence, and challenges such as funding, intellectual property, and cultural differences of the university-industry interface;
- The third session "**Technology Transfer and Internationalisation**" was dedicated to analysing various aspects relating to the internationalisation of research as well as technology transfer related activities. The aim of the session was to invite experts from various backgrounds, including policy makers, research organisations, academia and international players in the arena of IPR to share their view on the feasibility for an international approach to technology transfer.

The programme can be found in the Annex I of this report.

Session 1: Financing options for Technology Transfer projects, trends and opportunities

Abstract

In this interactive panel session there were opportunities to hear about existing funding schemes for technology transfer projects and the perspectives of early stage investment funds, such as Proof of Concept funds and venture capital when raising cash for early stage companies. The session also touched upon the Commission's initiatives related to bridging the 'valley of death' and relevant technical assistance.

Moderator

- Elena ANDONOVA, Joint Research Centre, European Commission

Speakers

- Robert BUSH, Senior Investment Executive, Superfounders
- Adam WORKMAN, Head of New Venture Support & Funding , Oxford University Innovations
- Andrea ALUNNI, Senior Advisor at Oxford University Innovation – Oxentia
- Vincent RYCKAERT, IP Business and Intelligence Director, IMEC
- Patrick MCCUTCHEON, Senior Policy Officer, DG Research & Innovation, European Commission
- Bart SWAELENS, Venture Development Manager, VITO
- Fabio MONDINI DE FOCATIIS, Senior Advisor for Equity Investments, European Investment Fund
- Luigi AMATI, CEO, META Group

Rapporteur and Session report writer

- Elena ANDONOVA

Presentations by the panellists

The session on financing TT and innovation was opened by **Robert Bush** from Superfounders, a Venture Capital (VC) entity active in South-East Europe. Mr Bush spelled out a few myths about VC. First it is not true that VC are risk takers, on the contrary they take minimum risks. This means that the high-risk (and disrupting) technologies -which would have highest impact- usually, do not get funded. Mr Bush also shed light into the decision making process within a typical VC. There are three forms of arbitrage most funds consider, the information arbitrage, the financial arbitrage and the portfolio arbitrage. Funding success is directly proportionate to the possibility for the fund to leverage on the risk arbitrage, and not on risk taking. The paradox is that those projects that need least of value-adding services obtain most financial capital. He was also questioning the ability of TTO to facilitate technology transfer with standardised procedures, since in his view technology transfer remains mainly a cultural issue.

Adam Workman explained the Proof of Concept Fund managed by OUI. He gave a brief history on the proof of concept funds available to Oxford University researchers, described the modus operandi of these instruments, very much governed by the technology transfer company of Oxford (OUI) and shared opinion on what works in this space. The secret according to him is not only to provide money but also to bring in education and networking. He expressed the need to search for "patient capital" which is usually what VC are not able to give. Therefore Oxford University has set up their own fund, Oxford Science Innovations to ensure that follow-on funding capacity is available to commercialisation projects in Oxford. He also stressed on the fact that besides being

interested in financial and economic gains, Oxford is also very interested in generating social impact, for which proof of concept instruments play a significant role in unleashing.

Vincent Rychaert noted that TT at IMEC is increasingly co-developing with industry, which entails more exclusivity. In order to mitigate this, he presented the notion of "collaborative IP". He presented various types of arrangements between academia and business for the creation of spin out companies via various licensing models. Key in his view was the creation of operating company with limited possibilities for sub-licensing or IPO or acquisition triggered transfer of rights.

Patrick McCutcheon outlined the TT activities managed by DG RTD, which include the Innovfin TT programme (13m euro already signed off), a TT project on capacity building and the "SME Instrument" programme. The latter provides a 50k euro initial grant to SME that could be followed by two grants of up to 2.5m euro in total. The largest recipient countries of the first calls were Italy and Spain, while the lowest ones were in Eastern Europe. Patrick stressed the rationale for these instruments, mainly being the lack of risk/private finance for technology transfer, but also to facilitate the transfer of R&D results with high potential from PROs to market.

Bart Swaelens described the approach of VITO to spin-offs and gave examples from different sectors. They focus mainly on energy, materials and healthcare. He also noted that most VC are local and therefore there is little competition.

Fabio Mondini mentioned the great gap in VC in Italy with US (10 times more) and Israel (100 times more). He presented the CDP (Cassa Depositi e Prestiti) – EIF ITAtech Equity Platform which is a new financial instrument to support technology transfer across Italy. Through ITAtech, CDP and EIF will jointly provide up to 200m euro to finance a dedicated investment program in the field of technology transfer. The platform presents equity instruments financing SMEs, Mid-Caps and innovation projects from universities and PROs.

