

CHINA AND THE 21ST CENTURY POWER PARTNERSHIP

Paving the Way to a Cleaner, Smarter, and More Resilient Power System

Mission and Objectives

The 21st Century Power Partnership (21CPP) aims to accelerate the global transformation of power systems. The initiative engages in a broad range of research and technical assistance activities to support bilateral and multilateral collaboration that accelerates the diffusion of high-impact policy and regulatory strategies. The Power Partnership connects governmental, nonprofit, and industry stakeholders to share experiences, accelerate learning, and expand the visibility of power system transformation efforts around the world.

China's participation is key in accomplishing the goals of 21CPP: accelerating the global transition to clean, reliable, and cost-effective electricity while advancing the science and technology of future integrated energy systems. In recent years, China has supported massive clean energy deployment projects and is currently undertaking its most significant power sector reform in more than 15 years. Implementing institutional frameworks and policies to foster a competitive, transparent, and sustainable electric power system in China will not only secure a clean, affordable, and reliable electricity supply for 1.3 billion people, but will also offer opportunities to stimulate and commercialize innovative technical and business solutions with global applications.

The 21CPP China program was established in 2016 with four goals:

- **Validating and highlighting** the role of high renewable electricity futures within China's five-year planning process
- **Establishing** China's transition from a fossil-fuel-dominated nation to a leader in the field of renewable energy
- **Enabling** the institutional pathways to achieving the efficient deployment of clean, affordable, and reliable energy
- **Disseminating** results and lessons learned globally through multiple outlets.

Activities

The 21CPP China program focuses research and activities in three technical areas:

1. Power System Planning and Operations Support

This work stream supports China's ability to perform power system planning and operations with increased renewable deployment. It seeks to enable decision

About the 21st Century Power Partnership

The 21st Century Power Partnership is a multilateral effort of the Clean Energy Ministerial and serves as a platform for public-private collaboration to advance integrated policy, regulatory, financial, and technical solutions for the large-scale deployment of clean energy generation in combination with deep energy efficiency and smart grid solutions.

makers to have greater ambition and confidence in achieving high levels of renewable energy while maintaining power system reliability and affordability. This effort involves providing technical assistance to the China National Renewable Energy Center to produce the annual China Renewable Energy Outlook and exchanges with State Grid Energy Research Institute to support their long-term planning, modeling, and scenario analysis and their near-term operational modeling.

2. Power Market Design and System Flexibility

This work stream supports China's power sector reform and establishment of power markets. This task explores issues in grid design, inter-provincial transmission analysis, wholesale power market design, retail restructuring, and options to incentivize flexibility. This task supports China's decision makers and grid operators in making the transition to a market-based power system by disseminating lessons learned in international market design and by developing applicable best practices for the China context.

3. Renewable Energy Integration

This work stream supports cost-effective integration of variable renewable energy sources into the transmission and distribution grids based on analysis of ongoing technology innovation, system solutions, and policy and economic mechanisms from the United States and other nations. This task includes support for China's green certificate mechanisms, national carbon market, and efforts to reduce renewable energy curtailment while providing incentives for renewable integration (including the integration of distributed energy resources).

Main Partners

China National Renewable Energy Center (CNREC), State Grid Energy Research Institute (SGERI), Danish Energy Agency, and German Corporation for International Cooperation (GIZ).

Collaborating Partners

China Electric Power Research Institute, Tsinghua University, North China Electric Power University, Electric Power Planning & Engineering Institute, Peking University, Energinet, German Energy Agency, and Agora Energiewende.

2018–2019 Anticipated Activities

Publish China Renewable Energy Outlook 2018

Continue partnership with China National Renewable Energy Center (CNREC) and international partners to conduct research on stated policy and low-carbon scenarios. Support CNREC tasks on mid-term evaluation of the thirteenth five-year-plan on renewable energy development, renewable cost reduction, power market development, and regional clean energy transition.

Clean Grid Vision: 2020–2050

Continue research efforts on the Clean Grid Vision project by producing initial scenario results; drafting analysis on next-generation power market design, electrification and demand-side management; and understanding the role of storage in systems with high penetrations of renewables.

Workshops and Study Tours

A series of workshops and study tours are planned in China and in the United States on topics that include power market design and market monitoring, power system modeling and scenario analysis, and renewable energy integration.

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