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Tashkent State Technical University, photo by JETRO Tashkent

Technology needs to reduce CO_2 emissions in Uzbekistan

- Hydrogen and Ammonia
- CCUS Trend
- Renewable Energy Business Trend

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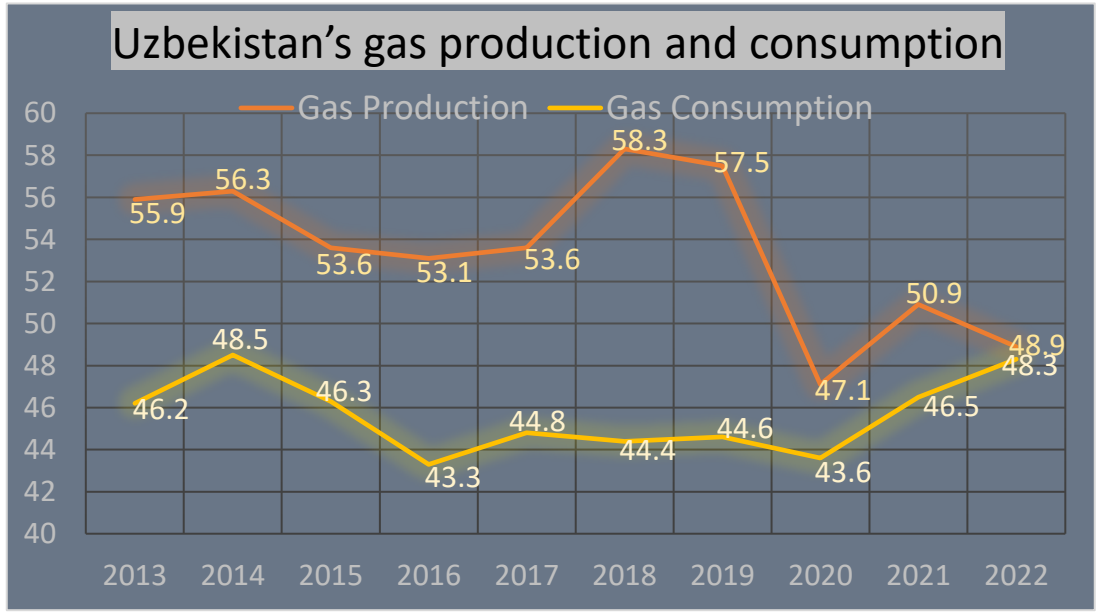
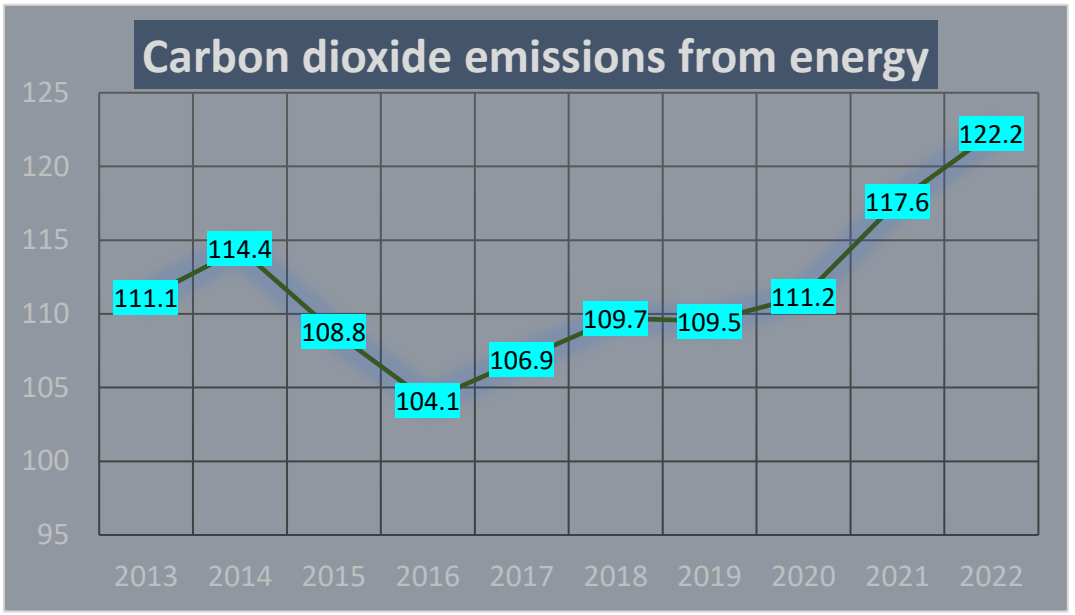
Prerequisites for the development of renewable energy in Uzbekistan

