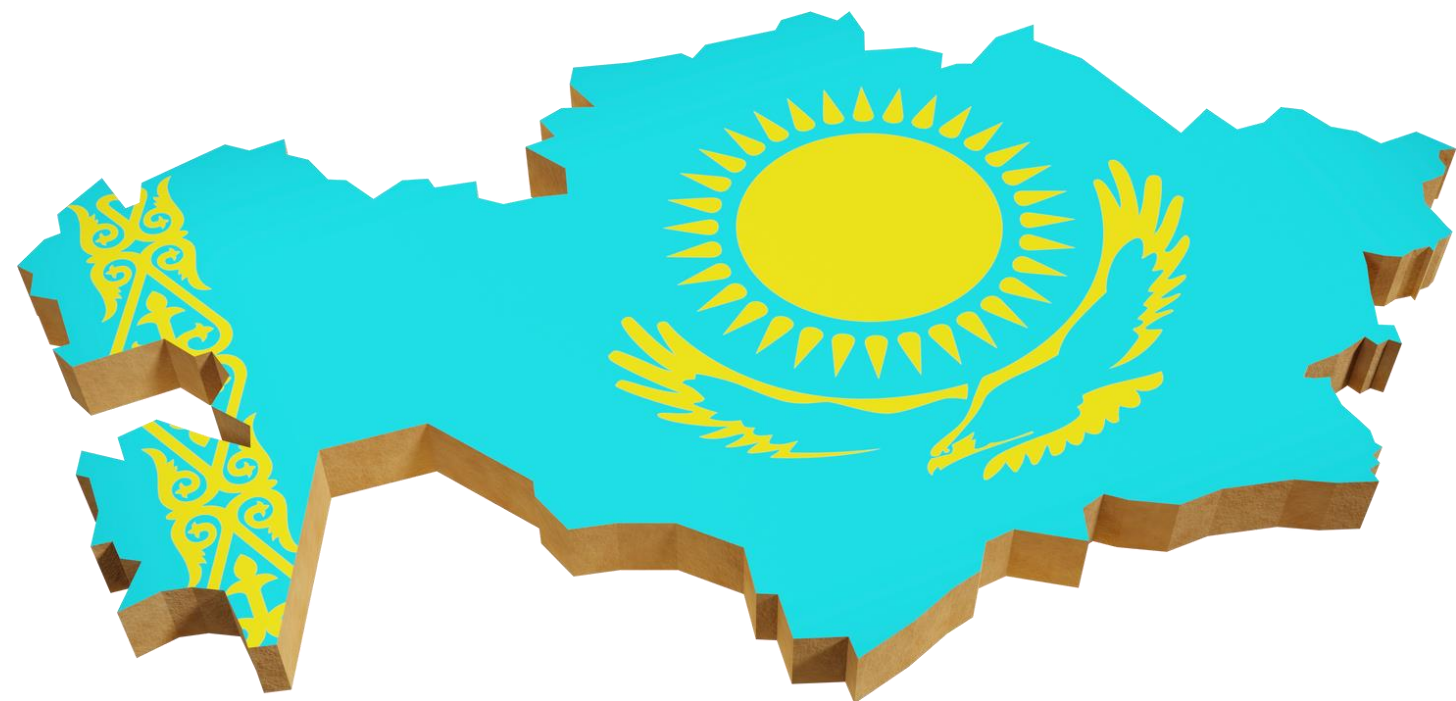


# Report on the development of the SDG7 road map for Kazakhstan

Access to affordable, reliable, sustainable and modern energy for all



# Report Highlights

**Part 1:** Overview of the energy