Steinbeis

TRANSFER

10 YEARS

CONGRATULATIONS.

CELEBRATING
10 YEARS
STEINBEIS CENTRE
FOR TECHNOLOGY
TRANSFER INDIA.

02 | 2019

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PUBLICATION DETAILS

Congratulations. Celebrating 10 years Steinbeis Centre for Technology Transfer India.

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Photos and images:
Unless stated otherwise, photos and images were provided by Steinbeis Enterprises and project partners named in the text.

The platform provided by Steinbeis makes us a reliable partner for company startups and projects. We provide support to people and organizations, not only in science and academia, but also in business. Our aim is to leverage the know-how derived from research, development, consulting, and training projects and to transfer this knowledge into application – with a clear focus on entrepreneurial practice. Over 2,000 business enterprises have already been founded on the back of the Steinbeis platform. The outcome? A network spanning over 6,000 experts in approximately 1,100 business enterprises – working on projects with more than 10,000 clients every year. Our network provides professional support to enterprises and employees in acquiring competence, thus securing success in the face of competition.

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STEINBEIS PROJECTS & PUBLICATIONS 2009 – 2019

CONGRATULATIONS. CELEBRATING 10 YEARS STEINBEIS CENTRE FOR TECHNOLOGY TRANSFER INDIA.

STEINBEIS CENTRE FOR TECHNOLOGY TRANSFER INDIA
10 YEARS OF SUCCESS AND MORE

Steinbeis Centre for Technology Transfer India

Today, Steinbeis experts play an active role in regional economies throughout Germany but also internationally. We establish Steinbeis partner enterprises across the globe to tap into promising foreign markets. Our local contacts know the lay of the land, the needs of customers, the country-specific idiosyncrasies – ideal prerequisites for competent technology transfer abroad.

For ten years now, the Steinbeis Centre for Technology Transfer India has been our competent partner in the promising and growing Indian market. On this anniversary we congratulate cordially. The experts at the Centre support SMEs on site in the use of innovative technologies to improve existing services and products. Companies can thus expand their range of products and services and open up new markets. In addition to technological consulting, the Steinbeis Centre's portfolio also includes applied research and development as well as training and certification.

The development of Steinbeis India shows impressively that this range of services meets the needs of the markets. Since 2009, Vineet Kumar Goyal has significantly initiated and supported the establishment of further Steinbeis companies in various other locations in India with their own specialisations. The foundation of a new enterprise is preceded by gaining several years of consulting experience together with the experts at Steinbeis Centre for Technology Transfer India.

On the following pages you will find special contributions of Vineet Kumar Goyal and colleagues, who have accompanied him the last 10 years, and a kaleidoscope of all publications of the Steinbeis Centre for Technology Transfer India in our Steinbeis media. By doing this, we would like to express our special thanks and respect for the work of the Centre and its people.

We wish Vineet Kumar Goyal and our colleagues at the Steinbeis Centre for Technology Transfer India the continuing passion, commitment and competence to continue to implement the core idea of the Steinbeis Group for our customers and partners and for themselves so successfully as hitherto: Steinbeis. Transfer Visions into Business!

Prof. Dr. Michael Auer Manfred Mattulat
Steinbeis Foundation Board

PART I

A HISTORICAL OUTLINE OF STEINBEIS INDIA

BY JAN E. BANDERA

A HISTORICAL OUTLINE OF STEINBEIS INDIA
LEAD BY VINEET KUMAR GOYAL

Today we celebrate the tenth Anniversary of Steinbeis India. This is a good reason to outline its history, which is strongly connected to its founder, Vineet Kumar Goyal, who qualified as an electrical engineer and has an executive master's in international business. Even before setting up the Steinbeis Centre for Technology Transfer India, Vineet Kumar Goyal had been able to look back on 15 years of experience in industry.

This story actually starts a number of years earlier, when Vineet Kumar Goyal worked as a senior counselor at CII, the Confederation of Indian Industries in Delhi. Drawing on his industrial experience after working in several fields of industry, with included positions as an engineer and business executive, the position at the CII offered him certain perspectives at an intermediary level – from a Business Membership Organization.

In the late nineties and early 2000s, the CII began to develop an interest in international models of technology transfer. It invited a group of experts from the CII and several government bodies (Technology Development Board, Ministry of Science and Technology, Government of India) to go on a study tour to learn about the Steinbeis model in Stuttgart, Germany.

By 2004, having set up a handful of CII-TDB Technology Transfer Centers within several institutions, the technology transfer network was facing the challenge of becoming more active in the areas of overlap between industry and the institutes. It was then that Vineet Kumar Goyal was given the task of managing the CII-TDB Technology Transfer Network. Over the next two years, he successfully expanded the network to 30 centers, spanning a variety of disciplines and institutions in India, and also focusing on establishing closer collaboration with industry at the centers.

In April 2006, Vineet Kumar Goyal moved with his family to Hyderabad in order to go back to a "secure job" in industry. But he never forgot about his experience with the networks between industry and the institutes, for which he had developed a passion. He still felt strongly about making the concept a success in the Indian academic and industrial ecosystem.

In 2008, he got back in touch with Steinbeis when weighing up the possibility of closer collaboration. He was particularly interested in assessing the potential of starting a career as an entrepreneur and consultant himself under the umbrella of Steinbeis. His focus, however, would be on the Indian market.

This process of finding out more about the philosophy and working methodology of Steinbeis lasted almost two years. At the same time, Vineet Kumar Goyal prepared for his new venture as a consultant. Finally, in 2009 he formally applied to our Steinbeis headquarters for a franchise agreement. This laid the foundations for our anniversary today.

STEINBEIS CENTER FOR TECHNOLOGY TRANSFER INDIA

The Steinbeis Center for Technology Transfer India (SCTI) was founded earlier this year in the Indian city of Hyderabad. The center, based on a partnership with research provider 2E Knowledge Ventures Pvt Ltd, aims to promote an environment for technology development, technology transfer and the implementation of innovations through technical bodies and research institutions. (Source: Steinbeis Transfer Magazine 3/2009)

The underlying philosophy of the franchise agreement with Steinbeis is to facilitate domestic/national operations following the example of Steinbeis in Germany. Over the past 35 years, Steinbeis has established a self-sustainable and diversified commercial market for "new" technology services. This market, based on the expertise of university professors and researchers, addresses the needs of small and medium-sized enterprises. It still also allows Steinbeis to work entirely without government subsidies. It has shown that cooperation between industry and universities can be stimulated through a simple, efficient, and demand-oriented system of technology transfer.

In the spirit of the franchise agreement, Vineet Kumar Goyal focused his efforts on establishing a network of specialized Transfer Centers at a variety of universities in India. During the first five years, Steinbeis India signed up a variety of institutions and experts with the aim of setting up a network of over 20 centers in India. The most noteworthy centers are the Steinbeis Solar Research Centre in Chennai, the Steinbeis Centre for Renewable Energy Technologies and Knowledge Transfer in Manipur, the Steinbeis Centre for Automotive Technologies Chitkara University in Chandigarh, the Steinbeis-AIT Centre for Technology Transfer, the Ansal Institute of Technology in Gurgaon, the Steinbeis CLIK Centre for Technology and Innovation, the Consortium of Electronics Industry of Karnataka, the Steinbeis-IamSME Centre for Technology and Innovation, the Integrated Association of Micro, Small & Medium Enterprises (IamSMEofIndia) in Faridabad, the Steinbeis IAU Centre for Technology & Innovation, and the Industry Association of Uttarakhand, Dehradun. One of the most recently established centers is the Steinbeis Centre for Smart Urban Mobility at the National Institute of Technology in Warangal.

Visit to India of former Steinbeis Chairman Prof. Dr. Heinz Trasch in 2009

HISTORICAL OUTLINE OF STEINBEIS INDIA BY JAN E. BANDERA

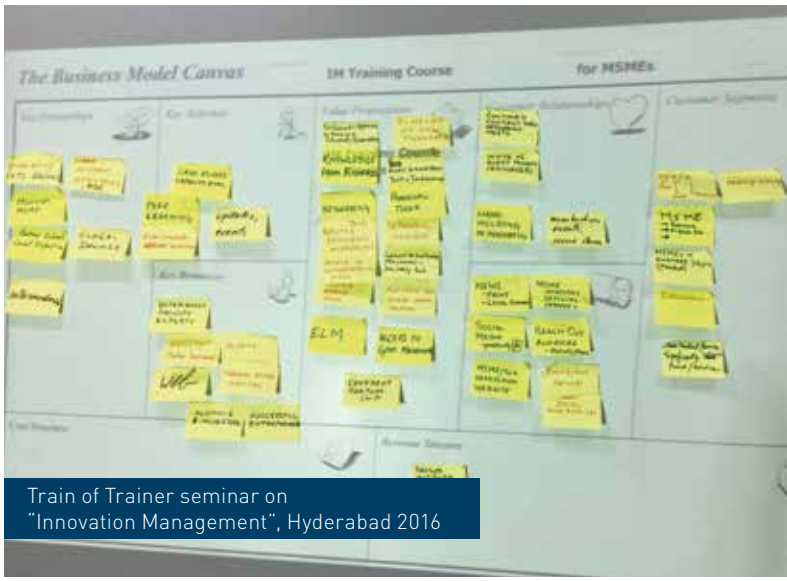
We had several occasions over the past ten years to maintain and hone our close relationship, either in the course of project work or during the annual Steinbeis Day, an event aimed at strengthening ties within the Steinbeis Network. Steinbeis's first visit to India took place in 2009, when the former Steinbeis Chairman Prof. Dr. Heinz Trasch visited India in November and participated in a seminar on industry-institute interaction (Business Leadership thru Collaborative Innovation).

Prof. Dr. Michael Auer, the present Chairman of Steinbeis GmbH & Co. KG für Technologietransfer, made the next visit of a senior Steinbeis official to India in August 2015. During this visit, Michael Auer met senior government officials from the Ministry of Science and Technology, Dr. A. Chakraborty, Director of the Indo-German Science and Technology Centre, senior officials from the German Development Agency GIZ India, the director of MSME Development Institute in Okhla and the chairman-cum-managing director of the National Small Industries Corporation. He also had the opportunity to address students at GL Bajaj Institute of Technology at Noida.

