KNOWLEDGE SHARING ROUNDTABLE REPORT

Name of the Event: Supporting Companies to Go International for Research and Innovation Collaboration
Date: Tuesday, May 16, 2017
Location: Oxon Hill, MD
Venue: Gaylord National Resort & Convention Center

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1. CONTEXT

The roundtable “Supporting Companies to go International for Research and Innovation Collaboration,” was held at the Gaylord National Resort & Convention Center in Oxon Hill, Maryland, on Tuesday, May 16, 2017, during the TechConnect World Innovation Conference and Expo under the auspices of the BILAT USA 4.0 project, which aims to support science, technology, and innovation (STI) partnerships between the European Union (EU) and the United States of America (US). The knowledge-sharing round table, along with a cooperation seminar, was organised to present experiences of existing EU-US cluster collaborations and to exchange good practices regarding industry internationalisation capacities development. The roundtable was held as part of the delegation visit of 19 European cluster

organisations from nine EU countries to the US organised by BILAT USA 4.0 and the European Cluster Collaboration Platform (ECCP).

The roundtable was developed with the specific objective of sharing good practices for establishing and sustaining international research and innovation collaborations. It included experts from both the EU and US. The discussion is summarised in this report, followed by the agenda and speaker bios.

2. REPORT ON THE ROUNDTABLE

The roundtable discussions on "Supporting Companies to Go International for Research and Innovation Collaboration" (90 minutes) centred on the following questions:

- What role do European cluster organisations play in pre-competitive research and development (R&D)? What opportunities exist for US participation?
- How do established research institutions achieve open innovation given existing barriers to collaboration?
- What STEM (science, technology, engineering, and mathematics) workforce practices are done well in the EU, and what could be done better in the US?
- How can businesses and business clusters organise needs-driven R&D (research that targets the needs of business) from the outset?
- What special challenges do small- and medium-sized enterprises (SMEs) face when collaborating with big business on R&D and innovation?
- When it comes to collaboration between academic and other research organisations, what special challenges are created by internationalisation?
- What are IP best practices for making collaborations easier, quicker, and more productive?

The discussion also addressed the role of public funding in applied research and identified examples of successful collaborations between academic and other research organisations.

The session was moderated by Dr Roland Stephen, SRI International, USA, and brought together six panellists with expertise in international research and innovation collaboration:

- Christiane Egger, Deputy Manager, Cleantech-Cluster Energy, Austria
- David M. Hart, Director, Center for Science and Technology Policy at George Mason University; and Nonresident Senior Fellow, Metropolitan Policy Program at the Brookings Institution, USA
- Carlo Kraskovic, Project Manager, Mare TC FVG, Italy
- Scott N. Paul, President, Alliance for American Manufacturing (AAM), USA
- Andrew Steigerwald, Senior Advisor, Advanced Manufacturing Office, U.S. Department of Energy, USA
- Stefan Uhlig, Senior Project Manager, Cool Silicon e.V., Germany

The audience was invited to comment on discussion points throughout the roundtable.

2.1. SUPPORTING COMPANIES TO GO INTERNATIONAL FOR RESEARCH AND INNOVATION COLLABORATION

The roundtable opened with a brief presentation from Svetlana Klessova, inno TSD, France. She announced that BILAT USA 4.0 partner SPI has produced a report on business internationalisation for BILAT USA that will be available to the public soon. The report identifies intellectual property rights and time zone differences as two of the key physical impediments to internationalisation. The report also identifies EU programmes aimed at helping companies overcome these barriers. Factors key to successful company internationalisation include engaging in trade missions and joining cluster networks or business organisations. The roundtable is intended to accompany the report and help identify how companies can internationalise better and more quickly.

2.2. PRE-COMPETITIVE RESEARCH IN THE EU AND US

The panel discussion first addressed the organisation of pre-competitive research in the EU and US, and how EU companies envision engaging the US in this activity.

