Advancing into a Resilient Energy Future through Sino-German Cooperation

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Forword

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The global energy transition is entering a decisive phase. Around the world, countries are undertaking the complex task of transforming energy systems that have developed over decades. At the same time, energy demand continues to rise, the climate crisis is intensifying, and geopolitical tensions are reshaping the conditions for international cooperation. Achieving climate neutrality while safeguarding economic competitiveness and energy security has therefore become one of the defining policy challenges of our time.

In this context, China plays a pivotal role. As the world's largest producer and consumer of energy and the leading market for renewable energy deployment, developments in China have a direct impact on global emissions trajectories. Progress within China's energy system is therefore indispensable for meeting international climate targets. For Germany - drawing on decades of experience with the Energiewende, including regulatory design, market structures, grid integration and industrial decarbonization - this creates a clear rationale for engagement. Cooperation in the energy sector is thus not an end in itself but follows a strategic logic.

First, it is a direct contribution to global climate action. Without substantial progress in China, global climate goals will remain out of reach. Technical cooperation that supports effective policies, regulatory frameworks and practical solutions can therefore generate impact far beyond national borders.

Second, engagement with one of the world's largest and most dynamic energy markets creates opportunities to help shape key developments. Trends emerging in China - whether in policies, technologies, standards or market design - often influence global pathways. Structured cooperation enables Germany to contribute its expertise to these processes and to support the development of resilient and integrated energy systems internationally.

Third, such cooperation also aligns with economic interests. German companies are active in key areas of the energy transition, including renewable energy, energy efficiency and industrial transformation.

Dialogue on regulatory approaches and technical solutions can enhance transparency and predictability in a major market environment, thereby improving conditions for economic exchange and collaboration.

Finally, cooperation has an important political dimension. In a global environment marked by increasing tensions, technical collaboration often remains a viable channel for dialogue. Particularly in the context of Germany-China relations - characterised by both systemic differences and economic interdependence - joint work on complex challenges such as energy system transformation creates spaces for continued exchange and practical problem-solving.

Within this framework, GIZ assumes a distinct role. As the German Federal Government's implementing organisation for international cooperation, it operates at the interface between policy objectives and practical implementation. This is not development cooperation in the traditional sense - such cooperation with China formally ended in 2009 - but a partnership focused on protecting global public goods, based on mutual exchange of knowledge and joint development of solutions.

GIZ's contribution lies in its integrated approach. The energy transition extends far beyond the deployment of individual technologies. It requires coordinated action across regulatory frameworks, electricity markets, infrastructure, industry, finance and digitalisation. It also depends on connecting actors that operate in different institutional and sectoral contexts - from government bodies and regulators to research institutions and the private sector.

GIZ facilitates precisely these linkages. By structuring policy dialogue, providing technical advice and supporting the demonstration of solutions, it helps translate political ambitions into practical, scalable measures. Its work connects national and subnational levels, brings together policymakers, industry and academia, and links technological innovation with regulatory and market frameworks.

The projects presented in this report illustrate how this approach is applied in practice. They range from improving energy efficiency in energy-intensive industries and developing zero-carbon industrial parks, to advancing the integration of renewable energy into complex systems. Emerging areas such as energy meteorology, green data centres and sector coupling further highlight how systemic solutions can enhance the efficient use of renewable energy across sectors.

The energy transition will shape the economic and political landscape of the 21st century. Its success will depend not only on national strategies, but also on the ability to cooperate across borders, to learn from different approaches and to jointly address complex systemic challenges. This report provides insight into how Sino-German cooperation in the energy sector contributes to this effort - and how GIZ helps translate the strategic objectives of the German government into tangible impact.

Energy Transition: A Strategic Global Issue

Energy transition is the fundamental response to the global climate crisis. While countries are adding renewables on an unprecedented scale to achieve the goals of the Paris Agreement, the underlying reality is sobering: energy-related emissions remain record-level high, accounting for over two-thirds of the global total. The weather dependence of renewables and geopolitical volatility pose challenges to energy security and prices, while demand continues to rise amid the rapid expansion of the global digital economy.

The energy sector today is undergoing profound change

Weather-Dependent
Wind and solar power increases volatility and challenge supply stability

System Flexibility
Requires all players to connect and the whole system to integrate

Geopolitical Volatility
Poses challenges to energy security and prices

Artificial Intelligence
Expands rapidly driving a surge in electricity demand

For Germany, the Energiewende has reached a critical juncture. It must balance its 2045 climate-neutral targets with industrial competitiveness and technological sovereignty.

China stands at a similarly decisive crossroads. To meet its 2030 carbon peaking and 2060 neutrality targets, the nation must bridge the gap between its world-leading renewable additions and a power system where coal still generates 60% of electricity.

No nation can achieve this transformation alone. While governments define their own policy agendas, global dynamics dictate the parameters of success, from technological standards and cost curves to resource supply chains.

In this context, 2025 represented a significant shift. The focus has moved beyond the mere deployment of solar and wind towards the more complex task of systemic integration. **The priority is no longer just adding renewables but designing and managing the energy system to integrate high share of renewables:** balancing supply, grids, demand, storage, and reforming market designs. This shared challenge marks a new frontier in energy system development, where political commitment, technical expertise and international cooperation determine a clean, secure and affordable future for all.

As the German international cooperation agency, GIZ facilitates bilateral exchange with China to address shared challenges such as the energy transition. This collaboration is particularly important in areas where it both serves national interests and contributes to shaping global rules that support sustainable growth for a shared future.

Germany: A Global Pioneer of the "Energiewende"

Germany is among the earliest countries who began its systematic energy transition (Energiewende), in the 1990s. Today, renewables are the country's primary source of electricity. A combination of mature legislation, subsidies, market mechanisms, and carbon pricing is driving the energy transition, while the country continues to invest heavily into more renewable generation, grid, storage, hydrogen, and sector coupling.

However, the transition has reached a more complex phase. By the end of 2025, Germany faces high system costs and regulatory complexity. Grid bottlenecks, insufficient storage, slow progress in electrification, and protracted planning procedures hinder implementation. Balancing energy security, decarbonisation and industrial competitiveness remains a delicate task as Germany strives to align policy, infrastructure, innovation, and public support for its carbon neutrality ambitions.

China: The World's Largest Energy Transition Case

As the world's largest energy producer and consumer, China is shifting its coal-dominated system towards a low-carbon energy structure. Along with the rapid renewable expansion in recent years, the country has built the world's largest and most comprehensive clean energy value chain. It also plays a critical role in global supply chains for key energy transition related minerals.

The challenge lies in scale, urgency and complexity: China must retire large amounts of coal, building a "new-type" power system with renewables, while securing supply to keep up with the still growing demand. Rapid renewable expansion has also resulted in overcapacity, intensifying competition and increasing the risk of low-value investment. Legislation, standards, market mechanism and business models must evolve to support system integration to ensure sustainable growth in all sectors.

Germany: setting the global benchmark

Complex
Regulatory Architecture

Advanced
Market Operation

Leading
Integration Solutions

China: driving global momentum

Efficient
National Policy to Local Action

Rapid
Lab to market of cuttingedge technologies

Digital
Connectivity into the energy transition

GERMANY	CHINA
Climate and Emission Targets	
Climate neutral by 2045 -65% GHG emissions by 2030 (vs. 1990) -88% GHG emissions by 2040 (vs. 1990)	**Carbon neutrality before 2060** Carbon peak before 2030, reduce GHG by 7–10% below peak levels by 2035 ›65% CO_2 intensity reduction by 2030 vs. 2005 -17% CO_2 intensity by 2030 vs. 2025
Renewables-Based Electricity Generation	
57% in 2025 (primary wind & solar) **Goal**: ≥80% by 2030	**38%** in 2025 (primary hydro, wind, solar) ›30% non-fossil share in primary energy consumption in 2035
Renewables Capacity	
210 GW in 2025 **Goal**: 360 GW by 2035 (215 GW solar, 145 GW wind)	**2,340 GW in 2025** **Goal**: 3,600 GW wind and solar by 2035

Why should Germany Cooperate with China on Energy?

The energy transitions of Germany and China are no longer separate paths; they are deeply interconnected global shifts. Cooperation is far more than an exchange of knowledge: **it is a strategic necessity to manage systemic risks, safeguard industrial competitiveness, and define the global rules of a net-zero economy.**

Maximise Global Climate Impact

China is the world's largest emitter of greenhouse gases. A successful energy transition in China delivers substantial global emissions reductions and is therefore of key strategic importance for achieving Germany's international climate targets.

Tackle Frontier Energy Challenges

Germany and China are at the forefront of the global energy transition. As both countries face new and complex challenges, exchanging on renewable integration, grid management and clean technologies helps develop innovative solutions and supports more secure, affordable and clean energy systems in both countries.