sector

**Part 2:** Power capacity expansion plan

**Part 3:** NDC target

**Part 4:** Existing policies

**Part 5:** Collaboration with UNECE and ESCAP

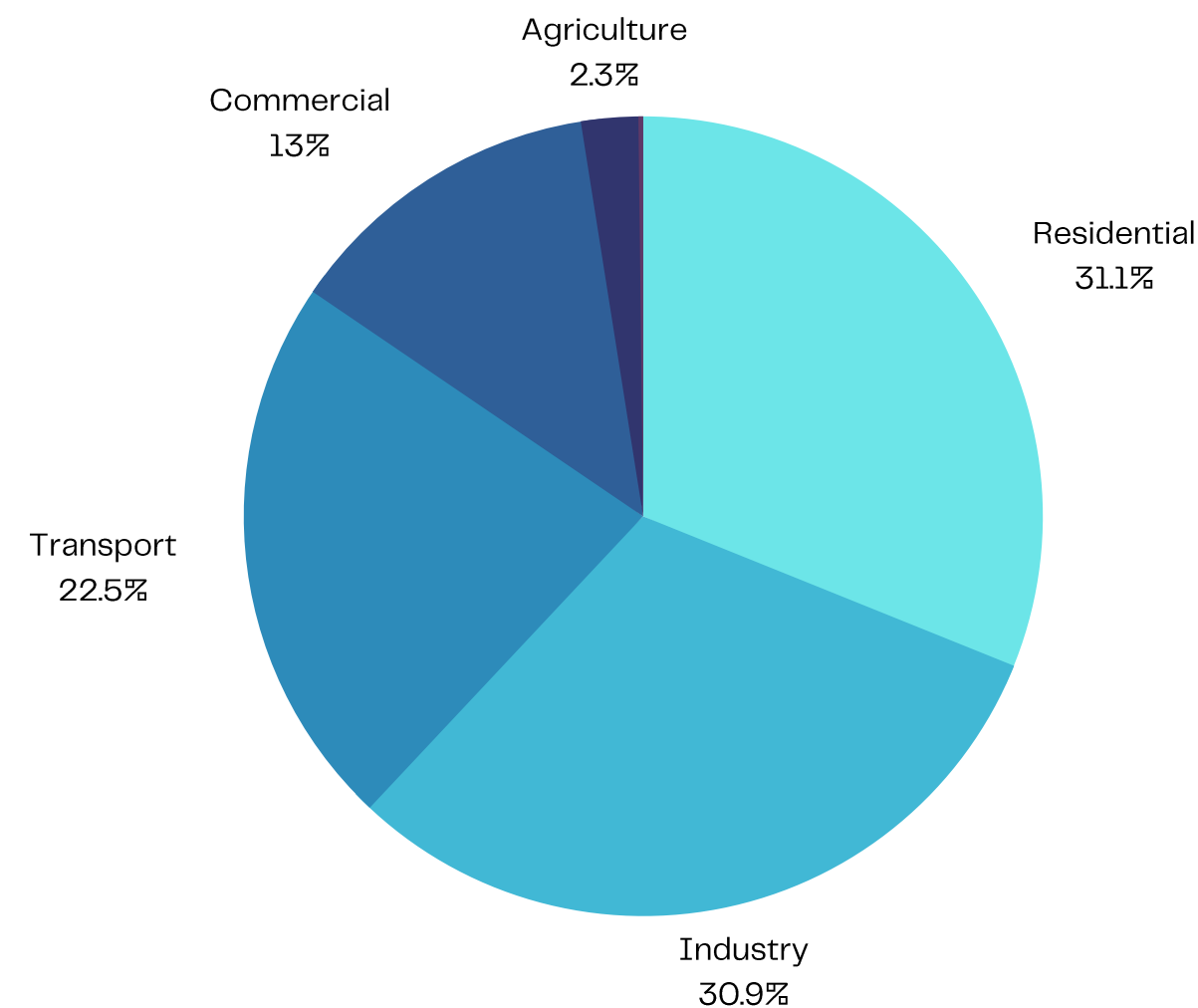
**Part 6:** Activities undertaken and plans