Stefan Uhlig said pre-competitive research in the EU is clustered around universities. Both spin-offs and larger companies often co-locate with universities. Cluster organisations enable collaboration among these entities. Through cluster organisations, companies work together and share the market while universities conduct the pre-competitive research. EU clusters are looking for opportunities to participate in US research activities, even if their involvement is initially small.

Scott Paul emphasised that most firms cannot solve pre-competitive research problems on their own. However, the US has practical limitations to collaborative research among competitors that do not exist in the EU. In particular, manufacturing policy differs between the US and the EU. The US is still trying to find the best way to use public-private partnerships for clustering and collaboration outside of defence research. Under the Obama administration, policy makers established the Manufacturing USA programme, which supports the development of a series of research centres led by universities that join companies, universities, and US federal agencies in pre-competitive research. These research centres bring together both domestic and international businesses and are sponsored by the Department of Defense, Department of Energy, and Department of Commerce. These research centres are similar to the Fraunhofer Institutes in Europe. The centres aim to identify and address gaps and challenges within an industry and help position small- and medium-sized enterprises (SMEs) to be globally competitive in the future.

Christiane Egger provided insight into the functions of EU cluster organisations. These organisations create deep ties among their members through joint marketing and research. Clusters help members move their industry forward using both push and pull activities. Clusters encourage members to consider what society will need in five, ten, or even fifteen years from now. They help members focus on where the needs are and estimate what the future will bring for their industry. In Austria, there is a state agency to promote the sustainable energy market and advise consumers. Her cluster is currently focused on the digitisation of energy, smart grid, smart metering, and smart energy. The sustainable energy industry has just started struggling with the digital revolution in technologies and models.

2.3. ACTIVITIES OF THE US NATIONAL LABS

The discussion then moved to the activities of the US's 17 national laboratories and their efforts to more effectively address the needs of the US.

Andrew Steigerwald said the national laboratories face increasing expectations to help the public. The basic versus applied model of research doesn't focus on the process of moving technologies towards commercialisation. The shift towards pre-competitive research necessitates organisations consider how they can contribute to the development of things beneficial to society. The research entities are now expected to play a role in such pre-competitive research. Whereas universities have not traditionally promoted collaborative research, federal policy makers are finding that scientists in the national laboratories are enthusiastic when they are given the opportunity to collaborate with external partners.

The national laboratories use many Cooperative Research and Development Agreements (CRADAs) for collaboration with industry. Oak Ridge National Laboratory in Tennessee employs CRADAs exclusively. The lab hosts thousands of businesses, entrepreneurs, and independent researchers every year. The federal government encourages companies that wish to work with the national laboratories to relocate nearby in order to leverage the laboratories' expertise. Working with international companies is more difficult for the national laboratories, but it is not impossible. Opening branch offices near the national laboratories is one way international companies can make cooperation much easier.

In response to an audience question about the ability of the national laboratories to travel to conferences and trade shows in order to demonstrate their technology to larger audiences, Steigerwald said budgets

for travel are likely to remain low, but concern over this issue has been voiced by many parties. In response to another question about the Department of Energy's (DOE) use of intermediary partners, Steigerwald indicated that the DOE work with a handful of non-profit organisations, but that DOE focuses on technology transfer for which it does not need third-party participation.

2.4. INCORPORATING PUBLIC FUNDS INTO PRIVATE RESEARCH

Next, the discussion turned towards the challenges of working with public funds and how they can be incorporated with private research funding.

Carlo Kraskovic indicated that finding the right combination of public funding and private partnerships to support clusters is particularly difficult in Italy. Cluster organisations help big industry, SMEs, and researchers work together to meet their needs. Successful projects require good leadership, mutual understanding of needs, and a positive industry environment. Clusters make sure projects meet all compliance issues and assess the economic implications of the projects for SMEs, in addition to providing general guidance and monitoring for research projects.

David Hart described efforts within the Manufacturing USA programme to reshape how public funds are used. Agreements on the use of public funds must fall within the mission of the agency. Companies need incentives for investing in university or national laboratories. Some scientists are eager to join collaborations, while others require more persuasion. Programmes like Manufacturing USA require ongoing public support like the Fraunhofer institutes do in Europe. The US will not commit to supporting permanent research centres under the Manufacturing USA programme unless the centres demonstrate their worth.