Andrea Alunni described the plan for the Links Foundation in Turin, a consortium between the Politecnico and Istituto San Paolo, aiming at supporting TT in Italy. The goal of the Foundation is to act as connector/primary reference point of Turin as actor capable to accelerate the innovation process, technology transfer and business development of companies. Andrea also shared experiences from Oxford and his work there as a seed fund manager. He made references to the ingredients for successful technology transfer ecosystems.

Mr Luigi Amati talked about the important role of business angels in the innovation chain to help start-ups (he estimated that there are at least 150,000 of them in Europe). He presented the Italian's Angels for Growth, a network that grew from 9 to 140 members in six years with around 3 to 5m euros invested annually. He also presented some success stories.

Session conclusions

During this panel various initiatives for supporting technology transfer financing in Europe were discussed, being proof of concept funds, equity based platforms in the shape of fund of funds as well as more traditional business angels networks. Among the success factors for creating sustainable technology transfer initiatives were quoted also the availability of networks and business support services. Financing technology transfer activities could not be successful if done in isolation, it is an on-going process that requires diligence, networks and dedication.

Session 2: Opening of Research Infrastructures & Co-Creation with External Users

Abstract

This session covered various aspects relating to the opening up of RIs for external users, e.g. companies, universities and publicly funded institutes, for the development of innovative products, services and processes. Issues to be discussed involve opportunities, such as access to international excellence, and challenges such as funding, intellectual property, and cultural differences of the university-industry interface.

The first aspect of the discussion is how RIs can share good practise and work together to increase accessibility for customers. The range of research instruments and services will be different across the various organisations, as will business models and contractual arrangements, so the main objective is to find common denominators and complementarities. The second topic addresses how work particularly with SMEs can be intensified, this of course alluding to the weight given to this type of companies in EU policy making. The third topic deals with the value that the European level could add with regards to accessibility of research infrastructures. Here the possibilities of establishing a pilot action on the European level will be explored, and e.g., if it would be pertinent that DG JRC would have the role as the European level coordinator for Member State RIs in order to share and convey good practise across the EU.

Moderator

- Mattias DINNETZ, Policy Officer, IP and Technology Transfer, Directorate-General Joint Research Centre, European Commission

Speakers

- Laura ESPOSITO, Research infrastructure, DG Research & Innovation, European Commission
- Olof SANDBERG, Chief Strategist, Research Institutes Sweden (RISE)
- Mattias DINNETZ, Policy Officer, IP and Technology Transfer, Directorate-General Joint Research Centre, European Commission
- Edward MITCHELL, Head of Business Development, European Synchrotron (ESRF)
- Matthias KECKL, Project manager, Fraunhofer-Gesellschaft e.V., Fraunhofer Venture Lab
- Asier RUFINO, Director General, Tecnalia Ventures
- Fabio TAUCER, Policy Officer, Directorate-General Joint Research Centre (JRC), European Commission
- Bernard DENIS, Knowledge Transfer Senior Advisor, CERN

Rapporteur and session report writer

- Mattias DINNETZ

Presentations by the panellists

Laura Esposito gave the first key panel talk, 'the role of research infrastructures in translating open science to open innovation.' First there was an explanation on the definition of research infrastructures as 'facilities, resources and services that are used by the research communities to conduct research and foster innovation in their fields', and the main types of RIs, i.e., knowledge-based resources, e-infrastructures, and major scientific equipment. There are networks of national and regional RIs open to all European public and private sector researchers in Europe, which are supported by the European Commission by way of *Integrating Activity* projects.

Mrs. Esposito spoke about the European Strategy Forum on Research Infrastructures (ESFRI), with EC-RTD acting as secretariat, which was set up by the EU Council of Research Ministers in 2002 to support the development of a long term vision and European policy for Research Infrastructure. The associated ESFRI strategic roadmap aims at identifying new pan-European RIs and major upgrades to existing ones. The ESFRI roadmap is updated every two years. The talk also focused on how RIs can be helpful in supporting the EC quest of translating open science into open innovation, i.e., through actions for innovation in the RI part of the Horizon 2020 Work Programme and by way of interacting with various H2020 measures in support of innovation and economic impact. In addition, RIs promote excellence in highly demanding fields and enable the vastly important discoveries in science and technology. They fulfil their mission by offering access to extensive data and excellent resources not available elsewhere, and by doing so they support competitive research at the international level, yielding outputs to be exploited in industry or for social purposes. She concluded with some examples of RI projects focussed on innovation and on the strategic orientation for the next RI WP 2018-2020.

Olof Sandberg continued with his key note intervention on the leading Swedish RTO, RISE Research Institutes of Sweden, which embraces research infrastructures as well as associated test beds and demonstration facilities, the latter two concepts being the focus of the presentation. The RISE definition of test and demonstration (T&D) activities is 'a physical/virtual platform or infrastructure for companies, universities, institutes and other users to prove, test, develop or do research on their product or service, and in some cases including pilot plant.' The various settings in which the test and demonstration activities are carried out include laboratory, isolated, real life, virtual, and services and policies.

