

RENEWABLES IN KAZAKHSTAN: THE CURRENT STATE, POTENTIAL, FINANCING MECHANISMS

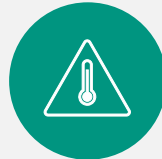
SEPTEMBER 2023

INTERNATIONAL COMMITMENTS OF KAZAKHSTAN



The United Nations Framework Convention on Climate Change, 1992

Stabilise greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system"



Paris agreement, 2015

- Hold "the increase in the global average temperature to well below 2°C above pre-industrial levels"(during 1850-1900)
- Pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels "



Source: United Nations

KAZAKHSTAN IS PART OF THE GLOBAL DECARBONISATION MOVEMENT

1994

Ratification of the UN Framework Convention on Climate Change

2015

Presented NDCs to Reducing Greenhouse Gas Emissions: unconditional and conditional reduction of GHG emissions by 15% and 25% by 2030 compared to 1990

2016

Ratification of the Paris agreement

2020

Announced the goal of achieving carbon neutrality by 2060

2023

Adopted the Strategy for achieving carbon neutrality of Kazakhstan until 2060

Source: Strategy for achieving carbon neutrality of the Republic of Kazakhstan until 2060

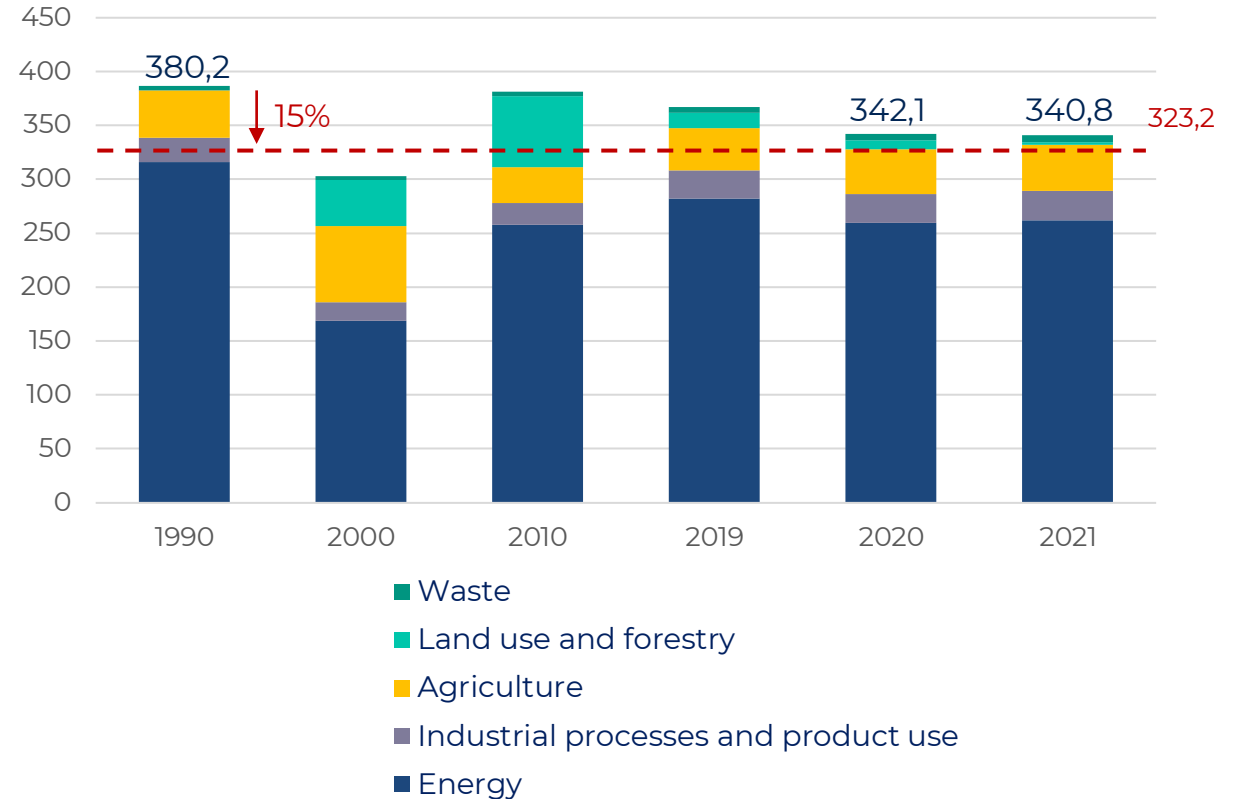
GREENHOUSE GAS EMISSIONS IN KAZAKHSTAN

> 75%

The energy sector is the main source of greenhouse gas emissions in Kazakhstan



Greenhouse gas emissions in Kazakhstan by sector, millions tons of CO₂e



Source : Ministry of Ecology and Natural Resources of the Republic of Kazakhstan. National report of the Republic of Kazakhstan on the inventory of anthropogenic emissions from sources and removals by sinks of GHGs not regulated by the Montreal Protocol on the greenhouse gas inventory.

RENEWABLE ENERGY CAPACITY IS EXPANDING GLOBALLY (1/2)

3 372
GW

Total cumulative
renewable energy
capacity in the world,
2022

30%

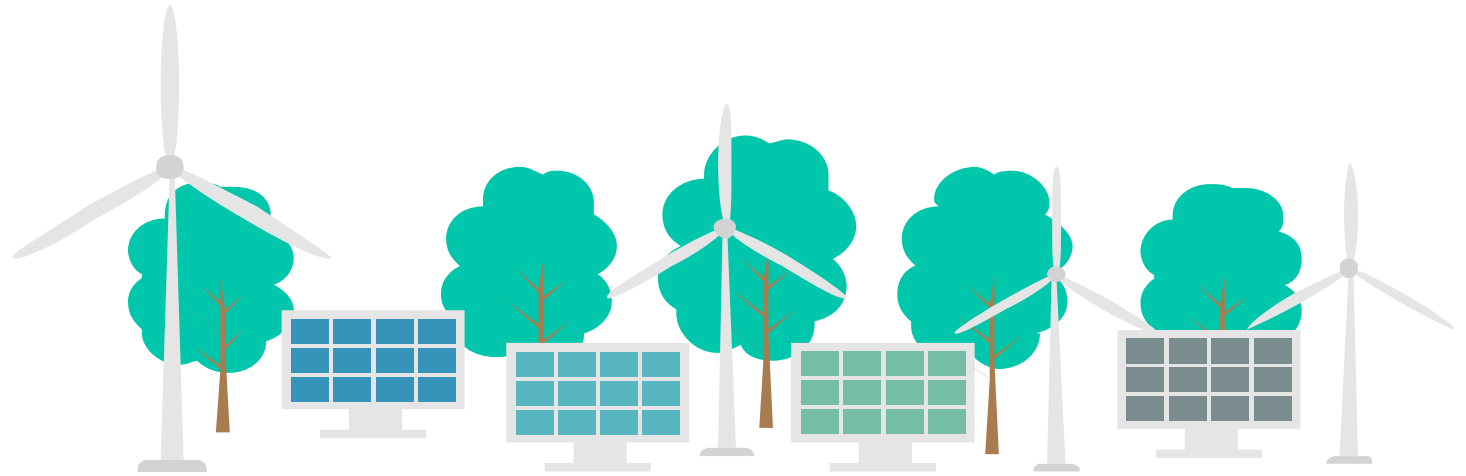
Share of global electricity
generated by renewables
in 2022

