



中德能源合作

Energiepartnerschaft

DEUTSCHLAND - CHINA



中华人民共和国国家发展和改革委员会
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Sino-German Energy Partnership



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Foreword

China and Germany are paving the way towards a global energy transition. In China, the Energy Revolution (能源革命) has catapulted the country towards becoming the largest installer of renewable energy capacities by far and its energy conservation programs target thousands of companies throughout the country. Germany's *Energiewende* is a pioneer in both practice and policymaking of energy efficiency and renewable energy development. In Germany, the share of renewables in the electricity sector has surpassed 40% last year. Amongst others, energy audits and energy efficiency networks between companies have become common tools showcasing the German industries' efforts in pursuing the principle "Efficiency First!".

A decade has passed since we decided to join forces, exchange best practices and intensify the bilateral cooperation on the energy transition. For the Sino-German Energy Partnership, the year 2018 was characterized by an even deeper cooperation, new focal topics and bilateral projects, and an intensified cooperation with industry.

Our partnership's political year was marked by the visit of a Chinese delegation to the Berlin Energy Transition Dialogue (BETD) led by Vice-Minister Liu Baohua, National Energy Administration (NEA), and his subsequent bilateral meeting with Parliamentary State Secretary Thomas Bareiß, Federal Ministry for Economic Affairs and Energy (BMWi). Two BMWi delegations visited China for our two annual working group meetings with the National Development and Reform Commission (NDRC) and NEA

in May and October, respectively. At the latter, we took our cooperation to the next level – three new focal topics covering spot markets, renewable incentives and energy storage, were added to the existing exchange on sustainable heating and power sector flexibilisation.

With the first energy diagnosis in a Chinese coal power plant in September, our bilateral Sino-German demonstration project "Energy Diagnosis in the Energy-Intensive Industry" finally entered the decisive implementation phase. By December, German and Chinese experts had jointly conducted energy diagnoses in five heavy industry sectors. In 2019, we will jointly select and implement the most promising energy efficiency measures together with the participating companies.

Finally, the first meeting of the German Local Business Advisory Council marked an important milestone for our private sector cooperation. Invited by BMWi, 16 German company representatives discussed challenges and opportunities for doing business in China's energy sector. The second meeting followed in October. The council's regular meetings pose an effective instrument for integrating the private sector's voice into our partnership's activities.

We reflect on yet another successful year, and look forward to many new highlights and exciting tasks in the year of the pig. If you want to work with us on shaping our bilateral cooperation, please feel free to get in touch anytime.

Enjoy reading our annual report!
Your Sino-German Energy Partnership

About the Sino-German Energy Partnership

Since its initiation in 2006 at the Sino-German Forum for Economic and Technological Cooperation, the bilateral cooperation between China and Germany in the energy sector has developed into a strategic partnership in 2016. The Sino-German Energy Partnership links three levels of action: high-level policy dialogue, business-to-government exchange as well as an exchange of experiences on technical and regulatory solutions promoting the energy transition. The main aim of the partnership is to foster and advance the far-reaching and profound energy transitions that are ongoing in both countries by exchanging views, best practices and knowledge on the development of a sustainable energy system, which is in particular characterized by improving energy efficiency and expanding the use of renewable energy.

Overall steering and structure

For China, the National Development and Reform Commission (NDRC) and the National Energy Administration (NEA) are in charge of the partnership, while the Federal Ministry for Economic Affairs and Energy (BMWi) is in the lead on behalf of Germany.

Two thematic working groups have been established under bilateral agreements in order to facilitate cooperation as well as intensify the exchange of information, experiences and best practices. On the Chinese side, the working group on “energy” is led by NEA, while the working group on “energy efficiency” is headed by NDRC.

Working Group on Energy

- Electricity and spot market reform
- Promotion and market integration of renewable energies

- Power sector flexibilisation and system integration of renewables
- Sustainable heating and cooling
- Energy storage

Working Group on Energy Efficiency

- Energy conservation and efficiency in industry and buildings
- Energy efficiency in cities
- Energy efficiency networks
- Innovative business and financing models

The energy partnership also aims to encourage private sector cooperation and showcase best practice technologies, innovative services and business models to drive the energy transition in both China and Germany. Both sides have agreed to jointly implement demonstration projects promoting energy conservation to demonstrate exemplary solutions for energy efficiency in industry and integrated district energy planning serving as references for China. Another joint project titled “German Energy Transition Expertise for China” is supporting the technical exchange with the China National Renewable Energy Center (CNREC), the leading think tank for renewables in China, on developing long-term scenarios for a future energy system with high shares of renewables.

