



arm wind

Leading the energy transition: Eni's experience in renewable business in Kazakhstan

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Eni strategy for decarbonization

We recognize that the energy sector's biggest challenge is balancing **maximum access to energy with the fight against climate change**

That is why we are **changing our energy mix**, allowing us to reduce our impact on the planet

UPSTREAM NET ZERO EMISSIONS* BY 2030 (SCOPE 1)

TOOLS

					
Increased efficiency	Forestry projects	Share of gas (85% by 2050)	Zero carbon sources (<55GW by 2050)	Circular approach	CCUS
NEW TECHNOLOGIES					

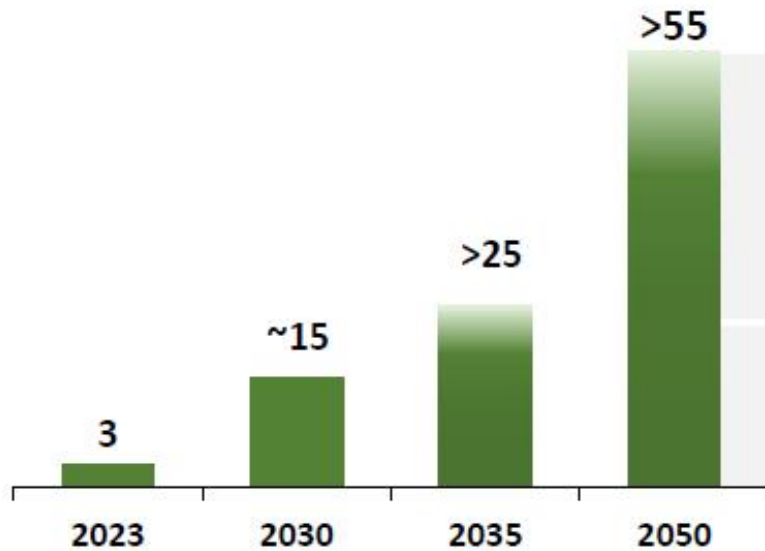
AGENDA 2030



Eni Strategy for Renewable Energy



INSTALLED CAPACITY | GW



DESTINATION MARKETS

70%
OECD COUNTRIES

30%
NON-OECD COUNTRIES



DEPLOYING DIVERSIFIED TECHNOLOGIES



Business Models



Energy Solutions Business Models

Brownfield

Renewable energy generation projects in proximity of O&G assets, aimed at capitalising on industrial and contractual synergies

Greenfield

Independent Renewable energy generation projects not directly linked to existing production of O&G assets, for energy sales to domestic off-takers or industrial customers

RES projects leveraging Eni O&G organizations in the country



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RES Industry in Kazakhstan and RoK targets till 2050



as of Dec 2020:

115

RES facilities in operation

1634.7

MW of installed capacity

Plan for 2021:

+23

new facilities

+12



244.56MW

+6



69.49MW

+5



76.95 MW

\$1.5 Bln in 2021-25*

forecast investments estimated by MoE for additional 1.5GW (on top of currently installed 1.5GW) to reach at least 3GW by 2025