The partnership between Steinbeis India and Germany is characterized first of all by requests for certain specialists from Germany with industry experience. During the past years, several Steinbeis experts have been invited to run seminars and training courses in India, or receive groups on study visits to Germany. These include study groups from the Automotive Research Association of India (ARAI), who visited the Steinbeis Automotive Centre at Esslingen University, plus a UNIDO group visit and a training course on product development and manufacturing at the Steinbeis Headquarters in Stuttgart. Aside from this, a number of Steinbeis experts from Germany have been involved in training and seminars in fields such as innovation management, surface coatings and metallurgy, the IoT and embedded electronics, renewable energy, automotive electronics and automotive sensors, and advanced machine tools.

With respect to some of the B2B projects, we are particularly delighted to give mention to a successful joint venture called ANU-Smart Power Systems India Pvt. Ltd. (ASPIN), which was set up by SCTI in Bangalore in 2012 as part of a partnership between an Indian enter-

Study Tour of Automotive Research Association of India (ARAI) to Stuttgart in 2010



Train of Trainer seminar on "Innovation Management", Hyderabad 2016

prise and the Karlsruhe-based company Smart Energy-systems International AG. The JV revolves around the field of hybrid solar inverters.

Another interesting field of work between our two institutions is public-funded transnational projects in the area of collaborative development. Here we would like to mention a one-year project funded by the German Society for International Cooperation (GIZ GmbH). Together with four selected leading Indian business schools, we developed and ran training programs on innovation management based on the concept of "train the trainer." The target group benefiting from the two training programs were micro, small and medium sized enterprises (MSMEs) and intermediary organizations such as business membership organizations. This is a typical example of a project with an excellent scaling-up potential.

Ten years of Steinbeis India have resulted in a valuable treasure trove of experience, reference projects, and of course mutual trust. We look forward to tapping into this important source of intellectual equity in the increasing number of important projects that are now being looked into.

JAN E. BANDERA

Jan E. Bandera is director of the Steinbeis Transfer Centre Economic and Technology-Policy Dialogue.

Working in collaboration not only with partners in the Steinbeis Network but also with transfer partners outside Germany, the centre offers consulting and project management services, concentrating on areas like Turkey, India, Latin America, South Africa, Malaysia, and Georgia.

Execution of the Join Venture contract of ANU-Smart Power Systems India Pvt. Ltd. (ASPIN), in Bangalore in 2012

PART I

A DECADE OF SERVICES IN INDIAN MARKET

BY VINEET KUMAR GOYAL

BY VINEET KUMAR GOYAL

STEINBEIS CENTRE FOR TECHNOLOGY TRANSFER INDIA
A DECADE OF SERVICES IN INDIAN MARKET

THE INDIAN SCENARIO

India today offers ample opportunities for international business. Its thriving demography of working age youth, political stability and fast growing economy create a combination which no business should ignore.

Some of the noteworthy government projects and incentives are as follows:

- SAGARMALA PROJECT:
  The project includes modernization of ports, setting up of coastal economic zones, new major ports and fish harbours. Capital outlay of USD 10 billion (Ministry of Shipping).
- AMRUT:
  Its aim is to recast urban landscape and make urban centres more liveable and inclusive. Capital outlay of USD 7.69 billion.
- ROADS & HIGHWAYS:
  Development of about 7,000 km of national highways under Bharatmala Pariyojana. Capital outlay of USD 12 billion.
- RAILWAYS:
  Dedicated freight corridor for decongesting existing network. Capital outlay of USD 12.3 billion.
- SWACHH BHARAT ABHIYAN, OR THE CLEAN INDIA MOVEMENT
  was launched in October 2014 as a campaign to clean the streets and infrastructures of India. It is India's largest ever initiative in this area. Its objective is the elimination of open defecation, modern and scientific municipal solid waste management and capacity augmentation for local ULB's (Urban Local Bodies). The total cost of implementation of this initiative is INR 62,009 crores (approx. EUR 9 billion).
- CLEAN GANGES:
  Modi has given strong support to the rejuvenation of the Ganges river, putting the National Ganga Council under his direct chairmanship and pushing forward initiatives to improve the quality and environment of what is today one of the heaviest polluted rivers in the world. In addition to the Ganges project, other rivers like the Yamuna are high on the radar.
- SMART CITIES:
  India's Smart Cities Mission, which was launched in 2015, aims to foster sustainable and citizen-friendly urban development in the country, through an initiative called 100 Smart Cities. One of the main reasons for this massive project was to alleviate the metropolises and make other cities more liveable with good job opportunities. Some financing will come from the central government and states, the rest from development banks, public-private partnerships, etc. In addition to the 100 Smart Cities, there are several cities with big aspirations and the desire to implement smart solutions, Smart Port cities coming up, as well as various private cities for which the developers are looking for smart solutions.

Other government initiatives that Steinbeis India is partaking in include Make in India, which was launched by Prime Minister Modi in 2014 with the goal to transform India into a global design and manufacturing hub; Skill India, which aims to improve technical training on a large scale to provide the cutting-edge industries fostered by Make in India with the manpower they need; and Digital India, whose official objective is to "transform India into a digitally empowered society and knowledge economy" through digital infrastructures, e-services and citizens' education.

STEINBEIS INDIA

In line with the priorities of the growing nation, Steinbeis India focus is on providing Innovation Services to Small and Medium Enterprises (SMEs). Often SMEs do not have the manpower and resources to network with the proven Technology providers in India and abroad by scouting internationally. Technology Scouting and Technology

Transfer and Innovation (management) is a complex process which involves understanding of technology, socio-political issues, political and economic issues and lastly HR issues. SMEs are provided a one stop solution by aggregating various services- scouting for technology, being a point of contact with technology providers and where necessary and a platform to negotiate with Indian and Foreign firms / Institutions on business terms.

Our Focus areas are:

1. Renewable Energy (Focus Solar PV)
2. Automotive Electronics
3. Manufacturing (Process/Product)
4. Waste to Energy
5. Urban Mobility/Transport Planning and Engineering
6. Automation and Robotics
7. Technology and Innovation Management
8. Setting-up Technology/Innovation Centres with Academic/Research Institutions/Industry Associations
9. Setting-up State Innovation Networks

Steinbeis India has established its own network partners nationally and internationally. This has enabled us to offer expertise to clients even from countries that do not have Steinbeis Centres and connect with technology providers who may meet the peculiar requirements of Indian clients in terms of type of technology, pricing and other measures of technology transfer. We also have our own network of consultants in India, who are specialized in various fields and who are located in various cities in India.

Over the course of our existence since 2009, we have also established a Steinbeis India Network in various other locations in India, and just like in Germany, with their own specialisations. Indeed, we encourage our consultants to set up their own Centre after gaining a few years of experience of consulting with us.

The most successful of these offshoots is the Steinbeis Solar Research Centre in Chennai, which has been involved in technology development, Project Consulting and Training in Solar PV Centres.

Some of the other Centres of Steinbeis India network are:

1. Steinbeis Centre of Excellence in Smart Urban Mobility Technologies, National Institute of Technology Warangal
2. Steinbeis Centre for Renewable Energy Technologies and Knowledge Transfer, North-East India, Manipur
3. Steinbeis Automotive Innovation Centre, Chitkara University Chandigarh
4. Steinbeis Centre for International Business Management, Jagran Lakecity University, Bhopal
5. Steinbeis Centre for Technology & Innovation, Consortium of Electronics Industries of Karnataka
6. Steinbeis Centre for Technology & Innovation, Bhopal with Govindpura Industrial Association
7. Steinbeis Centre for Technology & Innovation, Faridabad with Integrated Association for Small and Medium Enterprises
8. Steinbeis Centre for Technology & Innovation, with Industry Association of Uttarakhand, Dehradun
9. Steinbeis Centre for Technology and Innovation, Ansal Institute of Technology, Gurugram
10. Steinbeis Academy for Advanced Technology Training and Entrepreneurship, Hyderabad

Steinbeis India also operates the Steinbeis Academy for Advanced Technical Training & Entrepreneurship. The Steinbeis Academy delivers two-pronged services in Solar Training to youth as well as Technology Assistance & Transfer to Small businesses in India.

Over the last 10 years Steinbeis Academy has trained more than 2,000 Engineers in Solar PV, Automation, Robotics, Product Design, Manufacturing and Automotive Technologies.

A DECADE OF SERVICES IN INDIAN MARKET

BY VINEET KUMAR GOYAL

HISTORY

Steinbeis India has its origin in the year 2009 with Vineet Kumar Goyal setting up 2E Knowledge Ventures Private Limited, for training of youth, to turn them into Professional Solar Engineers, and providing Consulting Services for Technology Transfer to Small and Medium Scale Enterprise.

On one hand, this was to go a long way in making youth employable and getting them jobs in a rapidly expanding solar and manufacturing sectors, on the other hands it was to support Indian Industry in the areas of Technical Consulting, Transfer and Executive Trainings.

Based on his long years of professional experience, including spending 6 years at the Confederation of Indian Industry (CII), Vineet Kumar Goyal noticed the difficulties that Small and Medium enterprises (SMEs) of India had in procuring appropriate technology for their expansion and for reducing costs.

Having seen the Steinbeis model work successfully in Germany in uplifting SMEs there, and leveraging his degree in International business, from the Indian Institute of Foreign Trade (IIFT), Vineet Kumar Goyal decided to take up its affiliation for India. The Steinbeis Centre for Technology Transfer India was thus set up and became the official representative of the Steinbeis network in India.

In keeping with the objectives of the Steinbeis Network, Steinbeis India too connects Industry with Academia, enables Professors and Inventors to promote their technology, brings in Technology from Germany and internationally, to entrepreneurs in India and gives a platform for consultants to deliver their services in a recognized manner.