12%

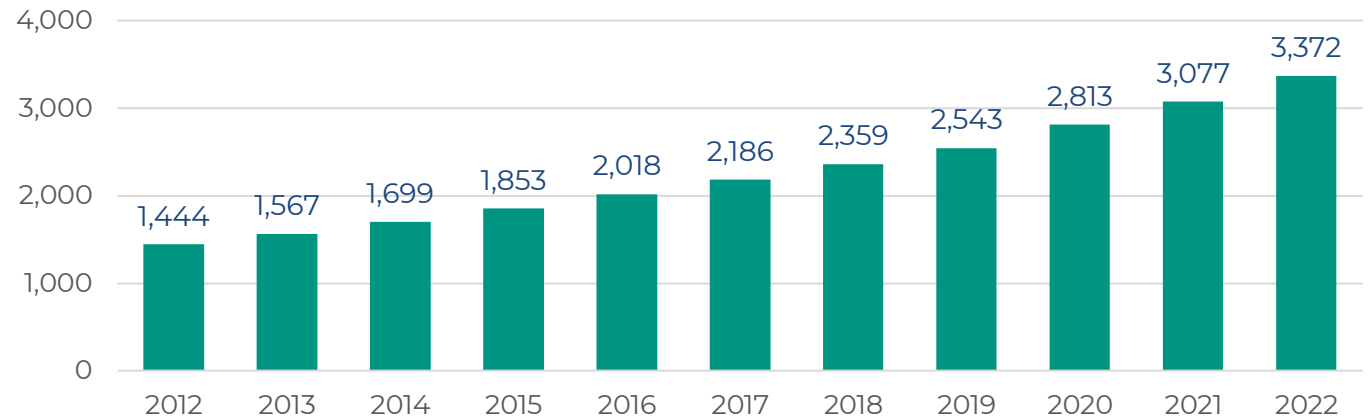
Share of global electricity
provided by solar and wind
energy sources in 2022

83%

Share of renewables in
global installed capacity
in 2022



Cumulative renewable energy capacity worldwide from 2012 to 2022 (GW)



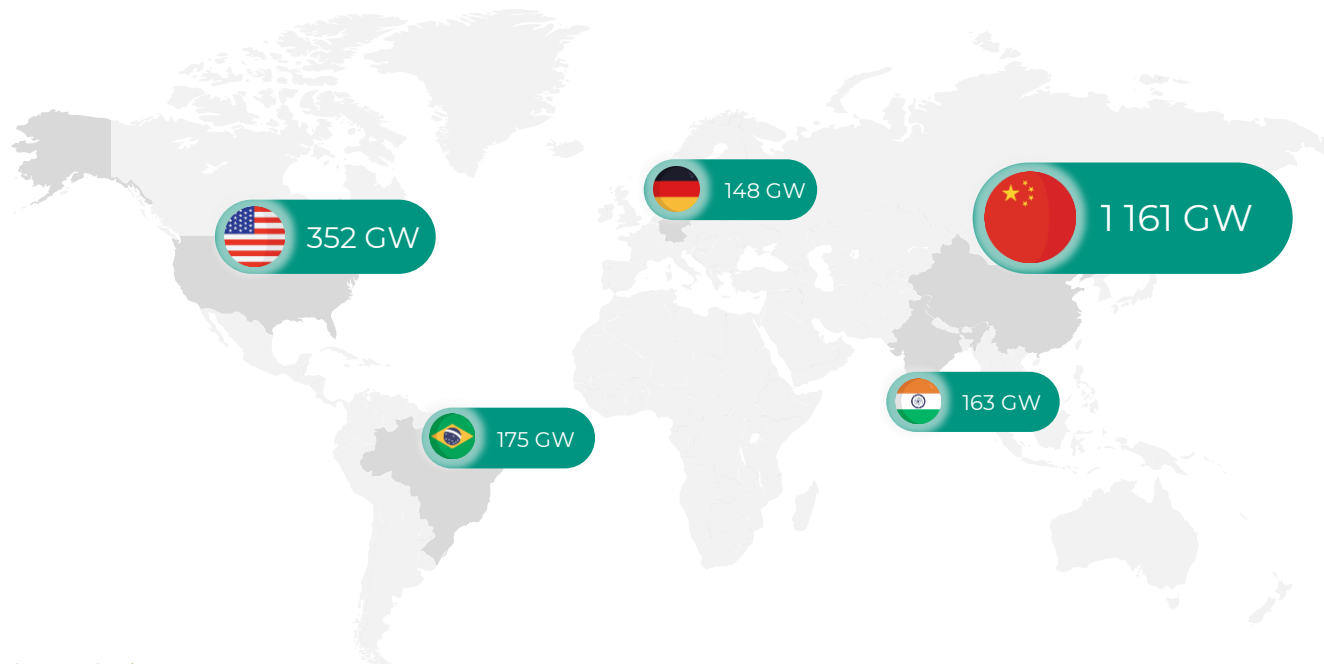
Source : [IRENA, REN21, Renewables Global Status Report 2023](#)

Source : [Statista](#)

RENEWABLE ENERGY CAPACITY IS EXPANDING GLOBALLY (2/2)

59%

Shares of top 5 countries (by total renewable energy capacity) in total global installed capacity as of 2022



Source : [Statista](#)

Top-10 renewable energy companies in the world by installed capacity, as of 2022

1	China Three Gorges Corp	China
2	Centrais Eletricas Brasileiras	Brazil
3	Enel SpA	Italy
4	China Huaneng Group Co Ltd	China
5	Hydro-Quebec	Canada
6	Iberdrola SA	Spain
7	Electricite de France SA	France
8	NextEra Energy Inc.	USA
9	State Power Investment Corp Ltd	China
10	RusHydro	Russia