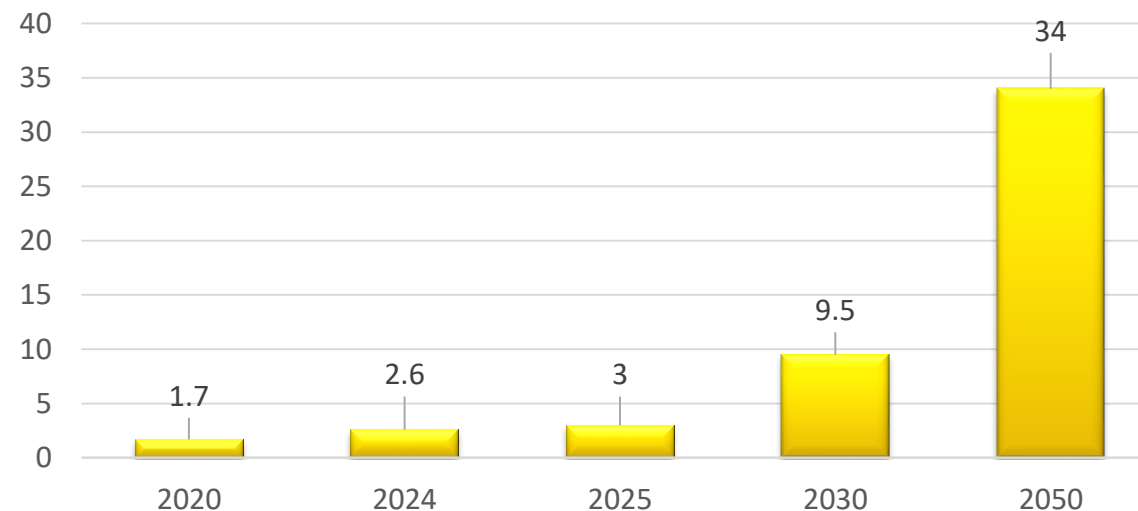
\$32-35 Bln @ 2050**

total investments for renewable energy sources until 2050

MoE Plans for RES development (@ year-end)

Target	Installed capacity, GW	RES power generation %	Total Power generation, GWh
2020	1.7	3%	113 800
2024	2.6	5%	123 500
2025	>3.0	6%	128 100
2030	9.5	10%	131 100
2050	34	50%	172 000

Installed Capacity GW



* RoK MoE Presentation at Kazakh Invest website <<https://invest.gov.kz/ru/media-center/webinars/7012/>>
 ** By applying \$0.75 M/MW for solar and \$1.5 M/MW for wind + allowance for hydro, the figure nears \$35 Bln

Eni Renewables in Kazakhstan



BADAMSHA Phase 1

- Agreement, on 21st Jun, 2017 among Eni, General Electric and RoK MoE for the development of renewables projects

BADAMSHA Phase 2

- On Sep 23rd, 2019, won the Badamsha-2 48MW Project

SHAULDER

- On Nov. 27th, 2019, Arm Wind LLP has won **first Auction** with Documentation of Turkestan Region, First Eni solar project in RoK

BADAMSHA Phase 1

- 48 MW
- 196 GWh/y
- FID Jun 18
- COD Mar 2020
- -172ktCO₂/y
- 22.68KZT/kWh

BADAMSHA Phase 2

- 48 MW
- 200 GWh/y
- FID Sep 2020
- COD Q4 2021
- -172ktCO₂/y
- 19.27KZT/kWh

SHAULDER Solar

- 50 MW
- c. 90 GWh/y
- FID Nov 2020
- COD Q4 2021
- -50ktCO₂/y
- 12.49KZT/kWh

c. 400,000 ton CO₂ eq/y Total (*)