Steinbeis India team comprises of twenty professionals from Graduates to Doctorates working in various areas as Subject Matter Experts, Business Managers, Recruitment, HR and Placement Experts, Digital Media and Marketing Specialists and handling National and International Accounting.

TRAINING PROGRAMS

As a unit of 2E Knowledge Ventures Pvt Ltd., Steinbeis Academy is today one of the most reputed Training Centres for Engineers in India. It is a European Energy Centre (UK) approved Centre of Excellence and is also a National Level Training Organization under Jawaharlal Nehru National Solar Mission (JNNSM) & Solar Energy Training Network (SETNET), approved by Ministry of New & Renewable Energy of India (MNRE), and National Institute of Solar Energy (NISE). We are also a Training Partner of National Skill Development Corporation of India (NSDC) through Electronics Skill Sector Council of India, and also approved as a training partner from Telangana Academy of Skills and Knowledge (TASK).

Since 2017, it has extended its services from simply training students to getting them placed as well. Indeed it now offers placement along with training in the same monetary package, because of its network and recognition of its brand among solar companies. Its recognition now extends beyond Hyderabad from where it would conduct its training programs.

Now, using help from associates, institutions and other organizations such as National Small Industries Corporation (NSIC), it has even started to deliver training programs in other parts of the country.

Our training portfolio comprises of:

A. Enhancing Engineers Employability (E-Cube) – for fresh engineers to gain expertise in key technical and management areas helping them for employment in some of the best Indian and Multinational Companies.

B. Working Professionals Proficiency Program (WP3) – for working Professionals who want to enhance their skills in the given technical and management areas, or who are looking for a lateral shift in their mid-career to get into new technical areas.

C. Technician Training Programs (TTP) – for Skilling at the Technicians (shop-floor) level.

TECHNOLOGICAL ASSISTANCE TO SMALL BUSINESSES

Small and Medium enterprises were identified by Steinbeis India early on as the vulnerable segment of Indian Industry, but at the same time holding the greatest potential for growth. It was then decided that the company would become a part of their growth story by assisting in their growth.

It services to Industry could be classified under the following heads:

a) Technology Research & Development
b) Technology Scouting and Promotion
c) Technology Evaluation & Preparing Expert Reports
d) Technical Consulting

Under these categories, the company has been able to give its services to a variety of industry segments, especially in Electrical, Solar, Industrial Engineering and Automobile Technology.

The smallest has ranged from doing a secondary market survey for Rice Bran derived products for a food processing company to doing providing Technological hand holding support to a client to set up a Megawatt (MW) size Waste to Energy plant.

A lot of this has been possible not just due to the Steinbeis Network, but also due to its own Technology partners in a diverse range of fields. Today Steinbeis India has its partners in North America, Hungary, Russia, South Korea, Taiwan, China, Singapore, Australia and Sri Lanka. Today the company welcomes the requirements of any Indian company in any industry segment who may want its assistance in scouting for technology.

SOME OF OUR PARTNERS

1. GEO CAPITA UK
For Technology Transfer, Financing and taking advantage of the Carbon Credits under Paris Accord for Clean Technology and Green Energy Projects.

2. LC INNOCONSULT INTERNATIONAL, HUNGARY
For Technology Transfer between Hungary and UK

3. INDO-EURO SYNCRONISATION, GERMANY
For Technology and Trainings in Industrial Robotics

4. EUROPEAN ENERGY CENTRE
For Consulting and Training in Renewable Energy and Energy Efficiency

5. QCC LTD. CHINA / TAIWAN
for Solar PV, LED Streetlight etc. technologies.

6. YET2.COM
Open Innovation Global Network based in USA

7. 360IP SINGAPORE
For Technology Scouting and Transfer from Singapore and China

8. DELTA TECH KOREA
For Technologies from Korea

In addition to all the above, the company also helps inventors, researchers and professors by assessing their inventions and getting them in contact with the correct party in India or internationally to successfully capitalize on their achievement and/or scale up their venture.

A DECADE OF SERVICES IN INDIAN MARKET

BY VINEET KUMAR GOYAL

SUCCESS: TECHNOLOGY EVALUATION

Steinbeis India assisted an entrepreneur who was running a 7.5MW biomass based power plant using various types of wood and agricultural wastes. The entrepreneur proposed to grow napier grass and use it directly in the boiler to generate bio-gas and burn the same in the boiler for generation of steam. Based on the techno-economic feasibility study done by Steinbeis India, the entrepreneur made an informed decision.

SUCCESS: RESEARCH REPORTS

In 2017, one of our clients wanted a study to be performed to gauge the market demand for chemicals extracted from Rice Bran Oil. He was a food processing company who was considering expanding production into this segment, and wanted a report from us to help take a decision. We successfully gave him the report, based on secondary research which illustrated the uses, opportunities and challenges. It helped the client to make an informed decision on business expansion.

Steinbeis in partnership with European Business and Technology Centre (EBTC – a project co-funded by European Commission and Euro Chambres) developed a report on "Holistic Mobility Solutions for Indian Cities" which focused on short-term solutions (Quick-Wins) and long-term solutions for enhancing mobility of select Indian cities (Chandigarh and Gurgaon) as a case-study, while mapping solutions from some of the leading European cities.

SUCCESS: TECHNOLOGY DEVELOPMENT

Battery Management System

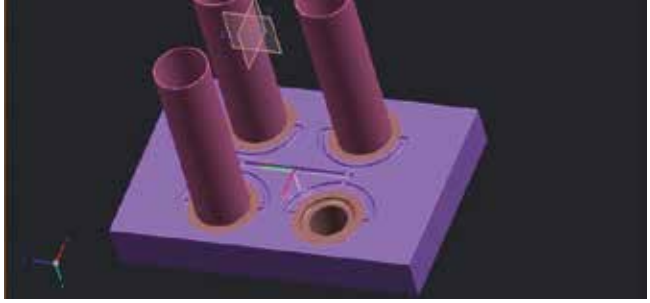
GRIET-Steinbeis Centre at Hyderabad in India closely worked with a battery manufacturing company to develop a battery management system for Telecom and Solar Applications. This system is quite important for the maintenance and upkeep of batteries in renewable energy (domestic) applications, where the batteries often lose performance and life owing to customer ignorance on the upkeep of batteries.

SUCCESS: TECHNOLOGY TRANSFER

Steinbeis India supported the transfer of Solar PV Inverters Technology from Germany to India. The transfer involved the establishment of a Joint Venture between a German company owning the IP rights of Solar Hybrid Inverter and an Indian SME (Small Scale Industry) in the field of Solar PV. The German company is a small company which transferred the know-how to the Indian company for manufacturing and selling the solar hybrid inverters in India.

SUCCESS: TECHNICAL CONSULTING

Steinbeis India was involved in the Hyderabad Megacity Project implemented by Humboldt University Berlin (HUB) as a part of the Sustainable Megacities Project sponsored by German Federal Ministry of Education and Research in many cities across the world. The HUB researchers spent a considerable amount of time studying the usage pattern and practices of thousands of farmers who are dependent on bore-wells for watering their fields. They have also networked with scores of NGO's, local politicians, local bodies, electric supply utilities, associations, technical consulting organizations and industry to arrive at a model for implementing a technical yet sustainable solution for betterment of motor & pump-set usage by the farmers. The result was a very holistic yet simple solution of implementing capacitors by all farmers in the selected feeders. The difference here is that of educating and informing the farmers of the benefits if all the farmers in a single feeder use the capacitors directly installed on the pump-sets – which is a very low-cost option (that is why high-end options like Automatic Power-Factor Controllers were rejected after a full-study). This not only resulted in better efficiency, but also benefitted the farmers by low burn-out rate of the motors and the resultant savings. The project also envisaged making a small cooperative for the farmers, to undertake the maintenance and upkeep of the capacitors – to make the solution sustainable in the long-run.



PROCESS UPGRADATION PROJECT EXAMPLES

- Improvement of Mould and Process Design for Industries having Plastics Injection Moulding in Faridabad.
- Common Coolant & Chip Handling System for CNC Machines for Auto-Component Manufacturers in Gurgaon
- Process Technology Improvements and application – Supply Chain Management Technology – Implementation & System Set-up

CLEAN TECHNOLOGY

Clean Technology has been the strong point of the company. The company has been able to successfully provide technical assistance in Solar Power, including in high end technology such as the Solar Inverters. Various companies large and small have received good offers from Steinbeis India which the company has been able to offer through its consultants as well as its technology partners in Germany, China and elsewhere.

Over the recent course of years, however, a lot of the consulting focus on Clean Technology has been on Waste-to-Energy. With the market for the traditional sources of Renewable Energy such as Solar and Wind already full with many market players, the company was keen in looking at more emerging streams. It was then noticed that Waste Management was becoming an increasingly difficult issue in India.

Taking cognizance of this issue, the central government launched the Swachh Bharat Abhiyan (Clean India Mission) and mandated that every Urban Local Body in India was to set up its own Waste to Energy plant to alleviate the pressure on overflowing landfills.

Steinbeis India then began to leverage its partners in Germany, France and elsewhere to provide Technical Consulting services to companies which had won tenders to set up Waste to Energy plants. It was a long and uneven road from 2016, two companies which had won tenders to set up plants in Andhra Pradesh had shown a positive response to Steinbeis India's outreach efforts.

The deal came to fruition with one of those companies signed up with it in 2018 for setting up its first plant in Bangalore. With its brand name growing in the Indian market as one of the only companies specializing in Waste to Energy know-how, the company began to get increasing numbers of enquiries from individuals and organizations for training in Waste to Energy. Responding to this demand and confident of its own experience, the company formally launched training services in Waste to Energy in February, 2018.

Aside from Waste to Energy and Solar, the company has also dealt with wastewater treatment technology and is gradually launching its services in Sustainable Urban Mobility. The project in wastewater treatment took place over the course of 2016-17 when it had teamed up with a company in Singapore to provide an Asian Development Bank (ADB) approved effluent treatment technology to a company in Bangalore. This company wanted to use the technology for a project in Colombia (South America).