RISE has about 100 T&D facilities, this being 50-60% of Sweden's total capacity, many of them being unique nationally, EU-wide and globally. RISE's strategy is to develop a common, synchronised offer for the organisation and to initiate pilot projects to underpin this offer, as well as to establish a test bed forum together with Sweden's innovation agency Vinnova and other involved parties for future test beds. There is a wish to involve SMEs to a higher degree than previously, and it is foreseen that this can be accomplished by way of coaching, providing innovation vouchers to introduce test beds, as well as collaborative efforts with customers at the test beds. Streamlining measures, such as a common RISE-wide format for managing IP-handling, is also expected to increase the use of RISEs T&D facilities.

In relation to the European level Mr Sandberg concluded that value at the European level could be added by taking into account the need for critical mass, that RIs position themselves as parts of supply chain, and that common standards and policies are developed and conveyed to the EU level.

Mattias Dinnetz provided an overview of the survey was carried out in anticipation of the meeting among TTO Circle members. The main findings were as follows:

- for the vast majority of the organisations, a dedicated agreement is signed between the research infrastructure and the users, defining the rights and obligations of all involved parties, while a small minority signs a specific IPR agreement;
- when it comes to working with SMEs, one third have answered that they have same conditions as larger industrial users, one third that special conditions apply due to particular situation of SMEs, and one third that access is given upon payment;
- for PROs, universities and other public organisations, 50% of the respondents answer that special conditions for access apply, 25% that conditions are the same as for larger corporates, and 25% access is given free of charge;
- for slightly less than 50% of the organisations the business model is non-profit, and the same is true for the business model that is a blend between a market-driven and a non-profit model. The remaining small minority work with a purely market driven business model;
- for about 45% of respondents IP generated belongs solely to the user, for slightly over 30% joint ownership applies, 10% of the RIs retained full ownership, and the remaining share of respondents did not answer this question
- main types of IP generated at the RIs include 1, "data", 2, patent, and 3, trade secrets ("know-how");
- almost all participating TTO Circle members are interested in sharing knowledge and practise and in developing a common EU-wide offering of research infrastructure, and 75% express interest to participate in a follow up TTO Circle workshop focusing on the exchange of best practise and collaborating on the opening up of their RIs.

Edward Mitchell gave a talk on the topic of 'Opening the European Synchrotron Research Facility (ESRF) for Innovation & Industry'. He highlighted the international aspects of ESRF with its 22 partner nations, along with its position as the foremost research facility in scientific output globally; there are over 25000 articles referencing the ESRF, 6500 scientific visitors annually including 4000 users, around 2000 proposals annually of which about 900 are accepted, leading to circa 1550 experimental sessions, and with 30% of the research involving industrial developments.

Efforts are being made to open up the ESRF for further industrial and commercial use, by way of the following four approaches: the first is client services/feasibility access, which allows customers to try out the facility for a simple quote and then retain results and IP. The second line involves public beam time, of which around 30% is linked to industry or industry/university activities, under which results must be published. The third approach occurs by way of collaboration and grants, such as industry sponsored staff (post-doc, PhD, trainees), and grants can be national, European and other private and public sources of funding. One example is a H2020 project amongst 22 light sources named CALIPSOplus, with 10% of the 10m euro budget assigned for industry activities, namely inter-light best practice, creation of a common NDA, and networking with regional innovation systems. The fourth and final route involves technology transfer, licensing and the direct manufacture-and-sale of instrumentation.

Challenges ahead relating to the quest of increasing the accessibility of ESRF for industry as a user include 1, industry awareness and training ("where to turn to"), inter sectorial mobility and confidence building, 2, appropriate experimental environments – real samples, real conditions – and full-service provision with easy and rapid access, 3, SMEs, research infrastructure scientist motivation – the "publication gap", and 4, mapping the "grey zone" of academia-industry collaborations.

Matthias Keckl provided an overview of the Fraunhofer ecosystem and new challenges, with particular focus on SME collaboration. The different activities and geographical placement of Fraunhofer Society institutes was outlined, and novel approaches were also accounted for.

One new project at Fraunhofer Venture is named 'Ventureconnect', which links to the three pillars: 1, business ideation at the Fraunhofer locations all over Germany, 2, business design including the 12-week accelerator FDays®, and 3, the subsequent technology transfer channels, i.e., joint venture, spin-offs, industry projects, and licensing. These three pillars are combined with 1, the screening of Fraunhofer institutes and SMEs to identify relevant research areas and needs, 2, the matching of Fraunhofer with industrial companies and the development of viable solutions and teams, 3, accelerated implementation of the solution and technology transfer, and 4, go-to-market, which includes the definition of suitable commercialisation strategies and business management.