Improve Market Access

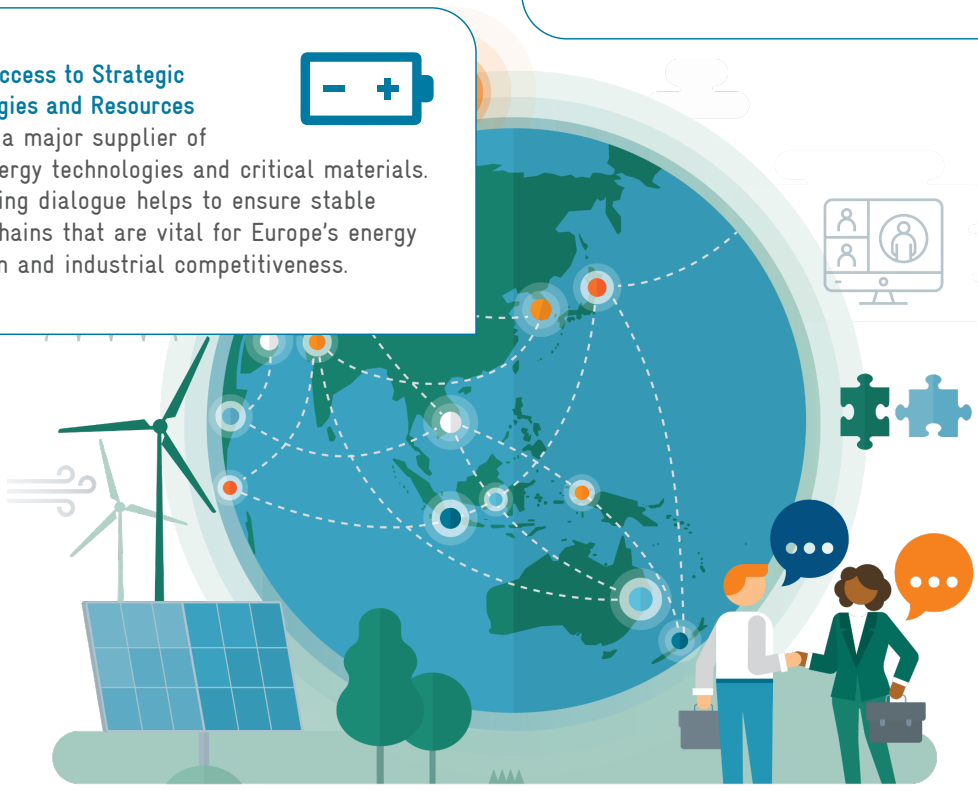
China's energy transition is creating a vast market for green technologies. Close cooperation ensures fair market access and opens significant opportunities for German companies to deploy high-quality solutions at scale.

Co-shape Future Energy Governance

China is a market-mover in terms of green energy scale and cost. Continuous engagement allows Germany and Europe to co-shape the frameworks that will regulate the global energy transition.

Secure Access to Strategic Technologies and Resources

China is a major supplier of clean energy technologies and critical materials. Maintaining dialogue helps to ensure stable supply chains that are vital for Europe's energy transition and industrial competitiveness.



What GIZ Does: Turning Bilateral Agendas into Action

As a public-benefit federal enterprise, GIZ supports the German government in achieving its development objectives. In China, GIZ builds on more than 40 years of experience. At the same time, it takes into account China's changing role in the world: Since 2010, Germany no longer provides development funds to China. Today, in the energy sector, we share know-how and solutions to manage the complexity of the energy transition in both countries. Through this bilateral partnership of equals, we aim to safeguard a clean, secure, and affordable energy supply, providing the blueprint for a global pathway to carbon neutrality.

Fields of Action

Bilateral Dialogue

We support high-level political exchange to turn national priorities into shared agendas.

Example: Every year, we prepare content and coordinate all parties to ensure the successful bilateral dialogues between the German and Chinese ministries, where the political agenda for cooperation is defined.

Policy Advice

We provide evidence-based analysis and best practices to help both sides navigate complex regulatory shifts.

Example: Our series of expert workshops contributed to policy discussions on renewable, power market, hydrogen, and further instruments. These were highlighted in China's first energy law to promote a low-carbon energy system.

Stakeholder Networks

We bridge the gap between think tanks, business, and politics to ensure diverse expertise informs every solution.

Example: We facilitate regular meetings under the German Local Business Advisory Council. There we connect German business to the government to exchange structural market challenges in China's energy sector.

Showcase Solutions

We implement demonstration projects that prove the technical and economic feasibility of green solutions for scaling.

Example: To decarbonise cement industry, we showcase measures on energy efficiency and alternative fuel substitution, which enabled 360,000 tonnes of CO_2 emissions reductions annually.

Consulting Services

We deliver integrated advisory and capacity building to support clients in solving complex green transition challenges.

Example: By integrating expertise in energy, climate and environment, we consult Taicang to achieve climate-neutral industrial park and support the 560 German SMEs there.

Strategic Communication

We foster transparency and international exchange and explain the "why" and "how" of the global energy transition.

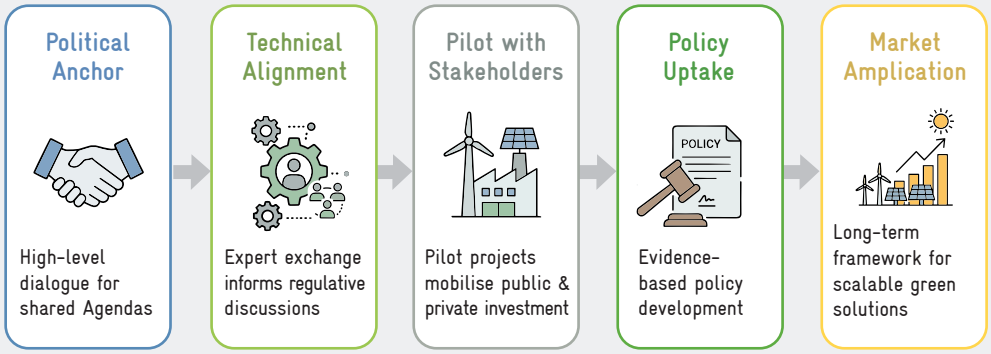
Example: We established a holistic Info Hub on Energy Transition in China and Germany and informed over 30,000 professional readers through newsletter, magazine, website and social media channels every year.

Our Impact: Translating Dialogue into Action and Change

By combining different levels of our action, we help to close the gap between abstract policy goals and measurable climate action.

By facilitating high-level dialogues, we ensure the alignment of national priorities and shared cooperation agendas. By connecting multiple stakeholders in technical exchange on key topics of energy transition, we inform the policy discussions leading to legislative blueprints. Our demonstration efforts not only cut emissions directly but also provide a "proof of concept" of green solutions that mobilise public and private investment to bridge the gap to market reality. Evidence-based results from pilots will vice versa inform policy development. This further strengthens long-term framework conditions and market amplification for low-carbon solutions.

How we manage to achieve impact:



By integrating these levels of action, we effectively bridge the gap between high-level policy objectives and concrete, measurable climate action.

Numbers of 2025

3
High-level political dialogues facilitated

3,000+
Professionals reached across 12 thematic fields

100+
German companies actively engaged

3
Major demonstration projects implemented

35,000+
Readers of **100+** strategic publications

30+
Technical workshops, trainings

Measurable Impact 2020-2025: Concrete Results of International Cooperation

Over the past five years, our work has delivered measurable, long-term results. We have moved beyond dialogue to implementation, shaping policies, reducing emissions, building capacity, and mobilising significant investment. These figures demonstrate the concrete value of international cooperation on climate and energy.

1. Shaping Sustainable Policy

17+

Policies, laws and standards supported (2021–2025) through German policy expertise, private sector engagement

2. Decarbonising the Future

698,000 tCO_2e

reduced annually

Achieved through three Sino-German demonstration projects – equivalent to the annual emissions of approximately 152,000 conventional passenger cars

