

Annual Report 2014/15 ■

**Knowledge and
Technology Transfer ■**



Knowledge and Technology Transfer ■

Innovation processes do not stop at national borders. They boost the international competitiveness of companies and regions. They facilitate sustainable growth and simultaneously contribute towards solving global problems.

Here, in close partnership with our public and private customers, we develop and implement sophisticated solutions that address the specific problems posed by **knowledge and technology transfer**.

The business area "Knowledge and Technology Transfer" focuses on the following four market segments:

- professionalization of transfer processes,
- innovation funding,
- competition and technology analysis and
- international innovation policies.



We convert the “raw material” of knowledge into practical applications for industry, institutions, regions and policies.

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Professionalization of Transfer Processes

We focus on processes that promote practical cooperation between the spheres of science/research, business and politics. Here we support research institutions, research networks and transfer companies in organizing their transfer activities professionally and we advise political decision-makers on issues related to public transfer funding and promotion. In collaborative projects we devise dialogue processes that are targeted towards effectively disseminating research findings to various stakeholders and towards conducting joint research and development activities. The increasing international division of labour along global innovation and utilization chains and the growing necessity for innovations in networks (innovation 4.0) presents companies, research institutions and regions with fundamental challenges. Our experts support you in creating solutions with the latest findings from applied research.

- Organization of knowledge and technology transfer services
- Processes, structures and stakeholders in public transfer funding
- Science communication and "participatory research"

Led by:

Steffen Preissler

Head of Knowledge and
Technology Transfer Division

Head of Unit Professionalization
of Transfer Processes

Innovation Financing

We take on the neutral role of an "interpreter" between innovators and investors. International research and innovation projects with multipliers from the sectors of finance, science/research and politics form a joint working framework to further develop the transnational transfer of innovative financial instruments, particularly in the field of environmental innovations. It is thus possible to better supply promising innovation projects with funds.

We work for customers from finance, science/research and politics.

With this range of services, we enable innovators to save considerable time and costs in searching for perfectly suited regional and interregional investors. A scientifically substantiated comparison of the investment criteria relevant to the market forms the authoritative basis for our services. We plan, organize and participate in tailor-made events on the topic of innovation funding.

For investors we provide access to promising and scalable innovation projects. In this way they also achieve considerable savings in time and costs. The range of services of the market segment Innovation Funding is rounded off with participation in interactive event formats and access to the Fraunhofer network and to other (co-)investors.

- Implementation of funding strategies/instruments, particularly in the context of EU projects
- Analysis of perfectly suited funding options for innovators and international investors
- Further development and transnational transfer of innovative financial instruments, particularly in the field of environmental innovations

Led by:

Dr. Robin Bürger

Head of Unit Innovation Financing

Competitive Intelligence

Together with and for our private and public customers, we develop solutions for continuously monitoring and analyzing the competition. Constantly keeping an eye on the international competition and evaluating the current technological developments is a key to success for technology companies and research institutions. Our focus here is on technology analysis. On the basis of our Book of Competitors platform, we develop tailor-made, interactive and constantly updated applications. The right recipients in the company are thus provided with the latest findings in an ongoing process so as to be able to make the right decisions. Customer-specific data and innovative analysis methods can easily be incorporated, which we combine with the Fraunhofer know-how on technologies, markets and regions. In this process, data protection has top priority for us.

- Customized solutions for continuous competition monitoring
- Finding and assessing global competitors and experts
- Analysis of fields of technology

Led by:

JProf. Dr. Lutz Maicher

Head of Unit Competitive
Intelligence

Junior Professor for Technology
Transfer at Friedrich Schiller
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Entrepreneurship and Innovation for Development Cooperation

We focus on innovation-policy issues in transnational cooperation. The economic and political changes in the world require constant adjustments to Germany and Europe's international cooperation. Here our analyses and recommendations for action examine the transnational innovation processes and from this derive information for initiatives in international innovation policy regarding the design, instruments, time and action planning, introduction and implementation and, finally, the measurement of the results of these initiatives. In this way, we support political decision-makers and organizers of international partnerships in a concrete way with the excellence of our experts.

Led by:

Prof. Dr. Utz Dornberger

Head of Unit Entrepreneurship
and Innovation for
Development Cooperation

EU-MEX INNOVA – Transatlantic bridges for research and development

The EU-MEX INNOVA project is supporting Mexico in internationalizing its research landscape and in networking with European partners.

Mexico sees cooperation with Europe as a key element in its strategy for sustainable and inclusive growth.

Aligned with the goals of Horizon 2020, the European Union – Mexico Bilateral Innovation Initiative (EU-MEX INNOVA) seeks to foster cooperation in R&D between the European Union (EU) and Mexico. The project sets up a sustainable, knowledge-based bilateral dialogue between the key players and stakeholders in order to facilitate public and private research projects, develop joint mechanisms and promote the use of EU and Mexican instruments as effective tools for developing partnerships in science, technology and innovation.

With its expertise in internationalizing R&D and building innovation capacity, the Fraunhofer Center Leipzig is contributing a feasibility study on a joint international ST&I liaison office, a map of high potential European innovation players, a catalogue of best practices for promoting innovation and a pilot action plan to overcome innovation challenges.