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH was commissioned by the BMWi with the implementation of the bilateral energy partnership with China. A secretariat with full-time advisors in Berlin and Beijing serves as a point of contact and coordination regarding its activities.



High-level meetings on minister and vice minister level

High-Level Bilateral Meetings

Participants: BMWi / NDRC, NEA



Working Group on Energy

Partner 国家能源局
National Energy Administration

Focal Topics

- ▶ Electricity and spot market reform
- ▶ Promotion and market integration of renewable energies
- ▶ Power sector flexibilisation and system integration of renewables
- ▶ Sustainable heating and cooling
- ▶ Energy storage

Annual working group meetings on director-general level to exchange on latest energy policy developments and define topics for technical exchange

Working Group on Energy Efficiency

Partner 中华人民共和国国家发展和改革委员会
National Development and Reform Commission

Focal Topics

- ▶ Energy conservation and efficiency in industry and buildings
- ▶ Energy efficiency in cities
- ▶ Energy efficiency networks
- ▶ Innovative business and financing models



Technical Exchange

GIZ / Implementation Partners (EPPEI, CNREC, CREEI)



Implementation of activities, projects and exchange

Technical Exchange

GIZ / Implementation Partners (dena, NECC, ERI, CECEP, CIECC)



German Local Business Advisory Council

GIZ / Industry representatives

Roundtables

GIZ / Industry representatives

Specific challenges identified in the Local Business Advisory Council can be discussed within roundtables in order to develop joint solutions with relevant stakeholders.

Key Facts and Figures



Quotes and Impressions

“The Sino-German cooperation on energy already has achieved great success. The German Energiewende and China’s Energy Revolution share the goal to establish a clean, safe and efficient energy system. We aim to deepen the exchange and jointly drive innovation for the transition.”

Li Fanrong
Vice Administrator, National Energy Administration of P.R. China (NEA)

“The Sino-German cooperation on energy efficiency and energy conservation is not only of great significance for the reduction of energy consumption in both countries, it also plays a crucial role in the global effort to improve energy efficiency.”

Ren Shuben
Director General, National Development and Reform Commission of P.R. China (NDRC)

“Germany and China are both pioneers as regards the expansion of the use of renewable energies. They aim to establish a secure, affordable and environmentally friendly energy supply.”

Rainer Baake
Former State Secretary, German Federal Ministry for Economic Affairs and Energy (BMWi)



Above: Participants of the inaugural meeting of the German Local Business Advisory Council © GIZ

Bottom left: NEA Vice Minister Liu Baohua discusses China's Energy Revolution at the Berlin Energy Transition Dialogue 2018 © BETD

Bottom right: Thorsten Herdan, BMWi, meets An Fengquan, NEA, at Working Group "Energy" meeting in October in Suzhou © NEA



Left: Sino-German experts conduct an energy diagnosis in a Chinese cement plant © Huaxin Cement

Bottom: Participants of the fourth Sino-German working group "Energy Efficiency" meeting in Beijing © GIZ





BMWi delegation visits a successful Sino-German cooperation project in the Chinese aluminum foil industry © GIZ

Focal Topics

In the last years, China and Germany have continuously deepened the bilateral cooperation on challenges and solutions of the energy transition. Working groups meet annually to review the last year's activities and decide on the focal topics for the upcoming year.

Working Group on "Energy"

Electricity and spot market reform

China's power sector is currently undergoing a thorough market reform. Today, electricity spot markets are trialed on provincial level to gain experiences for the introduction of a nationwide spot market in the near future. In 2000, Germany's first electricity exchange started trading in Frankfurt. Two decades later, German and European power markets are ever more integrated and numerous products, from futures to intra-day products, are offered on the trading floor. Within the Sino-German Energy Partnership, German and international experts share best practices and offer advice for China's efforts to establish effective and efficient spot trading mechanisms.

Promotion and market integration of renewable energies

Renewable energy (RE) – wind, solar, biomass, hydro and geothermal energy – are drastically reshaping our energy systems. Where central, fossil generators provided steady energy supply for millions of households in the past, intermittent and decentralized RE have seen an unprecedented growth in installed capacities and record cost decrease during the last decade. China and Germany are both frontrunners when it comes to RE: Germany as one of the pioneers of the *Energiewende* (energy transition) with a 40% RE share in net public electricity

generation; and China as the world's largest installer of RE (2018: approx. 730 GW total installed RE capacity). As partners, both countries share best practices on promotion schemes, competitive tenders and market integration of RE.