2.5. SCIENTIFIC AND TECHNICAL WORKFORCES OF THE EU AND THE US

This conversation was followed by a discussion of the scientific and technical workforces in the EU and the US. So far, the EU has devoted more spending towards developing a workforce to support advanced manufacturing and the production of new materials than the US.

Scott Paul said there is bipartisan agreement that something needs to be done about the scientific and technical workforce in the US. Historically, US internship programmes have been geared towards construction and not an industrial setting, but industrial internships are coming back into fashion. Siemens is an exemplar for these efforts in the US. The Siemens gas turbine manufacturing facility in Charlotte, North Carolina, has generated a large return on investment and offers a good case for supporting internship programmes in the US. The apprenticeship programme in North Carolina took off, and now policy makers and companies are considering how the programme can be scaled.

In Europe apprenticeships are built into secondary school, whereas the average age of apprenticeship in the US is 29 years old. This difference in age between the US and EU is something US policy makers are grappling with now. Since US education is decentralised, other incentives are needed to establish and maintain such apprenticeship programmes. Congress has called upon manufacturers to set up programmes, especially as the world enters industry 4.0 and a whole new set of skills will be needed.

Stefan Uhlig said that European cluster members, especially small companies, also struggle to find the right staff. Cluster organisations have a difficult time helping their members with staffing issues. Clusters support cooperative programmes between research institutes and companies through which students have the opportunity to gain experience by spending time in companies and other networks. Companies benefit from access to a new workforce and the opportunity to show students the benefits of working for their organisations. This is especially true for mid-sized companies whose employees are nearing retirement and will soon need to recruit and train a new workforce with little help from the government.

Christiane Egger commented on the workforce dynamic between large organisations and startup companies. Large companies often offer greater compensation, recruiting all the talent in an area and crowding out SMEs from the labour marketplace. Cluster organisations often hear complaints about

finding enough qualified employees. The large manufacturing companies pick up all the talent who are willing to be apprentices. This group of people is primarily composed of immigrants. The EU and companies with these programmes are still determining how many apprenticeships immigrants should be allowed to hold. Large companies advertise their sectors by visiting schools, and benefit from this contact. However, family-owned companies offer a better value-proposition for employees. Such firms provide lower salaries, but also greater job security. If cluster organisations are to continue supporting smaller companies, they will need to support training programmes that teach people to understand new equipment.

2.6. THE ROLE OF INNOVATION IN FIRMS

The discussion moved to the role of innovation in large and small firms.

Carlo Kraskovic emphasised the importance of finding the right tools to increase open innovation and encourage new players to join. Open innovation should attract partners from both within a cluster's territory and from other countries, and attract actors that offer something new to the industry. Clusters use innovation challenges to promote this practice. The cluster organisation will ascertain the medium- to long-term technological needs of large companies. After determining company priorities, the cluster organisation will put out a call to all stakeholders, soliciting ideas or solutions to match the technological needs. This helps large companies save time in exploring the question and identifying possible answers, and helps people focus on finding a real solution.

Delegation member Sam Goodall said that his cluster organisation, Cambridge Cleantech, runs a similar open innovation programme in conjunction with Belgium, The Netherlands, Sweden, and Denmark. The programme aims to facilitate cooperation at the EU-US-UK level, but faces difficulties related to intellectual property rights. US companies are very concerned about fines for working with technologies that require licensing or export controls. American companies actively avoid such partnerships because they are unsure what they can and cannot discuss or work on.

David Hart stated that there are American companies seeking technologies, but these companies are hesitant to share technologies with foreign companies. The EU, however, is more collaboratively oriented. The Fraunhofer institutes make the EU leaders in collaborative work. The CRADAs used by Department of Defense labs have made it easier to include international partners. Open innovation and connecting large companies to supply chains requires building trust. He has worked on open innovation events with a South Korean electronics company that demonstrated that intellectual property rights can be protected. American universities are viewed as honest brokers regarding intellectual property and can help to establish partnerships.