3. Building Green Competence

600+

Energy sector stakeholders trained to strengthen green skill capacity

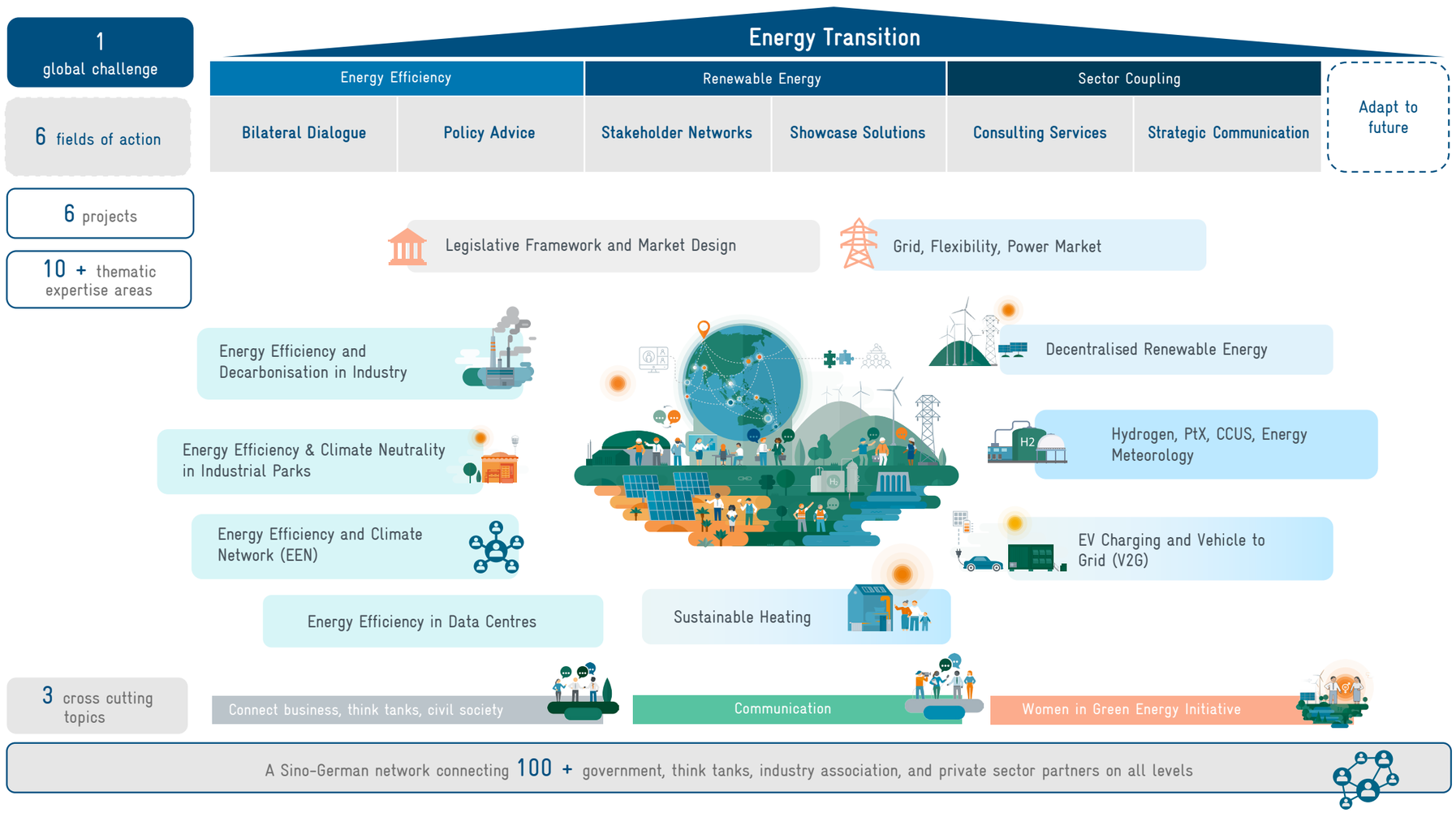
4. Mobilising Investment

≈EUR 96 million

Public and private capital leveraged for the green transition

Our Holistic Approach towards Energy Transition

In the energy sector, system integration is more complex and important today! Our holistic appraoch addresses the core interdependencies of energy transition: balancing variable renewable supply with flexible grid and power system while synchronising demand through more efficiency and electrification. At the same time, sector coupling linking power, heat, and transport builds true resilience. By bridging the gap between policy, industry, and all levels of action, we ensure these complex technical elements function as an integrated, secure energy system fit for a climate-neutral future.



Our strength

Integrated solutions for systemic impact

Energy transition is a system challenge. It requires coordinated action across policy, markets, infrastructure, industry, finance, and technology – and alignment among actors who rarely operate in the same space.

GIZ fosters precisely these connections. Our work connects policymakers, industry stakeholders and academia and links technological innovation with regulatory and market frameworks. This integrated approach allows us to create systemic transformative impacts rather than isolated technical results.

Continuity and access

Our long-standing government-to-government cooperation and over 40 years of local experience in China provide trusted access, institutional insight and continuity for a reliable partnership.

Credibility and delivery

Our policy-driven technical expertise ensures that political ambition is translated into practical, context-specific solutions – from dialogue to implementation.

2025: A Year of Systemic Impact

In 2025, as both Germany and China's energy transition move towards mastery of systemic complexity, our work to support the bilateral cooperation underwent a qualitative shift in depth and width. The shared goal is clear: building a new, integrated, flexible energy system that secures supply and economic growth.

Key Highlights 2025

Localising the Transition: State-to-Province Partnerships

In 2025, our work supported the new level of cooperation. The launch of the IKI-funded project, "Supporting China's Climate Targets through Ambitious Green and Low-Carbon Energy Transition," has extended bilateral energy cooperation on national level to concrete local implementation.

By connecting Germany's industrial heartlands, North Rhine-Westphalia and Baden-Württemberg, with China's leading energy provinces, Jiangsu and Sichuan, we aim to jointly develop decarbonisation measures for the power sector and demonstrate how subnational collaboration can translate shared climate ambitions into concrete solutions for the integrated energy systems of tomorrow.

June 2025 | German federal states delegation visiting Ultra-High Voltage (UHV) project in Suzhou, Jiangsu province

Integrating Solution: Zero-Carbon Industry Parks

Industrial parks are the primary engines of carbon emissions and economic growth. Following China's first national policy guide for Zero-Carbon Industrial Parks in 2025, we launched an integrated consulting service to support transforming these hubs into climate-neutral pioneers.

Moving beyond isolated thematical advice, we act as the international service provider for Taicang High-tech Zone in Jiangsu Province with a holistic approach linking energy, climate, circular economy and green finance to become a zero-carbon industrial zone. As Taicang hosts over 560 German SMEs, we aim to provide a scalable blueprint that supports both industrial clusters in achieving their climate targets and German enterprises have the green infrastructure they need to meet ambitious supply chain targets while remaining productive.

June 2025 | Letter of Intent for cooperation signed in Stuttgart between GIZ & Taicang

Future-Proofing: Energy Meteorology & Green Data Centers

In 2025, we expanded Sino-German cooperation into new frontiers shaping the future of the energy transition. Energy meteorology improves the assessment of renewable energy resources and the forecasting of their variability. It also helps anticipate risks associated with climate-related extreme weather. On the demand side, digitalisation is driving rapid growth in electricity demand, particularly from data centres. Through expert dialogues and joint workshops with leading German and Chinese institutions, we linked scientific innovation, digital technology, and energy policy. By fostering bilateral exchange on forecasting, digital infrastructure efficiency, we aim to pave the way for smarter, greener, and more resilient energy systems that are fit for the future.

Rows of solar panels under a cloudy sky, Unsplash/Sikwe Scarter

Impactful Dialogues on All Levels 2025

March 2025

Political Dialogue

BMWE & NDRC met for 13. annual meeting and agree priorities for cooperation

March 2025

International Conference

High-level representative shares energy transition in China at Berlin Energy Transition Dialogue

March 2025

Industrial Exchange

Chinese heat pump industry delegation visited ISH Exhibition in Frankfurt

March 2025

Energy Efficiency Demonstration in Cement Industry

Field visit in two selected pilot cement plant to explore solutions for decarbonising energy-intensive industry

April 2025

Energy Efficiency Demonstration in Industrial Park

Launch of Sino-German demonstration cooperation in industry parks

June 2025

Expert Dialogue

Sino-German workshop on energy meteorology bridging weather science and power system operations

July 2025

Kickoff Event in Jiangsu

Launched the state-to-province energy cooperation

October 2025

Knowledge Sharing

German expertise enriches 2025 International Forum on Energy Transition (IFET)

October 2025

Think Tank Cooperation

GIZ & EPPEI sign the MoU on Power System Green Transition Cooperation

Our Thematic Focuses

Energy Efficiency

The cleanest energy is the energy not used. As energy systems transition away from fossil fuels, understanding on energy efficiency also reflects a shift from traditional savings to systemic efficiency across electrified, digital, and increasingly flexible energy systems.

Energy Efficiency and Decarbonisation in Industry – Cement

Building on a strong track record in industrial energy efficiency across five energy-intensive sectors (cement, paper, ceramic, glass and airport), we have delivered measurable energy savings, emissions reductions, and policy impacts through Sino-German demonstration cooperation. Drawing on this experience, in 2025 we focused on the cement industry as a priority sector.

Energy Efficiency in the Cement Industry: A Key Step towards Decarbonisisation

The cement industry is a highly energy-intensive sector. China produces more than half of global cement output. Both the Chinese and German cement industries face similar challenges in improving energy efficiency, including high investment costs for CCU/CCS technology, the high price of green electricity, and the access to alternative fuels and raw materials.

As a typical hard-to-abate sector, the cement industry has not yet established a clear, mainstream decarbonisation pathway. Due to a lack of commercially viable alternatives for emission reduction, improving energy efficiency remains a top priority. Although most carbon emissions in this sector stem from limestone decomposition, around one-third still result from fuel combustion. Increasing the use of alternative fuels therefore plays an important role in cement decarbonisation.

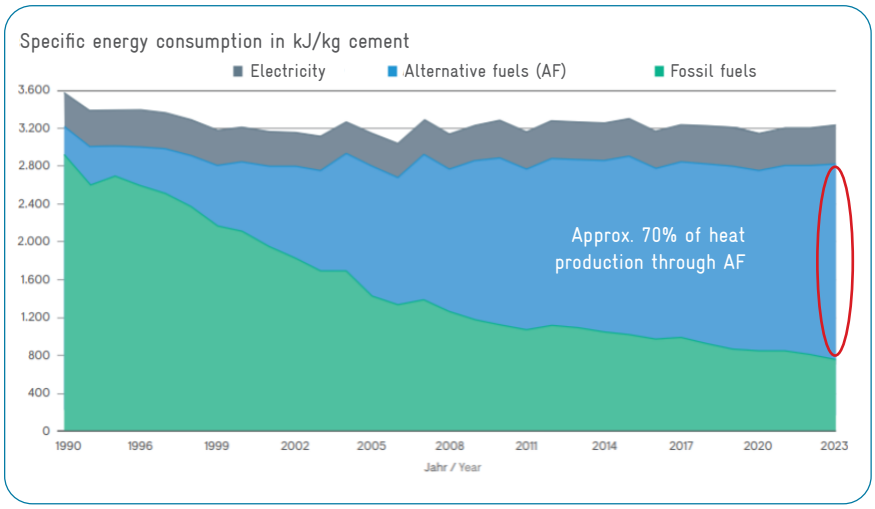
However, despite major technological upgrades and extensive deployment of waste heat recovery, China's average share of alternative fuels remained around 5%, compared to over 70% in Germany after three decades of policy support, technological development, and market formation.