Challenges pertaining to this work embrace customer understanding, the 'not invented here' predicament, bureaucracy and red tape, achieving sufficient focus on KPI, difficulties in spotting trends, and understanding the potential of new technologies.

Asier Rufino delivered an overview of Tecnalia Ventures and the organisation's venture building activities, with statistics on staff, number of patent applications annually and number of patents in the portfolio, start-ups, revenues, and EU funding. The focus is on 'deep tech' start-ups. There was presentation of the technology transfer platform that has been integrated by leading RTOs to support project development, involving the identification of opportunities, business case development, validation through pilot actions, and product launch.

The Basque Electrical Laboratories Alliance was put forth as a test and demonstration good practise case. The alliance combines facilities including power labs, high voltage, and additional infrastructure including temperature-rise tests, large climatic chambers, materials and mechanical labs, as well a resonant unit for online testing.

Opportunities comprise venture building in that RTOs/Universities could be seen as a destination of choice for entrepreneurs/start-ups/SMEs, the strengthening of the innovation ecosystem, and the speeding up of minimum viable product development/market reach. Challenges, on the other hand, include the business model development, implementing right incentives for researchers/research organisations to continuously provide these services. Also communication with and preparation of researchers for SME collaboration is a challenging aspect, as is the social dimension of matchmaking and infrastructure sharing.

Fabio Taucer described European Commission Joint Research Centre activities in relation to the opening up of research infrastructure to external users. The JRC has 41 research infrastructures with the potential of access for external users. At the end of June 2017 the JRC launched its first call for proposals for access to JRC infrastructures to external users, with two separate modes of access. One mode is relevance driven, and embraces a peer review selection process targeting academia, public research and other institutions, as well as SMEs. Users pay only additional costs and in-kind contributions are possible. Nuclear RIs may grant cost free access. The second mode is market driven and aimed at offering access to private enterprise, with payment of full access costs by the users. A framework for access has been developed along with intellectual property provisions and is applicable for both modes. Selected users are granted access upon signing an agreement with the JRC determining rights and obligations. There is for the moment no financial support for additional costs.

The JRC is interested in sharing good practises with the objective of increasing accessibility for users, with two main issues being in focus, the first being the securing of a fair, clear, and transparent procedure for granting access to external users, which includes aspects such as health & safety, rules for safety, IPR, data protection, confidentiality, liability, and financial aspects. The second relates to networking, i.e., the development and promotion of clustered offers across RIs, as well as common outreach activities.

Increasing involvement of and access for SMEs is an important objective for the JRC. One manner of doing this is by providing special access conditions for SMEs, similar to those of public institutions, thus differentiating them from larger corporations. This involves reduced cost of access, assistance for the establishing of partnerships with academia, open access for IPRs and delay of embargo period for commercial exploitation, and support for additional costs. Another important objective consists of training and capacity building.

Bernard Denis started out by giving an overview of the CERN accelerator complex, as well as examples of other research infrastructures, including irradiation, cryogenic and isotope production facilities. The CERN Research Board regulates the use by collaborations of institutes of the accelerator complex through the CERN Experimental Programme. The experiments are included in the programme and scheduled based on recommendations received from the various CERN Experimental Committees. Governing documents include the 1, MoU, which lists collaborating institutes, funding agencies, staff involved, responsibilities, and obligations relating to construction, installation and operation of the experiment, 2, the general conditions with safety and resources coordination, insurance, personnel aspects, and description of CERN service and equipment, and 3, applicable rules for involved personnel. The intellectual property governance includes free, irrevocable and non-exclusive license for the execution of the experiment.

The use of research infrastructure for institutes within the framework of a scientific collaboration with CERN follows a similar approach to experiments, i.e., the general conditions are the same, while use by industry or institutes in the framework of Knowledge Transfer contracts implies rules similar to those regulating the work of subcontractors active on CERN sites. When no IP is generated the work is deemed to be a service contract, whereas the generation of IP takes place under a research contract or collaborative R&D project. IP belongs to the partner that created it, and with the possibility of joint ownership.

Session conclusions

Research infrastructures promote excellence in highly demanding fields and enable vastly important discoveries in science and technology. They fulfil their mission by offering access to extensive data and exceptional resources not available elsewhere, and by doing so they support competitive research at the international level, yielding research outputs to be exploited by industry or for social purposes. RIs could be attractive for venture building by way of being a destination of choice for entrepreneurs, start-ups, and SMEs. Customer-RI interaction has the potential of speeding up of minimum viable product development, thus achieving faster market reach.