SUCCESS:

In 2017, we procured wastewater treatment technology from a company in Singapore as part of an Asian Development Bank (ADB) supported scheme to enhance the preservation of waterways and as a result give better treatment to the sewage discharged from industries in India.

FUTURE EXPANSION

Steinbeis India is involved with a German Company under a Indo-German Project to organise 29 solar training programs across 6 states of India involving trainings of Electricity Distribution Company Officials, Solar Energy Corporation of India-Inspectors, Solar Master Trainers Certified by Sector Skill Council and State Nodal Agencies for Renewal Energy.

VINEET KUMAR GOYAL

Vineet Kumar Goyal is director of the Steinbeis Centre for Technology Transfer India and offers Indian companies technology consulting, technology transfer, applied research and development, and the development of training courses and continuing professional development programs.

PART I

“INDIA IS AND WILL REMAIN AN IMPORTANT FUTURE MARKET” BY UWE HAUG

"INDIA IS AND WILL REMAIN AN IMPORTANT FUTURE MARKET"

INTERVIEW WITH UWE HAUG, DIRECTOR STEINBEIS INTERNATIONAL

Mr. Haug, Steinbeis has been active in India for over 20 years. How has the economy in the country developed during this time and what are the possibilities for Steinbeis?

In these more than 20 years, not only the Indian economy, but also the entire global economic interdependence has changed rapidly. When India began to liberalize in 1991, initiated by the World Bank/IMF, and thus opening up to the world market, German companies also began to euphoria. However, these reforms faltered in 1993. Nevertheless, in February 1995 Steinbeis signed a „Memorandum of Understanding" with the „Confederation of Indian Industry", the Indian Industry Association. This resulted in a long-term partnership cooperation. In the mid-nineties, especially as a result of the rise of China, investments by German companies in India declined, so that the necessary services provided by Steinbeis were also declining in India. However, in the last 5-10 years India has become more attractive again. This also has to do with the reforms now being implemented in India. For Steinbeis, this opens up opportunities to build new approaches with potent partners in India.

The Indian market offers many opportunities for German SMEs, but it also carries risks. What do companies need to consider?

India is and will remain an important future market. Attractive for foreign investment makes the subcontinent with its 1.3 billion inhabitants the size of its potential sales market. In addition, there is the high level of economic growth, a growing, consumer-friendly middle class and still a low level of market saturation. Despite these opportunities, there are also many challenges. These include, for example, regulatory uncertainty, a lot of bureaucracy, inadequate infrastructure and poor job opportunities for the young and rapidly growing population. German companies operating in India with a subsidiary or other form of liaison office should think carefully about how to manage this legal entity. The administrative work includes especially bookkeeping and accounting, as well as the personnel cost allocation. But tax planning and settlement, reporting and payments to the Indian tax authorities and paying social security contributions are also critical compliance tasks. In addition, of course, a reporting and controlling for the India business must be set up in the home company in Germany itself. In order to determine the necessary information, appropriate „fact finding tours" (locally!) are recommended. This allows companies to get a realistic picture of the market and the necessities for their specific needs.

What potential does India offer for research and development and what does that mean for German companies, especially SMEs?

Especially for the SMEs from the strong sectors in Baden-Württemberg, there are increasing opportunities: the automotive, pharmaceutical, mechanical engineering and IT industries are considered particularly interesting. Especially in the IT sector, India has had a good reputation for several years. For the German SMEs, this means that, as part of a local settlement, the safeguarding and qualification of local employees must be kept in mind at the same time. In terms of research and development, many larger companies have already set up corresponding research centers in

India. Here, it is important for SMEs to establish good cooperation and networks or to use existing ones in order to participate from the local generated know-how.

In your opinion, how will India's position in the global economy change in the future and what consequences will this development have for German companies?

India is still on a reform path. The current Modi government has undertaken major reforms in 2017: the devaluation of cash to combat tax evasion and corruption, and the standardization of value added tax. Other topics are: reform of the weak banking sector (especially state-owned banks), the reduction of bureaucratic hurdles, and the compensation of increasing social imbalances are key factors in India's overall stability. Regrettably, regulatory uncertainties are currently still a major barrier to foreign investment in India.

However, India has great potential in pursuing its reform path. It has a well-diversified economy and a well-developed services sector. For German companies this is an opportunity and a requirement at the same time. In addition to the development of the Indian market, it is also important to bring the social standards as well as the sustainability goals to the local production sites and to establish them locally. Especially SMEs, which often have family-run companies, have the chance to make a difference. Accordingly, a commitment in India should not be viewed solely from a business perspective. By setting up local operations there is also the opportunity to make a positive contribution, especially to the young, rising generation in India.

UWE HAUG

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He is centrally active as a corporate developer for Steinbeis companies. He also coordinates the international Steinbeis network and is part of the team of the Ferdinand Steinbeis Institute as project leader for Micro Testbeds.

PART II

STEINBEIS TRANSFER MAGAZINE

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The Steinbeis Magazine

Added value by bundling competencies

Molecule design for genetic therapy
Computer-aided nucleic acid design for therapy to treat type 2 Gaucher's disease

Schools for the rich, schools for the poor?
A Steinbeis study investigates school fees

Measuring and testing: an innovative approach
A system for measuring magnetic properties

03|2009

CONGRATULATIONS. CELEBRATING 10 YEARS STEINBEIS CENTRE FOR TECHNOLOGY TRANSFER INDIA.

Steinbeis Center for Technology Transfer India

The Steinbeis Center for Technology Transfer India (SCTI) was founded earlier this year in the Indian city of Hyderabad. The center, based on a partnership with research provider 2E Knowledge Ventures Pvt Ltd, aims to promote an environment for technology development, technology transfer and the implementation of innovations through technical bodies and research institutions.

The research and development environment in India is improving by the day, as organizations push ahead with innovation after innovation. The latest Global Competitiveness report confirms that India boasts a comparatively high proportion of researchers per head of population, as well as a significant number of research institutes. The Indian government offers a variety of support programs to promote research projects. As a result, India's competitive advantage is gradually shifting away from its former image as an outsourcing location for low-cost production – and the country is now increasingly respected for its high standards in technology and innovation. Indian technology centers are accelerating market-based research – and an increasing number of companies are turning to them as research partners.

At the moment, SCTI's primary aim is to forge links with potential partners and establish Steinbeis transfer centers in a variety of fields of expertise. Talks are already underway with the Indian Institute of Technology, the National Institute of Design, Delhi University and the International Institute of Information Technology. The SCTI is also already working with transfer centers based in Germany, and helping to establish partnership between German transfer centers and Indian enterprises.

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The Steinbeis Magazine

Nicely networked

Steinbeis on a local level
Our centers in the Neckar-Fils region

Help yourself
Steinbeis is partner in the Hyderabad Megacity project

Nice welding, laser!
Development of a groundbreaking laser welding process

Fits like a glove
Using smartphones to determine shoe size

03 | 2012

CONGRATULATIONS. CELEBRATING 10 YEARS STEINBEIS CENTRE FOR TECHNOLOGY TRANSFER INDIA.

Helping others to help themselves

Steinbeis signs on as partner to Hyderabad megacity project

"One of the biggest challenges facing newly industrializing countries like India is how to make full use of the benefits brought by economic development – for the good of the millions of people in the country who earn their living as simple farmers, or manual workers, or in similar ways," believes Vineet Kumar Goyal, director of the Steinbeis Center for Technology Transfer in India. Accordingly, developments that bring benefit to these people should not be limited to improvements in healthcare provision or living conditions, but better education, training, or employment opportunities. The Indian government has made some important steps forward with a variety of education projects. The Steinbeis Center for Technology Transfer in India is playing an active role in projects aimed at introducing modern technology to help people help themselves.

In every village, town and city in India there are people working or providing services on their own account in small shops, bakeries, barbershops or snack bars. They might be offering services such as train ticket reservations or electricity bill payments, for which they charge a small fee. Most entrepreneurs work in farming or as skilled craftsmen. They are crucial for the long-term development of the country, which is why it is all the more important for India to support these entrepreneurs and give everyone an equal opportunity to be part of the nation's rapid economic and technological development.

When Vineet Kumar Goyal talks about people empowerment, he is mainly referring to the introduction of modern technology. "Empowerment is not just about improving qualifications in themselves, it requires an environment which promotes development," he explains. Introducing new technologies can improve conditions for skilled craftsmen, living standards, the educational system but also lots of other areas. This was already India's experience with the telecommunications revolution ten years ago. Poorer people in rural areas, even people like rickshaw drivers and vegetable sellers, were given access to extremely cheap cell phone

technology, opening the door to telecommunication services. This resulted in improved development potential for millions of small business owners throughout the country.

The Hyderabad-based Steinbeis Center for Technology Transfer India is a team member of the Hyderabad Megacity Project (HMP). The idea behind the project is to support businesses that develop sustainability models aimed at reducing energy consumption. Central to the project is the need to involve the population and support individual citizens' initiatives, as people need to be made aware of the necessity of lifestyle changes. The project is being carried out on behalf of the German Federal Ministry of Education and Research (BMBF) and is being coordinated by researchers at Humboldt University in Berlin.

As part of his work on the project, Christian Kimmich, a researcher at Humboldt University, examined the usage patterns and working practices of thousands of farmers who depend on local wells to water their fields. The aim was to find a way to improve the energy efficiency of watering systems. Working in cooperation with non-governmental organizations (NGOs), local politicians, the authorities, electricity supply companies, trade associations, technical consulting organizations, and trade and industry, the goal was to implement a model aimed at improving the use of engines and pumps, based on sustainable technology. The result of the project was simple: The watering systems used by certain farmers are now equipped with power factor correction units (PFCs) fitted with capacitors. The project aims to form a small farmers' cooperative which would be responsible for coordinating the maintenance and fitting of PFC capacitors in the long term. A local NGO called the Self-Employed Welfare Society (SEWS) will ensure that farmers have access to the right information and can communicate with one another and exchange views. The Steinbeis Center for Technology Transfer India is providing technical expertise and making its experience available to others. Working alongside CWS Hyderabad, the Pune-based Prayas Energy Group, the Power Systems Research Center at IIIT Hyderabad and the social scientist Philip Kumar, the transfer center is helping SEWS and the collective electric supply society CESS with the setting up of the project, which would then be extended to other areas.

