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FRAUNHOFER INSTITUTE FOR FACTORY
OPERATION AND AUTOMATION IFF, MAGDEBURG

DEVELOPING THE FUTURE TOGETHER

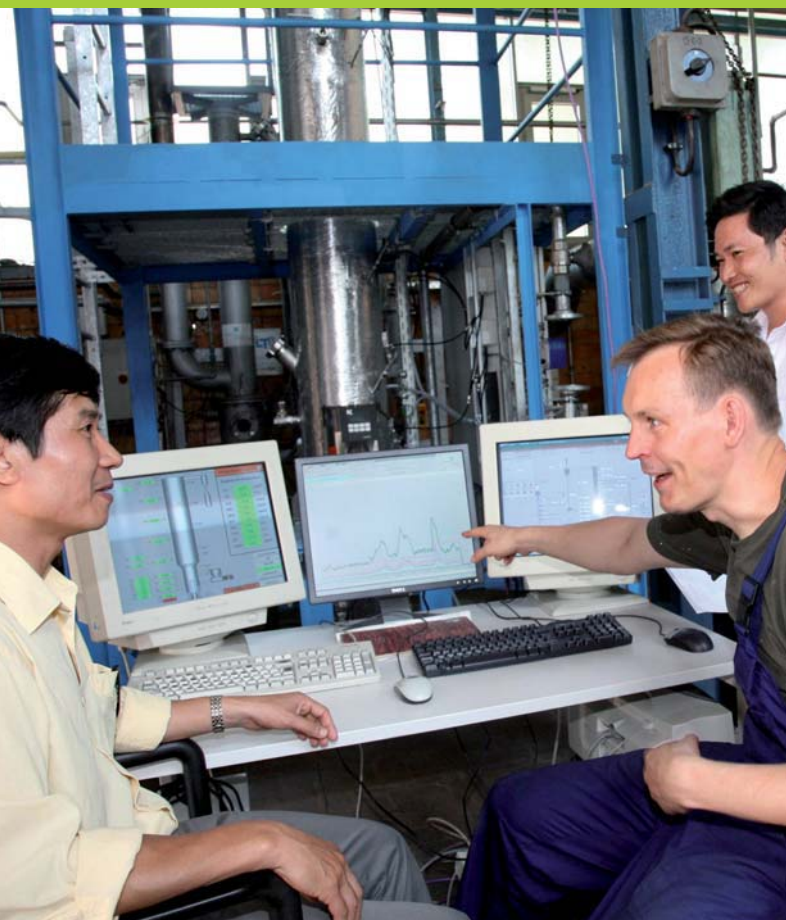


Photo: Dirk Mahler

AN EXPEDITION INTO THE FUTURE: 10 YEARS OF THE FRAUNHOFER IFF IN ASIA

The Fraunhofer Institute for Factory Operation and Automation IFF based in Magdeburg, Germany, is an independent institute of the Fraunhofer-Gesellschaft, the leading European organization for applied research. The Fraunhofer-Gesellschaft specializes in applied research of direct utility to private and public enterprise and of wide benefit to society.

The Fraunhofer Institute for Factory Operation and Automation IFF specializes in research and development in the fields of digital engineering, logistics, automation and process and plant engineering. Our contract research clients include international industrial concerns, small and medium-sized enterprises (SME) and public authorities. Firmly integrated in international networks, we cooperate with research organizations all over the world. For over ten years, we have been collaborating with business, research, academic and government partners in Asia, specifically in India, China and above all Vietnam, Indonesia, Malaysia, Thailand and the Philippines. In particular, our expertise in logistics, renewable energies and sustainability management has attracted our Asian partners' interest. By collaborating on fascinating joint projects, they profit from their German colleagues experience. Together, we are applying this valuable knowledge and know-how to the particular conditions in Asia. What innovations will give your company the crucial edge over the competition? While this brochure presents but a small selection of many successfully completed projects, you are sure to find sources of inspiration for future projects. That's where we step in to support you – let us develop the future together!

Photo: MEV

MORE CORPORATE SOCIAL RESPONSIBILITY IN MALAYSIA

Corporate social responsibility and corporate sustainability management are catchphrases circulating in the Asian corporate environment with increasing frequency. Managers of manufacturing enterprises integrated in global supply chains are particularly growing more aware of the significance of these concepts. After all, end product customers all over the world are increasingly not only interested in product quality and brand names but also the conditions under which a product is manufactured. Under what conditions do employees work? Is the environment polluted? Are resources efficiently utilize in manufacturing? These factors enable small and medium-sized enterprises in Asia to establish clear unique selling points.