Germany & China – Areas for Learning: Replacing Fossil Fuels with Alternative Fuels

Energy saving and carbon reduction in the cement industry

CHINA	GERMANY
10% share of alternative fuels in cement plants was the goal of 2025	**70%** already in 2023
Policy support: China's 14th Five-Year-Plan for Circular Economy (2021-2025) **Market support:** China integrated cement industry into carbon trade (2024)	Succesful implementation of regulatory framework, financial incentives & technical feasability
Remains fragmentated	

Reducing emissions in hard-to-abate sectors is indispensable for achieving global climate targets. Through carefully designed demonstration measures in China's cement industry under the Sino-German Energy Partnership, we demonstrate how limited public funding can leverage substantial private investment, achieve measurable decarbonisation, and improve market conditions for German low-carbon solutions in China.



GOAL:

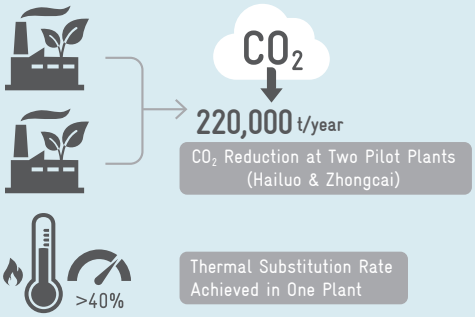
Scaling low-carbon solutions for the cement sector by demonstrating energy efficiency measures

ACTION TAKEN:

Demonstration approach to leverage & amplify: Acting as a neutral facilitator, we supported the Sino-German demonstration measures on energy efficiency and alternative fuel substitution in two Chinese cement plants. The approach combined technical implementation, expert workshops, and structured policy dialogues, connecting major Chinese cement producers, German solution providers, and political institutions from both countries.

IMPACT:

Climate impact:



One pilot plant from the Anhui Conch Group plant showcased how German green technologies and operational know-how, provided by KHD Humboldt Wedag, can be deployed under economically viable business models in the Chinese market.

Investment mobilisation

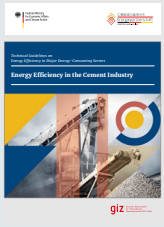
Together, the two enterprises invested around EUR 15 million in technical retrofits associated with the demonstration measures

Systemic impact through policy uptake

Pilot evidence informed a policy recommendation on improving the utilisation of alternative fuels, submitted as input to China's 15th Five-Year Plan on Energy Efficiency (2026–2030). This strengthens long-term framework conditions for low-carbon solutions.

Our Knowledge Asset:

Energy Efficiency in Cement Industry

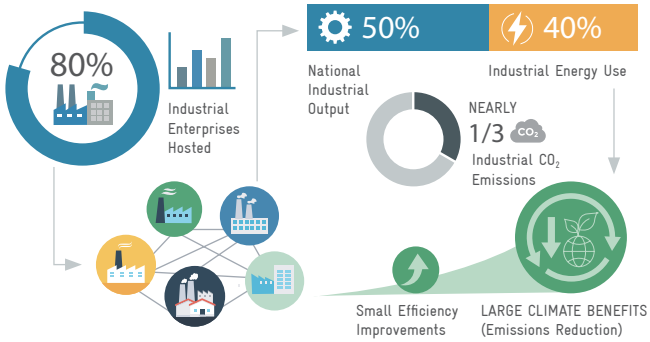


Energy Efficiency & Climate Neutrality in Industrial Parks

Industrial parks are the "engine rooms" of the energy transition. By concentrating industrial activities, infrastructure, and energy use, they enable the planning and deployment of integrated energy solutions at scale. This not only delivers significant emissions reductions but also fosters innovation in green finance and business models.

Germany & China – Scale Meets Complexity

In **China**, a total of 2,500 industry parks host around 80% of industrial enterprises.



In 2025, zero-carbon industrial parks gained strong policy momentum. Over 300 parks launched zero-carbon initiatives. Yet fully realising zero-carbon parks remains challenging. It requires system-wide solutions that align green energy supply with buildings, transport and industrial processes.

Germany & EUs climate-neutral urban development provides the roadmap for systemic change.

The "EU Mission – Climate-neutral & smart cities" supports 100 cities in the EU (11 cities in Germany) to become climate-neutral by 2030. In Germany, around 350 industrial parks illustrate how clustered enterprises can improve energy and resource efficiency through electrification, digitalisation, and integrated energy management solutions.

GOAL:

Transforming industrial parks from high-emission zones into climate-neutral pioneers by demonstrating that system integration is both technically feasible and economically profitable.

ACTION TAKEN:

- **Integrated concepts:** Developed integrated energy concepts for pilot parks (2025 in Shunyi, previous years in Jintan, Xintai, Jiaxing, Dunhuang) and supported the application of cost-effective measures by engaging German companies in China
- **Methodology:** Developed a "German Best Practice" methodology package to guide urban districts and parks toward binding climate targets.
- **Multi-stakeholder facilitation:** Bridged governments, grid operators, and industry associations to align green finance with technical implementation.
- **Technical partner:** Delivering holistic advisory service cross energy, climate, circular economy, green finance to support zero-carbon development in local industrial parks

IMPACT:

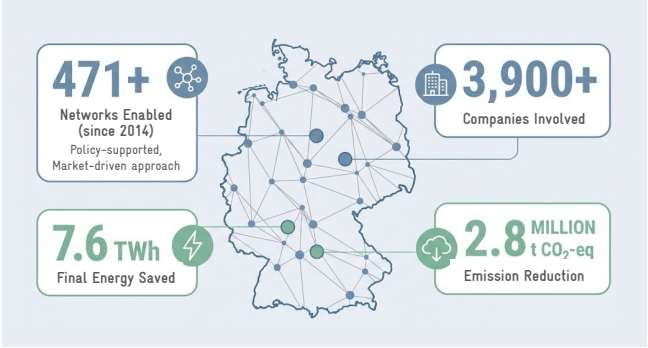
- **Setting higher standard:** Jintan pilot park adopted the German Sustainable Building Council (DGNB) standard benchmarking higher energy efficiency in buildings.
- **Market access:** German SMEs with operations in China successfully participated in public tenders, increasing visibility, strengthening fair market access, and ensuring the deployment of high-quality green solutions.

Energy Efficiency and Climate Network (EEN)

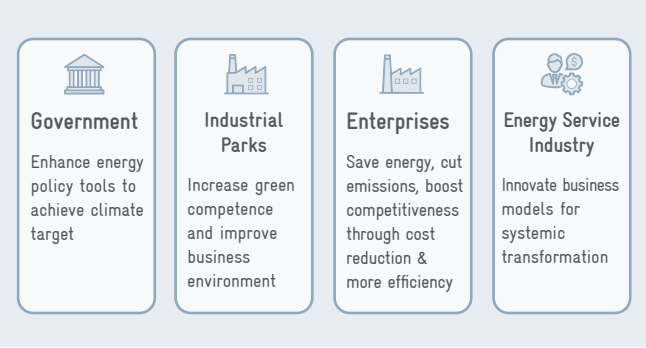
Energy efficiency and climate networks represent a proven instrument that bridges the gap between corporate action and national climate targets. By connecting local municipalities, energy service companies (ESCOs), and industrial consumers, EENs transform decarbonisation from a purely technical challenge into a collaborative business advantage.

Germany's proven impact at scale: Since 2014, Germnay's national Initiative of Energy Efficiency and Climate Networks enabled over 471 networks.

In **China**, EENs offer significant untapped potential to advance green development across key industries, industrial parks, and large enterprises.



Proven impact: Voluntary, structured cooperation for significant industrial decarbonisation.



Significance of promoting energy efficiency networks (EEN) in China

GOAL:

Promote EENs as an innovative and replicable energy service business model driven by the market and supported by policy.

ACTION TAKEN:

- **Lighthouse pilot:** Supported the Sino-German EEN pilot in Taicang High-Tech Zone, demonstrating how structured exchange and cooperation between industrial companies can deliver measurable savings.
- **National dissemination:** Disseminated EEN across China by convening German and Chinese stakeholders-industry associations, energy service industry, industrial parks and companies-to exchange supporting policies and mechanisms.

IMPACT:

Local Impact

Pilot Success: 10 companies (8 German SMEs) achieved

- 25,000 MWh annual energy savings
- 38,000 t CO_2 reduction (12.3% GHG reduction)

▲ Achieved

Regional Expansion

Scalable Model: From one network to groups of EENs:

- Replicating success across other industrial parks in China

Global Inspiration

Policy & Standards

- Planning a national process standard for EENs, this can further inspire dissemination in other countries

▲ Expected

Energy Efficiency in Data Centers

Data centres are the core infrastructure of the digital economy, with rapidly growing scale and energy demand. As a result, they are among the fastest-growing electricity consumers worldwide. On average, electricity accounts for around half of total data centre operating costs, making energy efficiency and access to renewable power key drivers of their development. At the same time, data centres can actively support the energy transition. Through flexible operation, demand response and digital control, they can provide significant flexibility to power systems and help integrate variable renewable energy.