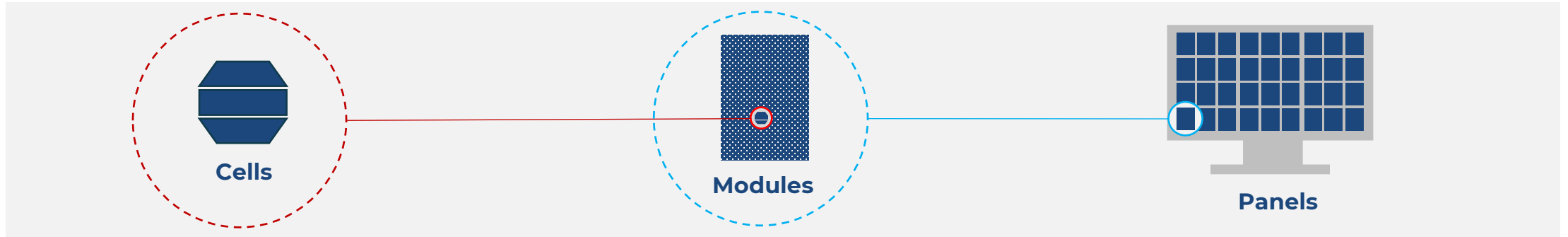
Top-10 renewable energy companies by number of projects abroad in 2022

1	Enel SpA	Italy
2	Iberdrola SA	Spain
3	Energias de Portugal SA	Portugal
4	BP Plc	UK
5	RWE AG	Germany
6	TotalEnergies SE	France
7	Amazon.com Inc	USA
8	European Energy AS	Denmark
9	SMARTENERGY Group AG	UK
10	Agence des Participations de l Etat	France

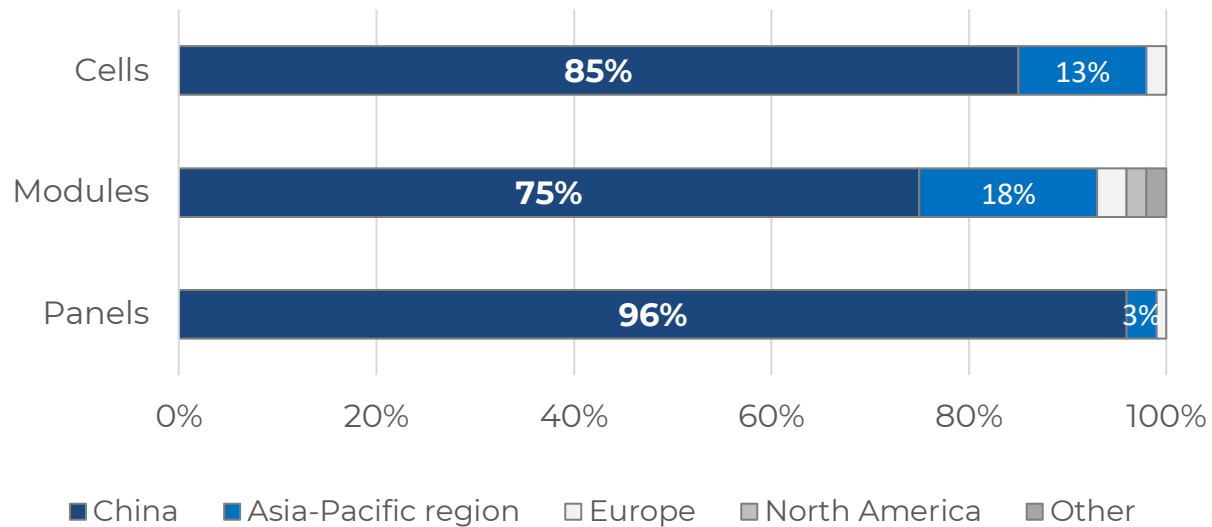
Source : [Global Data](#)

Source : [Investment Monitor](#)