One project at the HMP is called Solar Powered Schools. Its main aim is to develop a sustainable and scalable model for introducing solar energy systems to schools. The Steinbeis Center for Technology Transfer India is supporting the project with consulting services. A number of schools with different financing models will be examined to pinpoint the requirements and possible approaches for introducing solar energy systems. The Nexus Institute from Germany already identified three schools for the project - Sri Aurobindo International School, which is mainly attended by middle-class children in Secunderabad, and Kallam Anji Reddy Vidyalaya - operated by Dr. Reddy Foundation - a school and hostel for the children of migrant city labourers in Hyderabad, and Meridien School - serving the children from higher income group people in the society. Phungmayo Horam of Humboldt University has already worked with school principals, former pupils and parents on funding models based on donations, voluntary support, state funding and saving schemes. The project managers would also welcome financial support from other project partners.

Vineet Kumar Goyal is convinced that the project will be sustainable, particularly given the social and technological nature of the project and the way both mutually dependent factors are being taken into consideration. His goal: Based on experiences with the Hyderabad Megacity Project, he would like to develop further models for implementing the concept in other regions of India.

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Succes as a network

Feature topic: Material and surface technology
Insights from the experts at Steinbeis

Solar energy for schools in India
Steinbeis supports pilot project

How competent is your company?
Steinbeis Company Competence check

HORIZON 2020
TRANSFER talks to Prof. Dr. Norbert Höptner

01 | 2014

CONGRATULATIONS. CELEBRATING 10 YEARS STEINBEIS CENTRE FOR TECHNOLOGY TRANSFER INDIA.

Successful project: photovoltaic installation at the Sri Aurobindo International School

Solar energy for schools in India

A pilot project looks into the possibilities of decentralized energy production

With a population of nearly 7 million, Hyderabad is the sixth largest metropolis in India. Located in the southern Indian state of Andhra Pradesh, this city is seeing continual growth in its population, primarily accelerated by a booming economy and an influx of people migrating from the countryside. As a result of these changes, the city has witnessed a sharp rise in demand for commercial energy, and, indirectly, energy consumption. Since this demand is met through conventional energy production, per capita emissions of green house gases are on the rise. The "Solar Schools" pilot project is part of a German–Indian research project called "sustainable Hyderabad." It was established to foster the sustainable development of the future megacity: Three secondary schools took part in the pilot study and installed solar photovoltaic (PV) systems on their school rooftops. The Steinbeis Centre for Technology Transfer India carried out the project together with its project partners.

The rising demand for energy has led to frequent power outages in Hyderabad in recent years and these blackouts have significantly affected teaching conditions in schools, particularly since key electronic devices such as computers, fans, and lighting systems need power to run. Yet Hyderabad enjoys lots of sunshine – anywhere from 5 to 5.5 kWh per day – and that means gaps in energy production can be filled, in part, through alternative sources. The solar project aimed to demonstrate that it is technically and financially feasible to cover a part of the schools' energy needs through solar power production. It focused on four key targets:

- To bridge the gap between energy supply and demand in the schools
- To research the feasibility of installing small PV systems on school rooftops and develop a sustainable business plan for installation, which could be used as a blueprint for other buildings
- To contribute to administrative improvements and compile information for political debate on funding solar systems
- To raise awareness of environmentally friendly energy production

Improving on the current institutional situation, the Indian government has been supporting solar energy since 1992 through the Ministry of Alternative and Renewable Energy. It introduced the National Action Plan for Climate Change (NAPCC) in 2008, effecting a paradigm shift within the Indian climate protection initiative: Solar energy development was identified as a core national objective of the initiative. In 2009, the Jawaharlal Nehru National Solar Mission (JNNSM) proposed an ambitious target of achieving up to 20 GW of power through solar energy production by 2022. Various financing plans were established to reach this national directive, for both grid-dependent and independent solar energy plants. Smaller, grid-dependent solar energy plants would be funded at the state level through fixed tariffs laid down by energy regulatory bodies. However, institutional limitations have made it difficult to implement appropriate measures in most of the states across the country, and this also holds true for Andhra Pradesh. In addition, commercial awareness of renewable energy is still in its infancy in India, with most households unable to bear the high installation costs for such systems. The pilot project aimed to prove the feasibility of small PV installations in the city of Hyderabad in order to raise awareness.

The project kicked off with the development of a financial model. The model was established through several workshops and project planning meetings. It proposed that 30% of the costs would be subsidized by the state and the remaining 70% would be covered by the schools through charitable donations and corporate social responsibility contributions made by companies.

In terms of engineering, selecting the components was a key priority for the project. The usage rate or fill factor of a PV installation determines the quality of the system. The usage rate defines the performance of the overall system, defined as the ratio between the maximum attainable output and the actual open circuit voltage. The project team selected a PV module guaranteeing 25 years of operation and an efficiency of 80% under standard operating conditions. It also included an inverter and a battery storage system, each boasting a running efficiency of 85%. Together, the system includes a solar module, inverter, charge regulator, battery storage system, data storage, and peripheral accessories such as cables and mounting parts. The PV systems were installed at the three pilot schools by qualified systems engineers and electricians. Teachers and students were involved in the installation process to give them a better understanding of how PV systems work. The output of a system can easily be monitored in real time thanks to the integrated data storage and a dedicated online portal. This also means potential errors can be quickly identified.

The work in Hyderabad showed the project team the financial feasibility of small-scale photovoltaic installations and highlighted the challenges and opportunities that arise in emerging markets. The collective experience made in terms of financing, coordinating, and managing such compact, rooftop solar installations will prove useful in making knowledgeable decisions in other megacities. At present, financial assessments show a payback period of over eleven years for a 3 kW system. This speaks for great market growth potential despite the high initial installation cost. It also clearly shows that there is true market potential, even without funding from the state.

The experience made by the solar industry in Hyderabad underscores the typical teething problems that can arise in emerging markets with inexperienced decision-makers. Despite an impressive number of new suppliers on the market, only few were interested in the project – most project developers were involved in megawatt projects. Together with Granzör Engineerings Pvt. Ltd., a project developer from Delhi, the Steinbeis Centre for Technology Transfer India ultimately found experienced project consultants to carry out the project.

The schools in Hyderabad showed great willingness to switch to solar technology, primarily for two reasons: (1) In comparative terms, the high cost of generating emergency backup power with diesel generators nearly match the long-term costs of running the solar installation and (2) the payback period is very attractive. Over the course of the project, other schools in Hyderabad also showed an interest in using solar energy. The project team is convinced that small-scale, rooftop solar installations will begin to find broader application as the technical and financial feasibility of the pilot project becomes more well known. In addition, the government is now establishing a long-term framework for projects. The state of Andhra Pradesh has introduced a solar energy storage system for operators of installations to store excess energy. This initiative is a step in the direction of a feed-in tariff for solar energy in the near future. Plans to expand the project can be linked to state programs for rooftop solar installations to foster knowledge sharing and motivate more people to become involved.

The project team agreed that one particularly important aspect of the project was the awareness it has raised for renewable energy and sustainable choices made against the backdrop of climate change. The long-term running and maintenance of the solar installations by teachers and students fosters theoretical and practical understanding of this new technology. The results of the pilot project can be shared between schools through common activities and workshops. And research institutes and companies can tap into the PV data generated by the system. The pilot project also underscored the role played by public bodies in facilitating wider use of small solar installations. However, this would mean reviewing the existing political instruments and guidelines for the industry to promote more widespread acceptance in society. Current funding offered by the Indian government is not enough to ensure long-term growth in the sector, since the financial means are limited to an unknown number of projects and it is unclear what future funding systems might look like. For the sector to grow in the long term, well-organized initiatives are needed, taking project feasibility into account along with the financial burden on public funds due to higher solar tariffs.

This case study has shown that small-scale solar installations can make a substantial contribution to clean energy production in cities – only, however, if certain conditions are met: Solar energy is only an option in countries with plenty of sun. Furthermore, business and cultural factors will determine the extent to which renewable energy can be used.

Steinbeis Centre for Technology Transfer India

Portfolio of services
- Technical consulting
- Technology scouting
- Technology evaluation
- R&D
- Technical training
- Further education
- Expansion of the Steinbeis Network in India

Key areas
- Mobility (automotive and aerospace technologies)
- Manufacturing technologies (machine tools and automation, etc.)
- Renewable energy technologies (solar PV, CSP, geothermal, etc.)

Vineet Kumar Goyal, Phungmayo Horam, Angela Jain, Christine Werthmann

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The Steinbeis Magazine

Transfer sans frontières

Feature Topic: Our International Activities
Insights from Steinbeis experts throughout the world

Bond or Turing?
Steinbeis Swipe!: Digitalization and technology convergence

Keeping Warranty Costs Under Control
Steinbeis forecasts infrequent failure rates

Leading Like Hidden Champions
Steinbeis conducts research into more effective leadership

01 | 2016

CONGRATULATIONS. CELEBRATING 10 YEARS STEINBEIS CENTRE FOR TECHNOLOGY TRANSFER INDIA.