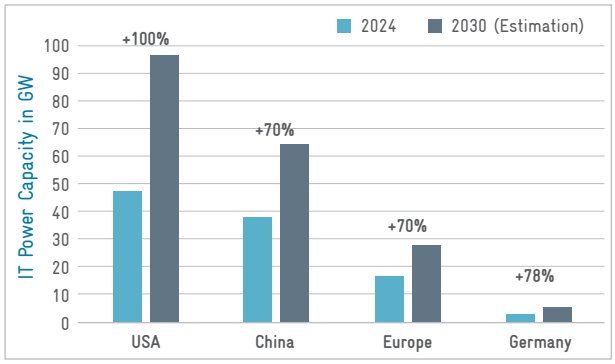


Figure: Estimated data centre capacity trends in the USA, China, Europe, and Germany (2024 and 2030). Source: Hintemann et al. (2024a).

Germany & China – Rising Energy Consumption in Date Centers

GERMANY

Electricity use in 2023:

~ 20 TWh (around 3.7% of national electricity demand);

The largest location for digital infrastructure in Europe

Regulation

Energy Efficiency Act (EnEfG)
- Power usage effectiveness (PUE) ≤ 1.3 by 2030
- 100% RE electricity from Jan. 2027 onwards
- 10–20% waste heat reuse targets

Green Data Centres

Energy efficiency

Renewable power

Waste heat utilisation

CHINA

Electricity use in 2023:

70–130 TWh (0.9%–2.7% of national electricity demand); accounting for 25% of global data centre electricity consumption

By end of 2025:
- PUE ≤ 1.25 for new large-scale data centers
- ≥80% green power for new computing capacity

Projected to **260–470 TWh** by 2030

China's response in managing rapid data centre expansion and rising electricity demand offers valuable reference for Germany, particularly in balancing digital infrastructure growth with climate targets.

Germany's experience in aligning regulatory frameworks, market-based incentives and technical standards can, in turn, complement China's implementation efforts, jointly informing scalable models for future green digital economy.

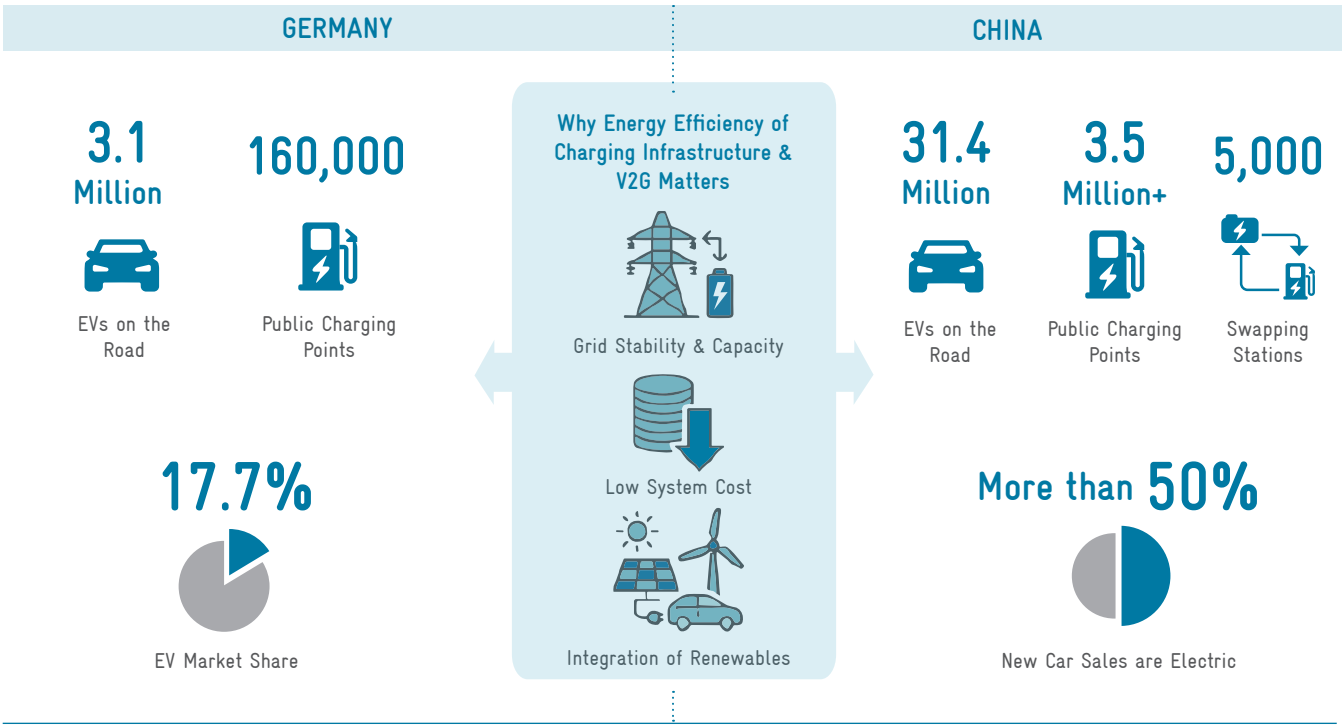
GOAL: Better policy and regulatory framework, market conditions for green data centers

ACTION TAKEN: We advanced the Sino-German cooperation on data centre energy efficiency from shared understanding to targeted system optimisation. In January 2025, we established a common view of policy frameworks, technical benchmarks and market practices. Building on this, in January 2026 we deepened the exchange towards waste heat utilisation in data center and computing center, linking digital infrastructure with energy systems and enabling more effective, scalable decarbonisation solutions.

OUR KNOWLEDGE ASSET: Date Center Flexibility in China and Germany

EV Charging and Vehicle to Grid (V2G)

Electric vehicles (EVs) continue to expand in both Germany and China, supported by the rapid growth of charging infrastructure. This development offers significant potential for improving energy efficiency and grid flexibility.



Increasing Energy Efficiency of EV Chargers

The **European Union (EU)** has identified EV chargers as a priority product group to assess Ecodesign for Sustainable Products Regulation (ESPR) requirements. Its preparatory analysis shows that improved efficiency standards could deliver significant energy savings – around 3 TWh by 2030, rising to about 21 TWh per year by 2050. This corresponds to the annual electricity use of around 1 million households by 2030, rising to about 7 million by 2050.

China plans to build a total of 28 million charging facilities by 2027, meeting charging demand of over 80 million vehicles. The rapid expansion of charging networks highlights the need for efficient infrastructure. In October 2025, China issued the first national energy efficiency standard for charging infrastructure (GB 46519-2025), establishing clear energy efficiency thresholds for electric vehicle chargers.

GOAL: Foster efficient, innovation-friendly EV charging market through exchange and standard alignment

ACTION TAKEN: We facilitated bilateral exchange on eco-design and efficiency standards (methodologies, testing, regulation through preparatory EU Eco-design study for EV Charger by Fraunhofer ISI and China's first national Standard on EV charging energy efficiency by the China National Institute of Standardisation).

OUTCOME:

- Better understanding of emerging technologies, performance indicators, and feasible regulatory pathways.
- Support of a fair, transparent and innovation-driven market environment for charging infrastructure in both countries.

Turning EVs into Grid Flexibility Providers through Vehicle to Grid (V2G)

Vehicle-to-Grid (V2G) enables electric vehicles to act as mobile storage, supplying electricity back to the power system when needed. According to the IEA, V2G could provide up to 600 GW of flexible capacity globally by 2030, contributing to offset lower renewable electricity generation during peaks as well as the increase of capacity needs to meet peak demand.

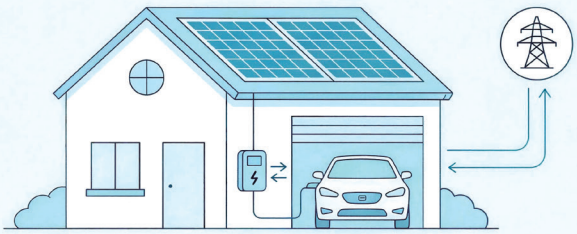
As EV adoption and charging infrastructure grow fast in China and Germany, this concept will become essential for improving grid stability, supporting renewables integration, and managing peak demand. With early pilot projects and business models now taking shape, both countries are beginning to turn concepts into reality.

GERMANY

Household Integration Focus

166,000 Vehicles Capable of Bidirectional Charging

- Growing availability of **V2G-ready wall boxes & tariffs**
- Strong focus on **household-based V2G applications**

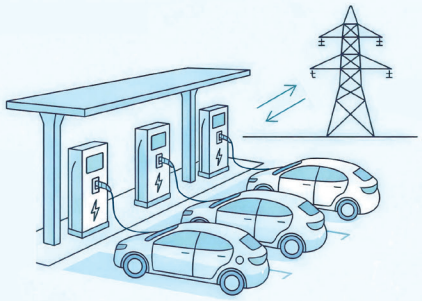


CHINA

System-scale Pilots & Infrastructure

30 V2G Pilot Projects Launched in 2024

- **28 million charging facilities** planned by end-2027
- **Application in commercial settings,** such as public transport and public parking facilities



The main challenges for V2G deployment in both countries are cost, scale, and technical readiness. In **Germany**, barriers include the limited availability and costs of V2G-capable vehicles, battery degradation, slow rollout of smart meters, and restricted data access. In **China**, V2G adoption remains small-scale, costly, and difficult to commercialise.