- The energy generation of Uzbekistan depends by **82%** on natural gas

- Domestic natural gas production declines year on year, the country started importing gas from 2020:



- Carbon dioxide emissions from energy generation are increasing:



Priority ways to reduce gas emissions in Uzbekistan

Uzbekistan has increased its commitments to reduce specific GHG emissions by 35% per unit of GDP compared to the level of 2010 (NDC1 indicated a 10% reduction)

Ways to reduce emissions	Attitude of the government	Expected emissions' reductions
Transition to renewable energy sources and construction of new hydropower, solar, wind plants	1st priority	16.7 mln.tons
Reduction of direct emissions (switching to "green" transportation)	2nd priority	2.7 mln. tons
CO_2 capture from the air	*unreported*	*unreported*
Offsetting through investment in projects that reduce carbon dioxide emissions	*unreported*	*unreported*

Source: Report "Scenarios for Uzbekistan to achieve carbon neutrality" by Institute for Macroeconomic and Regional Studies under the Cabinet of Ministers of Uzbekistan

CCUS in industry

Carbon and greenhouse gas emission targets have not yet been established for industrial enterprises

A system of monitoring and accounting of carbon emissions at the industrial enterprises is planned for implementation from January 1, 2024

Industrial plant in Tashkent, photo by JETRO

Industrial enterprises with environmental impact will be required to implement measures to reduce their carbon footprint if carbon emission standards established for them are exceeded

Forecast indicators of solar and wind energy

Indicators	2022	2024	2026	2028	2030	2050
Share of green energy in total electricity generation*	8.0%	9.0%	24.3%	29.0%	30.5%	carbon neutrality**
Capacity of solar and wind, MW	236	3,000~ 4,000	8,000	*n.a.*	12,000	47,000 ***
Number of solar and wind farms	2	9~15	20	*n.a.*	>30	*n.a.*

Notes: All data presented are based on government or publicly available information.
* Including hydroelectric power
** Achieving carbon neutrality by 2050 is an optimistic scenario, while the baseline scenario assumes achieving carbon neutrality by 2060 and the pessimistic scenario envisages achieving carbon neutrality by 2070
*** EBRD estimates
n.a. – information is not available

Green Hydrogen and Green Ammonia

- Major partner: **ACWA Power (KSA)**

- 3,000 tons of green hydrogen producing plant at MAXAM-Chirchik JSC ammonia plant. Project cost - $88 million

- development of a feasibility study for a project to produce 500,000 tons of green ammonia per year. ACWA Power will not be the owner of the project;