SOLAR EQUIPMENT MANUFACTURING



SOLAR EQUIPMENT MANUFACTURING, 2021

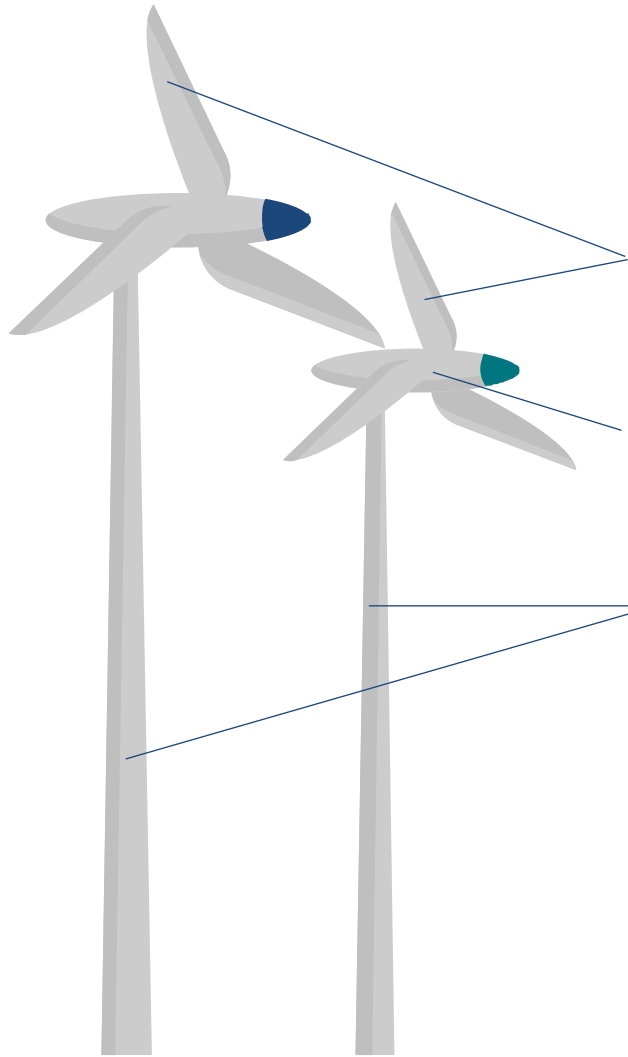


TOP 10 GLOBAL MANUFACTURERS OF SOLAR MODULES IN 2022

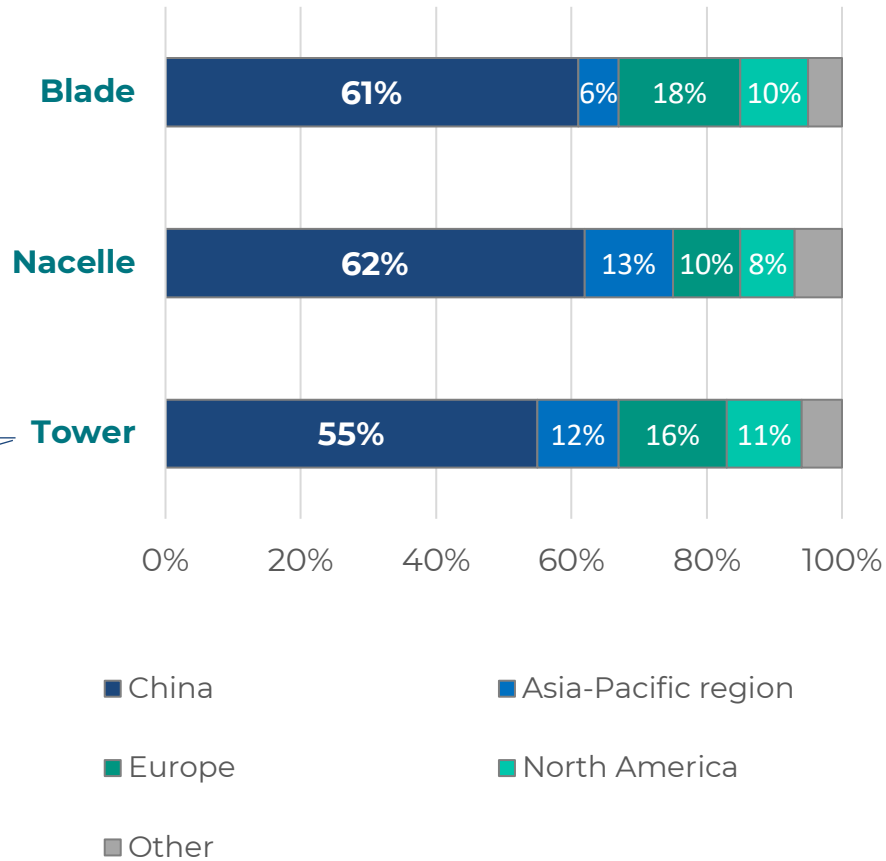
1	LONGi (China)	60 GW
2	Trina Solar (China)	50 GW
3	Jinko Solar (China)	45 GW
4	JA Solar (China)	40 GW
5	Canadian Solar (Canada)	14.5 GW
6	Hanwha Q CELLS (South Korea)	12.4 GW
7	Risen Energy (China)	8.1 GW
8	Astroenergy (China)	8 GW
9	First Solar (USA)	7.9 GW
10	Suntech Power Holdings (China)	4.4 GW

Source : Visual Capitalist, <https://www.blackridgeresearch.com/blog/top-solar-pv-module-panel-manufacturers-companies-suppliers-producers>

WIND POWER EQUIPMENT MANUFACTURING



WIND POWER EQUIPMENT MANUFACTURING BY REGION, 2021



TOP-10 GLOBAL WIND TURBINE MANUFACTURERS IN 2022

1	Vestas (Denmark)	9.6 GW
2	Siemens Gamesa (Spain)	8.8 GW
3	Goldwind (China)	8.2 GW
4	GE (USA)	7.4 GW
5	Envision (China)	5.8 GW
6	Ming Yang (China)	4.5 GW
7	Windey (China)	2.1 GW
8	Nordex (Germany)	1.9 GW
9	Shanghai Electric (China)	1.7 GW
10	CSIC (China)	1.4 GW

Source : Visual Capitalist, <https://blog.bizvibe.com/blog/energy-and-fuels/top-10-wind-turbine-manufacturers-world>

RENEWABLES IN KAZAKHSTAN AT A GLANCE

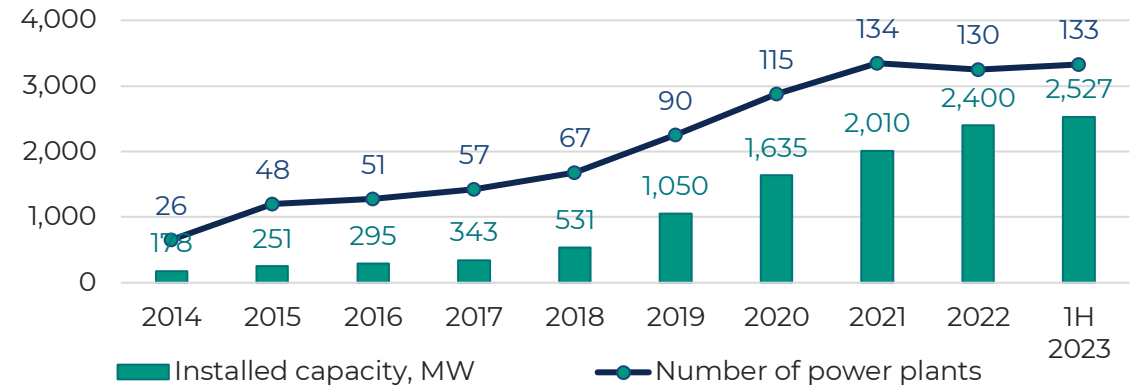
\$2.2
bn

investments attracted to renewables in Kazakhstan as of 2022

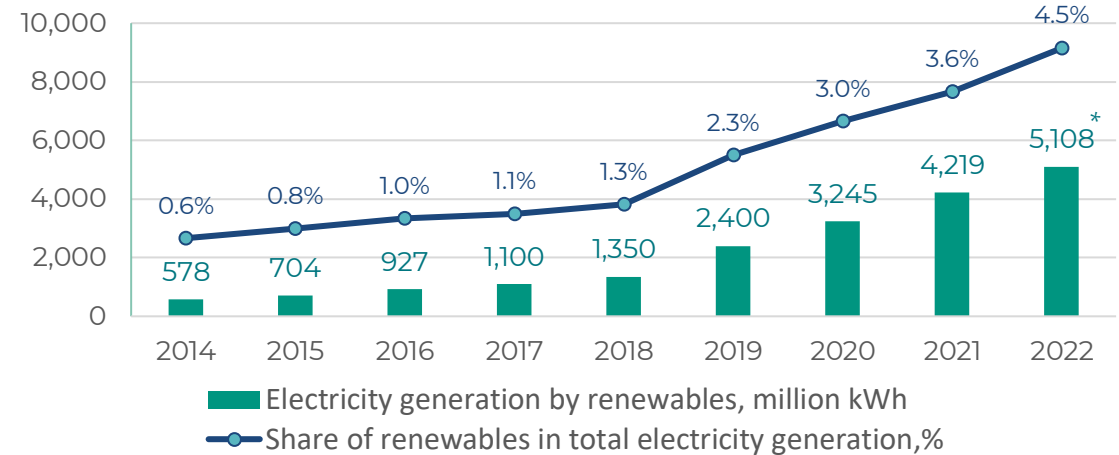
6.8
GW

renewable energy capacity will be commissioned by 2027 as part of auctions

NUMBER AND INSTALLED CAPACITY OF RENEWABLE ENERGY POWER PLANTS



ELECTRICITY PRODUCTION BY TYPES OF RENEWABLE ENERGY POWER PLANTS



* Note: the website of the Ministry of Energy of RK indicates a rounded number of 5110 million kWh