The primary objective of the EMIT CSR project was to qualify Malaysian businesspeople and multipliers, e.g. industry associations, in corporate management information systems that focus on corporate sustainability management. Networks were established with European software vendors, consulting firms and universities. In seminars, participants were trained to directly apply and disseminate their acquired knowledge.

Project Partners
Multimedia University Malaysia (MMU), Cyber Jaya, Malaysia
Asian Society for Environmental Protection (ASEP), Thailand
Megaskills Limited (MGS), United Kingdom

EMPASIA: EMPOWERING SMALL AND MEDIUM-SIZED ASIAN ENTERPRISES

Over ninety percent of the established enterprises in Southeast Asia are classified as small and medium-sized enterprises. They provide a majority of the populace with income and contribute substantially to the national economic output.

Integral to global value added chains, they also exert tremendous influence on the economic performance of internationally operating corporations. Hence, small and medium-sized enterprises play a significant role in the achievement of national and international goals related to climate protection and sustainable development.

Initiated by the Fraunhofer IFF, the project Empowering Asian Business Intermediaries through Knowledge-based Networking-focused on Sustainability Management EMPASIA takes up this idea. Together with its partners, the Fraunhofer IFF has been developing qualification actions for Thai and Vietnamese companies, associations and consulting organizations since 2007. These actions have focused on sustainability management for small and medium-sized enterprises and the organization of international partner networks for the research community and industry.

This network empowers Asian partners to qualify companies in sustainability management and corporate social responsibility. The SME Bank, the National Science and Technology Development Agency (NSTDA), the National Food Institute (NFI), the Office of Small and Medium Enterprises Promotion (OSMEP) and

Photo: PhotoDisc

Thailand Textile Institute (THTI) were recruited to actively participate in the EMPASIA project in Thailand.

The METRO Group Vietnam, Ford Vietnam Ltd., the Cooperative Union Hai Phong and die Vietnam Commercial University pledged to support the project in Vietnam.

These organizations are members of the project's National Advisory Boards and thus facilitate constant dialog between business, research and government.

Project Partners
Asian Society for Environmental Protection (ASEP), Thailand
Vietnam Productivity Centre (VPC), Vietnam
Louth County Enterprise Board (LCEB), Ireland