Challenges relating to such increased accessibility of RIs include:

- industry awareness and training – customer understanding
- inter sectorial mobility and confidence building
- appropriate experimental environments – real samples, real conditions – and full-service provision with easy and rapid access
- increasing SMEs involvement
- overcoming the 'not invented here' predicament of potential customers
- minimising bureaucracy and cutting red tape

- difficulties in spotting trends, and
- understanding the potential of new technologies.

The objective of increasing accessibility of RIs for users would include focusing on two main issues, the first being the securing of a fair, clear, and transparent procedure for granting access to external users, which includes aspects such as health & safety, rules for safety, IPR, data protection, confidentiality, liability, and financial aspects. The second relates to the networking dimension, i.e., the development and promotion of clustered offers across RIs, as well as common outreach activities.

Increased involvement of SMEs could be incentivised by providing special access conditions for such entities, similar to those of public institutions, thus differentiating them from larger corporations. This involves reduced cost of access, assistance for the establishing of partnerships with academia, open access for IPRs and delay of embargo period for commercial exploitation, and support for additional costs.

Value at the European level could be added by taking into account the need for critical mass, that RIs position themselves as parts of supply chain, and that common standards and policies are developed and conveyed to the EU level. One way of reinforcing such development would be to design and run a pilot action for increased SME/startup access, which would include the sharing and conveying of good practices across the EU. Although there are several such initiatives at national and regional levels (e.g., innovation vouchers), they lack transnational and EU-level character and strategy.

Session 3: Technology Transfer and Internationalisation

Abstract

This session covers various aspects relating to the internationalisation of research as well as technology transfer related activities. The aim of the session was to invite experts from various backgrounds, including policy makers, research organisations, academia and international players in the arena of IPR to share their view on the feasibility for an international approach to technology transfer.

Moderator

- Peter MOORES, Managing Consultant, Oxentia, Oxford, UK

Speakers

- Robert BURMANJER, DG International Cooperation and Development, European Commission
- Georges HAOUR, Professor of Technology and Innovation Management at IMD, Technology Transfer and Innovation in China
- Juan SORIA, CONICET, National Scientific and Technical Research Council of Argentina
- Olga SPASIC, Senior Program Officer, Innovation Division, WIPO
- Lisa COWEY, IPR and technology transfer expert and Senior Advisor for Western Balkans
- Jean-Charles GUIBERT, Senior Advisor for Innovation, CEA

Rapporteur and session report writer

- Elena ANDONOVA

Presentations by the panellists

The focus of this session was on internationalisation of TT activities, chaired by Peter Moores of Oxentia. The panel discussion was introduced by **Blagoy Stamenov**, Policy Analyst, Knowledge for Finance, Innovation & Growth Unit, Joint Research Centre, European Commission, which reported on the result of a joint study by JRC and EARTO. The study focused on Internationalisation of Public Research Organisations (PROs) and discussed the drivers and motivation of PROs to engage in internationalisation. The main outcome of the study concurred with the idea that basic science oriented PROs engage in international scientific cooperation for reputational and publications-oriented experience. Applied oriented PROs engage in international activities for social and economic reasons, which might include finding new funding sources, clients, and consumer base.

Lorenz Kaiser and **Mathias Rauch** described the FhG activities in internationalisation. Internationalisation, in their view, presented a big opportunity but also a significant challenge with 2bn of income and 69 institutes under the FhG umbrella. In their view, internationalisation means meeting strategic imperatives, or goals to add value not only for the institute but also for Germany. Researchers cooperate anyways (on academics level), however the decision of FhG to establish presence in another country would mean that the country is ready to accept the FhG model and also contribute to funding. Each engagement is covered by a mother institute and 5% of their budget can be invested in other countries by their rules. Quality management and compliance are taken seriously. US, Chile, Sweden, Austria, Portugal and the UK are just few examples of the countries where they established presence.

Olga Spasic gave an overview of the WIPO activities. She explained the role of WIPO in supporting internationalisation. She related these efforts to the mandate of the

organisation in supporting SMEs, because their stakeholders (the governments) are currently preoccupied with the topic of SMEs development and growth. Furthermore, WIPO is also mandated to develop IP laws, internationally. Their registration systems, such as the PCT enable internationalisation efforts in technology transfer, but most recently WIPO also started performing economic studies and analysis to provide support beyond actual IP administration. For examples, the Global Innovation Index they devised is an important tool that can support policy development. Ms Olga Spasic also presented an approach to develop IP-TT capacity building in countries in need.

Jean-Charles GUIBERT described the institute's activities and stipulated that internationalisation efforts differ across the various activities. They perform research initiatives for biotech, nuclear research, electronics and in his view internationalisation is more difficult for some areas and less so for others. In the US, Japan and China, however, CEA have dedicated business/ project development persons. In his view, the main goal of internationalisation is to gain customers. If they were to set up various offices internationally, that would be very costly. For that reason they had to develop a policy based around the 'cost of acquiring a customer'. The minimum cost can vary from 50k to 1m euros and they need to perform cost benefit analysis to make a judgement where to become active and in what format (set up a physical office or not). In his opinion, joint venture structures in the technology transfer space could be the way forward.