2.7. POLICIES SUPPORTING COLLABORATION

Regarding the development of polices that support collaboration, Carlo Kraskovic said Italy and the EU have been helpful. His cluster's focal point is the approximately 20 SMEs looking to explore the possibility for bilateral cooperation on maritime technologies. Without the policies set up by Italy and the EU, such cooperative activities would have a difficult time finding financing.

Christiane Egger described the success of her cluster in supporting US expansion. The cluster's first mission to the US in 2008 resulted in only two companies establishing a US presence. Now her cluster has 30 companies with a US presence, most of which are SMEs. Support for this expansion came from state and EU programmes for internationalisation. The cluster's programme is small and has a limited budget, but works with energy technology clusters in both Spain and Finland.

The state programme helps adapt the cluster internationalisation programme to meet US regulations and rules, which are expensive and difficult for companies to adjust to. Small companies must make large investments for future sales in order to enter the US market. Technology transfer can bring down regulatory barriers, but, overall, exporting to the US is very expensive. For example, one company that has developed clean boilers needs to meet American Society of Mechanical Engineers standards for the

steel in its boilers. The test costs $100,000 for each boiler type. The company must also meet state and local rules. While some states accept EU standards, insurance companies will not, so home insurance won't cover the clean boilers. Mutual recognition of standards is exceptionally difficult, especially when crossing the Atlantic. Lowering these barriers would save everyone money.

2.8. WRAP-UP

Audience members indicated that many EU companies are hesitant to move to the US even if they have attracted partners, because they are afraid larger players will force them out of the market or buy them out.

An audience member reminded everyone that the European Institute of Innovation & Technology participates in the Horizon 2020 programme and has a network of large industry partners and clusters. This organisation can help with collaboration and expansion. The Institute has helped high potential clusters raise money and might be able to help companies enter US markets.

Although the business environment in the US is as fragmented as it is in Europe, business intelligence and scouting can help companies overcome barriers to expanding to the US.

Roland Stephen closed the roundtable by recommending cluster organisations look into Select USA, as well as state offices of international or economic development. He concluded by thanking all the panellists for their contributions.

3. EVENT DOCUMENTATION

3.1. AGENDA

11.00 PRESENTATION OF THE PANELISTS, *Jessica Avery, SRI*

11.05 INTRODUCTORY PRESENTATION ON "SUPPORTING COMPANIES TO GO INTERNATIONAL FOR RESEARCH AND INNOVATION COLLABORATION", *Svetlana Klessova, inno TSD, BILAT USA 4.0*

11.15 KNOWLEDGE SHARING ROUND TABLE. PANELISTS FROM THE EU AND THE US:

- *Christiane Egger, Deputy Manager, Cleantech-Cluster Energy, Austria*
- *David M. Hart, Director, Center for Science and Technology Policy at George Mason University; and Nonresident Senior Fellow, Metropolitan Policy Program at the Brookings Institution, USA*
- *Carlo Kraskovic, Project Manager, Mare TC FVG, Italy*
- *Scott N. Paul, President, Alliance for American Manufacturing (AAM), USA*
- *Andrew Steigerwald, Senior Advisor, Advanced Manufacturing Office, U.S. Department of Energy, USA*
- *Stefan Uhlig, Senior Project Manager, Cool Silicon e.V., Germany*

Moderation by Roland Stephen, SRI, BILAT USA 4.0

12.20 SUMMARY & CLOSING, *Svetlana Klessova, inno TSD*

3.2. SPEAKER BIOGRAPHIES

JESSICA AVERY, *Research Analyst, Center for Innovation Strategy and Policy, SRI International*