# Overview of the energy sector (1/2)

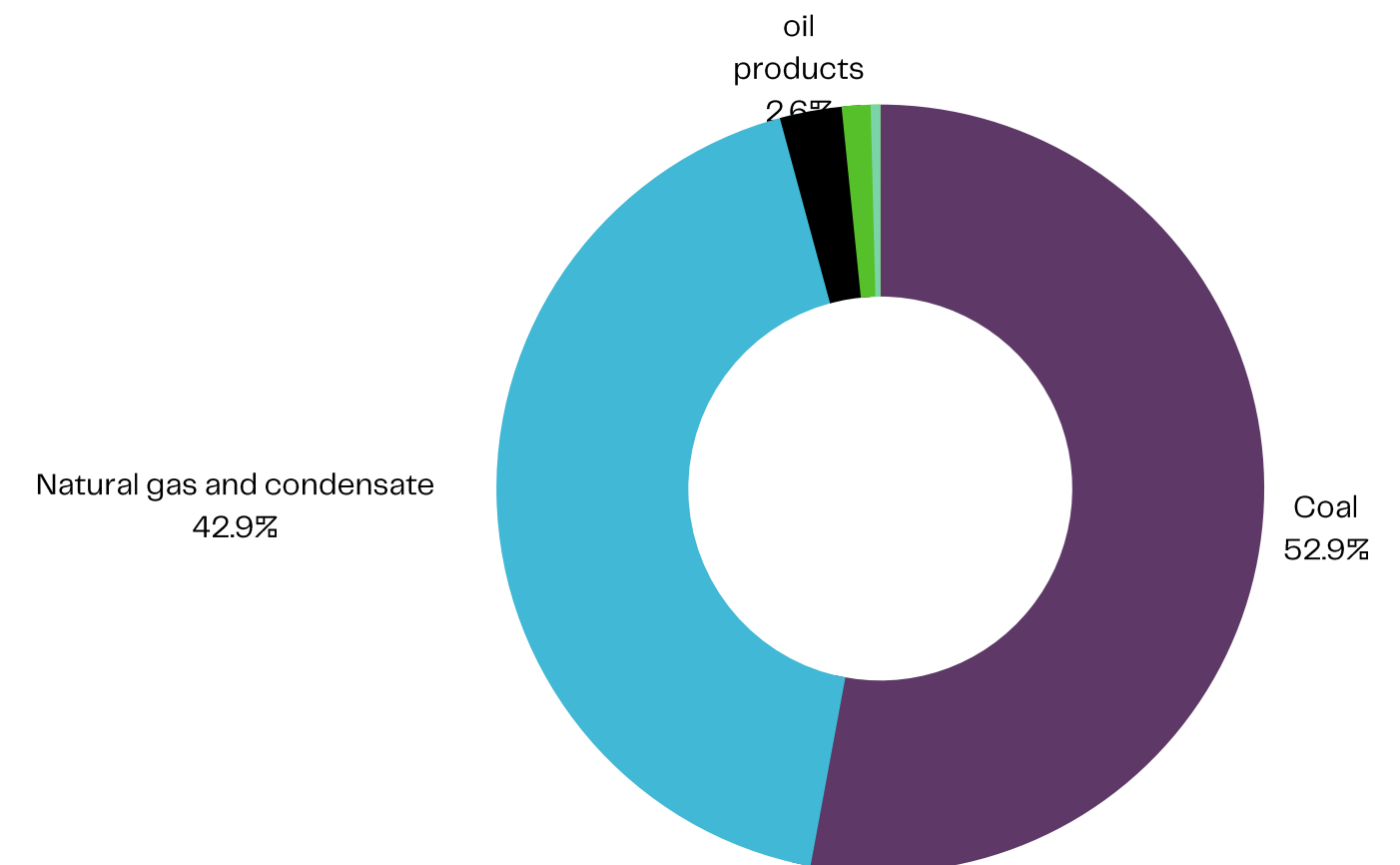
In 2021, the total final energy consumption (TFEC) was 42.4 Mtoe (figure 2). Most of the demand came from the residential sector (31.1 per cent), followed by the industry sector (30.9 per cent), transport sector (22.5 per cent) and commercial sector (13 per cent). Agriculture and non-specific energy use accounted for 2.3 per cent and 0.2 per cent.

The total primary energy supply (TPES) in 2021 was 66.4 Mtoe. The energy supply mix was as follows: coal 52.7 per cent, natural gas and condensate 42.7 per cent, crude oil and oil products 2.6 per cent, hydropower 1.2 per cent, wind and solar 0.4 per cent, and biomass 0.4 per cent.

