

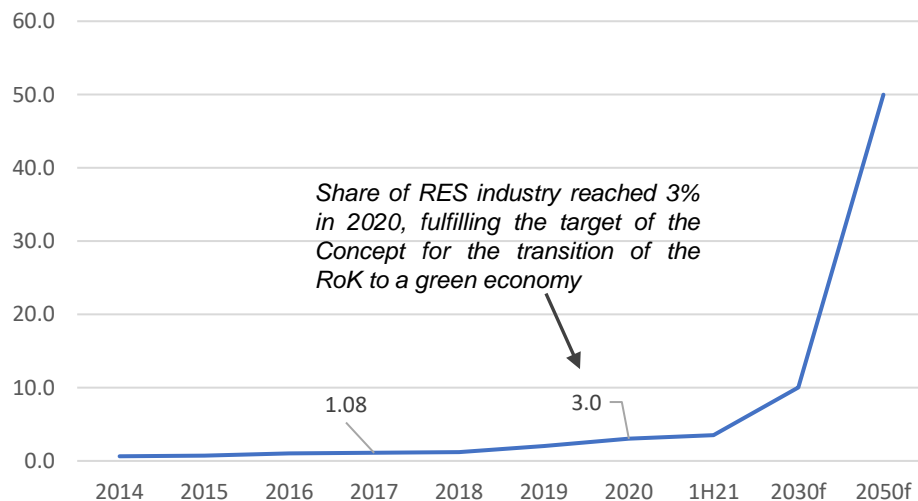
Kazakhstan's renewable energy sources facilities with total installed capacity of 2,010MW in 2021, up 11 times from 2014

- ✓ 1960: the first green project was put into operation in Kazakhstan, Antonovskaya HPP on Lepsy River, now its owner being Kainar- AKB battery plant.
- ✓ 2013: active development of the renewable energy market began in Kazakhstan, the Concept for the transition of the RoK to a green economy was adopted.
- ✓ Institutional changes started with the creation of the Settlement and Financial Center for the Support of RES (RFC) KEGOC. The new organization received the role of a single purchaser, as well as the function of a supplier of electricity to the grid. The RFC began signing offtake contracts with investors who were guaranteed a fixed tariff for 15 years with an obligation to buy back the entire amount of generated electricity.
- ✓ 2016: RES investment projects receive preferences i.e. **exemption from custom duties and VAT on imports, provide in-kind grants from the state.**
- ✓ 2018: A downward tariff auction was launched. The contract is signed with the investor who offers the lowest tariff for a certain site.
- ✓ 2020: RES investment projects were included in the priority list and the package of preferences was increased i.e. **exemption from property & land taxes and exemption from corporate income tax** were added to the existing incentives. The **deadline for the contract is extended to 20 years. For small-scale RES projects, the state provides partial subsidizing costs at the level of local executive bodies** (source: Samruk Energy).
- ✓ The RES industry became noticeable in 2017, when the volume of renewable energy generation began to steadily exceed 1% of the total electricity generation. In 2020, the share of the RES industry reached 3%, fulfilling the target of the Concept for the transition of the RoK to a green economy. **As at 1H21, the share of green energy reached 3.5%.**
- ✓ As at end-2021, there were **134 renewable energy sources facilities in Kazakhstan with a total installed capacity of 2,010MW** compared to 177.52MW in 2014, an increase of almost 11 times.
- ✓ By type of renewable energy generation in Kazakhstan today: solar 57%, **wind 29.1%**, small hydroelectric 13.4%, bioelectric 0.5%.

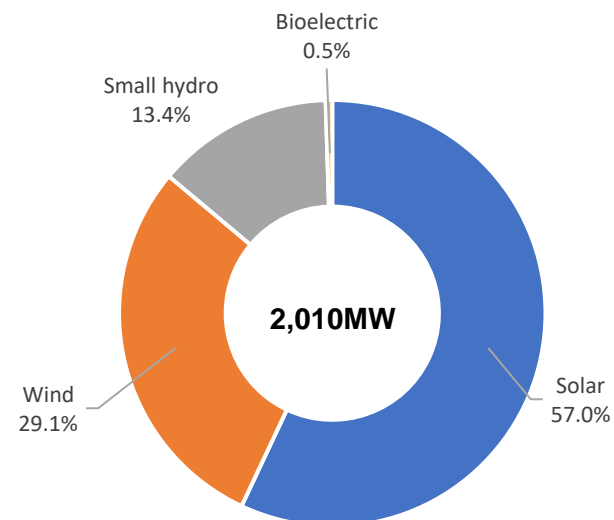
Kazakhstan targets RES share of 10% by 2030 and 50% by 2050, wind energy will be essential factor in achieving these goals

