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# ***Adaptive management of mitigation projects implemented in rural areas: contribution to Kazakhstan's goal of carbon neutrality***

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# Main goals of climate policy

- To reduce greenhouse gas (GHG) emissions by 15% from 1990 levels by 2030 (Paris Agreement)
- RES development (3% in 2020; 15% by 2030, 50% by 2050)
- Decarbonization of economy, to achieve Carbon Neutrality by 2060



# Doctrine to achieve carbon neutrality (CN) by 2060: conclusions

- According to the stated goal of the President, the Ministry of Ecology, Geology and Natural Resources has developed a Doctrine to achieve carbon neutrality by 2060. It includes 2 scenarios: base line and carbon neutrality, where the baseline scenario is a path without measures to decarbonize the economy.
- **In 2017, the fuel and energy basket consisted of 54% coal and 24% oil and 22% gas. Model calculations showed that by 2060 the share of fossil energy resources in the structure of primary fuel and energy resources will decrease by 3.4 times and amount to 29%, and the share of renewable energy will increase from the current 3 percent to 70.** According to calculations, in 2060 the industrial sector will consume 65% of all energy resources. Building consumption will be reduced by up to 23%, and transport energy consumption will be reduced by up to 9%.
- **“According to the model calculations, by 2060 emissions will amount to about 76 million tons of CO<sub>2</sub>,”** (42 agriculture, 21 industry, 6 oil/gas). Brekeshev informed. Ecology Minister Serikkali Brekeshev noted that according to the modeling, the baseline scenario will not allow us to achieve the forecast indicators of economic growth.

<https://strategy2050.kz/ru/news/uglerodnaya-neytralnost-ozvuchen-stsenariy-po-dostizheniyu-nulevykh-vybrosov-v-kazahstane/>

# Doctrine to achieve CN by 2060: power generation

- Power generation, billion kWh

	2017	Baseline scenario				<u>Carbon neutrality scenario</u>			
		2030	2040	2050	2060	2030	2040	2050	2060
Coal-fired thermal power plants and thermal power plant	68.9	71.7	58.1	29.5	31.4	33.5	13.3	0.2	0.0
Gas thermal power plants and thermal power plants	21.8	44.3	58.1	80.4	100.8	39.8	70.7	78.6	102.6
<u>Oil products</u>	0.8	0.9	1.8	1.6	1.6	0.3	0.2	0.1	0.0
Hydro	11.2	11.5	19.0	25.0	19.1	23.2	25.4	25.4	19.5
Wind	0.3	1.0	6.0	8.6	10.6	21.0	97.3	173.3	201.7
Sun	0.2	1.3	2.3	4.8	8.2	12.6	48.8	157.6	283.5
<u>Biomass</u>	0.0	0.0	0.0	0.0	0.0	1.6	1.6	3.2	4.5
<b>Total</b>	<b>103.2</b>	<b>130.7</b>	<b>145.3</b>	<b>149.9</b>	<b>171.8</b>	<b>132.1</b>	<b>257.3</b>	<b>438.3</b>	<b>611.8</b>

In 2060, in the CN scenario, solar energy will account for up to 46% of all electricity generation and 56% of renewable electricity, while wind energy will account for 33% and 40%, respectively. In the long term, the use of renewable energy will be accompanied by energy conservation systems

# Doctrine to achieve CN by 2060: GHG emissions from fuel combustion in industry

- GHG emissions from fuel combustion in industry by sectors, Mt CO<sub>2</sub>-eq