Badamsha Wind Farm

Eni's first wind farm project
WORLDWIDE

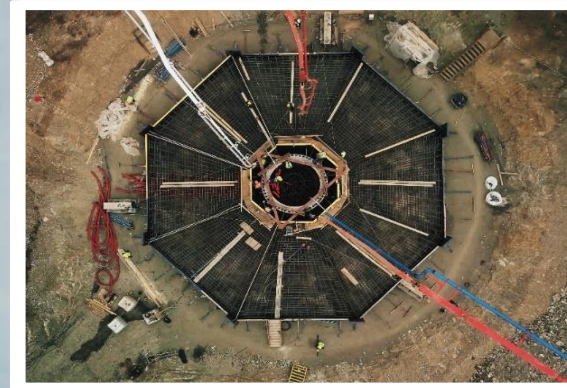
~460 ha Farm area

13 WTGs

3.69 MW Rated power

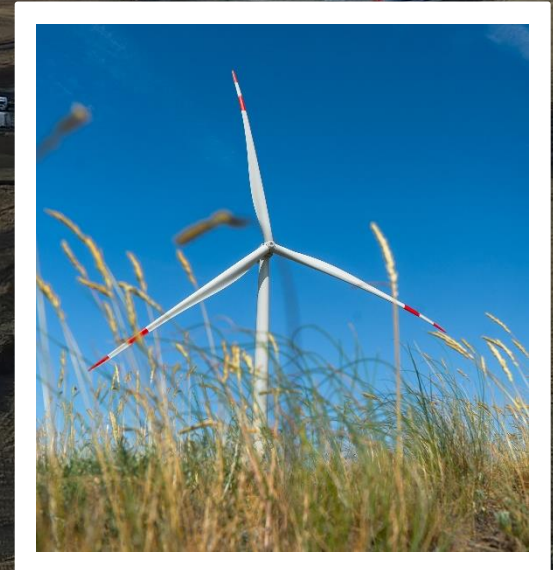
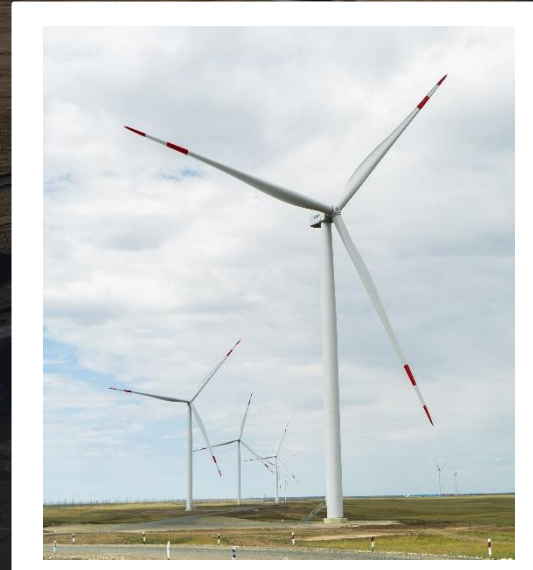
130 m Rotor diameter

85 m Hub height

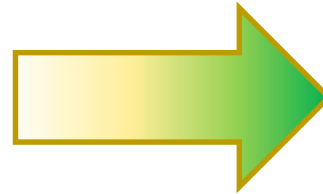


13 foundations of 26 m diameter
15 000 m³ concrete total

- Fully **privately** financed
- **~USD 100 mln** Investments
- Production **195.6 GWh/y * 25y**
- COD **24 March 2020**
- Tariff **22.68 KZT/KWh**
- **450 ppl** employed at construction at peak
- **12 locals** currently employed
- CO₂ saved **172,000 t/y**



Benchmark Time To Market: Similar Wind Farm projects in Kazakhstan

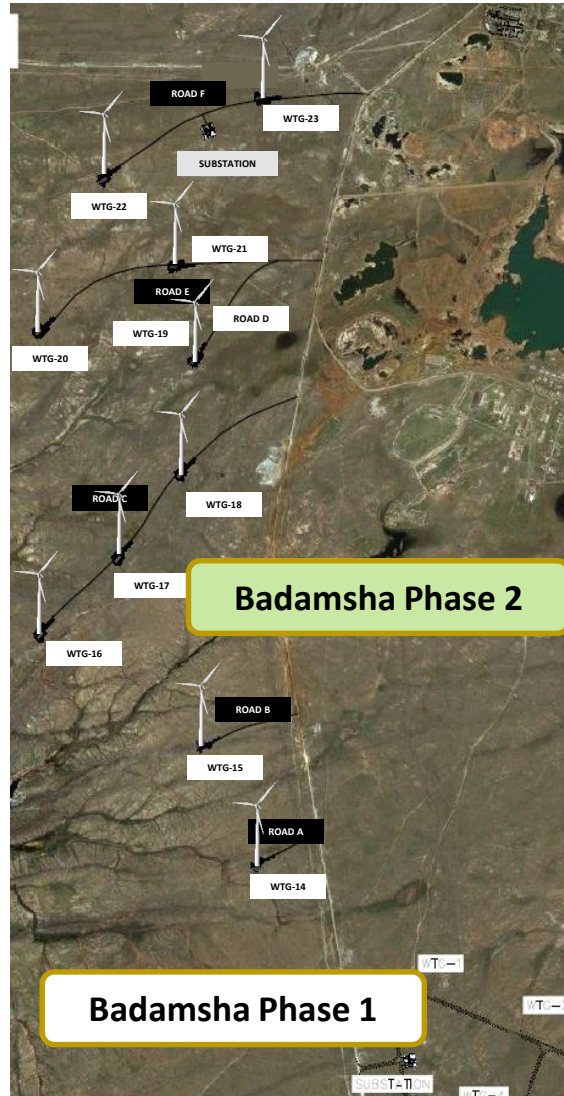


The construction of Badamsha Phase 1 until the COD required half time compared to the average duration for similar wind farm in Kazakhstan