INNOVATIVE BUSINESS MANAGEMENT TOOLS FOR THAI ENTERPRISES

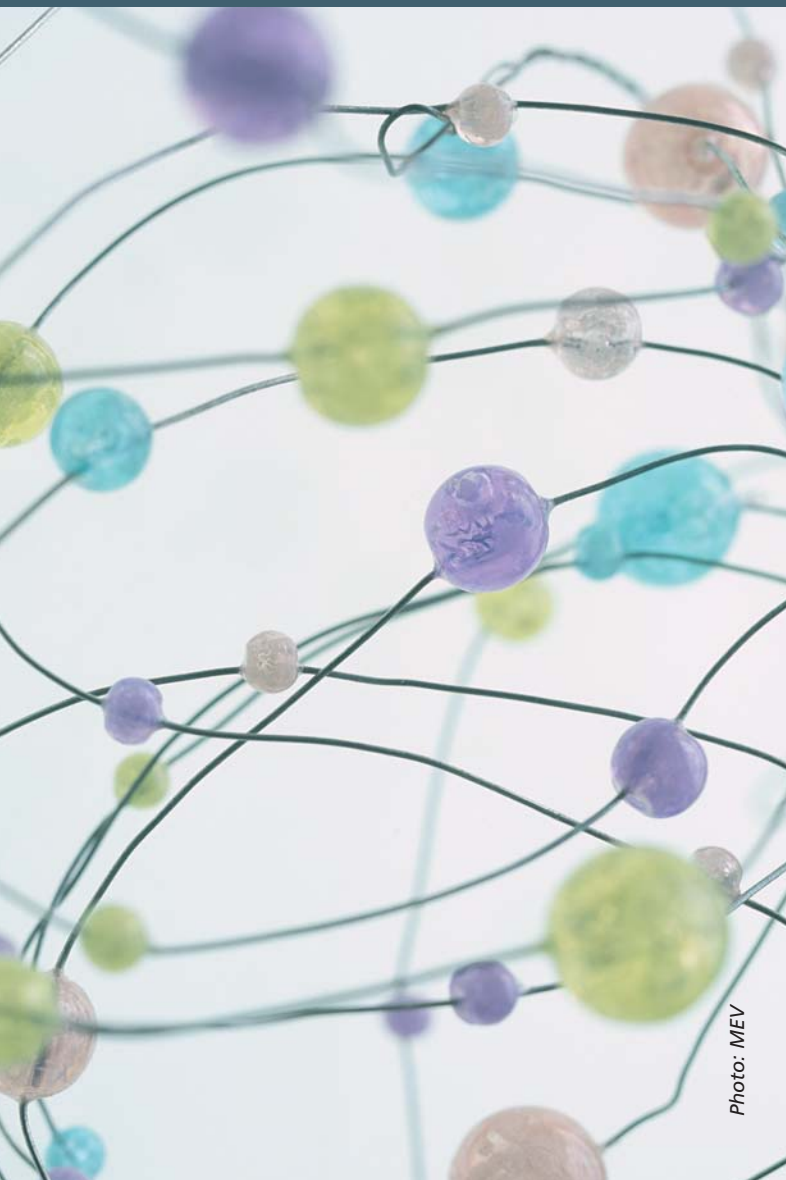


Photo: MEV

Anyone who operates a company with the latest management methods is able to save labor and costs. Considerable potential to optimize controlling lies dormant in many companies.

In 2006, experts from the Fraunhofer IFF started the project TEAMS SME (Technology Partnership and Training Cooperation in European Management Information Systems to Enhance the Competitiveness of Thai SMEs) to take advantage of such reserves. Policy makers from various target groups such as businesspeople, consultants, ministry staff and academics were familiarized with select methods and instruments of corporate controlling. Training sessions on the efficient use of innovative management information systems were conducted in various centers of industrial concentration in Thailand, e.g. Bangkok, Chonburi and Hat Yai, and emphasized knowledge transfer, network building, know-how transfer and cooperation startup. The attendees will find it easier to identify potentials for optimization and to transfer processes they learned about in training to their own corporate environment.

The European Commission and project partners intended TEAMS SME to boost the competitiveness of Thai industry and initiate cooperation between Thai and European companies and organizations.

Project Partners
The Federation of Thai Industries (F.T.I.), Thailand
Asian Society for Environmental Protection (ASEP), Thailand
Supported by the European Commission

Photo: W. Steinacker/PIXELIO

HARMONIZED INFORMATION MANAGEMENT FOR SPATIAL DATA

Asian cities are growing at an incredible pace and the management and sustainable development of infrastructures confront city planners with tremendous challenges. National development presents similar challenges. Logistics, power systems, water supply and telecommunications – in short, every element of the public infrastructure – all converge in the administrative bodies. A variety of spatial information systems are employed, which were individually developed for different domains of spatial development. Unfortunately, the equally large variety of file formats often makes communication between systems problematic.

Only managers of urban and rural infrastructures who are able to exchange all the necessary information with harmonized systems manage to keep such overly dynamic developments under control. In the research project SagisLOG, researchers from the Fraunhofer IFF and their partners investigated methods to harmonize and efficiently manage spatial data und spatial information systems in Thailand with the goal of ensuring that information management functions throughout the country. Mae Hong Son, Chaiyaphum, Chai Nat, Chonburi and Chonphum provincial administrations were involved. Cooperation was initiated between European and Thai research organizations, interdisciplinary know-how was transferred to the region of Southeast Asia and multistage plans to harmonize spatial data were devised.

Project Partners
Burapha University, Chonburi, Thailand
University College Cork, Ireland
Otto von Guericke University Magdeburg, Germany

