

## ContainerPower Energy Solutions

# Wind and solar complementary construction of Hairong Communication Base Station in Kazakhstan



## Overview

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The system utilizes solar arrays and wind turbines to store the electricity generated through an intelligent wind solar hybrid controller into a battery, and then converts the stored DC electricity into AC electricity through an inverter, which is sent to the base station equipment to provide a stable power supply system for the base station. Can wind-solar-hydro complementarity improve China's future power system stability?

Wind-solar-hydro complementary potential shows great temporal and spatial variation. Renewable complementarity can improve China's future power system stability. In the context of carbon neutrality, renewable energy, especially wind power, solar PV and hydropower, will become the most important power sources in the future low-carbon power system.

Should Kazakhstan adopt an energy security strategy?

Global trend of tightening carbon regulation presents yet another impetus for broader modernization and systemic reforms of energy sector in Kazakhstan. Kazakhstan should articulate and adopt an official Energy Security Strategy document, guided by these general observations.

Can wind power & solar PV affect the bearing capacity of power grids?

The output of wind power and solar PV as unstable power sources can be volatile in adjacent time periods, which will affect the bearing capacity of power grids. At the same time, excessive output of wind power and solar PV can result in more curtailment of wind power and solar PV.

Will Kazakhstan achieve its INDC conditional emissions target by 2030?

Given its current trajectory, Kazakhstan may not achieve its INDC conditional emissions target by 2030; national GHG emissions may even drift upwards in early 2020s with further economic recovery and higher energy consumption; a more concerted effort is needed to reverse this.

Is the Kazakhstan-China pipeline a good option for Kazakh oil exports?

The Kazakhstan-China Pipeline (KCP) was main non-Russian route for Kazakh oil exports in 2022. – KCP remains substantially underutilized, as it tends to yield relatively unattractive netbacks given fixed China border price at discount to an international benchmark and provides access to one market (and buyer).

Which project will boost Kazakhstan's oil production in 2024-25?

Tengiz: Future Growth Project is main source of Kazakhstan's incremental oil production during 2024-25. Kashagan: Phase 2 development is likely to lift project output through 2030s, cushioning overall national production decline trajectory.

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