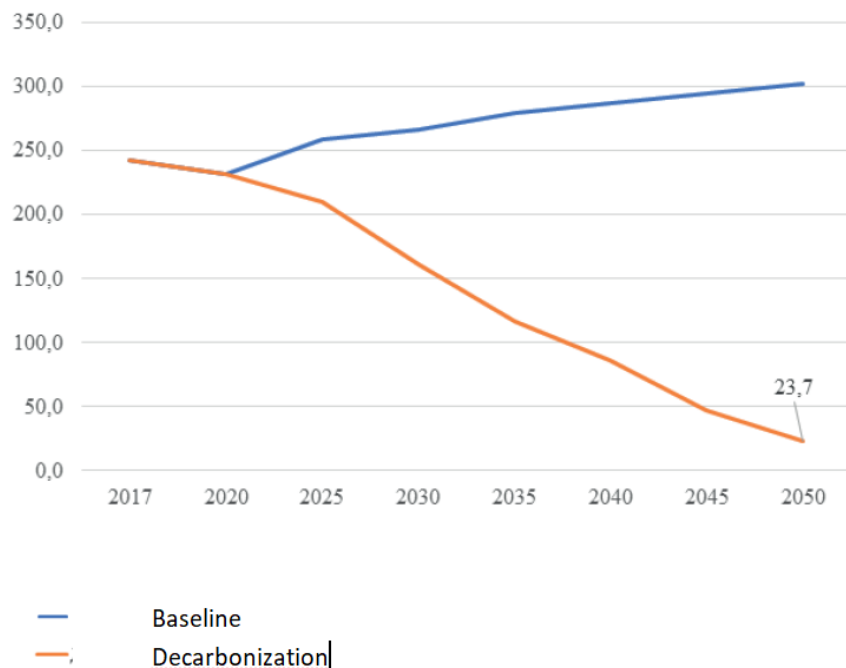
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	Baseline scenario					<u>Carbon neutrality scenario</u>			
	2017	2030	2040	2050	2060	2030	2040	2050	2060
<u>Ferrous metallurg</u>	17.03	20.69	21.09	20.61	21.89	17.16	1.66	2.05	0.92
<u>Non-ferrous metallurgy</u>	1.91	2.41	2.00	2.14	3.20	2.32	1.45	0.86	0.38
<u>Chemical industry</u>	0.01	0.01	0.02	0.03	0.03	0.01	0.02	0.03	0.04
<u>food industry</u>	0.36	0.85	0.96	1.18	1.13	0.61	0.81	0.00	0.00
<u>Mineral industry</u>	3.45	4.64	4.88	5.43	5.45	4.57	4.55	2.78	2.61
<u>Mining</u>	5.49	8.99	10.43	11.06	12.65	8.91	4.33	0.00	0.00
<u>Other industries, construction</u>	2.85	6.02	6.21	7.38	9.28	7.61	2.80	0.00	0.00
<b><u>Gross GHG emissions</u></b>	<b>31.10</b>	<b>43.62</b>	<b>45.59</b>	<b>47.82</b>	<b>53.63</b>	<b>41.20</b>	<b>15.63</b>	<b>5.72</b>	<b>3.94</b>
<u>CCS technologies</u>	0	0	0	0	0	0	-4.63	-5.22	-3.27
<b><u>Net GHG emissions</u></b>	<b>31.10</b>	<b>43.62</b>	<b>45.59</b>	<b>47.82</b>	<b>53.63</b>	<b>41.20</b>	<b>11.00</b>	<b>0.50</b>	<b>0.68</b>

After 2031, the CC scenario : introduction of carbon capture and storage (CCS) technologies . In 2060, 82% of the remaining emissions will be captured. Strong reduction of GHG emissions is achieved by improving EE in industry and by changing the structure of energy consumption. The reduction in energy intensity in 2060 could reach 55% compared to 2017.

# GHG emissions reduction due to decarbonization

## Greenhouse gas emissions in the energy sector by scenarios, million tons of CO<sub>2</sub>-eq.



Energy system TIMES Model was used (The Integrated MARKAL-EFOM system), developed under the IEA technology Systems Analysis Program)

**Baseline scenario-** no restrictions on GHG emissions

**Decarbonization scenario-** investigating opportunities for **maximizing GHG emission reductions provided by the model with taking into account the possibility of using clean energy technologies** (including introduction of nuclear power plants in 2030 and 2035).