LOOKING TOWARD THE FUTURE: CORPORATE SUSTAINABILITY MANAGEMENT FOR LONG-TERM CORPORATE SUCCESS

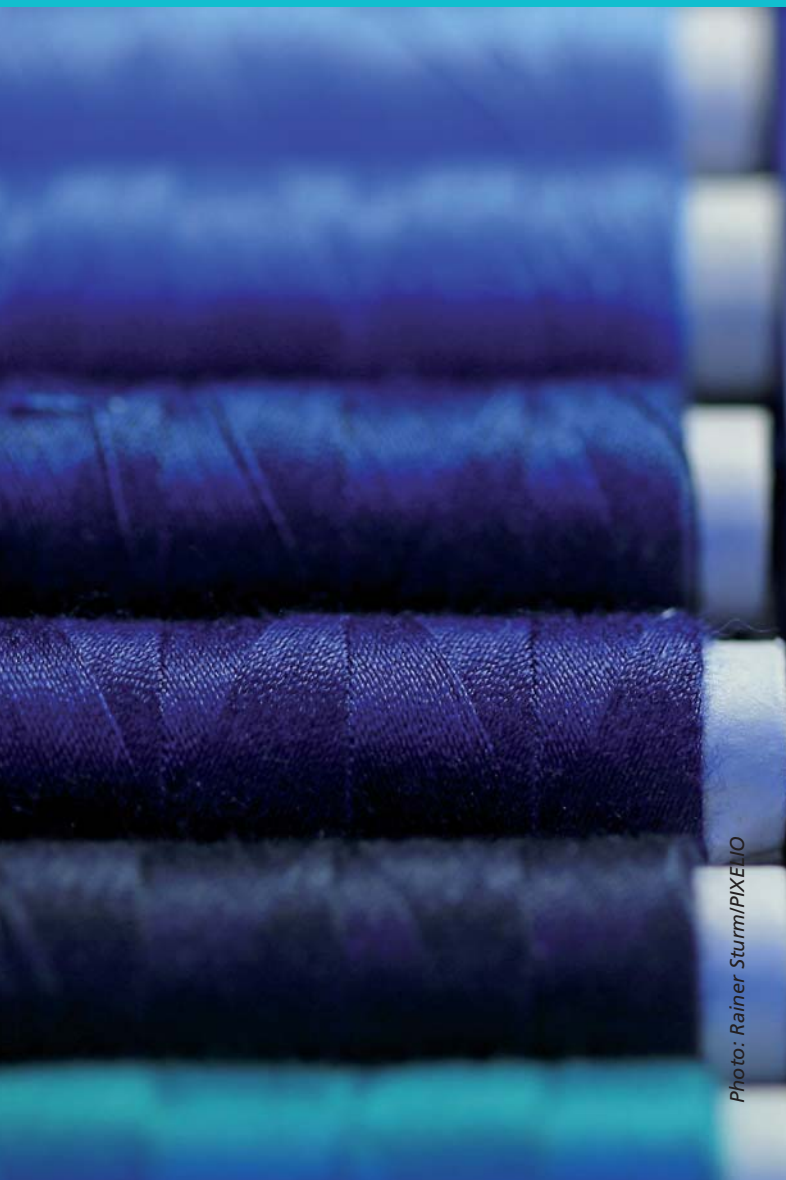


Photo: Rainer Sturm/PIXELIO

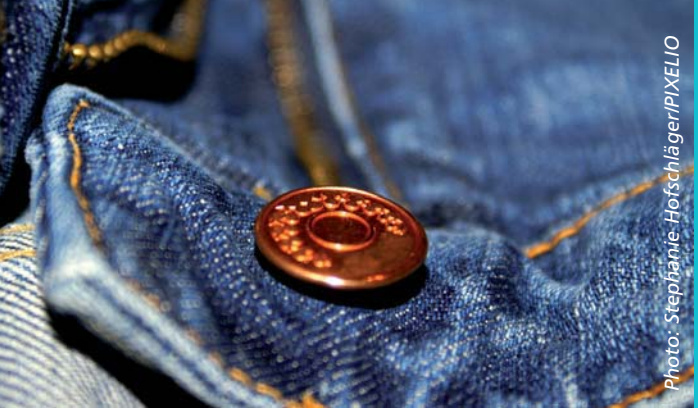


Photo: Stephanie Hofschläger/PIXELIO

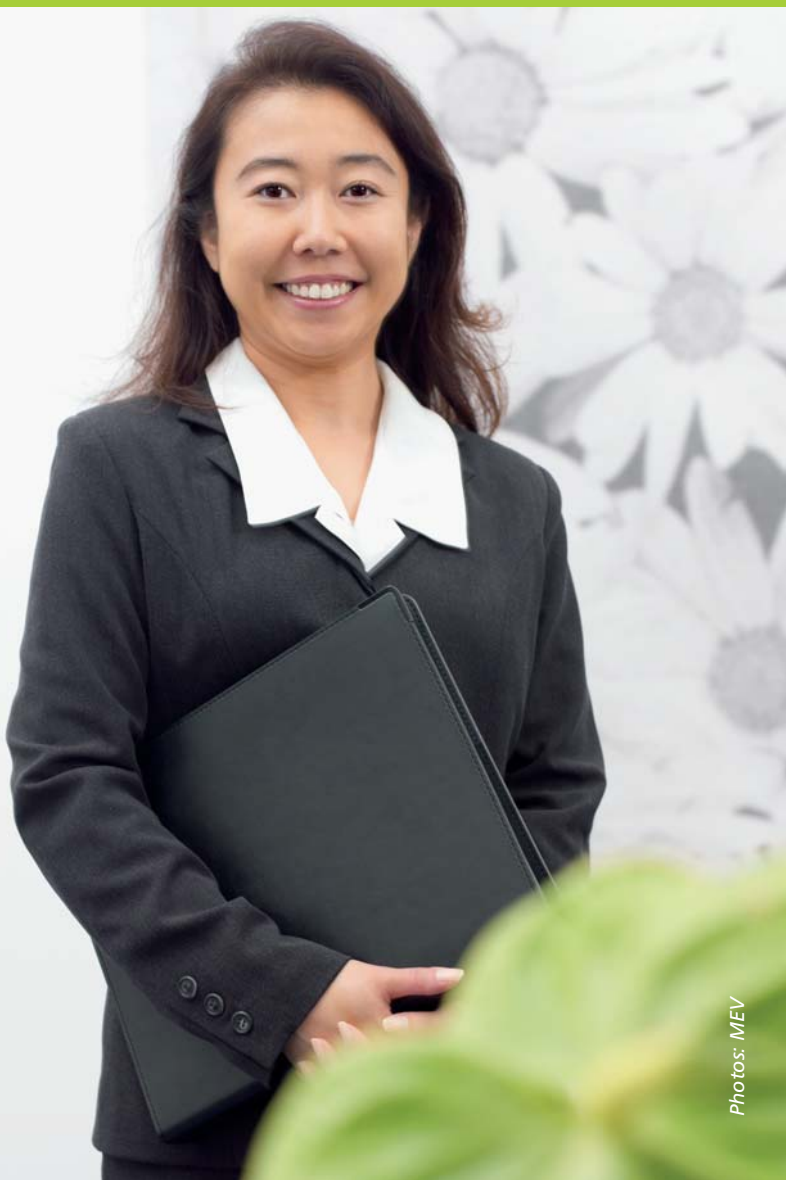
Sustainable corporate management is steadily growing in importance as ecological and social factors become as vital to companies as economic factors.

Experts from the Fraunhofer IFF and InWEnt gGmbH and Indonesian, Philippines, Thai and Vietnamese companies addressed this situation in a project entitled Environmental Performance Assessment for Industries. The main objective was to develop and pilot software-supported performance indicator systems for the target group: companies from resource intensive industries. The performance indicator systems incorporate every relevant factor, e.g. manufacturing, logistics, finances, environmental protection and quality. Participant training and train-the-trainer actions were implemented and the performance indicator systems for sustainability management were piloted in select companies, which already experienced substantial savings during the first year of use. A medium-sized food company saved a total of US$ 118,000; an oil and gas industry training center cut its expenses by US$ 98,000. The amortization time was just four months! The results clearly demonstrate that sustainability management cuts expenses and thus boosts efficiency and competitiveness.

Project Partners

Asian Society for Environmental Protection (ASEP), Thailand
Asia Pacific Roundtable for Sustainable Consumption and Production (APRSCP), Philippines
Indonesian Society of Environmental Professionals (ISEP), Indonesia
Vietnam Productivity Centre (VPC), Vietnam
InWEnt gGmbH, Germany

CORPORATE SUCCESS THROUGH GREATER ENVIRONMENTAL AWARENESS



Photos: MEV

Companies from all over the world have been locating in Thailand in recent years because of the attractive conditions for manufacturing. Above all, resource intensive branches of industry have relocated their production facilities here, thus making SMEs an integral part of international supply chains.
In the wake of globalization and transforming societal attitudes, the Thai business community has come to regard compliance with international standards as the fundamental prerequisite for sustainable corporate success. Hence, many companies are relying on environmental information systems.