As of 2022

Type of power plant	Number of power plants	Capacity, MW	Electricity generation, million kWh
Conventional power plants (thermal, hydroelectric, gas turbine power plants)	74	22 136	107 758
Renewable energy plants:	130	2 388	5 108
- Solar power plant	46	1 149	1 763
- Wind power plant	44	957	2 411
- Small hydro power plant	37	280	934
- Bioenergy plant	3	2	0
Total	204	24 524	112 866

Source: Ministry of Energy, Concept for the Development of the Fuel and Energy Complex of RK for 2022-2026, JSC "Samruk-Energy" reports on RE market for 2021 and 7 months of 2022, Qazaq Green Association of RES, AIFCA calculations

KAZAKHSTAN HAS ENORMOUS POTENTIAL FOR RENEWABLE ENERGY



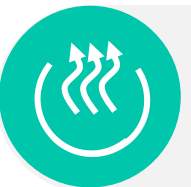
solar energy potential –
1 000 billion kWh/year



wind energy potential –
920 billion kWh/year



hydro energy potential –
166 billion kWh/year



thermal potential of
geothermal waters –
4,3 GW



biogas – agricultural waste
(grain, livestock)



The renewable energy potential depends on the natural resources of the region:

- The southern region has a high solar energy potential – there are more sunny days per year than throughout the country – from 2200 to 3000 hours per year
- The climate is favorable for wind farms due to the presence of wind corridors with wind speeds of more than 5 m/s. The Caspian Sea region, Northern and Southern Kazakhstan have the highest wind energy potential
- Hydro resources are distributed throughout the country, but among them it is worth noting :
(1) the Irtysh River basin with the main tributaries, (2) the Ili River basin and (3) the basins of the Syrdarya, Talas and Chu rivers

Source: JSC «KOREM», Guide for investors on the implementation of renewable energy projects, 2022. Ministry of Energy of the Republic of Kazakhstan and USAID.

AUCTION MECHANISM FOR SELECTING RENEWABLE ENERGY PROJECTS

<p>The auction mechanism for selecting renewable energy projects was introduced starting from 2018</p>	<p>Agreements with a single purchaser - “Financial Settlement Centre for Renewable Energy Support” LLP - are concluded at auction tariffs</p>	<p>Auction prices should not exceed the ceiling prices established by the Ministry of Energy of the Republic of Kazakhstan</p>	<p>Auction prices are subject to annual indexation for the CPI and for projects with credit obligations in foreign currency: 30% to the CPI and 70% to the change in the foreign currency exchange rate</p>	<p>Auction Organiser (Operator) – JSC “Kazakhstan Operator of the Electric Energy and Capacity Market” (KOREM) under Ministry of Energy of Kazakhstan</p>
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THE PROCEDURE FOR CONDUCTING AUCTIONS FOR THE SELECTION OF RENEWABLE ENERGY PROJECTS



Source: JSC KOREM website, Rules for organizing and conducting auction sales, including qualification requirements for auction participants, content and procedure for applying

POWER PURCHASE AGREEMENT (PPA) TO PURCHASE ELECTRICITY FROM RENEWABLE ENERGY SOURCES



4

Ministry of Energy

Determination of the auction winner for renewable energy project

Ministry of Energy includes the auction winner into:

- List of organisations producing energy using renewables
- Plan for the placement of renewable energy facilities

5

Investor - auction winner

Within 60 days after inclusion in the List of organisations producing energy using renewables, submits an application to sign a PPA with the Financial Settlement Centre (FSC) for 20-year term

OR*

signs PPA directly with the consumer

**Note: According to the Law on Supporting development of renewables, the investor has the right to sell electricity from the renewable energy facility to the FSC or directly to the consumer*

Disputes between the parties under the PPA with the FSC can be resolved in the AIFC International Arbitration Centre:

- *rules and language of arbitration – at the discretion of the applicant*
- *arbitral tribunal – 3 arbitrators*
- *applicable right – substantive law of the Republic of Kazakhstan*
- *the place of arbitration proceedings – Astana city*



Before entering into an arbitration agreement, the Financial Settlement Centre is obliged to obtain the consent from the Ministry of Energy of the Republic of Kazakhstan

Source: Law to support the development of renewable energy sources, «FSC» LLP, JSC “Samruk-Energy” report on renewables for 7 months of 2022. Rules for the centralized purchase and sale of electricity produced by renewable energy facilities by the FSC.

OTHER MEASURES OF STATE SUPPORT FOR RENEWABLES

MEASURES OF STATE SUPPORT FOR THE DEVELOPMENT OF RENEWABLE ENERGY SOURCES

- Renewable energy (RE) generators are exempt from payment for electricity transmission services;
- Financial settlement of imbalances due to RES is carried out by the FSC;
- Priority dispatch for RE generators;
- The transmission company has no right to refuse to connect the RE facility due to lack of network availability;
- The transmission company bears the expenses for the network's reconstruction and expansion;

(note: the above preferences apply only when renewable energy generator signs an agreement with the FSC)

- Land plots and connection points are reserved for RE auctions;

To receive investment preferences, investor should:

- ✓ **Submit an application** to the authorised body for investments attraction – Investment Committee under the Ministry of Foreign Affairs of the Republic of Kazakhstan
- ✓ **Conclude an investment contract** with the Investment Committee

INVESTMENT PREFERENCES FOR THE IMPLEMENTATION OF RENEWABLE ENERGY PROJECTS

In 2016, RE projects were included in the list of **investment projects**

creation of new, expansion and (or) updating of existing facility, including facilities created, expanded and (or) updated during the implementation of the PPP project

In 2020, RE projects were included in the list of **priority investment projects**

- 1) creation of new production facilities **≥ 2 million MCI* (KZT 6.9 bn in 2023)**
- 2) expansion and (or) update of existing production facilities **≥ 5 million MCI* (KZT 17.25 bn in 2023)**

**Note: Monthly Calculation Index = 3450 KZT in 2023*

Investment preferences	Investment project	Priority investment project
Exemption from imposing customs duties on imports	✓	✓
Import VAT exemption	✓	✓
State in-kind grants	✓	✓
Exemption from CIT		✓
Land tax exemption		✓
Exemption from property tax		✓

Source: Entrepreneurial Code of the Republic of Kazakhstan, Government Decree "On Some Issues of the Implementation of State Support for Investments", USAID and Ministry of Energy. Investor's Guide to Renewable Energy Projects in Kazakhstan, 2022, JSC Kazakh Invest, open sources