Energy consumption in 2021

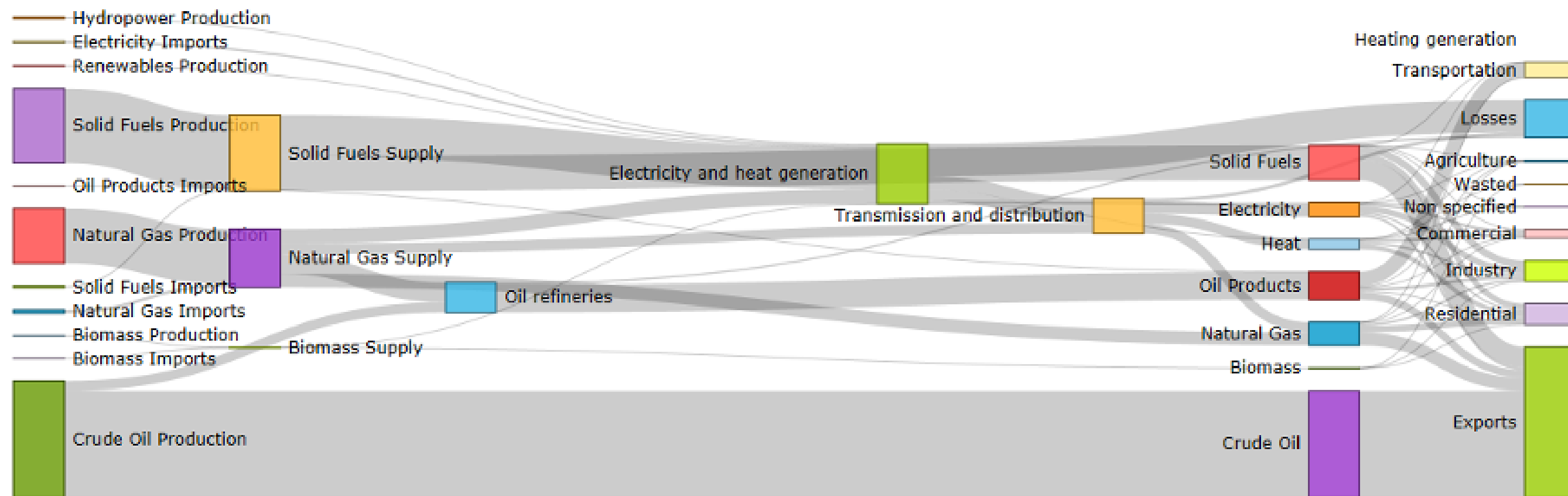


Energy supply by fuel in 2021



# Overview of the energy sector (2/2)

Total installed power generation capacity in 2021 was 23,957 MW. In terms of capacity mix, coal and gas accounted for 81.2 per cent of the capacity. Renewables accounted for 18.8 per cent of capacity of which large hydropower was 10.6 per cent, solar 4.3 per cent, wind 2.8 per cent, and mini hydro was 1.1 per cent. Total electricity generation in 2021 was 114.4 TWh. Thermal power plants accounted for 89.1 per cent of power generation while the remainder came from renewable energy (large hydropower 8 percent, wind 1.5 per cent, and solar 1.4 per cent). Total heat generation in 2021 was 8.8 Mtoe coming from fossil-fuelled CHP and heat-only-boiler (HOB).



Sankey diagram of the energy sector 2021



# GHG emissions

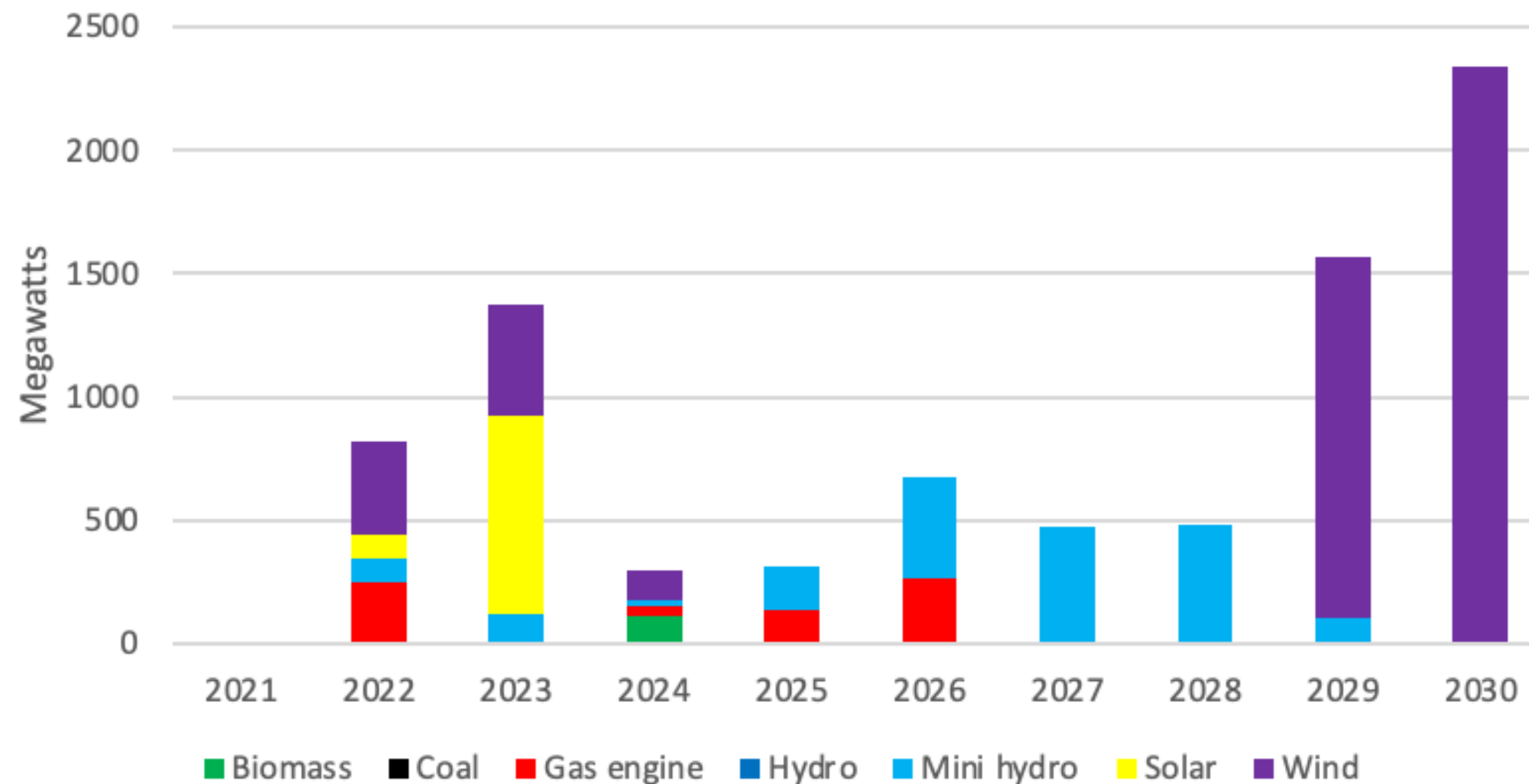
The energy sector emissions, from the combustion of fossil fuel, were calculated based on IPCC Tier 1 emission factors assigned in the LEAP model and expressed in terms of 100-year global warming potential (GWP) values. GHG emissions from the energy sector were estimated at 213.7 MtCO<sub>2</sub>-e in 2021.