The European Union – Mexico Bilateral Innovation Initiative, EU-MEX INNOVA, was launched to tie in with the EU Framework Program for Research and Innovation,

Horizon 2020. The initiative is designed to strengthen and promote research and development cooperation between the EU and Mexico. To this end, the project team is initiating a long-term, knowledge-based bilateral dialogue between key actors and stakeholders. This should facilitate research projects by public and private-sector actors and help to develop and advertise joint funding mechanisms for European-Mexican partnerships.

Duration: 9/2013 – 8/2016

Client: European Commission

Funding/Partners: CONACYT (Consejo Nacional de Ciencia y Tecnología), FEI (France Expertise Internationale), MINECO (Ministerio de Economía y Competitividad, España), MADRIMASD (La Fundación para el Conocimiento madrid), Agency for the Promotion of European Research (APRE), OSEO/BPI France, COPARMEX (Confederación Patronal de la República Mexicana)



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The bilateral project EU-MEX INNOVA (European Union - Mexico Bilateral Innovation Initiative) is facilitating more in-depth dialogue between European and Mexican actors in the field of research and development.





■ The accelerapp team from the Leipzig Fraunhofer Center.

“The experience, professionalism, knowledge and achievements of the Fraunhofer Institutes are widely known and need no recommendation. Nevertheless, we would like to highlight that we were positively surprised with all opportunities offered our company by Leipzig Fraunhofer Center. We want to draw everyone’s attention to the incredibly flexible and fully tailored services that were made available to us. It allowed our company to fulfill our plans and initiate very fruitful cooperative relations in Germany.”

Norbert Kowalkowski, CEO HTG High Technology Glass SA, Belmont-Lausanne, Switzerland

accelerapp – boosting marketability of innovations internationally ■

Developed by Leipzig Fraunhofer Center researchers, the accelerapp tool helps companies in identifying product adjustment needs, analyzing marketability chances and designing options for the further-development and market-transfer of their innovations.

Those wishing to tap international markets with new products need more than just stamina. Preparing, processing and managing international research projects and market launches also requires an enormous amount of time and financial and human resources. These are things which SMEs often lack because they are already working at full capacity to keep their day to day business activities running.

barriers are illustrated using existing case studies. Finally, the tool derives potential development pathways for the company and its products. accelerapp has already been used successfully in projects with twelve international companies from different countries.

accelerapp supports companies in analyzing marketability

Consequently, Leipzig Fraunhofer Center researchers have worked with industry experts to develop the accelerapp methodology. accelerapp is a tool that assists companies in identifying needs and creating solutions with regard to R&D and commercialization processes abroad. Geared towards the management of international projects, this tool includes such convenient features as market validation and technology valuation. accelerapp develops, analyzes, tests and evaluates individual options for the further-development and transfer of innovations on global markets. Identified chances and



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Clients: twelve innovative, international technology companies from the fields of: IT, Medicine, Production, Biotechnology and Life Sciences, Transport and Logistics, Safety, Finance, Energy

Public partners: Poland: National Center for Research and Development (NCBR), South Korea: Small and Medium Business Corporation (SBC) South Korea, IITP South Korea

Partners: Poland: Poznan Science and Technology Park, Kraków Technology Park, Science and Technology Park Gliwice, Pomeranian Science and Technology Park, Gdingen, South Korea: Chungbuk National Technology Park

Team: Wojciech Roskiewicz, Małgorzata Krowicka, Balthasar Kinkel, Philip Friebe, Wojciech Muras, Michał Turowicz, Maria Krukowska, Jungtaeg Oah, Kiseon Lee, Kamila Godosz

Managing Europe's forests sustainably

INTEGRAL – Future-oriented integrated management of European forest landscapes

Places of recreation and retreat or sources of raw materials? The European cooperation project INTEGRAL is examining the challenges involved in modern and sustainable forest management.

Over one third of Europe's total area is covered by forest. But who is allowed to use this forest? Who determines its value as a resource for commercial exploitation, a local recreation area or an ecosystem deserving of protection? If we are to take account of these different interests and use forests in an economically, environmentally and socially responsible way, then we need to rethink how they are managed.

The special importance of communication

Consequently, experts from 13 countries are working to develop new policy and management approaches to sustainable forest management as part of the EU-wide project INTEGRAL (Future-Oriented Integrated Management of European Forest Landscapes). Their findings are enabling a range of actors to assess the impact of environmental, socio-economic and political factors on the development of forest landscapes. As part of INTEGRAL, the Fraunhofer Center for International Management and Knowledge Economy is formulating recommendations for action with regard to putting strategic concepts into practice. Communication is particularly important in this context. It is necessary to

create awareness among relevant actors and the general public of the need for sustainable forest management. To this end, the Leipzig researchers are also defining criteria for effective knowledge transfer.

Duration: 11/2011 – 10/2015

Funding: European Commission, 7th Framework Program of the European Union, Grant agreement -Nr.: 282887

Partners: 21 partners from 13 EU countries, including Germany: Technische Universität München, Institute of Forest and Environmental Policy, University of Freiburg

Team: Annamaria Riemer, Inga Žirkova, Jödis Winkler, Brett Aho

Project website: www.integral-project.eu



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Transdisciplinary research was conducted to analyze the current challenges for European forest policy. Forward-looking approaches to forest policy and the future management of forest landscapes in the EU were then developed on this basis.