***BD1 Execution phase duration (BoP Contract signed to COD): from 05/11/2018 to 24/03/2020 – 17 months**

Similar project names	Construction start till COD
WPP in Akmola Reg. (45MW)	30 month (2013 – 1H'2015)
WPP in Akmola Reg. (50MW)	32 month (2017-Agosto 2019)
Badamsha 1 (48MW)	17 month* (11' 2018 – 03'2020)

Now Eni continues Badamsha WF with Phase 2



- ~USD 85 mln Investments
- +48 MW Installed Capacity
- 10 WTGs x 4.8MW
- 158 m rotor diameter
- 101 m hub height
- Production 200 GWh/y * 25y
- COD September 2021
- Tariff 19.27 KZT/KWh
- ~300 ppl employed at construction at peak
- CO₂ saved 172,000 t/y

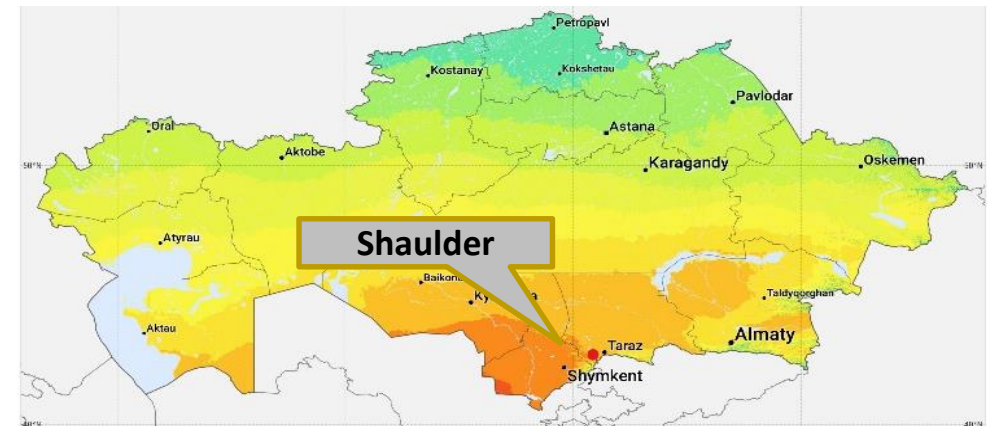
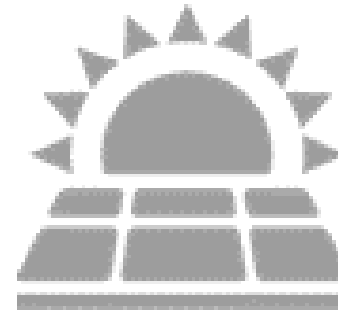


***3 WTG foundations built in Q4 2020
+ 7 foundations in Q2 2021***

Shoulder Solar Power Plant



- ~USD 35 mln Investments
- 50MW Installed Capacity
- Production 90 GWh/y * 30y
- COD Q4 2021
- Tariff 12.49 KZT/KWh
- ~250 ppl employed at construction at peak
- CO₂ saved 50 000 t/y



Permit for Early Works (access roads and fencing) obtained, to start in Q1 2021

Assumptions for the following years RES development:

- For the years to come Auctions - the main mechanism to assign RES MW
- Possible focus by Authority will be on hydro and wind power
- Most of the future auctions will be of the type “*auction with documents*” i.e. including pre-defined locations, technical conditions and connection point

Eni RES Business Development in Kazakhstan



Arm Wind strives to keep up with 2050 **installed capacity goals** set by the RoK Green Economy Concept and Eni strategy by engaging in **new project development** opportunities through:

- MoE Auction mechanism and/or
- other commercial models/opportunities

Eni's RES vision in Kazakhstan

- Kazakhstan is a key Country in Eni Investment Portfolio
- Leveraging a benefit of operating at the international level, pursuing an implementation of the RES best practices in Country
- Explore new cooperation opportunities, such as bilateral commercial model
- Consider new technical solutions, such as combined wind-solar power and storage technologies