AUCTION RESULTS FOR THE SELECTION OF RENEWABLE ENERGY PROJECTS

54

auctions held

83

projects selected

1 746

MW

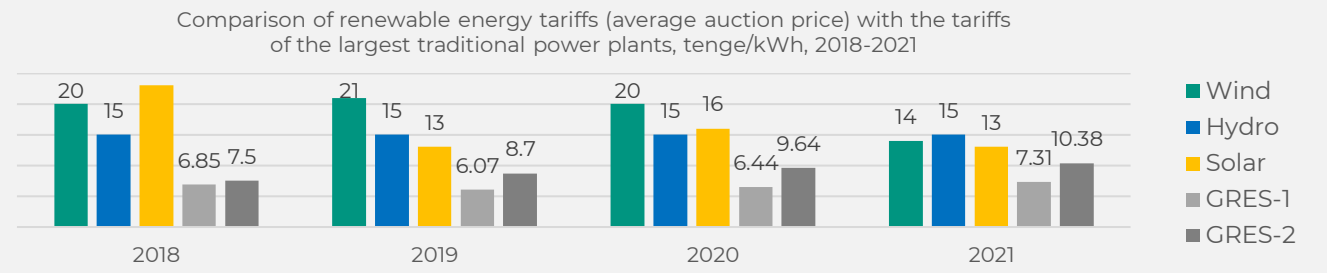
capacity installed

\$400 m

investments
attracted at auctions
(during 2018-2021)

RES type	2018	2019	2020	2021	2022	Total
Capacity offered at auctions (MW)						
- Wind	620	100	65	50	400	1 235
- Solar	290	80	55	20	60	505
- Hydro	75	65	120	120	220	600
- Bio	15	10	10	10	10	55
Total:	1000	255	250	200	690	2 395
Selected during auctions (MW)/number of projects						
- Wind	501 / 16	109 / 5	65 / 3	50 / 1	400 / 8	1 125 / 33
- Solar	270 / 12	87 / 3	60 / 4	20 / 1	40 / 2	476 / 22
- Hydro	82 / 7	7 / 2	23 / 9	12 / 4	-	124 / 22
- Bio	5 / 1	10 / 3	-	5 / 2	-	21 / 6
Total:	858 / 36	213 / 13	148 / 16	87 / 8	440 / 10	1 746 / 83

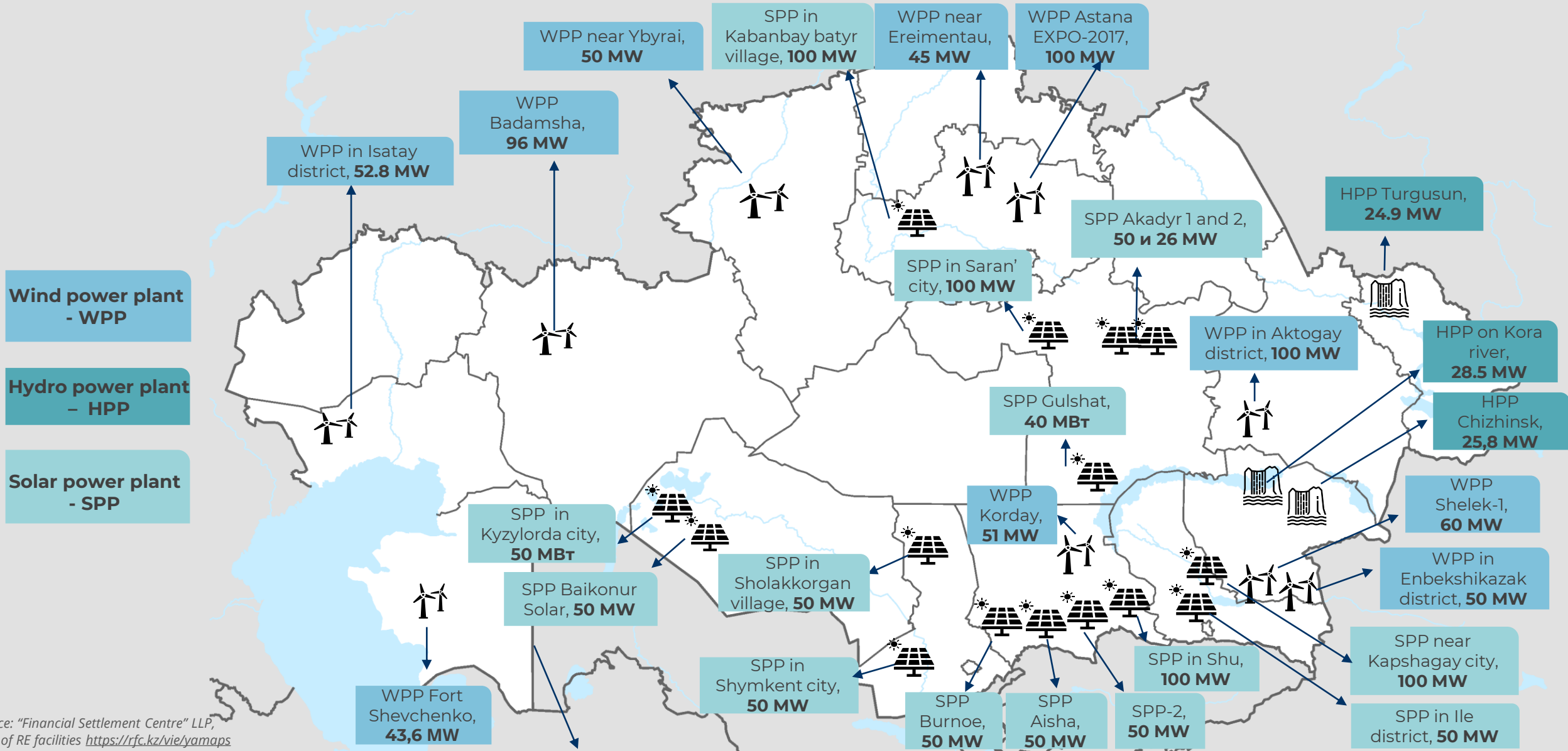
- Tariffs for renewable energy, namely wind and solar energy, continue to decline from year to year
- The difference with the tariffs of traditional stations with coal generation is gradually decreasing



Note: GRES-1 and GRES-2 are the largest thermal (coal based) power plants in Kazakhstan

Source: LLP "FSC", JSC "KOREM", report "Auctions for renewable energy projects in Kazakhstan", 2018-2021, PWC. Energy transition in Kazakhstan, open sources

LARGEST RENEWABLE ENERGY PLANTS IN KAZAKHSTAN



Source: "Financial Settlement Centre" LLP, map of RE facilities <https://rfc.kz/vie/yamaps>