Power sector flexibilisation and system integration of renewables

Next to effective subsidy schemes and promotion mechanisms, power sector flexibilisation plays an important role for the system integration of renewables. Here, the technical exchange and advice within the energy partnership focuses on the flexibilisation of fossil power plants as well as the right market mechanisms (including spot markets and ancillary services) and business models, storage and sector coupling.

Sustainable heating and cooling

To achieve a holistic energy transition and decarbonization of all sectors, increasing the share of renewable and low-carbon power sources in the heating sector is essential. Today, the Chinese and German heating sectors still largely depend on the fossil fuels coal, oil and gas. However, Germany's push-and-pull approach consisting of use obligations for new buildings and incentives for retrofitting existing buildings, amongst others, already paves the way for a sustainable heating future. In China, switching from coal to gas, waste heat utilization, power-

to-heat and direct utilization of renewable heat sources are discussed as viable options for the heat transition. Both countries actively exchange on policy and technology aspects of the heat transition.

Energy storage

Energy storage technologies are key to the integration of high shares of RE into the energy system. Set on the Energy Partnership's agenda during the working group meeting in 2018, the bilateral exchange does not only cover storage technologies, but furthermore policies, business models and standards.

Working Group on "Energy Efficiency"

Energy conservation and efficiency in industry and buildings

Enhancing energy conservation and efficiency in industry and buildings are keys to a successful energy transition. The Sino-German demonstration project "*Energy Diagnosis in the Energy-Intensive Industry*" showcases the intensive bilateral cooperation on energy audits and improving energy consumption in China's industry sector. Jointly implemented by GIZ, Deutsche Energie-Agentur GmbH (German Energy Agency, dena) and National Energy Conservation Center (NECC), the project aims at introducing state-of-the-art energy audits and diagnoses to Chinese companies. Joint studies and an ongoing exchange on technical solutions and standards for air tightness contributes to enhancing energy efficiency in buildings. Furthermore, Chinese and German experts regularly discuss and exchange on policy advancements and best practices for energy efficiency in the building and industry sector. The first "*Sino-German Energy Efficiency Cooperation Projects Award*" will be awarded to best practice energy efficiency projects at the 1st Sino-German Energy Day in 2019 and highlights the close and fruitful cooperation between both countries' private sectors.

Energy efficiency in city quarters

Integrated city-level energy planning, i.e. an integrated and holistic approach to designing and developing energy generation, transportation and consumption, provides an important baseline for increasing energy efficiency in cities. The Sino-German demonstration project "*Energy Efficiency in Cities/City Quarters*" will showcase the integrated and efficient utilization of renewables, industrial waste heat and conventional power supply on the generation side, and demand-side management and smart energy consumption technologies on the demand side. The demonstration project is scheduled to kick-off in 2019.

