

Economic modelling for Kazakhstan 2060 Carbon Neutrality Strategy: Lessons Learnt

GIZ Programme on Capacity Development for Climate Policy in the countries of South East, Eastern Europe, the South Caucasus and Central Asia, Phase III

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On behalf of:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany

Expectations from LT-LEDS Kazakhstan



- to guide society, government and business in transition toward a low-carbon future;
- seize the opportunities of the global transition to low-carbon development and minimize the economic risks associated with lack of action;
- provide a strategic vision for large-scale decarbonization, transformation of economic sectors, major investments, and transformation of technology and infrastructure;
- complement the existing long-term strategies.

Sectoral and Macroeconomic Modelling for LT-LEDS



- Defines the least-cost pathway to reach carbon neutrality by 2060;
- Estimates the investment needs;
- Defines key sectorial milestones for reaching carbon neutrality;
- Estimates the ancillary benefits of decarbonization;
- Provides technical and economic arguments for the national dialogue on decarbonization and consensus building.

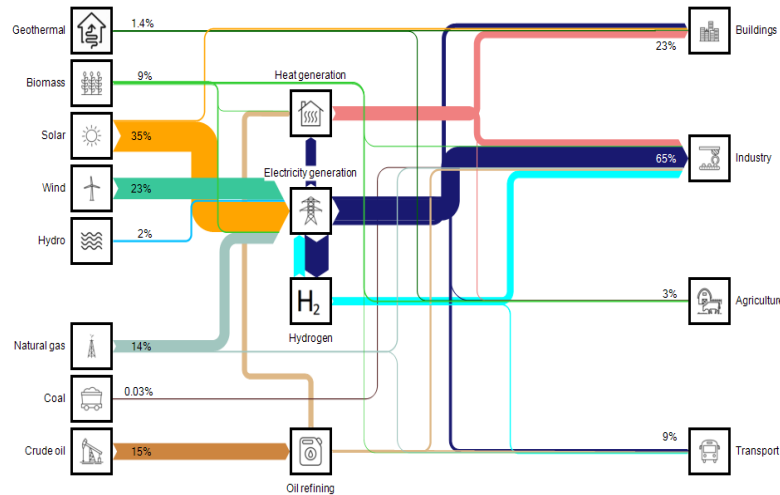
The modelling framework applied

Three interlinked economic and technological models:

- **TIMES-KAZ:** contains detailed information on available technologies and their costs and is used to produce a least-cost energy system => possible energy futures.
- **CGE-KAZ:** estimates how the Kazakh economy might react to changes in policy, technology and other external factors.
- **SD-KAZ:** a set of System Dynamics sectoral models to understand the nonlinear behaviour of complex systems over time and assess direct, indirect and induced economic and societal costs and benefits i.e. income effects, health consequences and costs of accidents.
- **TICS-KAZ:** a hybrid model created by linking the three models above to increase consistency and accuracy of modelling and providing a broader scope of indicators.

Macroeconomic and sectoral modelling results

2060 Net zero emissions



- Ambitious climate policies are economically beneficial and technologically possible.
- GDP in 2060 carbon neutrality scenario is 97% higher in comparison to the BAU scenario.
- Need in USD 667 billion investments (46% in power and heat generation).
- Energy mix in BAU and Carbon Neutrality scenarios.

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