GOAL: Connecting policies, pilots and practice across two leading EV markets

ACTION TAKEN: We facilitated a series of bilateral workshops to exchange and compare policy development, pilot experience and emerging business models. In November 2025, we brought over 90 key stakeholders together to identify regulatory bottlenecks and assess economic incentives. By connecting Germany's strengths in household-level applications with China's broad pilot scenarios and digital platforms, the cooperation enabled mutual learning on interoperability, tariff design, system integration and cost-effective implementation pathways.

OUTCOME: This dialogue accelerates scalable, user-centred V2G solutions that enhance system flexibility, support grid stability and prepare both countries for higher renewable energy integration.

By future progress monitoring of China's 30 V2G pilots, we translate practical findings into transferable lessons and implementation pathways for international partners

Renewable Energy

High shares of renewable energy are no longer a question of capacity alone. They require a robust legal framework, well-functioning electricity markets, flexible power systems, reliable data, and decentralised solutions that work on the ground. Germany and China, as two leading energy transition economies, face different system realities, but share the same challenge: turning renewable expansion into a secure, affordable, and resilient energy system.

Legislative Framework and Electricity Market

Legislation is the cornerstone of accelerating energy transition. In the energy sector, laws and regulations set clear targets, shape investment conditions, guide market behaviour, and ensure the stable integration of renewable energy.

Germany has established a comprehensive and mature energy legislation framework. More than 15,000 legal norms also create complexity and administrative burden, which can hinder effective implementation. The German government therefore aims to increase clarity and streamline regulation where possible.

China adopted its first overarching Energy Law in 2025, marking a major milestone. Meanwhile, Renewable Energy Law, Electricity Law, Energy Conservation Law are being revised to reflect the rapid transformation of the energy system.

Effective electricity market design ensures a secure, low-cost and environmentally compatible electricity supply, even when the power is mostly derived from weather-dependent renewable energy sources.

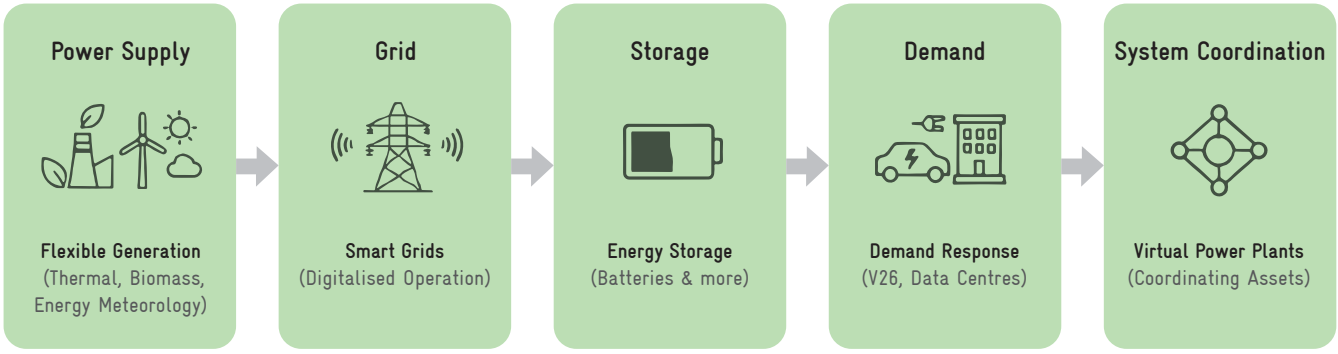
Germany operates an efficient electricity market which is highly interconnected with European electricity system, governed by uniform internal market rules. This integration enhances energy security. Since the launch of its first electricity exchange in 2000, the market has evolved into a sophisticated trading landscape. To align with EU regulation, Germany will adjust its renewable support schemes from 2027 onwards to fully integrate renewables into the market.

China speeds up reforms towards a unified national electricity market. In 2025, emphasis was on promoting crossregional electricity trading, integrating renewables in the market and encouraging the participation of more players.

Power System Flexibility with a High Share of Renewables

Flexibility in the power system is the ability to quickly adjust electricity supply or demand to keep the grid stable. As wind and solar generation are weather-dependent and only partly predictable, flexibility enables the system to balance while maintaining security and efficiency.

Technical Solutions for Power System Flexibility



Germany aims to increase the share of renewables in gross electricity consumption to 80% by 2030. Rising system costs present a major challenge. The new government is taking action to further balance efficiency, security, and affordability. In practice, this means aligning grid expansion with renewable energy deployment, strengthening flexibility on both the supply and demand side, digitalising the power system, using market-based price signals, rolling out smart meters, and establishing carbon capture technologies as part of climate protection.

In **China**, rapid renewable expansion and growing storage capacity are creating both opportunities and challenges for system stability and integration. By 2025, total wind and solar capacity have surpassed 1,600 GW, with around 200 GW added just this year. Energy storage capacity has doubled to over 30 GW, and ultra-high-voltage transmission lines have strengthened west–east power transfers. Pilots combining generation, grid, load, and storage improvements are enhancing demand response, enabling electric vehicles to support the grid (V2G). These developments show that maintaining a stable, reliable, and affordable system with a high share of renewables requires flexible solutions and careful coordination, therefore underlining the importance of international cooperation to share experience, tools, and strategies.

Energy Meteorology

As the world increasingly relies on volatile renewable energy sources such as wind and solar, better understanding and predicting weather and climate patterns has become essential for optimising energy yield, ensuring grid integration, and supporting long-term planning.

Energy meteorology provides a scientific foundation not only for assessing renewable energy potential and forecasting variability, but also for managing the risks associated with climate-related uncertainties. Both **Germany** and **China** are actively advancing energy meteorology through research, digitalisation, and practical application. Strengthening collaboration in this field will not only improve national energy resilience but also contribute to global efforts in combating climate change.

June 2025 | we convened the first Sino-German Expert Workshop on energy meteor-ology

Decentralised Renewable Energy

Decentralised renewable energy fundamentally reshapes how energy is produced, distributed and consumed. It involves electricity generation from smaller, geographically dispersed sources, such as rooftop solar and community-scale wind. By reducing transmission losses and strengthening local supply, decentralised renewables enhance system flexibility and resilience, empower communities and local economies, and support a faster, more inclusive energy transition.

Germany's experience shows that a system built on millions of distributed generators, such as rooftop PV, onshore wind, community solar and wind projects, creates a more resilient, flexible and socially anchored energy system. Almost all PV systems in Germany are distributed systems. In 2024, solar PV accounted for approximately 14% of Germany's total electricity generation.

China is increasingly prioritising decentralised renewable energy as a strategic complementary pillar to large-scale utility projects, recognising its value for local flexibility, rural revitalisation and system resilience. Policies and pilots in recent years on "whole-county PV", village and township wind power projects illustrate China's shift toward a more diverse, flexible and locally integrated energy system.

GOAL:

Support Germany and China in building renewable energy systems that function reliably at scale, by aligning legal and market frameworks, strengthening system flexibility, improving data and forecasting, and integrating decentralised renewable solutions.

ACTION TAKEN:

Policy & regulatory dialogue:

We facilitated structured exchanges between political decision-makers, regulators, system operators, and experts to address the legal and market foundations of renewable integration.

Technical exchange & joint knowledge building:

We bridge the gap between scientific research and policy by institutionalising technical exchanges on market mechanisms, grid flexibility, energy meteorology, and decentralised renewables. The outcomes of these technical exchanges informed policy frameworks with German best practices and supported the development of industry standards, enabling German companies to share expertise and help improve market conditions.

How can solar power and agriculture thrive on the same land?

By sharing German experience, we supported the standardisation of agrivoltaics in China, aligning high solar yields with agricultural protection. Joint work informed association standards in 2025 engaging German companies. Meanwhile, Chinese pilots such as spectrally separated agrivoltaics offered new insights on maximising sunlight use.

OUTCOMES & IMPACT:

Our policy advice and technical exchange contributed to China's first national Energy Law, adopted in January 2025. By aligning priorities on renewables, grid flexibility, hydrogen and market-based instruments, it supports global convergence on energy transition frameworks and offers a reference for other countries facing similar reforms.

Through exchanges between think tanks, grid operators, and regulators, we helped advance policy debates on flexibility options from demand-side response and grid-forming control to the alignment of grid expansion and market signals supporting more resilient power systems in both countries

Applying Sino-German policy experience in third-country contexts

Building on Sino-German policy experience, Germany and China jointly supported Mongolian-German legislative cooperation by sharing best practices on energy-efficiency laws and regulation. The exchange informed Mongolia's ongoing legislative development while illustrating how coordinated Sino-German engagement can support the adaptation of energy-efficiency frameworks in third-country contexts.

OUR KNOWLEDGE ASSETS:

Sector Coupling and Others

True transformation extends beyond the power grid to the heating and industrial sectors that form our economic backbone. Sector coupling, driven by green hydrogen and integrated heating solutions, allows renewable energy to decarbonise areas where direct electrification reaches its technical limits. For residual industrial processes, carbon management through CCU and CCS provides the final strategic bridge to achieving a fully climate-neutral and resilient system.

Sustainable Heating

Heating accounts for around half of global final energy consumption, making its decarbonisation a corner-stone of the energy transition. In both Germany and China, fossil fuels still dominate the heating sector.