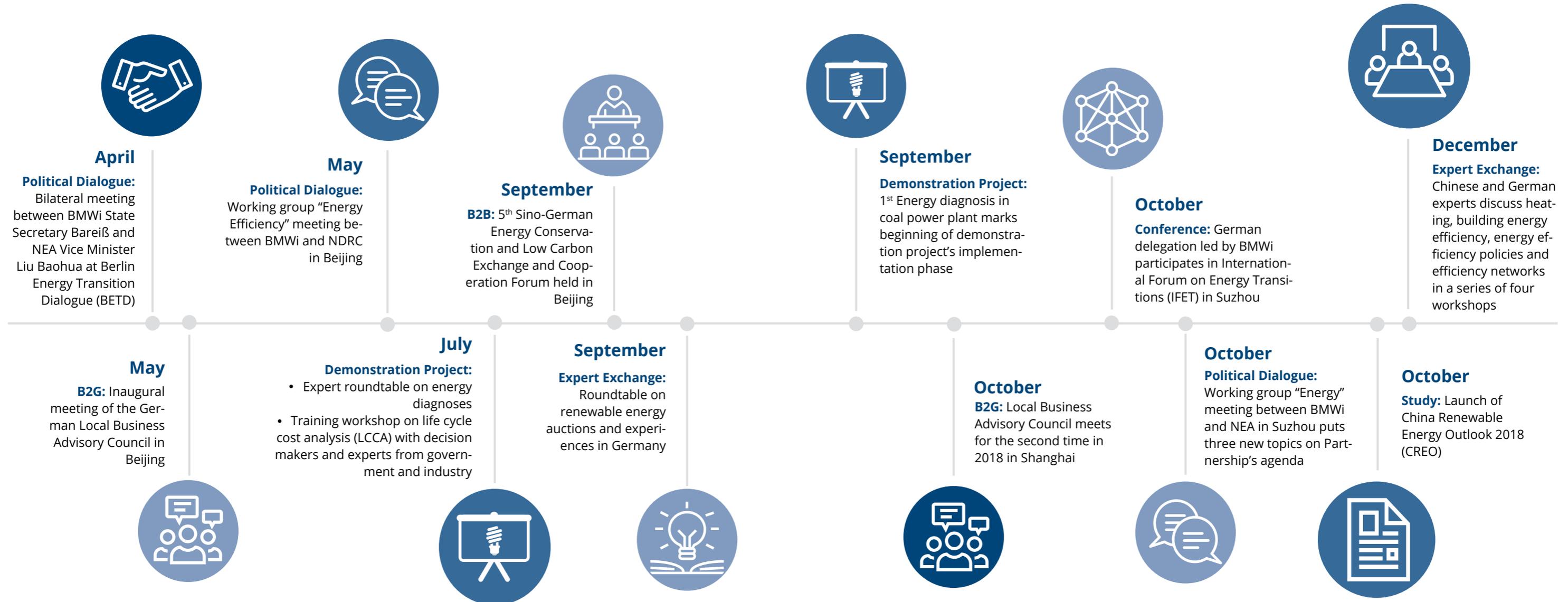
Energy efficiency networks

Energy efficiency networks (EEN) comprise up to a dozen companies with the goal to identify energy conservation potentials, set efficiency goals, and regularly exchange on best practices as well as the progress achieved. In Germany, EEN have been very successful in enhancing energy efficiency in small and big companies alike. Within the Energy Partnership, German and Chinese experts and practitioners join forces to evaluate and determine guidelines for setting-up EEN in the Chinese context.

Innovative business and financing models

New business models, financing opportunities and a thorough understanding of the economic benefits of energy conservation projects are important pillars for enhancing energy efficiency and conservation in all sectors. German and Chinese experts actively exchange on best practices for enabling efficiency projects. Activities include, amongst others, trainings on life cycle cost analysis (LCCA), advising and working with regulators, energy service companies (ESCOs), banks and lenders to identify suitable business and financing models.

Timeline of Highlights 2018



Highlights 2018

April | Political Dialogue: Bilateral meeting between BMWi State Secretary Bareiß and NEA Vice Minister Liu Baohua at Berlin Energy Transition Dialogue (BETD)

Supported by the Sino-German Energy Partnership, a Chinese delegation led by NEA Vice Minister Liu Baohua participated in the Berlin Energy Transition Dialogue (BETD) 2018. Apart from panel discussions and field visits to best-practice examples of Germany's energy transition, Vice Minister LIU Baohua and BMWi State Secretary Thomas Bareiß met to discuss the prospects of both countries' energy transitions and exchanged on the bilateral energy cooperation.

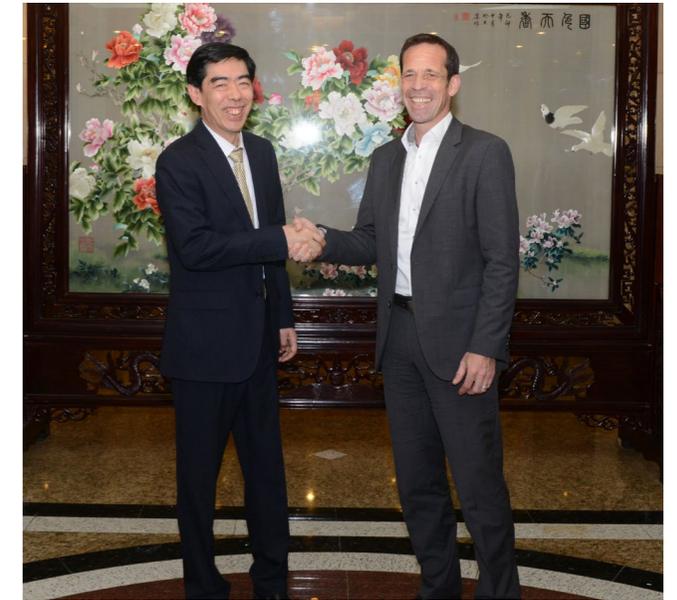
NEA Vice Minister Liu Baohua discusses China's Energy Revolution at the Berlin Energy Transition Dialogue 2018 © BETD