GHG emissions are declining up to 23.7 million tons of CO<sub>2</sub>-eq. by 2050 and, must be reduced further with the help of new technologies by 2060. (coal phase-out, use of carbon capture and storage technology)

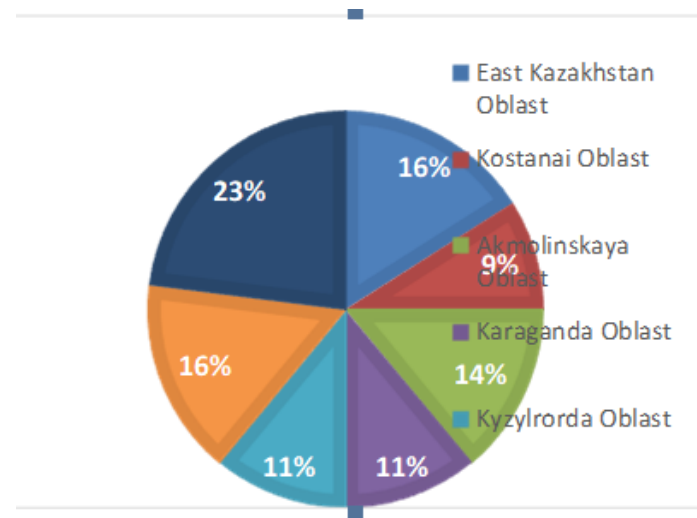
*Source: Kazakhstan's path to zero greenhouse gas emissions*

# Active Community involvement – element of transition to CN

- **This transition will require careful development planning, significant financial investment (\$650 billion in low-carbon technologies) , and active community involvement.**
- Approach of community involvement through involving the population (especially residents of rural areas) in the implementation of mitigation projects by using adaptive management of resources across local landscapes is introduced –unique for Kazakhstan.
- Total of 49 projects were implemented across 7 landscapes in these three thematic areas (biodiversity conservation (CB) land degradation (LD) prevention, climate change mitigation and adaptation (CC), including 16 projects in CC (2017-2021, SGP6).

# Distribution of the projects by region based on ecological zones

- The 16 CC projects, supported activities of green initiatives in Kazakhstan: installation of solar or wind generators, pyrolysis furnaces, the restoration of natural forests, 14 projects on energy efficiency (EE) based on social facilities and educational facilities in Kostanay, Karaganda, Kyzylorda, East Kazakhstan and Akmola regions; testing innovative financial mechanisms to improve EE in multi-apartment residential buildings in the Karaganda region.





# Innovative features in CC projects

- ***Multi-stakeholder Dialogue Platforms*** were created and operated to improve coordination among local community organizations , NGOs , representatives of the authorities for implementing and replication of projects, including:
- -a **multi-stakeholder policy platform** (become the driving force behind rural development strategies and play a leading role in project planning, landscape management, project implementation and monitoring, including in the field of Climate Change)
- - a **multi-stakeholder group** to identify landscape-level objectives and monitor results, so that they may exchange experience while introducing adaptive management in 7 landscapes via projects
- ***The innovation*** was that for the first time in Kazakhstan **the socially vulnerable segments of the population were involved in projects related to Climate Change, along with Akimats of regions, the social protection departments.**
- ***Capacity building*** covered more than 8000 people involved into CC projects, including 55% of women
- ***Youth participation*** is reflected in seventeen projects (or 35% of 49), of which 10 - are energy efficiency projects. Youth direct beneficiaries were **about 18000 persons in total.**

# Conclusions

- **Kazakhstan set its targets for achieving carbon neutrality by 2060.** This transition will require careful development planning, significant financial investment, and active community involvement.
- **Successful technologies, practices and systems from community-based initiatives are replicated and promoted for up-scaling by multi-stakeholder partnerships** using knowledge and lessons learned from identifying, testing and **adapting community innovations for landscape and resource management.**
- **through innovative dialogue platforms, the total co-financing of the project increased by 11.3%, the number of GHG emission reductions was increased by 48% from the planned indicators,** thereby having an additional effect in the form of local and global benefits (the completed CC grant projects reported the reduction of 1,529.14 tons of CO<sub>2</sub>e ).
- **The innovation is that civil society organizations have had such a first experience in Kazakhstan: they have become the driving force behind rural development strategies and play a leading role in project planning, landscape management, project implementation and monitoring.**
- **Expanding efforts to reach more communities in the regions of all segments of the population, including vulnerable groups and youth, by involving the self-employed population (whose share was 36.3% in 2021) is very important in Kazakhstan.**

# Thank you for attention!

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