Feature Topic: Our International Activities

Insights from Steinbeis experts

Globalization in business and science, plus the threats and of course the opportunities this entails, are just some of the key issues faced when going international. In this edition of TRANSFER magazine, our Steinbeis experts will introduce readers to some of these issues. Prof. Dr.-Ing. Dr. h.c. Norbert Höptner, Director of Steinbeis-Europa-Zentrum, starts with an introduction to European funding. He is followed by Da Li-Schumann, director of the Steinbeis Consulting Center China, who examines the best way for German SMEs to succeed when they enter Chinese markets. Giwang Lee, director of the Steinbeis Technology & Innovation Centre – Republic of Korea, a Steinbeis partner location in Seoul, reports on how international knowledge and technology sharing works between Korean and European companies. Prof. Dr. Werner G. Faix, founder, managing director, and associate member of the School of International Business and Entrepreneurship at Steinbeis University Berlin, examines why education has become so crucial in times of globalization. Vineet Kumar Goyal, director of the Steinbeis Centre for Technology Transfer India shows how the Steinbeis model of specific knowledge and technology transfer can also work in India. Prof. Dr.-Ing. Aleksandar Jovanovic, director of the Steinbeis Advanced Risk Technologies Group in Stuttgart, provides an introduction to risk and risk management. Sandra Haltmayer and Prof. Dr. habil. Heiner Lasi of the Steinbeis Transfer Center called Innovationsforum Industrie (STCII, at the Ferdinand Steinbeis Institute), outline the work carried out by the German country team of the Industrial Internet Consortium. This is followed by a description from Dr. Abdul Reezal, who heads up a Steinbeis partner enterprise called the Steinbeis Malaysia Foundation, of the steps his company is taking to help the growing Malaysian industry for medical products. Ardin Djalali of the School of International Business and Entrepreneurship at Steinbeis University Berlin then writes about the new demands placed on managers as globalization sweeps through the modern business world and discusses the steps they can take to manage these demands. Finally, Prof. Dr.-Ing. Dr. h.c. Norbert Höptner, Dr. Petra Püchner and Heike Fischer of Steinbeis-Europa-Zentrum expand on different ways to make key enabling technologies in Europe more accessible to SMEs.

Image: © kromkrathog – Fotolia.com

Knowledge and Technology Transfer Made in India

Steinbeis successfully introduces its model

India is the seventh largest country in the world. With over 1.2 billion inhabitants, it is the second most populated country on Earth. India sees its diversity as a unique selling point and has masterfully adjusted to international change. The small and medium-sized enterprises (SMEs) in India drive in 8% of the its GDP, they employ more than 69 million people, and they produce more than 6,000 products – ranging from traditional products to high-tech components. The Steinbeis Centre for Technology Transfer India lends support to this by placing its focus on fostering knowledge and technology transfer in India.

India's national manufacturing policy (NMP) was launched in 2011. Its aim is to raise the manufacturing share of GDP to 25% by 2022. In 2010, manufacturing only accounted for roughly 16% of GDP, while in other Asian countries it makes up at least 30% of GDP. Now the hopes are to create at least 100 million new jobs by 2022, while also improving international competitiveness, domestic added value, technological penetration, and the environmental friendliness of domestic growth.

To achieve this, Indian SMEs must improve in areas like quality, productivity, and market access by leveraging innovations and technologies introduced to business in order to gradually enhance products and services. This would allow them to achieve forward integration in the value chain and tap into new markets, which are looking for more variety. To this end, experts from the Steinbeis Centre for Technology Transfer India are on hand to lend support.

The Steinbeis Centre for Technology Transfer India was jointly founded in January 2009 by 2E Knowledge Ventures Pvt. Ltd. and Steinbeis. It offers its customers a variety of services:

- Technology consulting and publication of research findings. Among other things, this includes projects carried out in the field of smart travel solutions, smart cities, smart villages, eMobility solutions, financing, design and project planning for photovoltaic facilities, and other facilities for renewable energies, energy efficiency, and business cluster programs for lean management (subject to approval by the Lean Management Consulting Organization of the National Productivity Council within the Indian government).
- Technology scouting, marketing, transfer, applied R&D, expert reports and evaluations of technologies and IPs. This is offered in collaboration with other enterprises in the Steinbeis network, with technology transfer partners in North America, Hungary, Russia, South Korea, Taiwan, China, Singapore, Australia, and Sri Lanka, as well as with the

European Enterprise Network (EEN) and an independent innovation partner in North America.

- Professional training, continuing professional development, and independent certification. These services cover areas such as photovoltaics and renewable energy, the automotive industry, smart travel/eMobility, machine tools and production, technology transfer management, and more. The Steinbeis Centre for Technology Transfer India has been accredited as a center of excellence by the European Centre for Renewable Energy for it training courses on renewable energy and energy efficiency. Other accreditations include: certification as a national training organization by the Indian government's Ministry for New and Renewable Energy (MNRE) for working in line with the country's national solar targets; certification as a center of excellence by the National Institute of Solar Energy; certification from the MNRE as a partner of the solar energy training network (SETNET); certification as a training partner by the Indian Electronics Sector Skill Development Council and the National Skill Development Corporation; certification as a training partner by the Andhra Pradesh State Skill Development Corporation of the Andhra Pradesh government. The Steinbeis partner enterprise is also currently establishing an evaluation and certification system for technical training programs.

The current projects conducted by the Steinbeis Centre for Technology Transfer India are very diverse. For example, the enterprise is currently working with select premium institutions in India, preparing training programs for innovation management at SMEs and technology brokering organizations. This project is supported by the GIZ, a German association for international collaboration. The Indian Steinbeis Enterprise also worked closely with Steinbeis Technology Transfer GmbH & Co. KG to submit offers for two large-scale projects, both of which are being funded by the World Bank through the Indian Ministry of Micro, Small & Medium Enterprises (MSME). These projects are related to modernizations in automotive, electronics, and technology centers and Steinbeis has the technical qualifications to tender for these projects. What's more, the Steinbeis Centre for Technology Transfer India is working closely with IPEX Singapore on the transfer and commercial use of technologies in India. This project is being financed by the Asian Development Bank.

The Steinbeis partner enterprise was also involved in Humboldt University Berlin's megacity project in Hyderabad. The German Federal Ministry for Research and Education supports sustainable megacities in many cities across the globe through this project. In addition, the Steinbeis team supported technology transfer from Germany to India related to photovoltaic power inverters. As part of this project, a joint venture was established between a German company (which owns the intellectual property rights for the solar-hybrid power inverters) and an Indian SME working in the field of photovoltaics.

Together with the European Business and Technology Centre (EBTC) – as part of a project funded by the European Commission and the Union of European Chambers of Commerce and Industry (UECC) – a report was published on Holistic Mobility Solutions for Indian Cities along with a Compendium for Technology Transfer with Case Studies from Europe to India. More than 50 training programs have been carried out in cooperation with the experts at the Steinbeis Centre for Technology Transfer India in India and Germany – all of which were in various technology areas including: photovoltaic technology, surface coatings, molding technology, production, machine design, automotive project planning, industrial sensors, and technology transfer management.

Steinbeis Technology and Innovation Centre Network in India:

- AAUTOSYNC – Steinbeis Centre for Innovation, Punjab
- Steinbeis Centre for Automotive Technologies & Training, Pune
- Steinbeis Centre for Renewable Energy Technologies & Knowledge Transfer, Manipur
- Steinbeis Centre for Solar Technologies and Training, Chennai (SCSTC), Chennai
- Steinbeis Centre for Solar Technologies Training, Cochin
- Steinbeis Centre for Technology Transfer India, Hyderabad
- Steinbeis Solar Research Centre (SSRC), Chennai

Image: Solar V channel technology, developed by the Steinbeis Solar Research Centre, Chennai, Tamil Nadu, India

Vineet Kumar Goyal is director of the Steinbeis Centre for Technology Transfer India and offers Indian companies technology consulting, technology transfer, applied research and development, and the development of training courses and continuing professional development programs.

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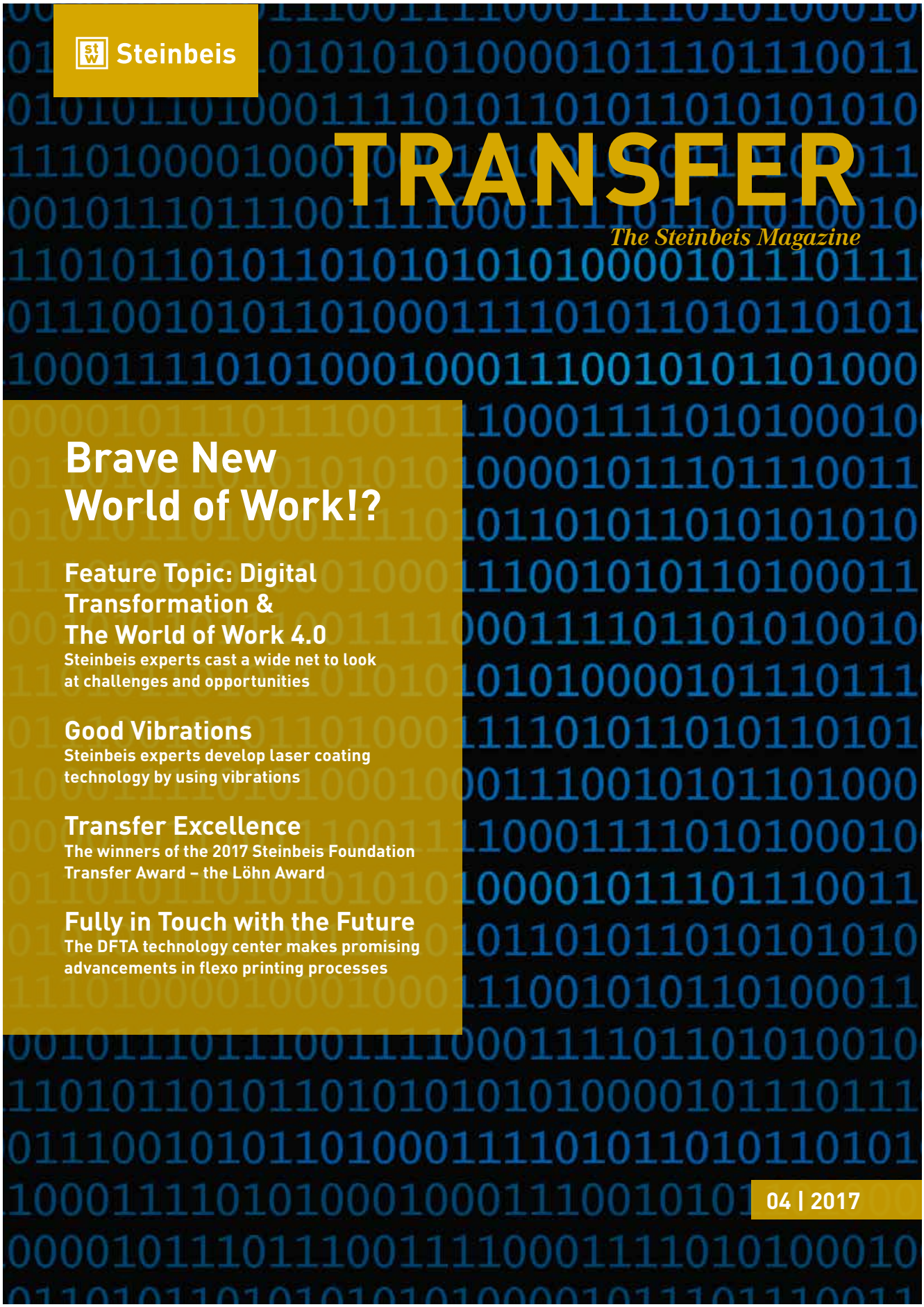

CONGRATULATIONS. CELEBRATING 10 YEARS STEINBEIS CENTRE FOR TECHNOLOGY TRANSFER INDIA.