Germany & China: Status on heating transition

GERMANY

2024: 18.1%

Renewable heat

2030 target: 50%

climate-neutral heat

Requires a package of transformation measures

- Expanding district heating and heat networks
- Increasing electrification
- Mandating 65% renewable energy in new heating systems

CHINA

2024: ~ 97%

fossil-fuel-based district heating in Northen China

Major Green Solutions

- Heat Pumps
- Waste Heat Utilisation

KEY CONSTRAINTS for wider deployment

- Regulatory gaps
- Limited standardsation
- High upfront costs & Low market awareness

GOAL:

Decarbonise the heating sector in both countries and improve the market conditions for green heating solutions

ACTION TAKEN:

We work together with government, researchers, industry associations and companies to tackle the challenges of low-carbon heating transition. Our focal areas include:

- Heating electrification (heat pumps)
- District heating by reforming heat metering and pricing
- Heat–power coupling (H2P), where heating systems provide flexibility by using buildings as thermal storage and linking heat supply with electricity markets.

OUTCOME AND IMPACT:

Through this approach, we contributed to stronger support policies, new establishment of industry standards for system efficiency of heating facilities engaging German industry, improved market conditions for the large-scale deployment of sustainable heating solutions, and accelerated the ongoing heat metering reform.

OUR KNOWLEDGE ASSETS:

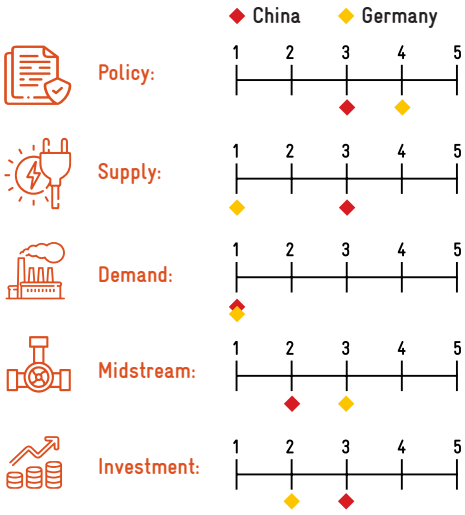
Hydrogen

Hydrogen plays a central role in the path to decarbonise hard-to-abate sectors and supporting the transition to a low-carbon economy. Hydrogen can enable the integration of variable renewable energy through the conversion and storage of surplus electricity, offering low-carbon solutions for industry and transport.

Germany and China: Common Challenge for Scaling – High Cost, Low Demand

Germany has established an advanced regulatory framework for green hydrogen, positioning itself as an early mover in hydrogen governance. However, regulation alone has not been sufficient to reduce investment uncertainty. High electricity prices constrain domestic production, leading to a strong reliance on hydrogen imports from within and beyond the EU. The current government initially focuses on sectors where demand already exists or can be easily catalysed.

China's green hydrogen supply is growing steadily, supported by large-scale investments from major energy companies. Yet green hydrogen still represents only a small share of overall production. Demand remains constrained by the cost gap between green and grey hydrogen and the absence of binding national quotas.



An Illustrative Estimation by the Energy Sector of GIZ in China

GOAL:

Support the development of a policy environment beneficial for domestic and international upscaling of green hydrogen to unlock its potential in reaching climate goals

ACTION TAKEN:

Our work has been evolving with German government's interest and the industry development

2022-2023
Exchange on Hydrogen Strategy

Aligned a shared understanding of green hydrogen's role in decarbonisation.

2024
Exchange on Standards

Enabled policy development for transparent market design and certification.

2025
Enabling Dialogues on Infrastructure

Anchored the exchange on hydrogen storage, transport etc.

IMPACT:

The phased cooperation helped establish a shared policy understanding, supported the development of credible certification and standards, and linked regulatory frameworks with emerging hydrogen infrastructure planning. Together, this laid the groundwork for scalable, sustainable green hydrogen markets in both countries.

OUR KNOWLEDGE ASSETS:

China's Hydrogen Sector 2025: Balancing Growth and Challenges

This report provides an overview of China's hydrogen sector in 2025, outlining key policies, stakeholders, technological developments, trade, standardisation efforts, and an outlook for renewable hydrogen.

CCU/CCS

Carbon capture, utilisation and storage (CCU/CCS) is a key tool for emission intensive and hard-to- abate sectors. It encompasses the full process of capturing CO_2 from the atmosphere, biomass, or fossil sources, and subsequently compressing, transporting, and then utilising, or permanently storing it.

In **Germany**, a regulatory amendment adopted in November 2025 opened the door to the use of CCU/CCS for hard to abate industrial emissions, while explicitly ruling out coal avoiding lock-in and prevent a slowdown in coal phase-out. The law creates a legal framework for the construction of CO_2 pipelines and storage facilities, taking into account the necessary safety and environmental regulations.

In **China**, CCU/CCS deployment has gained increasing attention and is advancing rapidly, as evidenced by more than 120 demonstration projects currently underway. However, further technological advancement, cost reductions, and supportive policy frameworks are still required to enable large-scale and commercially viable deployment.

GOAL: Enable the responsible use of CCU/CCS for hard-to-abate industrial emissions and alignment with long-term climate neutrality goals in both countries. Share China's experience from more than 120 demonstration projects to inform Germany's emerging CCU/CCS deployment and policy development.

ACTION TAKEN: Provided a platform for technical exchange, policy dialogue, and lessons learned on policy design, regulation, and standards, ensuring safety, environmental integrity. By combining Germany's regulatory and project experience with China's scale and innovation capacity, the partnership supports the accelerated adoption of CCU/CCS as a critical pathway for achieving low-carbon, sustainable energy systems in both countries.

OUR KNOWLEDGE ASSETS:

Facilitating China's Industrial Transformation with CCU/S

Factsheets series on CCU/CCS in Germany:

- State of CCU/CCS in Europe 2024-25
- CO_2 Infrastructure Regulation
- Incentive Systems for CCU/CCS
- Integration of CCU/CCS in Emissions Systems

Our Work in Practice

Impact is achieved where high-level political mandates meet the technical reality of implementation. We anchor Germany's energy priorities by operating across all levels of the transition: coordinating national bilateral dialogues, fostering regional state-to-province partnerships, and aligning market frameworks with industrial needs. These examples demonstrate how we transform abstract bilateral commitments into the practical, systemic solutions required for a secure and climate-neutral energy future.

Implement Bilateral Energy Partnership on National Level

The political dialogue on energy between Germany and China started in 2007 and developed into a bilateral energy partnership in 2016. Through structured dialogues, the partnership firmly aligns with both countries' climate strategies and contributes to broader international objectives. In collaboration with German and Chinese partners, we support the German Federal Government in realising the impact-oriented implementation of the partnership.

Institutional Structure of the Bilateral Cooperation Mechanism between Germany and China on Climate Change and Green Transformation

Globally, it supports the implementation of the Paris Agreement by advancing renewable energy, energy efficiency, and system integration. It supports **Germany's** Energiewende by creating a valuable global network between Germany and countries like China by jointly striving to decarbonise their energy systems, securing energy supply and driving sustainable growth. For **China**, the partnership strengthens efforts to achieve its "dual carbon" goals - peaking carbon emissions before 2030 and reaching carbon neutrality by 2060.

Political Steering: On behalf of the Federal Ministry for Economic Affairs and Energy (BMWE), we implement the Sino-German Energy Partnership (EP) and support the German government in achieving its goals in international energy and climate policies. We coordinate high-level dialogue by organising ministerial and seniorlevel meetings. We provide technical input and organisational support to ensure the structured involvement of all relevant stakeholders, particularly the German private sector. Through this role, we help translate political priorities into coherent cooperation agendas, concrete activities, and a shared strategic direction.

On the Chinese side, the National Development and Reform Commission (NDRC) co-chairs the working group on energy efficiency while the National Energy Administration (NEA) co-chairs the working group on energy.

From Dialogue to Impact: Timeline of Sino-German Energy Partnership

Translating Bilateral Vision into Systemic Change, 2007 – 2025 & Beyond

Building Foundation
2007 – 2015
Creating the basis for structured cooperation through Energy Dialogue

Milestones:
- Launch of bilateral working group on energy
- Initial MoUs on renewable energy and energy efficiency

Institutionalisation
2016 - 2023
Structured exchanges connecting government, think tanks & industry

Milestones:
- Establishment of the German Local Business Advisory Council to connect German industry to political dialogues
- Agreement on implementing three demonstration projects on energy efficiency

Implementation & Impact
2024 -2026
Turning bilateral policy visions into measurable results

Impact:
- Shaped policies & regulations
- Aligned industry standards
- Saved energy & reduced emission
- Improved marked access for German business operating locally

Future-oriented Systemic Change
2026 & Beyond

Integrating energy transition solutions across all levels to generate systemic transformative impacts for a secured and climate-friendly future and sustainable growth globally.

By implementing the Bilateral Energy Partnership, we establish a vital platform for Germany to gain strategic insights into China's rapid industrial scaling and cost-reduction pathways. By bridging these market insights with a commitment to comparable decarbonisation standards, the collaboration fosters a more level playing field and ensures fair competitive conditions globally.

October 2025 | 13th meeting of the Sino-German Working Group on Energy

Connect States and Provinces for Regional Energy Decarbonisation

While China has committed to ambitious carbon goals, the practical challenge lies in the provinces. These regions must balance rising energy demand with a still coal-dominated power mix. By leveraging Germany's experience in integrating climate policy with subnational decarbonisation, we facilitate peer-to-peer exchange between German States and Chinese provinces.