Industry representatives discussing the Chinese market's potentials at the business council's inaugural meeting © GIZ

May | Inaugural Meeting of the German Local Business Advisory Council in Beijing

The Federal Ministry for Economic Affairs and Energy (BMWi) and the Embassy of the Federal Republic of Germany in China hosted the first meeting of the Energy Partnership's "German Local Business Advisory Council" in Beijing. More than 25 high-level participants from large international companies, SMEs, government and the Chamber of Commerce (AHK) met to discuss common challenges and opportunities for German companies doing business in China's energy sector. The business council hence serves as an important business-to-government platform to integrate the needs of businesses into the bilateral political dialogue. The first business advisory council meeting was held back-to-back to the 2018 meeting of the working group on "energy efficiency" between BMWi and NDRC.



Ren Shuben and Thorsten Herdan at the working group meeting in May © GIZ

May | Political dialogue: Working group "Energy Efficiency" meeting between BMWi and NDRC in Beijing

On May 3, the fourth meeting of the Sino-German working group on energy efficiency was successfully held in Beijing. During the meeting, representatives of the National Development and Reform Commission of the P.R. China (NDRC) and the German Federal Ministry for Economic Affairs and Energy (BMWi) discussed the progress of the bilateral cooperation and decided on the focal areas for the upcoming year. Director-General REN Shuben and Director-General Thorsten Herdan headed the Chinese and German delegation, respectively. Special emphasis was put, amongst others, on promoting the bilateral policy exchange, advancing the Sino-German demonstration project on energy efficiency in industry and strengthening the exchange on energy efficiency networks in industry.

July | Demonstration Project: Expert roundtable on energy diagnoses & training workshop on life cycle cost analysis (LCCA) with decision makers and experts from government and industry

Both organized by the Sino-German Energy Partnership and the National Energy Conservation Center in Beijing, the events successfully facilitated the exchange on the status-quo, challenges and experiences of implementing energy audits, as well as the underlying policy challenges, and introduced life cycle cost analysis to decision makers in companies and government organizations, respectively. German Expert Jan Bleyl, presented the German experiences with energy audits and conducted the training on life cycle cost analysis (LCCA). The LCCA tool disseminated during the training attracted a lively discussion and participants showed great interest to try the LCCA analysis in future procurement activities.



Jan W. Bleyl discusses the benefits of life cycle cost analysis © GIZ

September | 5th Sino-German Energy Conservation and Low Carbon Exchange and Cooperation Forum held in Beijing

On September 6, the Sino-German Energy Conservation and Low Carbon Technology Cooperation and Exchange Forum was successfully convened for the fifth consecutive year in Beijing. The main objective of the forum is to build a bridge between innovative German technology and product providers and China's energy service companies and energy-intensive companies. In doing so, the forum fostered and provided for technical exchange, demonstration of best practices and business opportunities. More than 200 leading Chinese energy service companies and energy-intensive companies participated in the event.



September | 1st Energy diagnosis in coal power plant marks beginning of demonstration project's implementation phase

With two on-site energy audits in a Henan coal power plant and a Chongqing glass fiber factory between September 24 to 27, the Sino-German demonstration project on energy efficiency in industry entered the decisive implementation phase. Audits in the other demonstration companies, including cement, ceramics, paper and Beijing's airport, were conducted until March 2019. The project's aim is to conduct state-of-the-art German energy diagnoses in China's heavy industry, introduce and spread life-cycle cost analysis in China's industry and implement identified measures in a close partnership between German and Chinese companies. Audits were jointly implemented by a Sino-German expert group headed by the National Energy Conservation Center (NECC), German energy agency dena and GIZ.



September | Expert roundtable on renewable energy auctions and experiences in Germany

On September 28, the Sino-German Energy Partnership project and the German Energy Transition Expertise for China project jointly hosted an expert roundtable on renewable energy auctions and experiences in Germany, convened in the offices of the China National Renewable Energy Centre (CNREC). Mr. Malte Luks from Germany's Federal Network Agency and Mr. Anders Hove from GIZ successively introduced German and international renewable energy auction experiences, and participants discussed auction design and development in Germany and China.