IndInnovation – Innovation Management for Indian SMEs

Steinbeis experts and CEFE promote the interests of innovation initiatives for SMEs in India

India is a fascinating country on a number of levels, due to its amazing culture, the strongly growing economy, and the entrepreneurial spirit of its people. But at the same time, the subcontinent also has to deal with a number of social upheavals. The country is considered highly competitive and in some sectors of industry, it is innovative. For many SMEs, innovation, research, and development are simply not on the radar as relevant topics. As part of a program called Promoting Innovation in SMEs launched in 2016 by the German Society for International Cooperation (GIZ) Steinbeis experts from Germany and India, as well as CEFE International (Cologne) provided successful support to SMEs in India.

The IndInnovation project worked on two levels. First, the project team developed a training program for SMEs with plenty of case studies, and courses were run for a number of SMEs. Second, the experts developed a training program along similar lines for so-called intermediaries – chambers of commerce, technology parks, incubators, transfer offices, business support organizations, and other network multipliers.

The training program was based on a fairly innovative approach for India broken down into three phases. During Phase 1, both programs offered a 5-day training module based on case studies for SMEs and intermediaries to discover more about the topics of innovation, technology, product development, and process development. There were differences in the emphasis of content with made-to-measure instruction both for the SMEs and the intermediaries.

Based on the content of Phase 1, during Phase 2 the course participants were offered intensive mentoring – a novel concept in the Indian market. This allowed Steinbeis and CEFE to provide further support to individual innovation projects within the SMEs and intermediaries. During Phase 3, participants on the program were asked to present the current status of their innovation projects at a "finishing school."

The SMEs on the program were particularly open in presenting their innovation concepts to the other participants, sometimes even revealing prototypes developed during Phase 2. The Indian project partners had not anticipated this at the beginning of the project and were positively surprised by the outcome. In reality, the company owners were extremely honest and open and this is an important prerequisite for promoting technology transfer even more intensively in the future.

To ensure that the program developed and run by Steinbeis and CEFE could be organized on a local level from the outset, the project partners also asked four leading Indian business schools to become involved. These were allowed to take the training manuals and the three-phase process, and the plan is for them now to offer and run the program in the Indian market and thus safeguard the long-term survival of the project. Another important aspect of the project was to provide Indian business school lecturers with instruction on the special method of adult education called experiential learning. The fact that the program has met the expectations of the SMEs and provided an initial stepping stone into innovation processes is underscored by the large number of queries from industry received by the experts at Steinbeis India. People are asking for support with their own innovation processes. Also, a partnership agreement has now been signed with a further Indian management institute. Again, the aim will be to promote technology transfer through this university into local industry.

Image: © iStockphoto.de/Radiokukka

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PART II

CONFERENCE PROCEEDINGS AND DOCUMENTATION REPORTS

CONFERENCE PROCEEDINGS AND DOCUMENTATION REPORTS

2012 STEINBEIS DAY

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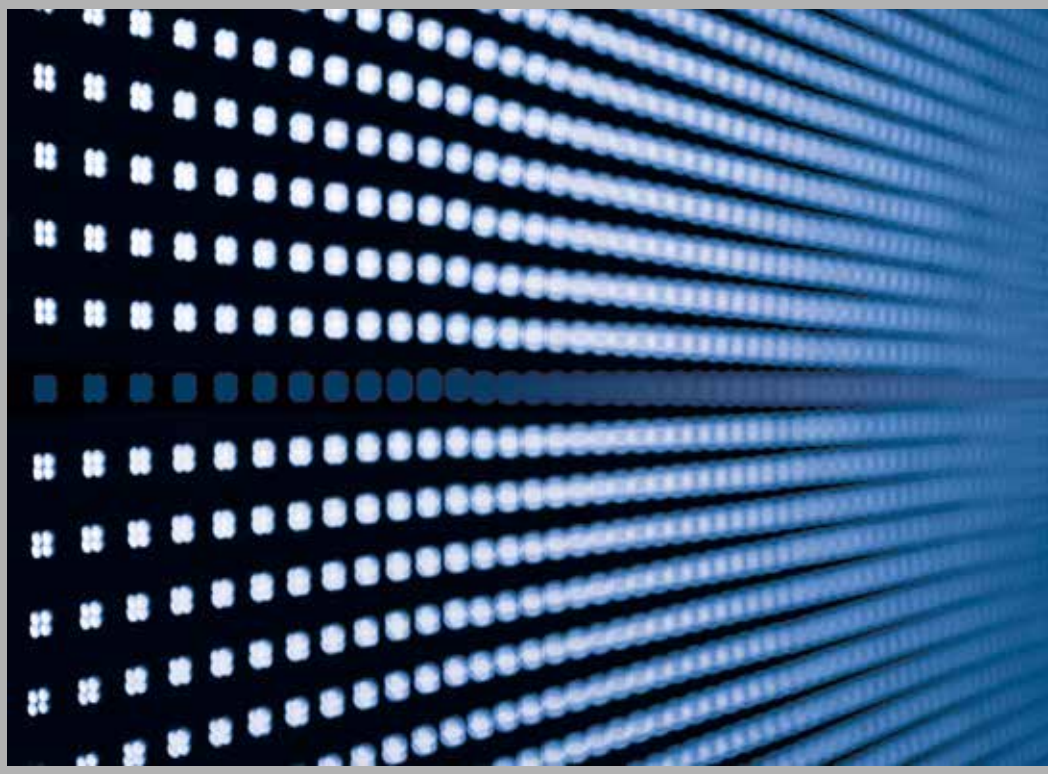
Steinbeis-Tag 2012



28. September 2012
Haus der Wirtschaft, Stuttgart

Role of Steinbeis Network in the development of Indian Manufacturing Industry – Case Study of Steinbeis – UNIDO Project in Machine Tool Sector

Steinbeis Center for Technology Transfer India

15.00 – 15.15 Uhr, König-Karl-Halle

India with 1.2 billion people – the second largest populous nation of the world carrying 1/8th of earth's population – is having rapid industrial and economic growth. It is the fastest growing free market democracy in the world today. India's economic growth, as measured by the gross domestic product, is about 8 % in the year 2011–12. The automobile industry, which is one of the biggest end-users of machine tools, registered a growth of 30 % in 2010–11 and about 20 % in 2011–12 despite a global economic crisis. Furthermore, government's increased spending on infrastructure and defence is boosting the growth of machine tools industry in the coming years. The factors requiring improvements for the competitiveness of Indian machine tool industry are modern production methodologies, enhancing volume to derive the benefit of economics of scale, Innovation and increase in R&D, implementation of soft technologies, such as Six Sigma, Kaizen, and lean manufacturing for quality enhancement, and skilled manpower by investing in training.

A major initiative to enhance the competitiveness of Indian manufacturing industry has been taken by United Nations Industrial Development Organisation – International Center for Advancement of Manufacturing Technology (UNIDO-ICAMT). Under this initiative, UNIDO-ICAMT is operating six machine-tool clusters with more than 100 manufacturing units.

Steinbeis Center for Technology Transfer India has partnered with UNIDO-ICAMT in this initiative and has undertaken / planned the following activities:

1. Training program on precision & ultra-precision machining & machines, June 2011 with German expert
2. Advanced course on integrated product design, 16–27 April 2012, in partnership with Steinbeis Transfer Center Process Development and Steinbeis Transfer Center International Technology Transfer
3. Workshop on managing the management of innovation, by Steinbeis India Consultant Dr. Subash Bijlani, University of Maryland
4. Six months project competence program (with specific product / process development projects) in association with Steinbeis Consulting Center Engineering design and product development
5. Training programs on Kaizen, Six Sigma, lean manufacturing with Indian consultants
6. Product safety certifications training and implementation in association with TUV, Intertek and UL
7. One year certificate program on product engineering, in association with Carl Benz School of Product Engineering, Steinbeis Business Academy

Similar initiatives are being planned in plastics processing and castings and foundary sectors. Steinbeis India invites Steinbeis Centers to partner in these initiatives.