Lisa Cowey talked about the transition of centrally planned economies in the region of the Western Balkans. She stressed on how the current systems there reflect on the past and how these states have experienced failed privatisations, disappearing Research Organisations and how universities that take on the research role have very little funds. Another observation she mentioned was that the technology produced by their universities cannot be absorbed locally (SMEs) but are lacking the high quality necessary to go abroad. There are further issues in the region such as brain drain (good local talent exists), huge political tensions etc. and she believes that all of these should be taken into consideration when developing instruments and tools to support development in the region. She gave the case of UK and Ireland as an example where scientific contributions led to sustained peace between those countries and in her view cooperation on both research and technology transfer fronts is necessary, if not vital in the Western Balkans.

Juan Soria described the activities of their organisation and explained how their services are 'one stop shop' for scientists and companies. The services include IP support, start-up creation and contract research and are horizontally integrated. They cover over 10,000 full time researchers within 150 research institutes, and mentioned some international cooperation in the research and developments and technology transfer spaces, including collaborations with Max Plank society, Stanford, Oxford among others. He explained that 90% of the CONICET institutes have double dependency, which means that IP is shared between CONICET and the institute, which in his view can create issues but have not been a significant problem to date. In the last 10 years CONICET has tripled the size with the objective to create knowledge and transfer it to society, to help the country develop and increase wellbeing for which internationalisation of their research and commercialisation of it would help. In his words, the purpose of the organisation is to expand the science abroad, but also help the country develop internally as well because often local companies do not have capacity to take IP to market.

Georges Hour introduced to the audience his latest book, 'Science to Business'. He made two important remarks, one stipulates that going from science to business is a very complicated process and for this to work the quality of the people involved is crucial. The

second remark focused on the fact that most TTOs are very national, only up to 10% of their business is international. So the question would be whether it makes sense to go international? The elephant in the room here is China. He thinks that for European scientists and businesses it would be crucial to be ready to do both ways with China.

Robert Burmanjer was the final speaker of the panel and he outlined the approach of DG DEVCO for collaboration with ACP (Africa, Caribbean and Pacific) countries in research and innovation. First he introduced himself and described some current relations with international players, including ACP and North and South America. He stressed on the importance of development cooperation. In his view, development of capacity is their goal, and they fund abroad activities on cultural policy, primary education, some small amount of money goes into knowledge transfer, since this is still perceived as a niche area. The European development fund is the main tool. But he also mentioned that they are putting together the programme for the next programming period and they would like to introduce and plan funding on regional basis, which would be a change from the past and also introduce research programmes for development cooperation. He also mentioned the Policy Support Facility which could substantiate innovation, including TT capacity development, focusing on a more 'bottom up approach'.

These interventions were followed up by Q&A session.

The first question from the audience was related to China, as a potential partner or market for technology transfer. Georges described the Chinese economy as lively, dynamic, agile and fast and in his opinion there are lessons to be learned in Europe in that respect. Lorenz shared some figures on China and demonstrated how the number of patents has grown significantly in the past decade and how they developed policy on IP which did not exist before. In his view a separate patent strategy for China should be developed. Jean said that CEA look for equilibrium in international vs regional economic impact. In the space of nuclear and electronics they took decision not to license IP directly to China. In Olga's view China are changing their strategy and now they are not only developing patents but high quality patents according to her observations.

Another question that came from the audience concerned the topic of choosing third countries for internationalisation. In Olga's view crucial for such collaborations are the enthusiasm of the technology transfer offices and respective counterparts. In her view the availability of information, the cultural prejudices and difference in language are barriers that need to be considered. In Juan's view the researchers at CONICET are already international and technology transfer could follow their path. In the biotech, especially agriculture-related topics, there are many market opportunities for Argentina but not only to license technologies and IP but rather build strong connection to collaborate, connect and develop jointly.

The last question concerned the challenges that organisations might face when they go abroad/ international.

Here Olga explained that getting the right people on board is crucial so the biggest constrain in her view could be the human resource factor. Furthermore, Olga mentioned a new law on IP regulation (Institutional policies) adopted in Poland, which in her view could remove some of the barriers mentioned, and these are the types of examples to follow, particularly in less developed regions.

Juan on the other hand explained that CONICET has a policy that obliges researchers to disclose inventions, but it does not necessarily always work. He thinks this could be a challenge, as much as funding is a challenge. Another problem he sees is that CONICET

academics are mostly peer reviewed oriented, which is generally a problem for tech transfer activities as publications- oriented culture in Argentina is very strong. In his view incentives are needed for technology transfer activities as well as internationalisation activities. CONICET in his opinion, have issues hiring local talent, so what they are investing in is in developing capacities. He mentioned that tech transfer managers have an extra job in that sense in teaching companies how to commercialise. Companies in Argentina according to him are not used in collaborations with academia on IP issues.