In the project ASIA IT & C FORCE in 2001, researchers from the Fraunhofer IFF and their international project partners worked to provide Thai SMEs access to clever solutions for their corporate environmental information management. An initial demand analysis provided the basis to analyze the transferability of European concepts and software solutions to the Thai corporate world. In the next step, Thai managers and consultants were trained to implement select environmental information management methods and software applications. The specialists connected existing European and Asian networks to assure continuous know-how transfer in the future and laid the groundwork for long-term European-Asian research cooperation in the field of environmental information systems.

Project Partners
Asia Society for Environmental Protection (ASEP), Thailand
Karl-Franzens-University Graz (KFU), Austria
Supported by the European Commission

Photo: Viktoria Kühne

POWER FROM RICE HUSKS

Researchers from Magdeburg and Hanoi Research Energy Recovery from Biomass

Residual products from Vietnamese rice farming used to be disposed of as waste. Yet, rice husks hold tremendous potential as energy. Hanoi University of Technology contracted the researchers from Magdeburg's Fraunhofer Institute to develop a circulating fluidized bed combustor (CFBC) that burns this biomass.

The Fraunhofer Institute for Factory Operation and Automation IFF and Hanoi University of Technology concluded a cooperation agreement to implement a project in which the specialists from the Fraunhofer IFF and Hanoi University of Technology jointly researched the quality of energy recovery from this material.

The researchers conducted in-depth tests on the combustion characteristics of rice husks and other typical biomass yields in Vietnam such as reeds and sugar cane. They were particularly interested in the possibility of mixing conventional fuels such as lower grades of coal with the biomass in the fluidized bed plant. These studies are particularly relevant for the Vietnamese market and are aimed at identifying inexpensive alternatives to expensive fossil fuels. Moreover, this substantially reduces pollution produced by landfills.

Project Partners

Dong Hai Technology Company Ltd., Vietnam
Hanoi University of Technology (HUT), Vietnam

TECHNICAL COOPERATION AGREEMENT BETWEEN ITRI AND THE FRAUNHOFER IFF

Photo: Christian Blobner

In 2004, the Industrial Technology Research Institute in Hsinchu, Taiwan and the Fraunhofer Institute for Factory Operation and Automation IFF in Magdeburg, Germany agreed to collaborate even more intensively. Dr. Hsin-Sen Chu, Executive Vice President of ITRI, and Dr. Gerhard Müller, Deputy Director of the Fraunhofer IFF, signed the Technical Cooperation Agreement.

Their cooperation is focused on the recovery of energy from renewable resources. After all, renewable energies hold tremendous potential. These natural treasures contain energy that superbly lends itself to efficient and environmentally compatible conversion into power. Together with their Taiwanese partners, the researchers intend to identify new methods to utilize fluidized bed gasification to recover energy from biomass and waste. High-tech cogeneration plants gasify residues such as rice husks or residues from bamboo cultivation in special fluidized bed plants. The experts from Magdeburg's Fraunhofer Institute are contributing their specific know-how in fluidized bed technology to this research: Synthesis gas generation, fuel gas cleaning, electrical power generation and measurement and control engineering.

With more than 6,000 staff members, ITRI is the largest research organization in Taiwan and a partner in the Biomass Asia network in which research organizations from China, Japan, Korea, Thailand, Vietnam and Singapore collaborate.