Our Approach

Our methodology centers on Multi-level Governance. We act as the technical and institutional bridge between national strategies and provincial execution. We connect Germany's industrial heartlands—Baden-Württemberg (BW) and North Rhine-Westphalia (NRW)—with China's leading energy hubs, Jiangsu and Sichuan.

Our role is to facilitate a mutual exchange of expertise. Through sharing German best practices in the power sector we provide provincial decision-makers in China with the expertise needed to translate abstract targets into actionable decarbonisation roadmaps while the cooperation is simultaneously also a valuable source of innovation for the German side.

2025: Understanding and Building Competence

In June 2025, we facilitated a delegation with representatives from the German federal government, the states BW and NRW and the Wuppertal Institute, to visit Jiangsu and Sichuan. This mission served as the operational launch of the IKI-funded project focusing on ambitious decarbonisation of the energy system. By guiding the delegation through ultra-high-voltage platforms and clean energy innovation hubs, we enabled a direct exchange on renewable integration and grid flexibility which will guide further implementation.

In November, we shifted from strategy to capacity-building for over 60 industrial parks in Jiangsu. Our experts provided technical training on carbon peak planning, emission quantification and trading and the use of green certificates. We also introduced innovative tools such as energy efficiency networks (EEN), synergising with our dissemination work of EEN under the Energy Partnership. Through the training, we strengthened the green competence of provincial stakeholders to translate national climate targets into operational measures and to advance more systematic, data-driven carbon management across industrial parks.

June 2025 | German delegation visiting Jiangsu & Sichuan

Expected Impact and Significance

This subnational approach demonstrates that effective international cooperation must reach the local level where industrial transformation is most intense. By connecting German federal states with Chinese provinces, we have created a scalable model for regional decarbonisation that complements national bilateral agreements. Our work ensures that German technical excellence and regulatory experience are embedded in the world's largest regional energy markets. This not only secures measurable progress toward global climate targets but also reinforces our role as the indispensable partner for delivering complex, multi-level energy transition mandates.

Supported by the International Climate Initiative (IKI), one of the German Federal Government's central instruments for promoting international climate action.

Bridge Policy and Market to Support Industry

The global transition to a climate-neutral energy system is fundamentally an industrial and economic transformation. While governments set political direction and regulatory targets, it is the private sector that develops innovative technologies, mobilises the necessary capital, and deploys solutions at the required scale.

We integrate industry perspectives through four primary channels:

1. **Strategic B2G Dialogue:** Through the Local Business Advisory Council (LBAC), we provide a direct channel for German companies to engage with German government on structural market challenges in China's energy sector.
2. **Technical Policy Advice:** We incorporate industry-led technical expertise into our policy recommendations to the German and Chinese governments, ensuring that regulations are grounded in industrial reality.
3. **Standard Alignment:** We facilitate the participation of German companies in the exchange and development of industry standards, promoting "system-thinking" and high-performance benchmarks.
4. **Access to Pilots:** We involve localised German companies with innovative green solutions in demonstration projects, proving the technical and economic feasibility of new technologies in real-world settings.

> The Sino-German Energy Partnership provided us with a platform to participate in a flagship project promoting sustainable building practices in China. German small and medium-sized enterprises offering green transition solutions often face challenges in receiving equal treatment in public tenders. Through this initiative, we have the opportunity to showcase German sustainability solutions and support China's efforts toward climate neutrality.
>
> – 2025.05, Brötje GmbH

ZOOM IN: Advancing Clean Heating by Engaging Private Sector

The decarbonisation of the heating sector represents one of the most complex challenges in the energy transition. Heat pumps, which can reduce emissions by up to 75% compared to coal-fired heating when powered by renewable electricity, are a cornerstone of this shift. Our work on heat pumps demonstrates how our integrated service model—linking policy, standards, and industry—delivers measurable progress.

Connecting Policy and Industry Expertise

Since 2021, we have worked to introduce German and European regulatory experience into the Chinese market. A key outcome is the annual Heat Pump White Book, developed in collaboration with the China Heat Pump Alliance (CHPA). By inviting German companies and the German Heat Pump Association (BWP) to share insights on market trends and policy incentives, we created a high-level reference for Chinese policy-makers.

These expert dialogues with policymakers in China have directly addressed a critical structural barrier: the classification of environmental heat as a renewable energy source. Drawing on the experience of Germany's building energy regulations, we provided evidence for how such a redefinition can unlock new subsidies and investment certainty.

Strengthening Standards for a Level Playing Field

To accelerate market uptake, transparency is essential. Fragmented standards often hide the benefits of high-efficiency products. We supported the development of a new group standard for measuring system-level energy efficiency in China. By introducing the European approach of assessing entire heating configurations rather than isolated components, we helped raise performance benchmarks. For German companies, this shift highlights their strengths in integrated system design, ensuring that quality and efficiency are recognised in the Chinese market.

2025: The Year We Observe Change

In March 2025, China released its first national action plan for sustainable development of the heat pump industry. The plan, reflecting input from German stakeholders, intents to strengthen regulatory frameworks, support industrial development, and signals long-term commitment to integrating heat pumps into China's clean heating transition. This also enables German companies to operate in a better and more predictable market environment.

Meanwhile the exchange outcome on reclassification of environmental heat is brought into China's ongoing revision of the Renewable Energy Law. Recognising environmental heat as a renewable energy source would open the door to new policy incentives - an essential step for accelerating the nationwide uptake of efficient, low-carbon heating technologies.

In Collaboration with:

Chinese government bodies

- National Development and Reform Commission (NDRC)
- National Energy Administration (NEA)

Chinese industry associations

- China Heat Pump Alliance (CHPA) at the China Energy Conservation Association (CECA)
- Clean Heating Industry Committee (CHIC)
- Environment and Energy Service Industry Asso-ciation (EESIA)

German industry associations

- Bundesverband Wärmepumpe (BWP)
- AHK Greater China

Research institutes and think tanks

- Energy Research Institute in China (ERI)
- Deutsche Energie Agentur (dena)

Private Sector

- Viessmann
- Wilo
- Dream Maker
- Stiebel Eltron
- MAN Energy Solutions
- Siemens Energy
- NECreat
- Oventrop
- Vaillant
- Danfoss

Facilitate Women in Green Energy Initiative

To promote gender equality and empower women in energy sector, we launched the "Women in Green Energy Initiative" in 2020. The initiative facilitates networking events, expert workshops, and capacity building activities to create equal opportunities for women to succeed in China's energy transition. A more diverse energy and climate sector improves the quality of solutions and enables a faster, fairer and more resilient pathway to energy transition.

Our Activities

CONNECT & EMPOWER

COMMUNICATION
Share information and knowledge

NETWORK EVENTS
Build dialogue platform and foster exchanges

EXPERT WORKSHOPS
Discuss and explore improvement appraches

CAPACITY BUILDING
Strengthen skills and leadership through training, mentoring

October 2025 | Women Empowerment in Energy Transition under the AI Age
As a Special Event at 2025 IFET in Suzhou

Numbers and Impact of the Initiative by end of 2025:

9 women's empowerment network events

40 partners & organisations connected

3,000+ audience connected through joining events offline or online

20 Chinese female professionals enhanced competence through global women's mentor programme

1 publication on Women in Renewable Energy translated and published in Chinese

30,000+ communication outreach (social media etc.)

> The energy transition is receiving global attention. As the head of the technical marketing department of an energy consulting firm, there is an urgent need to improve the ability to analyse industry issues and forecast technology trends. At the same time, to improve the team management ability and develop an energy consulting team with international perspective. Thus, hopefully our research results and recommendations in the energy field would better contribute to the energy transition.
>
> —— Mentee representative

Mentees to Mentors: Women Alumni Forge a Sustainable Cycle Women Empowerment in Energy Transtition

Some of the mentees of the global women's mentor program become mentors after the program, using their own experiences to encourage other women in global energy industry.

Rising Institutional Momentum on Empowering Women to Advance Energy Transition: A growing number of energy institutions in China are launching targeted initiatives—such as the Women's Expert Database in Energy Transition and research programs supporting the career development of female engineers in power sector. In 2023, these efforts have gained more recognition through the Women Empowerment Subforum at the biannual Suzhou International Energy Transition Forum, a high level international platform co-hosted by China's National Energy Administration (NEA) and the International Renewable Energy Agency (IRENA) since 2015.

Our Network

An Illustrative Selection

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giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Think tanks

dena German Energy Agency

Agora Energiewende

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IREES research for future.

Industry associations & private sector

AHK

DE INTERNATIONAL

econet china

THE EUROPEAN UNION CHAMBER OF COMMERCE IN CHINA 中国欧盟商会

GTAI GERMANY TRADE & INVEST

BVES German Association Energy Storage Systems

100+ active German companies under "Local Business Advisory Council"

Local government & industrial parks

NRW

Baden-Württenberg

China

国家节能中心 NATIONAL ENERGY CONSERVATION CENTER

中国电力企业联合会 CHINA ELECTRICITY COUNCIL

水电水利规划设计总院 China Renewable Energy Engineering Institute

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中关村储能产业技术联盟 CNESA China Energy Storage Alliance 中国能源研究会储能专委会

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