Robert mentioned that for DEVCO the major challenge would be to work with countries that have national commitment on research and innovation and have created sustainable TTOs therefore priority should be given to those countries that are focused to commercially exploit technologies but also have public policy around the issue of technology transfer.

Peter Moores contributed to the panel by mentioning the Newton Fund programme and how the UK is strengthening cooperation activities by investing in research collaborations as well as capacity building activities.

Giancarlo Caratti also made a contribution explaining how at the DG JRC we are trying to focus on regional and country development via smart specialisation strategies and how technology transfer can be seen as the operational element of such strategies. He also noted that the talent remains a big challenge in this respect and reiterated the importance of capacity creation.

The last question of the panel raised the issue of which is the main driver for internationalisation- sourcing technologies from 3rd countries, selling to 3rd countries or for joint collaboration in technology creation and exploitation.

Jean here said that it depends on the country and on the sector, while in Georges' view the example of Japan is an interesting one, where they have opened an extensive programme to engage in collaborations on R&D in Africa, as he pointed out as a diplomatic objective. In Robert's view it would also depend on the local ecosystem and especially when the EU is formulating policies on EU or country levels. Lisa concluded by expressing opinion that the basic criteria for all these activities lies in international patenting, where she thinks governments have an important role to play, which is to make patenting funds available to research organisations.

Session conclusions

Increased reputation, enhanced access to research and commercialisations funds, increased potential for co-creation and co-development were highlighted as the main drivers to the internationalisation of technology transfer activities. While efforts in the research space have already led to increased international cooperation on academic level, it is clear that there are certain benefits for the internationalisation of technology transfer activities as well. The format of engagements can differ but joint development, joint ventures, in and out licensing have all been mentioned as possible routes which would vary depending on the targeted countries. Governments, it has been highlighted (national as well as the EU) play a major role in supporting the internationalisation of TT process.

ANNEX 1

PROGRAMME

22 June 2017

Co-chairs: **Giancarlo CARATTI**, Head of Unit IP and Technology Transfer, Joint Research Centre, European Commission

Matt PERKINS, CEO, Oxford University Innovation

08.30 – 09.00	Registration & Welcome Coffee
09.00 – 09.30	Welcome Addresses
09.00 – 09.05	Giovanni DE SANTI , Director for Competences, Joint Research Centre, European Commission
09.05 – 09.15	Matt PERKINS , CEO, Oxford University Innovation
09.15 – 09.30	Will HUTTON , Chair of the Steering Group of the Big Innovation Centre
09.30 – 11.00	Session 1: Financing options for Technology Transfer projects, trends and opportunities
	<p>Moderator: Elena ANDONOVA, Technology Transfer Officer, Joint Research Centre, European Commission</p> <p>In this interactive panel session there will be opportunities to hear about existing funding schemes for technology transfer projects and the perspectives of early stage investment funds, such as Proof of Concept funds and venture capital when raising cash for early stage companies. The session will also touch upon the Commission's initiatives related to bridging the 'valley of death' and relevant technical assistance.</p>
09.30 – 09.45	<p>Technology Transfer funding: everything you need to know about fundraising but the venture capitalists won't tell you</p> <p>Robert C. BUSH, Partner, Superfounders</p>
09.45 – 11.00	<p>Round table: Opportunities and challenges, barriers and synergies</p> <p>Adam WORKMAN, Head of New Venture Support & Funding , Oxford University Innovations Andrea ALUNNI, Chairman of Links Vincent RYCKAERT, IP Business and Intelligence Director, IMEC Patrick MCCUTCHEON, Senior Policy Officer, DG Research & Innovation, European Commission Bart SWAELENS, Venture Development Manager, VITO Fabio MONDINI DE FOCATIIS, Senior Advisor for Equity Investments, European Investment Fund Luigi AMATI, CEO, META group</p>
11.00 – 11.30	Coffee Break
11.30 – 13.00	Session 2: Opening Up Research Infrastructures & Co-Creation with External Users
	<p>Moderator: Mattias DINNETZ, Technology Transfer Officer, Joint Research Centre, European Commission</p> <p>This session covers various aspects relating to the opening up of RIs for external users, e.g. companies, universities and publicly funded institutes, for the development of innovative products, services and processes. Issues to be discussed involve opportunities, such as access to international excellence, and challenges such as funding, intellectual property, and cultural differences of the university-industry interface.</p>
11.30 – 11.45	Laura ESPOSITO , Research infrastructure, DG Research & Innovation, European Commission
11.45 – 12.00	Olof SANDBERG , Chief Strategist, The Swedish Research Institute (RISE)
12.00 – 13.00	<p>Round table: Opportunities and challenges, barriers and synergies</p> <p>Edward MITCHELL, Head of Business Development, European Synchrotron (ESRF)</p>