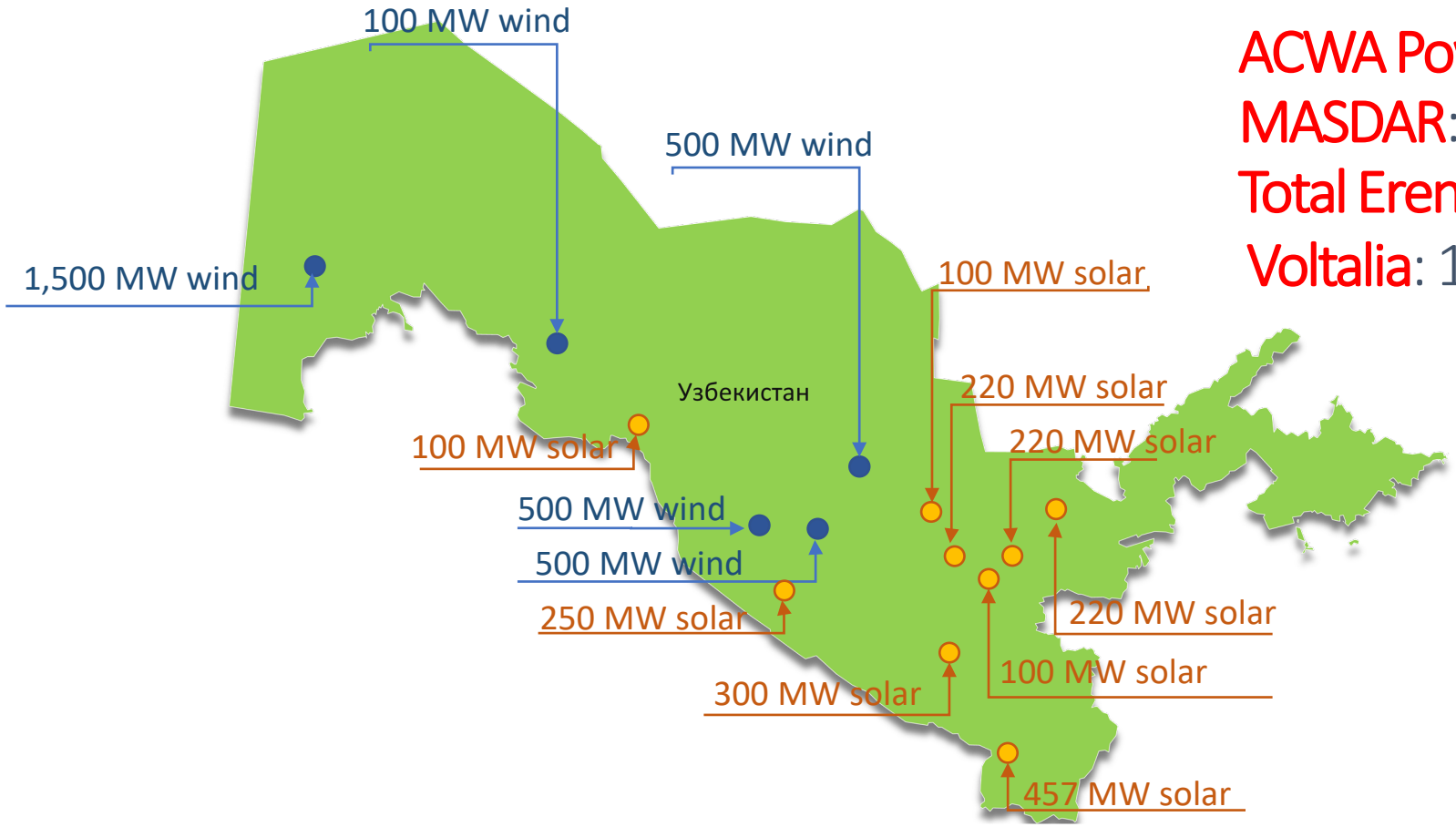
- another large green hydrogen project was proposed by the company to the Uzbekistani government

Office of ACWA Power in Tashkent, photo by JETRO

Investment capacity of green hydrogen	$40 billion (by 2050)

Major solar and wind projects

Projects implemented on the basis of a tender selection



ACWA Power: 8 projects; $6 bn
MASDAR: 7 projects; $2 bn
Total Eren: 1 project; $100 mn
Voltalia: 1 project; $100 mn

Technology used in the new solar and wind farms

Owners of solar and wind farms projects often rely on Chinese technology

ACWA Power (KSA)