RENEWABLE ENERGY PROJECTS TO BE OFFERED AT AUCTIONS IN 2023-2027



	2023	2024	2025	2026	2027	Total for 2023-2027	
Wind energy	Capacity offered, MW	500 MW	700 MW	800 MW	1000 MW	1000 MW	4 000 MW
	Number of projects and capacity per project	3 x 100 MW 4 x 50 MW	7 x 100 MW	2 x 200 MW 4 x 100 MW	2 x 200 MW 2 x 150 MW 3 x 100 MW	2 x 200 MW 2 x 150 MW 3 x 100 MW	
	Ceiling auction price, KZT/kWh	22.68 KZT/kWh					
Solar energy	Capacity offered, MW	250 MW	560 MW	450 MW	480 MW	450 MW	
	Number of projects and capacity per project	1 x 200 MW 1 x 30 MW 1 x 20 MW	1 x 200 MW 1 x 100 MW 1 x 90 MW 1 x 70 MW 2 x 50 MW	1 x 150 MW 2 x 100 MW 2 x 50 MW 1 x 30 MW	1 x 180 MW 1 x 140 MW 1 x 110 MW 1 x 50 MW	2 x 200 MW 1 x 50 MW	
	Ceiling auction price, KZT/kWh	41.23 KZT/kWh					
Hydro energy	Capacity offered, MW	100 MW	100 MW	100 MW	100 MW	100 MW	500 MW
	Number of projects and capacity per project	5 x 20 MW	5 x 20 MW	5 x 20 MW	5 x 20 MW	5 x 20 MW	
	Ceiling auction price, KZT/kWh	32.61 KZT/kWh	34.61 KZT/kWh				
Bioenergy: Capacity offered, MW	10 MW	10 MW	10 MW	10 MW	10 MW	10 MW	
Total offered capacity for the year, MW	860 MW	1 370 MW	1 390 MW	1 590 MW	1 560 MW	6 770 MW	

Source: The schedule of auctions for 2023 and the Plan of auction auctions for 2024-2027, approved by the Ministry of Energy of Kazakhstan, www.gov.kz

FINANCING OF RENEWABLE ENERGY PROJECTS IN KAZAKHSTAN

The most common structure used for financing renewable energy projects: 70% - Debt, 30% - Equity

1

EQUITY FINANCING IS PROVIDED BY FOLLOWING INVESTORS:

Investors with main activities in renewables (current)

- China: Universal Energy Ltd, Risen Energy, China Power International Holding Ltd., Next Green Energy
- Russia: Hevel, LLP «Evrus», LLP «Afric»
- Germany: SOLARNET, DERA GmbH
- France: Urbasolar SAS

Investors with main activities in renewables (signed agreements)

- Aqua Power (Saudi Arabia) - 1 GW,
- Masdar (UAE) - 1 GW,
- SANY Renewable Energy (China) - 1 GW,
- Total Eren (France) - 1 GW

Companies with coal power plants

- JSC “Samruk-Energy
- JSC “CATEC”

Oil & gas companies

- Total Eren, subsidiary of Total (France),
- Arm Wind, subsidiary of Eni (Italy),
- Shell (Netherlands)

Mining companies

- ERG is building the first for the company wind power station in the Aktobe region with capacity up to 155 MW

2

DEBT FINANCING IS MAINLY PROVIDED BY DEVELOPMENT INSTITUTIONS:



European Bank for Reconstruction and Development

European Bank for Reconstruction and Development provided around **\$500 m**



Eurasian Development Bank

Eurasian Development Bank – **\$219 m**



Development Bank of Kazakhstan

Development Bank of Kazakhstan – **over KZT 100 bn**



Green Climate Fund and Clean Technology Fund – **\$120 m**



Asian Development Bank – **\$42 m**

Source: : JSC “KOREM”, LLP “FSC”, <https://kz.kursiv.media/2021-04-07/nakoplenny-obem-investicij-v-vozobnovlyaemyu-energetiku-kazahstana/>, <https://astanatimes.com/2022/04/ebird-supports-kazahstans-green-agenda-initiatives-new-reforms/>, open sources, Eurasian Development Bank, website of the Development Bank of Kazakhstan, website of the Asian Development Bank

I-RECs AS ADDITIONAL FINANCING TOOL FOR RENEWABLES

International Renewable Energy Certificate (I-REC) — is a certificate confirming the origin of 1 MWh of renewable electricity produced

I-RECs are issued based on an international standard developed by the International Renewable Energy Certificate Standards Foundation

I-RECs are recognized in more than 50 countries (excluding the US and EU, which have their own standards)

When purchasing I-REC, the company is not buying the energy itself, but the green attribute of electricity generated by renewable energy sources.

I-RECs can be purchased by companies looking to reduce their carbon footprint: By purchasing I-RECs, companies can:

- *claim reductions in GHG emissions associated with the use of electricity within Scope 2 emissions*
- *use I-RECs in implementing ESG strategies and attracting investments*
- *use I-RECs to meet the requirements of international sustainability standards GHGP, CDP, RE100, ISO*

By selling I-REC, renewable energy producers receive additional financing, which they can use to modernise existing or build new renewable energy facilities.

The International REC Standard Foundation has approved Kazakhstan for I-RECs issuance in January 2022 and accredited ECOJER Association as an Issuer of I-RECs

9

renewable power plants registered

114

million kWh green electricity have been certified

25 000

I-RECs have been sold

10

companies have acquired I-RECs

Source: "ECOJER" Association www.ecojer.kz, <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/022822-reckoning-with-renewables-appetite-for-i-recs-grows-amid-tightening-of-carbon-credit-rules>, <https://inbusiness.kz/ru/last/desyat-kompanij-kazahstana-priobrel-mezhdunarodnye-zelenye-sertifikaty>, <http://www.akkamys.kz/news/1677512334.html>

GREEN FINANCE AT THE ASTANA INTERNATIONAL FINANCIAL CENTRE



The Green Finance Centre was created to promote the development of green and sustainable finance in Kazakhstan and Central Asia.

The Green Finance Centre is:

- The only company in Central Asia accredited by the International Capital Market Association (ICMA) and Climate Bonds Initiative (CBI)
- The absolute market leader in terms of the number of published verifications of sustainable financial instruments in Central Asia
- The regional chapter of the Green Investment Principles in Central Asia for the Belt and Road Initiative (GIP).



**LEADING FINANCIAL
CENTRE FOR GREEN
FINANCE IN
EASTERN EUROPE AND
CENTRAL ASIA**
(GLOBAL GREEN FINANCE INDEX 11)



AIFC GREEN FINANCE CENTRE

Over the 3 years since the issue of first green bonds, the green finance market has grown **to KZT 169 billion**. Of these, **2/3 were verified by the Green Finance Centre**.