This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 282887

■ INTEGRAL case study area Suvalkija, Lithuania (© Redas Rutkauskas). ■ INTEGRAL case study area Oberpfalz, Germany (© Ralf Moshhammer, TUM).

Célia Gavaud has more than 12 years' experience relating to European projects, and has coordinated more than 15 initiatives in the innovation and growth field. She holds two Masters' degrees in International Policy and Diplomacy and European Affairs, and is a French national and enthusiastic European who has lived in the UK, Germany and Italy. In relation to the PROGRESS-TT project, Ms. Gavaud oversees the relationship with the Commission, the consortium management, and third party stakeholders, and is responsible for the smooth delivery of project tasks, deliverables and milestones.



■ Célia Gavaud, PROGRESS-TT Coordinator at Pera Consulting (UK) Ltd.

Professionalizing technology transfer in Europe ■

How can technology transfer from universities and public-sector research institutions in Europe be improved? An interview with Célia Gavaud, Director of the European project PROGRESS-TT, and Lutz Maicher, Head of Competitive Intelligence Unit at the Leipzig Fraunhofer Center.



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Leipzig Fraunhofer Center researchers from the Competitive Intelligence Unit are part of the PROGRESS-TT consortium, which seeks to transfer functioning growth concepts from the private sector to technology transfer offices. Part of the European project involves developing a training program to build the capacity of specialists in the area of technology transfer.

Ms. Gavaud, the European project PROGRESS TT stands for "public research organization growing Europe through best practice solutions for technology transfer". What does the project aim to achieve within the next three years?

Gavaud: PROGRESS-TT is a pilot initiative to gather best practice around the process of technology transfer and to develop and test a suite of tools, methods and insights with selected technology transfer offices in the EU Member States and Associated States. PROGRESS-TT's ambition is to increase the efficiency and effectiveness of the technology transfer process in the European Union.



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■ Patrick McCutcheon, Senior Policy Officer, Director-General Research and Innovation, European Commission.

“Many universities and public research organizations in Europe do not have sufficient technology transfer competence or capacity to attract the financing needed to commercialize the outcomes of their research, and as a result do not have access to capital. For this reason, the European Commission supports PROGRESS-TT as an accompanying measure to improve the investor readiness of technology transfer offices and to facilitate access to the Technology Transfer Financial Facility (TTFF), a new financial facility it plans to launch to promote such technology transfer.”



■ Erik Vane, General Manager of ASTP-Proton.

“The PROGRESS-TT consortium is working towards creating sustainable impact for supported technology transfer offices, helping them realize their potential for growth. The technology transfer professionals will develop and decrease risks associated to the commercialization of research results, bringing them to a stage of maturity when they are both relevant and attractive to potential investors, industry and society. PROGRESS-TT’s approach is arguably the most important development in recent years in the technology transfer field.”

Within PROGRESS-TT the Leipzig Fraunhofer Center is leading the development of a capacity building strategy for technology transfer professionals in Europe. What is behind this strategy?

Maicher: The capacity building strategy will enable all stakeholders in the technology transfer process to identify the main barriers to success and to set up a tailored change management process to overcome these barriers. Missing commitment of the university management, insufficiently structured in-office working processes or limited access to tailor made tools and data are issues which we often hear about in practice. We directly target these problems.

What does the practical implementation of the capacity building strategy look like?

Maicher: We start by using the CCODE™ which is a growth model invented and successfully implemented for private companies by Pera Consulting. Together with selected technology transfer offices, we will then directly work to improve their capabilities, capacity, opportunities, desire and environmental setting through tailor-made teaching and coaching modules. We will partner successful technology transfer offices with other high-potential technology transfer offices to establish knowledge transfer between the two.

Ms. Gavaud, who is eligible for participating in the capacity building activities? When will the first activities be launched?

Gavaud: The selection process for recipients of the PROGRESS-TT support activities is currently being refined. Towards the end of 2015 a clear methodology will be established and implemented based on research output, exploitation effectiveness and efficiency of the technology transfer process. The first support activities will be launched during the second quarter of 2016. We will also be seeking involvement of the best performing technology transfer offices in Europe to act as mentors for program participants.

Duration: 1/2015 – 12/2017

Funding: The project Progress-TT (Public Research Organisation Growing Europe through best practice Solutions for Technology Transfer) has received funding from the European Union's Framework Program for Research and Innovation, Horizon 2020, No. 643486.

Partners: Pera Consulting (UK) Ltd, ASTP-Proton, DSM Nutritional Products, Knowledge Innovation Market, MI.TO Technology, Philips Intellectual Property & Standards, University of Bologna, VTT Ventures

Technology transfer
‘Technology transfer’ is an economics term. It refers among other things to the transfer of industrial methods to developing countries and the training of engineers and researchers at western universities and research facilities. It also includes the commercial use of research findings and their conversion into marketable products and services. This last aspect is the focus of PROGRESS-TT.

Capacity building
Capacity building is about enhancing knowledge, leadership qualities and the ability to make more effective use of one's own resources, as well as to realize sustainable goals and play an active role in shaping the future of a company, an industry or a state.