October | 2nd Meeting of the German Local Business Advisory Council Held in Shanghai

The German Local Business Advisory Council convened for the second time in 2018 on October 17 in Shanghai. The Meeting was hosted by the Federal Ministry for Economic Affairs and Energy (BMWi) and the German Consulate General, organized by GIZ and supported by the German Chamber of Commerce (AHK). The discussions and results of the second Local Business Advisory Council meeting served as an important input to the annual working group meeting on energy between BMWi and the National Energy Administration (NEA) two days later.

Before the council meeting, the BMWi delegation visited a successful Sino-German cooperation project displaying the application of a highly energy efficient air compression system in a Shanghainese aluminum product factory. Together with the German technology supplier and the Chinese customer, the German delegation discussed not only the innovative technological solution, but also the business model as well as the economic environment for German enterprises doing business in China.

Industry representatives at the 2nd meeting of the German Local Business Advisory Council © GIZ



Participants of the seventh Sino-German working group "energy" meeting © NEA

October | Political dialogue: Working group "Energy" meeting between BMWi and NEA in Suzhou puts three new topics on Partnership's agenda

On October 19, the 7th meeting of the Sino-German working group on energy was successfully held in Suzhou. Representatives from the German Federal Ministry for Economic Affairs and Energy (BMWi) and the National Energy Administration of the P.R. China (NEA) reviewed and discussed the recent progress of cooperation within the Sino-German Energy Partnership and decided on focal topics in the field of energy for the upcoming term. During this year's meeting, the German and Chinese delegations decided to extend their cooperation in the following areas: electricity spot markets, renewable energy subsidy tendering schemes, flexibilization of the electricity sector, sustainable heating and energy storage. By signing a renewed version of the working group's guidelines, both sides expressed their commitment to further deepen the bilateral cooperation on energy. The meeting was held in parallel to the third International Forum on Energy Transitions (IFET).

October | German delegation led by BMWi participates in International Forum on Energy Transitions (IFET) in Suzhou

On October 18 and 19, senior government officials, business leaders and key players in the global energy sector met at the third International Forum on Energy Transitions (IFET) in Suzhou, China. The international gathering, co-organized by the National Energy Administration (NEA), the International Renewable Energy Agency (IRENA), and the Jiangsu Provincial People's Government of China, serves as platform for dialogue and collaborative action on how to transform energy systems towards a sustainable, low-carbon and resilient energy future in China and globally. As a longstanding partner to NEA, the Sino-German Energy Partnership supported the multi-day forum. Thorsten Herdan, Director-General at BMWi, headed the German delegation. German representatives from the following institutions participated, amongst others: German think tank Agora Energiewende, German energy agency dena, GIZ and Lumenion GmbH.

October | Launch of China Renewable Energy Outlook 2018 (CREO)

On October 18, the China Renewable Energy Outlook 2018 (CREO) was officially launched at the third International Forum on Energy Transitions (IFET) in Suzhou. The report is the third in a series published by China National Renewable Energy Centre (CNREC), a leading Chinese think tank. CREO includes scenarios for China's renewable energy development until 2050 as well as projections for the country's energy production and consumption, emissions, water use, and employment. Germany supports the research and publication of CREO through the GIZ-implemented project German Energy Transition Expertise for China supported by dena and Agora Energiewende.



Thorsten Herdan, BMWi, speaking at the third International Forum on Energy Transitions (IFET) in Suzhou © IFET

December | Chinese and German experts discuss heating, building energy efficiency, energy efficiency policies and efficiency networks in a series of four workshops

To strengthen and continue the in-depth bilateral exchange between China and Germany on the topics of sustainable heating, building energy efficiency, energy efficiency policies and energy efficiency networks in industry, the Sino-German Energy Partnership organized four half-day expert workshops on December 10 to 11 in Beijing. The four expert salons brought together German and Chinese experts from governmental authorities, academia, think tanks and representatives of both country's private sectors. On the German side, high-level representatives of Fraunhofer ISI, LEEN GmbH, ifeu Institute and IREES introduced and discussed the German status-quo,

experiences and future strategies in the respective topics. Despite different framework conditions in both countries, the intensive discussions showed the high relevance and importance of exchanging on experiences and lessons-learned in the fields of energy efficiency and sustainable heating.

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