The GFC provides the following services to facilitate the green transformation of enterprises and to attract sustainable finance:

DEVELOPMENT OF ESG STRATEGY, POLICIES AND OTHER DOCUMENTS

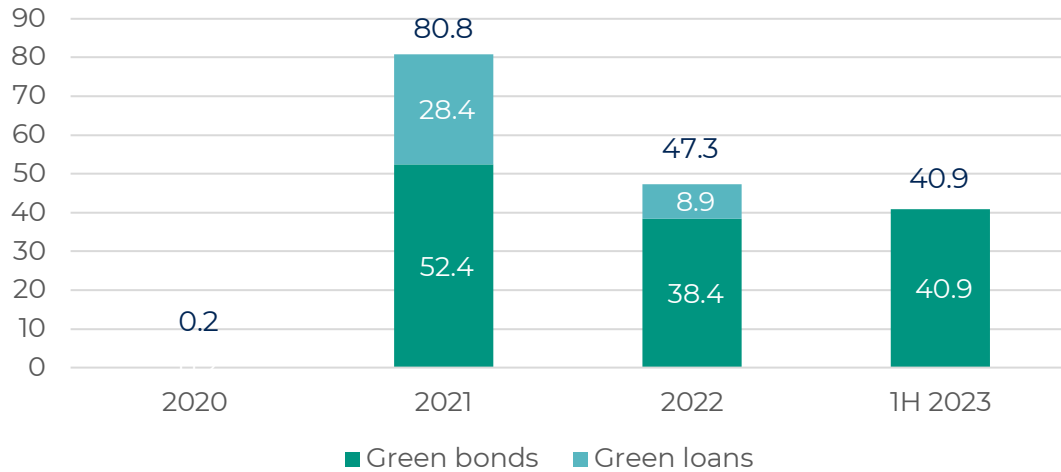
- 1 Sustainable finance policy
- 2 ESG screening
- 3 Sustainable development strategy
- 4 ESG reporting

PROVIDING EXTERNAL REVIEWS (SECOND PARTY OPINION)

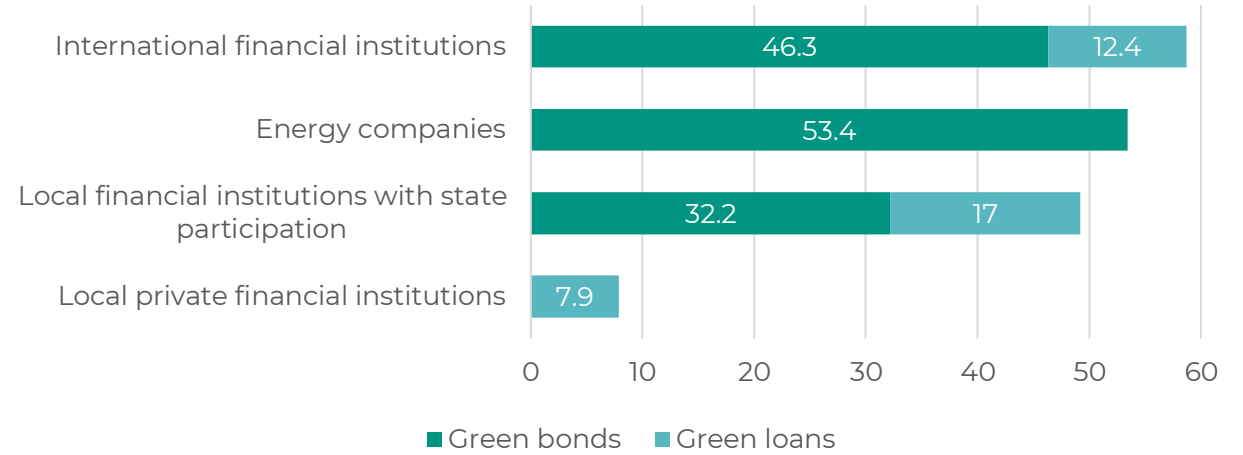
- 1 Second Party Opinions for green, social, sustainable bonds and loans
- 2 Second Party Opinions for transition bonds
- 3 Verification according to the CBI standard
- 4 Assessment for compliance with taxonomies of the Republic of Kazakhstan, the EU and other countries
- 5 Post-issuance Second Party Opinions

GREEN FINANCE MARKET IN KAZAKHSTAN

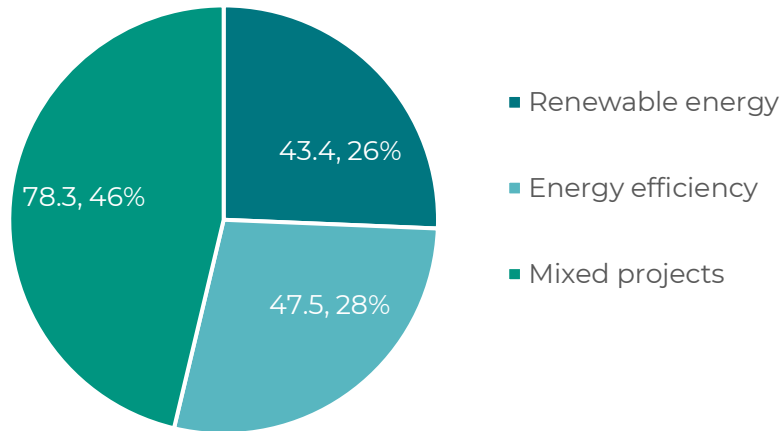
Issuance of green finance instruments in Kazakhstan, KZT bn



Issuance of green bonds and green loans in Kazakhstan by issuer type by the end of the 1-half of 2023, KZT bn



Use of proceeds of green bonds/loans according to the Green Taxonomy of Kazakhstan by the end of the 1-half of 2023, KZT bn



Green projects according to the Green Taxonomy of Kazakhstan

-  Renewable energy
-  Energy efficiency
-  Green buildings
-  Pollution prevention and control
-  Sustainable use of water and waste
-  Sustainable agriculture, land management, forestry, biodiversity conservation and eco-tourism
-  Clean transport

CASE STUDY: ISSUE OF GREEN BONDS FOR RENEWABLE ENERGY PROJECT

«DAMU» ENTREPRENEURSHIP DEVELOPMENT FUND

200
million KZT

Use of proceeds	Financing of renewable energy project
Maturity	36 months
Coupon rate	11.75%
Underwriter	JSC "BCC Invest"
External review provider	AIFC Green Finance Centre
Exchange	AIX

August 2020

The issue was carried out within the framework of a joint initiative of the UNDP in Kazakhstan and the Ministry of Energy of Kazakhstan with financial support from the Global Environment Facility (GEF), aimed at reducing the risks of investing in renewable energy sources.

The entire volume of attracted investments was used to finance the construction of a solar power plant in the Turkestan region.

Solar power plant (2 MW) in the village of Shauldir, Otyrar district, Turkestan region, financed by issuing the first green bonds in Kazakhstan



Photo: UNDP in Kazakhstan

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