Horizon 2020
Horizon 2020 is the European Union's largest research and innovation funding program to date. Launched in 2014, it is providing around EUR 77 billion in funding over a seven-year period (2014-2020). Horizon 2020 promotes collaborative projects designed to create sustainable growth and long-term jobs in Europe and to boost the competitiveness of the EU.





■ The four winners of the successful cooperation projects were announced on March 27th, 2014 at the Chemintz Messe, and were each presented with prize money valued at 5000 Euros. (Photo: Wolfgang Schmidt).

“In western German border regions, organizational structures developed as part of a longer process, facilitating ongoing cross-border cooperation between SMEs themselves and between SMEs and research institutions. Well-organized cooperation in the areas of research, development and training offers a genuine opportunity for the German-Polish and German-Czech border regions, whose structures have been largely weak to date. The project impressively documents the notable cross-border partnerships that have already developed.”

Iris Gleicke, Member of the German Bundestag, Parliamentary State Secretary and Federal Government Commissioner for the New Federal States.

Joint research activities in the German-Polish-Czech border region

What are the ingredients of successful research cooperation between German, Polish and Czech SMEs? – Insights into the German-Polish and German-Czech border regions.

Germany, Poland and the Czech Republic have long engaged in neighborly cooperation. However, the border regions remain structurally weak, with little experience of jointly developing demand-driven cooperation structures.

New strategies for the German-Polish-Czech border region.

Iris Gleicke, Member of the German Bundestag, Parliamentary State Secretary and Federal Government Commissioner for the New Federal States launched a research project on cross-border cooperation between SMEs in the border regions in 2013. This project was implemented by Leipzig Fraunhofer Center researchers in cooperation with the Institut Chemnitzer Maschinen- und Anlagenbau e.V. (ICM).

Learning from best-practice projects in the border regions

The team compiled examples of successful partnerships in the areas of research, development and training, and organized a competition to recognize successful projects. This competition, in conjunction with expert presentations and interviews with companies, served to identify the factors promoting and hindering cross-border cooperation in these regions. The results were compared with reference regions in western Germany and presented at a closing conference.

Duration: 7/2013 – 12/2014

Client: MdB Iris Gleicke, Commissioner for eastern Germany

Funding/Partners: ICM – Institut Chemnitzer Maschinen- und Anlagenbau e.V., European University Viadrina, Frankfurt (Oder)

Team: Steffen Preissler, Dr. Harald Lehmann, Anzhela Preissler, Velina Schmitz



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AGENT-3D – Additive-generative manufacturing

The 3D-Revolution for products manufactured in the digital age.

Additive-generative manufacturing is revolutionizing the industrial production process globally. Leipzig Fraunhofer Center researchers are examining ways of readying the new technologies for the market in eastern Germany.

3D printing ● and laser and electron-beam based procedures should enable individual components to be manufactured with a smaller amount of material in a shorter time frame in future, whether they be joint prostheses made from maize starch or titanium components for a gas turbine burner.

The production processes of the future

Following the strategy phase, the first technology projects are set to be implemented starting from autumn 2015. The research institutions involved will document, analyze and evaluate their progress and results. The Leipzig researchers will then focus on the question of how additive-generative manufacturing techniques are changing conventional manufacturing processes and what the production processes of the future ● might look like.

Duration: 1/2014 – 6/2015
(duration project: 2014 – 2020)

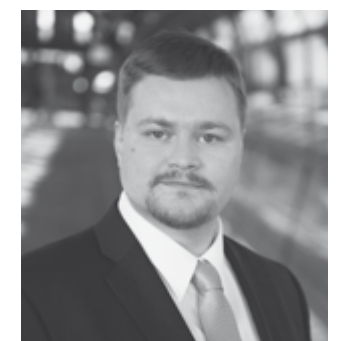
Client: Federal Ministry of Education and Research

Partners: Twelve research institutions and more than 45 companies

Team: Steffen Preissler, Dr. Harald Lehmann, Annamaria Riemer, Marianne Polkau, Inga Žirkova

Concept for strategy development

Twelve research institutions and more than 45 companies launched the strategic alliance AGENT-3D in 2014, with scientific oversight provided by the Fraunhofer Institute for Material and Beam Technology Dresden. The interdisciplinary team intends to build a strong network of representatives from industry, SMEs and research institutions in eastern Germany and develop additive-generative manufacturing ● into a key technology. Leipzig Fraunhofer Center researchers from the Knowledge and Technology Transfer Division are supporting the alliance as it develops its strategy. The organizational, communications and innovation concept of the alliance are based on a market study, expert interviews and partner surveys.



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■ **Dispensing head.**
© Fraunhofer IWS

■ **Turbo impeller.**
© Fraunhofer IPK

■ **Propeller, injection molding core with meander cooling channel, Bayonet nozzle.**
© Fraunhofer IPK



● **3D printing**
A 3D printer builds three-dimensional objects layer by layer. The printing process is computer controlled, based on a predefined 3D model. Typical materials that are layered on top of one another in liquid form by a 3D printer include plastics, synthetic resin, ceramics and metals.

● **Additive-generative manufacturing**
Additive-generative manufacturing involves 'generating' a component by successively 'adding' layers of material, usually using laser light or an electron beam. Unlike conventional manufacturing processes, additive-generative manufacturing makes it easy to combine several different materials, produce complex components at no additional cost, and offer replacement parts without having to store them.