Jessica Avery has more than 8 years of experience in science, technology, and innovation policy development and analysis, science communications, and scientific program support and evaluation. During her tenure at SRI, she has conducted research and analysis for projects focused on research and development, government innovation, and economic development. Ms. Avery's responsibilities have included analysis of science and innovation indicators, stakeholder interviews, and workshop facilitation and synthesis. Her work has supported federal (National Science Foundation), regional (New York, Nebraska, Pennsylvania), and international (UAE, European Commission, Ukraine) clients. Prior to joining SRI, Ms. Avery worked in the Office of Science Policy (OSP) at the National Institutes of Health (NIH). At NIH, she was responsible for researching, analyzing, and synthesizing science policy materials for NIH leadership on a variety of topics, including translational medicine, dual use research of concern, scientific collections, the value of biomedical research, and substance use, abuse, and addiction research. While in OSP, she coordinated and provided technical support for several high-profile meetings held by the NIH Office of the Director. Ms. Avery also supported the National Institute on Drug Abuse (NIDA) as an exhibitor at national conferences and has significant experience in publication development for OSP, NIDA, and the U.S. Environmental Protection Agency. Ms. Avery holds a B.S. from Duke University in Biology.

CHRISTIANE EGGER, *Ökoenergie-Cluster/Cleantech Cluster Energy, Austria*

Christiane Egger is Deputy Manager of the OÖ Energiesparverband, the energy agency of Upper Austria, and the manager of the Cleantech-Cluster Energy, a network of over 100 companies active in renewable energy and energy efficiency. She has led the development of this successful network since its beginning over 15 years. Christiane is also the Vice-President of FEDARENE, the European network of regional energy and environment agencies. She is the conference director of the World Sustainable Energy Days, one of the largest annual conferences in Europe on energy efficiency and renewable energy sources. Christiane is an expert in energy efficiency and in renewable energy sources with a focus in policy and market development. She has developed and successfully implemented numerous European collaboration projects and is a frequent speaker at international events. She holds degrees in law and in environmental engineering.

DAVID M. HART, *Center for Science and Technology Policy at George Mason University and non-resident senior fellow in the Metropolitan Policy Program at the Brookings Institution, USA*

David M. Hart is Professor and Director of the Center for Science and Technology Policy at the School of Policy, Government, and International Affairs (SPGIA) at George Mason University. Professor Hart served as Senior Associate Dean of SPGIA from May 2013 to June 2015. He served as assistant director for innovation policy, with a focus on advanced manufacturing, at the Office of Science and Technology Policy, Executive Office of the President, from July 2011 to August 2012. Hart's recent academic work focuses energy innovation and high-growth entrepreneurship. His books include Unlocking Energy Innovation (MIT Press, co-authored with Richard K. Lester), The Emergence of Entrepreneurship Policy (Cambridge University Press), and Forged Consensus: Science, Technology, and Economic Policy in the U.S., 1929-1953 (Princeton University Press). Prof. Hart is as a non-resident senior fellow in the Metropolitan Policy Program at the Brookings Institution and a member of the board of the Information Technology and Innovation Foundation.

SVETLANA KLESSOVA, *Director, inno TSD, France; BILAT USA 4.0 cluster activity responsible*

Svetlana Marie- Claire Klessova, M.Sc., is Director and senior innovation consultant at inno TSD, France. Svetlana has 20+ years of experience in international collaboration in science, technology and innovation and support to policy dialogue, set up of networks, cluster support, and support to academia-industry collaboration. She acted on over 60 projects as project director or senior consultant, and coordinated 10 large projects related to international research and innovation collaboration and strategic partnership between research and innovation organisations. She is responsible for the activity related to industry-academia and cluster collaboration in the BILAT USA 4.0 project www.euussciencetechnology.eu. Svetlana is also coordinator of the PICASSO project www.picasso-project.eu "ICT Policy, Research and Innovation for a Smart Society: towards new avenues in EU-US ICT collaboration".

CARLO KRASKOVIC, *Mare TC FVG, Italy*

Carlo Kraskovic is working as project manager in the field of international relations and European and national projects, for the maritime technologies cluster of the Italian Region Friuli Venezia Giulia. The latter enhances regional excellence in the maritime technology sector and is finalised to develop Research, Innovation and Education projects with the aim to enhance the competitiveness of the industrial basis of the FVG region. Carlo is focusing on collaborations with foreign clusters and aggregations in order to develop mutual actions to support stakeholders from territories involved. Responsible for the "Innovation challenge Italy Croatia" aiming to give an answer to specific needs expressed by big industries through the involvement of SMEs and research players, actually is coordinating regional collaborative projects supporting innovation in the field of maritime technologies.