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2013 STEINBEIS DAY

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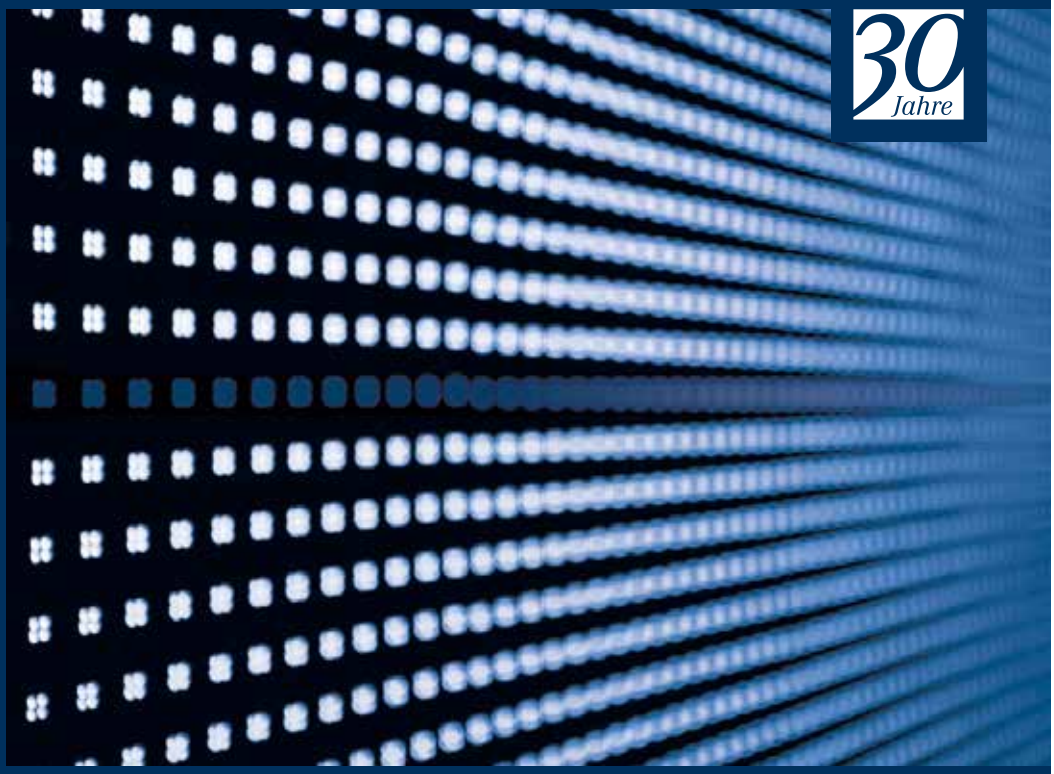

27. September 2013
Haus der Wirtschaft, Stuttgart

Steinbeis Centre for Technology Transfer India

Services

- Technical Consulting
- Technology Scouting
- Technology Evaluation
- Technology Development
- Technical Training
- Further Education
- Steinbeis Transfer Centres in India

Focal Subject

- Mobility (Automotive & Aerospace Technologies)
- Manufacturing Technologies (Machine Tools, Automation etc.)
- Renewable Energy Technologies (Solar PV, CSP, Geothermal etc.)

Project Examples

- To do a market research, identify and shortlist Indian companies having technical and implementation of specific food-processing technology
- To promote IP Commercialisation services in the Indian industry
- Short Term Training on Advanced Automotive Technology
- Certificate Training Program for Solar PV Installers
- Certificate Training Program on Solar PV – Technology & Business, with Indian Faculty
- Certified Training Program on Advanced Automotive Engineering
- Market Study for Off-Grid Hybrid Solar Inverters for Technology Transfer to India
- Training Program on Precision and Ultra-Precision machine Tools & Machining with Expert Faculty from Germany
- Certificate Training Program on Solar PV – Electrical System Design and Earthing, with Indian Faculty
- Certificate Training Program on Solar PV – Technology & Business, with Expert Faculty from Germany
- Galileo Master Certification Exam for Galileo Certified PV Professionals
- Certificate Training Program on Solar PV System & Solar Inverter Design with Indian Faculty and Industry Visit to HBL Power Systems Ltd.
- Technology Transfer of Hybrid Solar Inverters Technology to Anu Solar Power Pvt. Ltd., Bangalore
- Study of Energy Efficiency and Improvement in Power Factor for Agricultural Pumpsets at Sircilla, Andhra Pradesh, under Hyderabad Megacity Project, Government of Germany
- Pilot Project for implementation of Solar PV Systems on selected Schools in Hyderabad, under Hyderabad Megacity Project, Government of Germany
- Training Program on Industrial Product Design (for Machine Tool Industry)
- Hands-On Workshop on Solar PV – Technology & Business

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2014 STEINBEIS DAY

Steinbeis

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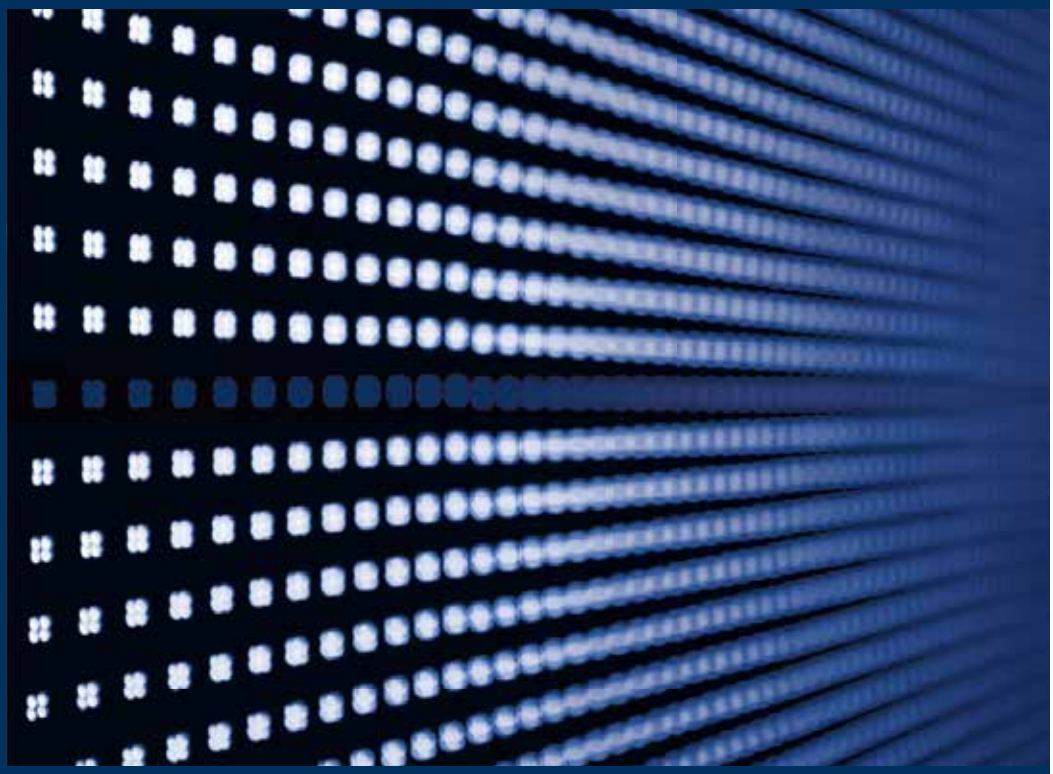

26. September 2014
Haus der Wirtschaft, Stuttgart

S&T Opportunities with India

Steinbeis Centre for Technology Transfer India

15.00 – 17.00 Uhr, Studio A

Some of the areas in which Indian firms seek technologies include sustainable energy, manufacturing, aerospace, education, and agriculture.

In the area of energy, the Indian government has put a premium on technology development in three areas: 1) renewable energy such as solar, biomass and biogas; 2) more efficient energy delivery; and 3) green technologies.

There are lots of small and medium sized companies in India eager to partner with German & European institutions and industry. Indian manufacturers often work on much smaller volumes compared to Chinese. This means that India provides a much bigger opportunity both in terms of supporting these enterprises by introduction of new technologies, as well as in terms of small manufacturing supplies from India. Typical deals with Indian partners involve joint ventures and success fee structures. Generally, Indian companies do not pay upfront fees, or, if they do, very small ones.

Steinbeis India has developed its own unique strategy to approach technology requirements from India – in terms of "Indianizing" the innovation model. It often helps by playing an intermediary role – disaggregating technology know-how from equipment requirements. The technology deal could often be reworked to focus on the actual know-how.

Secondly we have focused on Indian small and medium scale entrepreneurs. Often they do not know where to start. We have created unique partnerships with some industry associations to establish Steinbeis Transfer Centres a project in partnership with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. Then we use the Steinbeis Transfer Centres established with consultant experts and reputed engineering colleges within India or from the Steinbeis global network to help our Indian clients to find or develop technologies.

We also help source Indian technologies for Europe and other global customers.

We have partnered with innoget and created our own technology transfer portal www.steinbeis.innoget.com which works as a technology market place for India on the front-end. On the back-end it is connected with the innoget global marketplace for buying and selling innovations.

Steinbeis India has also created partnership with organisations like European Business and Technology Centre, which makes it easier for European enterprises and institutions to enter Indian markets and create partnerships.

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PART II

DISPLAYS

Steinbeis

Technology.Transfer.Application.

Steinbeis Centre for Technology Transfer India

Services

- International Technology Scouting & Transfer
- Technology Development
- Technical Consulting & Implementation Projects
- Training & Further Education

Focal subjects

- Mobility: Automotive and Aerospace (including MRO Services)
- Production Engineering: Machine-Tools, Plastics, Foundary & Castings, Electrical & Electronic Systems, Automation & Instrumentation
- Renewable Energy: Solar Photovoltaic, Solar Thermal, Biomass, Wind, Micro-Hydro

www.stw.de/su/1291

Steinbeis Centres for Technology Transfer in India

- Steinbeis Centre for Technology Transfer India, Hyderabad
- Steinbeis Centre for Renewable Energy Technologies & Training, New Delhi
- Ansal-Steinbeis Centre for Technology & Innovation, Gurgaon
- Steinbeis Centre for Renewable Energy Technologies & Knowledge Transfer, Manipur
- GNITS-Steinbeis Centre for Renewable Energy, Hyderabad
- Steinbeis Centre for Automotive Technologies & Training, Pune

www.stw.de/su/1291

Steinbeis Centre for Technology Transfer India

www.steinbeis.de/su/1291

Services

- Technical Consulting and Scouting
- Technology Evaluation and Development
- Technical Training
- Further Education
- Steinbeis Transfer Centres in India

Key Areas

- Mobility (Automotive & Aerospace Technologies)
- Manufacturing Technologies (Machine Tools, Automation etc.)
- Renewable Energy Technologies (Solar PV, CSP, Geothermal etc.)

CONGRATULATIONS. CELEBRATING 10 YEARS STEINBEIS CENTRE FOR TECHNOLOGY TRANSFER INDIA.