● **Industry 4.0**
The real and virtual worlds are converging into the "Internet of Things" in what is being dubbed the "Fourth Industrial Revolution". The term "Industry 4.0" refers to the goal of getting industry into shape for this process. Clients and business partners, for example, will be directly integrated into business and value creation processes, while intelligent monitoring will be used to manage and optimize manufacturing processes in real time.



Criteria for application-based support policy

An innovative support policy in Germany could help researchers to identify and leverage the economic potential of their work at an early stage.

Universities and non-university research institutions hold untapped potential in the form of scientific findings that, if used commercially, could drive significant economic progress. As part of the project "Ways of Promoting Vertical Transfer from Research and Academia - Lessons from Support Policy in Practice", or "WTT_Lehren" for short, Leipzig Fraunhofer Center researchers are identifying support criteria that contribute to the commercial success or failure of a research project.

Recommendations for innovative support policy

The Leipzig researchers began by conducting an empirical study of the ForMaT support program (Research for the Market im Team) of the German Federal Ministry of Education and Research (BMBF). This program brings economists and researchers from different disciplines together. A comparison of evaluation reports of other support programs, including EXIST (University-Based Business Start-Ups) and VIP (Validation of the Innovation Potential of Scientific Research), and supplementary interviews with program managers and participants provide the basis for further analysis. The study examined the influence of cooperation partners, professional science communication, financial instru-

ments and transfer service providers or the researcher's personality. The goal of the Leipzig Fraunhofer Center researchers is to derive recommendations for the BMBF on the further development of application-based support policy in Germany.

Duration: 11/2014 – 10/2015

Funding: Federal Ministry of Education and Research (BMBF)

Team: Dr. Harald Lehmann, Steffen Preissler, Annamaria Riemer, Velina Schmitz, Jens Rockel, Inga Žirkova, Anzhela Preissler, Julian Kehrer, Erik Ackermann, Marcel Liebich, Robert Köster



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Reviewed: the Knowledge and Technology Transfer of Leipzig's companies

What are the requirements of Leipzig's companies in terms of knowledge, technology and support for transferring their knowledge and technology? The second Leipzig transfer report endeavors to provide an answer to this question.

Creating links between business and academia is a key priority for technology transfer in Leipzig. Commissioned by the Leipzig Office for Economic Development, Leipzig Fraunhofer Center researchers from the Knowledge and Technology Transfer Division assessed the progress made in this area and the requirements of companies in the second Leipzig transfer report.

They conducted a survey in February 2014 to identify

- the requirements of companies for knowledge and technology,
- the requirements for specific transfer services, and
- how Leipzig-based companies assess the availability of knowledge, technology and transfer services in Leipzig.

Carried out in close cooperation with representatives from the Leipzig Office for Economic Development, the survey revealed that there is a particularly great demand for computer science and technical and economics expertise. This includes the need for support in terms of resources and transparency. Companies in Leipzig have to draw on resources from other regions to meet their knowledge and technology requirements.

Duration: 12/013 – 10/2014

Client: City of Leipzig

Partners: Twelve research institutions and more than 45 companies

Team: Steffen Preissler, Dr. Harald Lehmann



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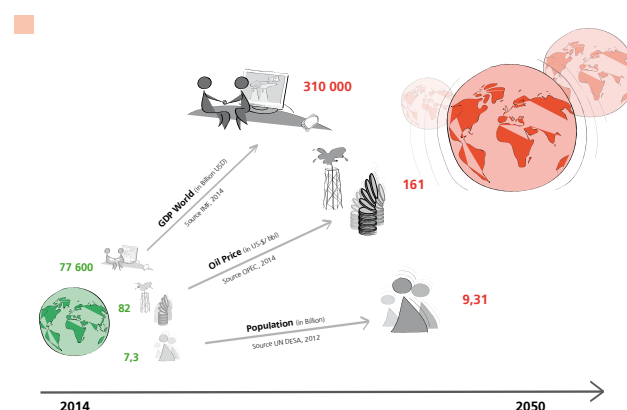
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Participants of the 2014 Transnational Financing workshops at the Fraunhofer-Forum in Berlin.



- The performance profile of the Innovation Financing Unit.
- The Unit offers innovative financing advice from a neutral point of view.
- The Innovation Financing Unit performs an interpretive function between innovators and external capital providers.
- The business and financing framework of sustainable economy can be improved through a better interplay between relevant stakeholders groups.

Achieving sustainable economic development by increasing resource efficiency in SMEs

PRESOURCE – Promotion of Resource Efficiency in Central European small and medium-sized enterprises.

Natural resources are becoming increasingly scarce. SMEs are asking themselves whether they are making efficient use of materials for their products, consumables and auxiliary materials, and energy and water in their manufacturing processes. This is the starting point for PRESOURCE, an EU project which aims to conserve resources and promote innovation in Central European SMEs.



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Capital for greater resource efficiency

Products that are highly material and energy efficient save money and make a company innovative and competitive. The benefits are self-evident, but in many cases difficult to quantify in monetary terms.

EDIT Value analyses of a company's overall situation

Developed as part of the EU project PRESOURCE, EDIT Value (Eco-Innovation Diagnosis and Implementation Tool for Increase of Enterprise Value) is an instrument that can easily be used by companies in order to identify how and where they can reduce costs and work more efficiently. EDIT Value examines a company's overall situation: its products, its management, its strategy and the interests of its workforce, shareholders, the local community and competitors. It produces a set of sound recommendations tailored to the company in question, with a customized cost-benefit analysis.