SCOTT N. PAUL, *President, Alliance for American Manufacturing, USA*

Scott Paul is the president of the Alliance for American Manufacturing (AAM), a partnership established in 2007 by some of America's leading manufacturers and the United Steelworkers union. Paul and AAM have worked to make American manufacturing and "Made in America" top-of-mind concerns for voters and national leaders through effective advocacy and data-driven research. Paul has hosted more than eighty "Keep It Made in America" events, including a presidential candidates' forum on manufacturing, and has testified before seven committees of the U.S. House and Senate. He frequently appears on television news shows, and regularly blogs on the Huffington Post. Paul is also a co-author of the 2013 book ReMaking America. Paul served as a staff member on Capitol Hill at various times from 1989 to 2001. He currently serves on the board of directors of the National Skills Coalition and the board of visitors of the political science department at Pennsylvania State University. Paul earned a BA in foreign service and international politics from Pennsylvania State University and an MA with honors in security studies from Georgetown University's School of Foreign Service.

ANDREW STEIGERWALD, *Senior Advisor, Advanced Manufacturing Office, U.S. Department of Energy, USA*

Andrew (Drew) Steigerwald, Ph.D., is Senior Advisor to the Director of the Advanced Manufacturing Office at the U.S. Department of Energy, which manages roughly $250 million manufacturing-related R&D per year. Dr. Steigerwald has held various high-level positions in the public and nonprofit sectors including the U.S. Agency for International Development (USAID) and the U.S. Council on Competitiveness. He also worked in the U.S. Senate, where he managed the innovation and technology policy portfolio for Senator Sherrod Brown, including helping to

develop the legislation behind the National Network for Manufacturing Innovation. Dr. Steigerwald earned his Ph.D. in interdisciplinary materials science from Vanderbilt University and a B.E. in engineering physics from the Ohio State University.

ROLAND STEPHEN, *Director, SRI, USA; BILAT USA 4.0*

Roland Stephen, Ph.D., Director, Center for Innovation Strategy and Policy, SRI International. Dr. Stephen has more than 15 years' experience directing projects in the area of cluster and workforce analysis, strategic planning, and programme design and evaluation. He is a leader in the development of new protocols and new metrics for the assessment of complex programmes designed to foster technology and cluster-based development. Recent projects include an assessment of Nebraska's key clusters and economic development ecosystem, and an assessment of the Jobs and Innovation Accelerator Challenge and the i6 Challenge for the Economic Development Administration, Department of Commerce. Overall his work focuses on the frontier between innovation, entrepreneurship, and economic development, and on institutional performance in this space. Prior to joining SRI, Dr. Stephen led several programmes at the Institute for Emerging Issues, at North Carolina State University, where he was an associate professor in the School of Public and International Affairs. Programmes included aligning higher education institutions around state economic development goals, and accelerating the growth of technology-intensive clusters through innovative policies and practices in technology and workforce development, infrastructure, and public finance. Stephen holds a Ph.D. in international and comparative political economy from the University of California, Los Angeles, and a B.A. in history and economics from Cambridge University in the United Kingdom.

STEFAN UHLIG, *Cool Silicon e.V., Germany*

Stefan Uhlig is senior project manager and received the diploma degree in Material Science from the Technical University Dresden in 2003. After that he joined Fraunhofer as a researcher in the area of functional ceramics. One of his main tasks was the coordination of cooperation projects with industrial partners as well as research activities in the field of microelectronic, photovoltaic and advanced ceramics processing and material development. In 2015 Stefan Uhlig joined Silicon Saxony in the role of a project manager in cross-cluster and cross-branch projects and is currently leading an internationalization project funded by the German Ministry of Education and Research.

3.3. CONTACT DETAILS OF ORGANISERS FOR ENQUIRIES

- Roland Stephen - roland.stephen@sri.com
- Jessica Avery - jessica.avery@sri.com