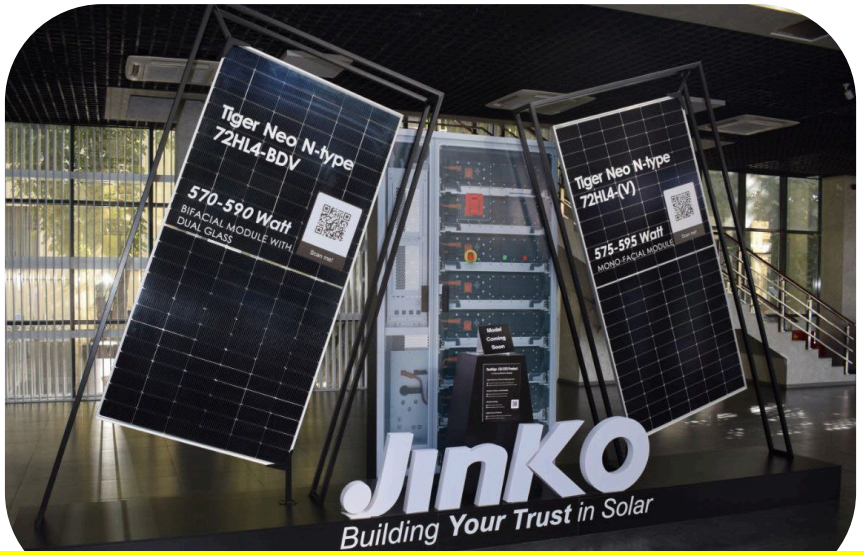
EPC Contractors	Suppliers of equipment*
China Energy Engineering Corp	Envision Energy
Shanghai Electric	*n.a.*

MASDAR (U.A.E.)

EPC Contractors	Suppliers of equipment*
SEPCO III (subsidiary of PowerChina)	Xinjiang Goldwind
CMEC	***n.a.***
Dongfang Electric	***n.a.***

Note: *- wind turbines or solar panels; n.a. – information is not available

China's Sungrow and Jinko Solar act as technology partners for the Uzbekistan's first 150MW solar panel production at Sun-Hightech LLC (in the Kashkadarya province of the country)



Jinko Solar’s panels at the lobby of the Ministry of energy, photo by JETRO Tashkent

Solar and wind projects on a direct negotiations' basis

- Since January 2023 the government started to conclude agreements for an industrial scale solar and wind farms on a direct basis;
- Several Chinese companies were selected as the project owners: China Gezhouba Group, Huaneng Renewables, PowerChina International Group, China National Chemical Engineering &Construction Corp., etc.
- These companies often act not only as project owners, but also as builders, or “self-builders”
- The new companies have pledged to put the new stations into operation in a record time of 1 year, which was the main reason for their selection as the new project owners
- The capacity of new stations under these projects exceeds the capacity of tender projects by 2-3 times

Installation of solar panels on roofs of buildings

- A new requirement to install solar panels on at least 50% of the free roof of new high-rise buildings is in place since January 2023
- Program for the installation of solar panels at public higher education institutions is in place
- The Solar Home Program to encourage the installation of small capacity solar panels (up to 50 kW) in households is being implemented from April 1, 2023

Ministry of Culture and Tourism
photo by JETRO Tashkent

Tashkent State Technical University
photo by JETRO Tashkent

Business Trends of Renewable Energy

- The government fully supports projects of new solar and wind power plants of foreign investors, which are expected to be commissioned in a short period of time (1-2 years)
- The government supports projects that enable vehicles (buses, trucks, etc.) to use clean energy sources, including green hydrogen
- In the green hydrogen and ammonia sector, pilot projects with small production volumes are being implemented, while larger projects have not yet received governmental approval
- Uzbekistan is going to establish its own production of solar panels (4 projects with a total capacity of 470 MW per year are planned)
- Accelerated installation of solar panels on the roofs of administrative, social and educational institutions in Uzbekistan continues
- China is the main technological partner for the construction of clean energy plants and provision of equipment (solar panels and wind turbines)

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Thank you!

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