Created by the Leipzig Fraunhofer Center researchers, the cost-benefit analysis shows capital providers when it is worth investing in resource-efficient changes and how environmental efforts can be translated into monetary terms. The researchers in Leipzig have also produced a virtual financing guide, which presents alternative financing instruments such as crowdfunding, venture capital and future funds as alternative sources of finance for SMEs.



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Duration: 7/2012 – 11/2014
Client: European Commission
Supported by: EFRE - Central Europe Program

Funding: Federal Environmental Agency (Leadpartner, D), Enviros Ltd. (CZ), Corvinus University of Budapest (HU), Stenum Ltd. (AT), Enea (IT), Pro-Akademia (PL), German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (D)

PRESOURCE
PROMOTION OF RESOURCE EFFICIENCY
IN SMEs IN CENTRAL EUROPE

Social sciences and humanities – a source of self-confident, successful entrepreneurship

October 2014 saw participants in an international symposium at Leipzig's Social Impact Lab take an in-depth look at the start-up culture in the social sciences and humanities.

Working with researchers from the University of Wrocław, the team, headed by Wojciech Roskiewicz from the Leipzig Fraunhofer Center, examined the similarities and differences between the start-up cultures of the social sciences and humanities in Germany and Poland. The one-year study was based on a review of the relevant literature and on comparative interviews with a range of sponsors, multipliers and start-up entrepreneurs in Germany and Poland.

The subsequent analysis showed several different approaches to start-ups. The study also identified factors that facilitate entrepreneurship within the humanities and social sciences. To conclude the one-year project, over 40 researchers and practitioners from sectors providing support to start-ups were invited to the Social Impact Lab in Leipzig to discuss the current situation with regard to the start-up culture in the social sciences and humanities fields.

"No specific application" - this ludicrous notion was dispelled in an address by Professor Peer Pasternack, Director of the Institute of Higher Education Research at Martin Luther University Halle-Wittenberg. The political scientist illustrated the sig-

nificance of the humanities and social sciences to the economy, culture and regional policy. The subsequent panel discussion was primarily an opportunity to hear from start-up founders themselves, who reflected the same kind of self-confident, successful entrepreneurship as the start-up founders surveyed as part of the study had done. Why is entrepreneurship in the social sciences and humanities fields still seen as the exception? The discussion participants were all in agreement that university start-up funding programs need to focus more strongly on start-ups in the social sciences and humanities, and that the start-up entrepreneurs themselves have a duty to raise their profile as role models for students interested in founding start-ups.

Duration: 7/2013 – 6/2014

Funding: German-Polish Science Foundation

Team: October 2014 saw participants in an international symposium at Leipzig's Social Impact Lab take an in-depth look at the start-up culture in the social sciences and humanities.



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Oliver Mauroner has held the post of Junior Professor for Innovation and Creativity Management at the Bauhaus-Universität Weimar since September 2013, researching ways for organizations to identify and exploit creative potential. He is involved in the university's neudeli start-up incubators and assists start-ups with putting together business plans and finding start-up funding.

The University of Wrocław and the German Polish Science Foundation joint project provides an overview of academic foundations and start up cultures in Poland and Germany. Not only German, but also Polish experts and Funding were interviewed as part of a country comparison analysis. The responses identified the main challenges, in particular with relation to the social sciences and humanities.

"The Leipzig symposium provided me with some great food for thought and some very interesting contacts for my work in the start-up workshop neudeli at the Bauhaus-Universität Weimar. There was some very frank discussion of the various challenges involved in supporting start-ups from the social sciences and humanities fields."

JProf. Dr. Oliver Mauroner

aluminium processing firms:

Technologist: "At last, I now see how much energy is used by the various machine settings, which allows me to make the manufacturing process more efficient and to ensure and monitor compliance with requirements on the part of the machine operators."

Technologist: "The automated outlier analysis provides an excellent overview of manufacturing issues and maintenance work that needs to be taken care of, such as replacing or repairing a frequency converter."

Controller: "I can now produce monthly reports at the touch of a button. The figures are valid and I now have more time and opportunity than ever to address and analyse energy correlations. We have already achieved a great deal, but we know that there is still considerable potential to be exploited in our processes."

Works manager: "Having a transparent overview of the factors influencing our energy consumption allows us to more effectively manage our manufacturing processes and helps us make decisions about further investments."

Making manufacturing processes energy efficient

EPVI is a software solution that can analyze the potential for optimizing production processes. The program is the fruit of cooperation between a regional company and the Leipzig Fraunhofer Center.

Together with Fraunhofer Center Leipzig researchers, you developed EPVI, an energy process optimisation technology for the manufacturing industry. What has come out of this three-year work partnership?

Bergmann: With EPVI, we have produced a software solution that combines energy and manufacturing data to identify potential for saving energy during the manufacturing process. This technology is of tremendous interest to our clients. The project with the Fraunhofer Center has allowed us to flesh out our idea, record and analyze customer requirements, and design evaluation tools. With EPVI, we are offering industrial enterprises a program that they can use to make their manufacturing processes energy efficient and more cost-effective.