	<p>Matthias KECKL, Project manager, Fraunhofer-Gesellschaft e.V., Fraunhofer Venture Lab Asier RUFINO, Director General, Tecnalia Ventures Elizabeth SHOTTON, Head of Industrial Liaison, Diamond Light Source Fabio TAUCER, Policy Officer, Joint Research Centre, European Commission Bernard DENIS, Knowledge transfer senior adviser, CERN</p>
13.00 – 14.00	Networking Lunch
14.00 – 14.30	Technology Transfer in Creative Industries: Case studies
	<p>Knowledge transfer and the case of commercialising projects stemming from Humanities, Social Sciences and creative industries Britta WYATT, Senior Consultant, Oxford University Innovation</p>
14.30 – 15.00	Coffee Break
15.00 – 16.10	News from TTO CIRCLE members
15.00 – 15.20	<p>EARTO paper on "How to Exploit the Untapped Potential of RTOs' Deep-Tech Start-Ups in Europe" Asier RUFINO, Director General, Tecnalia Ventures</p>
15.20 – 15.40	<p>Benchmark regarding entrepreneurship at different RTO's Hans BOUMANS, Technology Transfer Manager, TNO</p>
15.40 – 15.50	<p>New TTO CIRCLE Member Presentation Bart SWAELENS, Venture Development Manager, VITO</p>
15.50 – 16.00	<p>New TTO CIRCLE Member Presentation Špela STRES, Head of Innovation and Technology Transfer Center, Jozef Stefan Institute</p>
16.00 – 16.10	<p>New TTO CIRCLE Member Presentation Ling XU, Innovations Programme Manager, STFC - Science and Technology Facilities Council</p>
16.10 – 17.00	Other relevant initiatives
16.15 – 16.30	<p>Fabio MONDINI DE FOCATIIS, Senior Advisor for Equity Investments, European Investment Fund</p>
16.30 – 16.45	<p>Krystian Gurba, Deputy Director, Centre for Technology Transfer CITTRU, Polish Network of Academic Technology Transfer Centres (PACTT)</p>
16.45 – 17.00	Wrap-up and Closing first day of the meeting
20.00 – 22.00	Reception and Dinner

23 June 2017, Oxford

Chairing: **Giancarlo CARATTI**, Head of Unit IP and Technology Transfer, Joint Research Centre, European Commission

09.00 – 09.30	Registration & Welcome Coffee
09.30 – 11.00	Internationalisation and Technology Transfer
	Moderator: Pete MOORES , Managing Consultant, Oxford University Innovation
09.30 – 09.45	The Internationalisation of Research and Technology Organisations Blagoy STAMENOV , Policy Analyst, Knowledge for Finance, Innovation & Growth, Joint Research Centre, European Commission
09.45 – 10.00	Lorenz KAISER and Mathias RAUCH , Fraunhofer-Gesellschaft
10.00 – 11.00	Round table: Opportunities and challenges, barriers and synergies Robert BURMANJER , DG International Cooperation and Development, European Commission Georges HAOUR , Professor of Technology and Innovation Management at IMD, Technology Transfer and Innovation in China Juan SORIA, CONICET , National Scientific and Technical Research Council of Argentina Olga SPASIC , Senior Program Officer, Innovation Division, WIPO Lisa COWEY , IPR and Technology Transfer Expert and Senior Advisor for Western Balkans Jean-Charles GUIBERT , Senior Advisor for Innovation, CEA
11.00 – 11.30	Coffee Break
11.30 – 12.30	Discussion of progress and future activities of TTO CIRCLE – only for members
11.30 – 11.40	TTO circle : “State of the art” and future actions Alessandro FAZIO , Technology Transfer Officer, Joint Research Centre, European Commission
11.40 – 12.20	Round Table: TTO CIRCLE's future objectives and actions Moderator: Giancarlo CARATTI , Head of Unit IP and Technology Transfer, Joint Research Centre, European Commission Bernard DENIS , Knowledge Transfer Senior Adviser, CERN Asier RUFINO , Director General, Tecnalia Ventures Jean Charles GUIBERT , Senior Advisor for Innovation, CEA Vincent RYCKAERT , IP Business and Intelligence Director, IMEC Lorenz KAISER , Fraunhofer-Gesellschaft Hans BOUMANS , Technology Transfer Manager, TNO Lluc Diaz , Technology Transfer Officer, ESA
12.20 – 12.30	Wrap-Up & Closing
	Giancarlo CARATTI , Head of Unit IP and Technology Transfer, Joint Research Centre, European Commission
12.30 – 14.00	Closing Lunch

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