Project Partner
Industrial Technology Research Institute ITRI, Taiwan

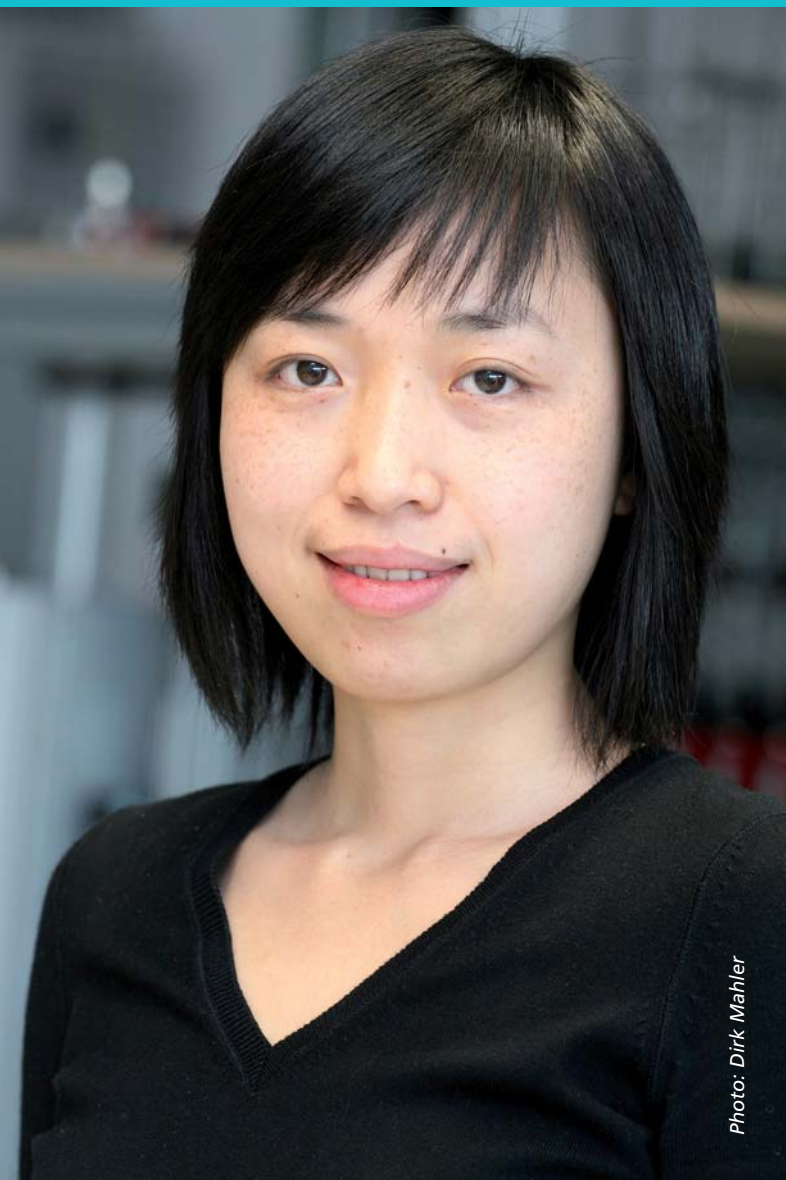


Photo: Dirk Mahler

SELECTED PARTNERS IN ASIA: COOPERATION WITH UNIVERSITIES

China
Tsinghua University, Beijing
Hong Kong University of Science and Technology, Hong Kong
Shanghai Jiao Tong University, Shanghai
Southwest Jiaotong University, Opto-Electronic Engineering Institute, Chengdu

Japan
Nara Women's University, Nara
Tokyo Metropolitan University, Tokyo
Tokyo University, Institute of Robotics, Tokyo
University of Kyoto, Kyoto
Kobe University, Department of Mechanical Engineering, Kobe
Niigata University, Department of Chemistry and Chemical Engineering, Niigata

Malaysia
Multimedia University Malaysia, Cyber Jaya, Malaysia

Thailand
Burapha University, Chonburi, Thailand
Chulalongkorn University, Bangkok
King Mongkut's University of Technology Thonburi (KMUTT), Bangkok
The Sirindhorn International Thai-German Graduate School of Engineering (TGGS), Bangkok

Vietnam
Hanoi University of Technology, Hanoi

SELECTED PARTNERS IN ASIA: COOPERATION WITH GOVERNMENT BODIES AND NGOS

India
Indian Institute of Science, Bangalore, India

Indonesia
Oil & Gas Training Centre Pusdiklat Migas, Jawa Tengah
Indonesian Society of Environmental Professionals (ISEP), Jakarta
Vocational Education Development Center (VEDC), Malang

Malaysia
Standards and Industrial Research Institute of Malaysia (SIRIM)

Philippines
Asia Pacific Roundtable for Sustainable Consumption and Production (APRSCP), Manila

Taiwan
Industrial Technology Research Institute (ITRI), Hsinchu

Thailand

Thai-German Institute (TGI), Chonburi
Asian Society for Environmental Protection (ASEP), Bangkok
Thailand Environment Institute (TEI), Bangkok
The Federation of Thai Industries (FTI), Bangkok
Bureau of Target Industries Development/Department of Industrial Promotion (Ministry of Industry), Bangkok
National Science and Technology Development Agency (NSTDA), Pathumthani
Office of Small and Medium Enterprises Promotion (OSMEP), Bangkok
Department of Public Works and Town & Country Planning (DPT), Ministry of Interior, Bangkok

Vietnam

Vietnam Productivity Centre (VPC), Hanoi

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