What is so innovative about this technology and what energy savings does it deliver for the manufacturing industry?

Maicher: EPVI is co-creation in practice - together with ccc, we have taken the idea from the conceptual stage and turned it into a technology used by the industry. It all started with ccc's vision to determine how much electricity, gas, compressed air and heat are used at each stage and in each batch during the manufacturing process. For example, a plant operator can use EPVI at any time to view the resource needs for the part currently on the machine and even take immediate action in the event of excessive energy consumption to enable savings of four to five per cent. This is what we refer to as the intelligent-energy factory.

What role does EPVI play in the German Government's plans for Industry 4.0?

Maicher: Industry 4.0 is primarily about the digitisation of manufacturing processes. EPVI already allows manufacturing firms to use hundreds of resource meters a second to manage energy efficiency in industrial works. EPVI is big data. This technology does not yet steer manufacturing processes on its own; rather, it helps technologies to operate on an energy-efficient basis. But I can also see manufacturing processes being managed on an automated basis in future.



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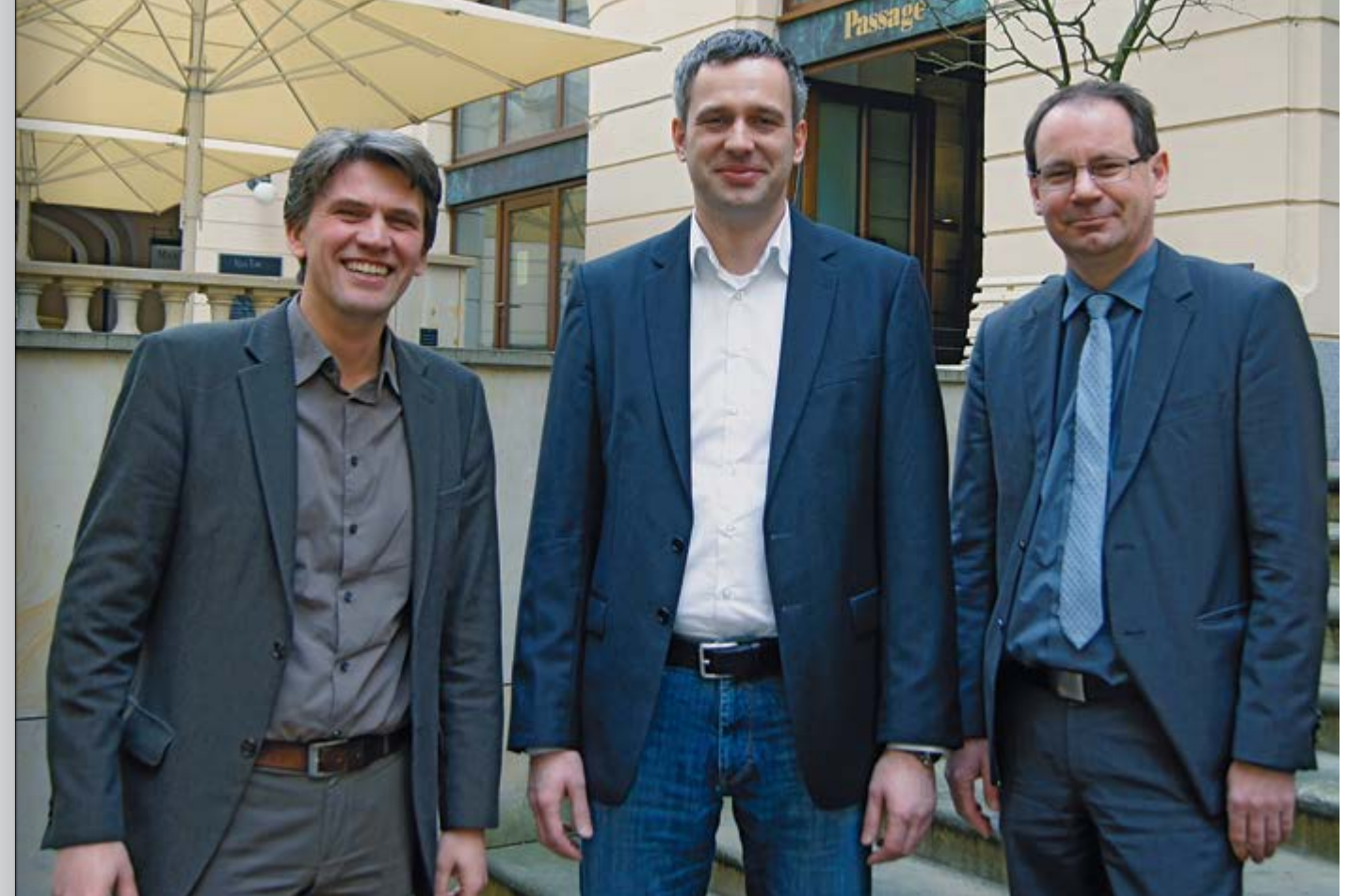
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Testimonials from circuit board manufacturers:

Quality management officer: "Having transparent information about energy use is a key prerequisite for introducing ISO 50001. We also require a good concept and a software program tailored to our needs. We have found both of these and are fully prepared for the next few years. Following monitoring, we are concentrating on analysis. A high degree of transparency is needed to allow conclusions to be drawn about causes and potential."