- ✓ According to the data from the Ministry of Energy of RoK, the resource potential of RES in Kazakhstan is estimated at:
 - Wind energy 920bln kWh per year;
 - Hydro energy 62bln kWh per year;
 - Solar energy 2.5bln kWh per year;
 - Thermal potential of geothermal waters 4.3GW.
- ✓ **Kazakhstan targets the share of electricity from RES at 10% by 2030 and 50% by 2050, and wind energy will be an essential factor in achieving these goals.**
- ✓ According to the Renewable Energy Association of Kazakhstan (AVEC), Kazakhstan's RES targets are realistic, supported by further reduction in capital costs for the constructions of new stations, increase in efficiency of panels & wind turbines, localization of individual industries, works & services, as well as the development of technologies for the accumulation of electricity.

Kazakhstan's RES Share in the Total Volume of Energy Production, %



Kazakhstan's Renewable Energy Generation, 2021



Kazakhstan's top 15 largest renewable energy facilities by installed capacity

Kazakhstan's Top 15 Largest Renewable Energy Facilities by Installed Capacity

No.	Project name	Company	Co-financing	Installed capacity, MW	Annual gross generation (thousand kW/h)	ICUF (installed capacity utilization factor) %	Year	Location
1	SPP Nura	Hevel Kazakhstan (former KB Enterprises)	EDB	100	150,000	13	2020	Akmola region
2	SPP Nurgisa	Eneverse Kunkuat	DBK, Industrial Development Fund	100	180,000	15	2019	Almaty region
3	WPP Zhanatas	WPP Zhanatas	EBRD	100	-	30	2020	Zhambyl region
4	SPP Shu -100	M-KAT Green	Total Eren SA, EBRD	100	150,000	14	2019	Zhambyl region
5	SPP Saran	SES Saran	EBRD, Solarnet GmbH/ Goldbek Solar	100	92,000	15	2019	Karaganda region
6	WPP Wind and Energy Technology	Wind and Energy Technology	No data	53	207,000	40	2018	Atyrau region
7	WPP Astana Expo - 2017	Green Energy TsATEK	DBK, Industrial Development Fund	50	190,000	40	2019	Nur-Sultan
8	SPP Kaskelen-50 MW	Mistral Energy	DBK	50	-	19	2020	Almaty region
9	SPP YuKSES 50	YuKSES 50	EBRD	50	77,000	15	2020	Turkestan region
10	SPP Kentau 50 MW	Hevel Kazakhstan	No data	50	-	20	2020	Turkestan region
11	SPP Burnoye Solar 1	Burnoye Solar -1	EBRD, CTF	50	80,000	15	2015	Zhambyl region
12	SPP Burnoye Solar 2	Burnoye Solar -2	EBRD, CTF	50	78,000	15	2018	Zhambyl region
13	SPP Agadyr 1	KazSolar-50	EBRD	50	80,000	15	2019	Karaganda region
14	SPP Baikonur Solar	Baikonur Solar	EBRD, ADB, CTF	50	88,000	16	2019	Kyzylorda region
15	WPP Badamsha	Arm Wind	Eni	48	150,000	40	2020	Aktobe region

Kazakhstan's top 15 largest renewable energy facilities by installed capacity (cont')

- ✓ The total installed capacity of the top 15 RES facilities is 1,001MW or 58.7% of all RES power plants in Kazakhstan.
- ✓ The max. capacity of one station reaches 100MW i.e. four solar stations (Nura, Nurgisa, Shu-100, Saran) and one wind farm (Zhanatas). The min. capacity in the top 15 at the Badamsha wind farm is 48MW.
- ✓ The average installed capacity utilization factor of the solar power plants is 15.6%, while wind farms show a higher capacity factor at 37.5% average.
- ✓ Most of the top 15 RES facilities were launched with the help of co-financing of international development institutions (EBRD, Eurasian Development Bank and Clean Technology Fund), which took part in 8 of the top 15. Meanwhile, Kazakhstani development institutions (Development Bank of Kazakhstan and Industrial Development Fund) took part in 3 projects.
- ✓ One project was launched through private investment i.e. Italian oil company Eni financed the construction of the Badamsha wind farm worth USD100mln. The Shu-100 solar power plant was built by Total Eren, a subsidiary of the French oil & gas company which is involved in the development of the Kashagan field. The project was financed by the EBRD.
- ✓ The institutional transformations laid down in 2016-2018 led to the rapid development of the RES industry, which was observed in the next two years. In 2019, the RES installed capacity increased by 97.8%, 55.7% in 2020 and 22.9% in 2021.
- ✓ 12 of the top 15 were put into operation in 2019-2020, among which 5 are currently the largest sources of renewable energy (100MW).

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