Technician from a media service: "The process of managing energy data always entails many changes and adjustments. I am now able to implement new measurement points very quickly and, most importantly, measure the bulk of energy consumption with virtual meters."

Technical manager: "Combining energy, manufacturing and order data is the only way to draw conclusions about how to improve the energy-efficiency of manufacturing processes. In this way, we are able to improve and optimize our processes on an ongoing basis, which saves on costs. The key thing is to put energy-efficient measures into practice in all departments throughout the company. This software helps us do so, as it allows all employees to work with the system, be they works managers, controllers or technicians."



JProf. Dr. Lutz Maicher, Sven Bergmann and Prof. Dr. Thomas Bruckner (ltr.).

...so the possibilities of EPVI have not yet been exhausted?

Bruckner: By no means. There are many different ways of distributing the load, that is, actual energy consumption, more effectively in the manufacturing industry. So far, this potential has been exploited primarily to reduce peak loads. In future, there will also be a focus on using demand-response measures as regular buffers to improve the use of renewable energies.

How much interest is there in EPVI on the German and international markets?

Bergmann: The level of interest among enterprises is very high as a result of economic pressure and due to the legislative requirements of Germany's Renewable Energy Act (EGG). In setting the energy saving targets, Germany is leading the way on this issue internationally.

Bruckner: Efficient data management allows flexibility potential to be pooled and sold on the balancing energy markets. EPVI allows enterprises to tap this potential for their manufacturing processes and to save on valuable resources.

How is cooperation between ccc software and the Fraunhofer Center Leipzig being continued?

Bergmann: There is additional potential to be leveraged by promoting the circulation of information between energy producers, network operators and consumers. We intend to work with the Fraunhofer Center Leipzig to address these forward-looking topics and develop technologies for the future.



Sven Bergmann, Division Manager Industriesoftware, ccc software gmbh: "We offer industry ventures and corporations a design solution to make finishing processes energy efficient."



Investing in young professionals and technologies promotes environmental awareness ■

Claudia Domel has been working as a research fellow at the Leipzig Fraunhofer Center since 2007. Since 2009, she has been responsible for the international funding activities of the German Federal Environmental Foundation (DBU) in Central and Eastern Europe as its Special Representative for the region. Domel's research work also focuses on developing networks for environmental technology and knowledge transfer in this area.

Ms. Domel, what are the tasks and challenges in the region for which you are responsible as DBU's Special Representative?

I am responsible for the Baltic states, for Kaliningrad and for Bulgaria, Romania and the former Yugoslav countries. While these countries span a very large geographical area, they approach environmental issues in a similar way. Environmental conservation has taken a back seat as all these nations grapple with economic problems. The challenge is to show that, far from being a "luxury issue", environmental conservation is essential to maintaining and improving our health and quality of life. Environmental conservation does not only incur costs, but can also deliver savings for businesses and municipalities, for example through the use of resource-efficient technologies. In this context, we are working with a range of institutions in the target region, seeking to use start-up financing and bilateral cooperation to introduce innovative environmental technologies and a specialist knowledge transfer. Investment in young professionals is a key factor here.

Environmental awareness cannot be taken for granted; rather, it must be fostered.

Which one of the environmental projects that you have supported in recent years remains most vivid in your memory?

There are a lot of very good projects the DBU funded in Central and Eastern Europe. One project that I remember as a truly European experience with participants from all the Balkan countries was particularly helpful in avoiding mistakes that were made in the former GDR after the fall of the wall. EU regulations require all countries to connect their municipalities up to a sewage network. Some planners and sewage system builders are pursuing their own interests, using EU funding to build massive sewage works, even in places where there is no apparent demand. Smaller scale, local sewage plants are more cost-effective for smaller communities and easier for them to run. Because many decision-makers in the municipalities were overwhelmed by the decision, we concentrated our project work on knowledge transfer, put together

a handbook and trained engineers in the specialist planning of treatment works to enable them to pass on their knowledge to their own countries.

Your work as a research fellow at the Leipzig Fraunhofer Center also entails project activities in Central and Eastern European countries. What project experience has been particularly helpful to you in your work as the DBU's Special Representative?

I have worked on environmental issues at the Leipzig Fraunhofer Center from the outset, that is, since 2007. Of course, conducting a great deal of research and numerous analyses in the environmental field and collaborating on an ongoing basis with specialist institutions in the target countries as part of several projects is helpful in developing knowledge. Consequently, my DBU colleagues consult me on many matters concerning the environment, the innovative components of project applications, the relevance and expertise of project partners, options for placing project results on a sustainable footing in these countries, and the potential impact of these results in these nations.

How is the Leipzig Fraunhofer Center supporting you in your work as the DBU's Special Representative?

Working on projects and engaging in dialogue with colleagues at the institute never fails to provide me with fresh impetus for my role at the DBU. I also find it very helpful to be able to work with the scientific sources and databases of the Fraunhofer-Gesellschaft and last but not least have the structure and generous support of our administrative team behind me whenever I need to make travel arrangements or deal with issues in projects. Most of all, I appreciate the working relationship I have with my three research assistants, who originally come from South-Eastern Europe or have close relations with those countries. In addition to supporting me with sound research, they afford me personal access to the cultures and unique features of their home countries.



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