Emissions from the power and heat generation sector were the largest at 123.3 MtCO<sub>2</sub>-e. It is followed by the residential sector at 28.5 MtCO<sub>2</sub>-e coming from solid fuel combustions for cooking and space heating. The transport sector accounted for 27.3 MtCO<sub>2</sub>-e rising from direct fuel combustions in internal combustion engines. The emissions attributable to the industrial sector were estimated at 26.8 MtCO<sub>2</sub>-e. Commercial and agriculture sector emission was around 7.8 MtCO<sub>2</sub>-e altogether.

# Power capacity expansion plan

The power capacity expansion plan, obtained from the Ministry of Energy, is as projected in the figure below, reaching a total capacity built of 8,328 MW by 2030. This assumes that the expansion plan is carried out according to the planned timeline. The given capacity addition will increase the share of renewable (including large hydropower) in the total installed capacity to 37.6 per cent, where the share of wind generation will increase significantly from 2.8 per cent in 2021 to 16.8 per cent in 2030.

Power capacity expansion plan 2023-2030  
by sector, CP scenario





# NDC target

Kazakhstan has committed to reducing GHG emissions by 15 per cent unconditionally (without international aid) and 25 per cent conditionally compared to 1990 level.

In 1990, the energy sector's emission was around 249.6 MtCO<sub>2</sub>-e. This translates to a cap of 212.2 MtCO<sub>2</sub>-e for unconditional target and 187.2 MtCO<sub>2</sub>-e for conditional target.

Under the current policy setting, the total emissions are expected to grow from 223.2 MtCO<sub>2</sub>-e or a 10.6 per cent emission reduction compared to 1990 level, falling short by a small margin to achieve the unconditional NDC target despite a significant decrease in GHG emissions.

Kazakhstan can further enhance its efforts to achieve the unconditional NDC target by accelerating the implementation of energy saving measures in order to align with the global improvement target of 3.4 per cent discussed in the previous section.

In the SDG scenario, total emissions are expected to further decrease to 191.8 MtCO<sub>2</sub>-e by 2030 or an emission reduction of 23.2 per cent compared to 1990 level, which meets the unconditional NDC target in the energy sector.

by  
**15% in  
2030**  
**Unconditional target**

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by  
**25% in  
2030**  
**Conditional target**

# Existing policies

Kazakhstan's energy sector development is guided by several national policies and legislations. These policies have been used as guiding references for the NEXSTEP modelling, to better understand the country's context and to provide recommendations in adherence to the national government's overarching direction.

01

**The Development Strategy of the Republic of Kazakhstan until 2050**

02

**The Concept for the transition of the Republic of Kazakhstan to a green economy**

03

**The Environmental Code**

04

**Law on the Promotion of Renewable Energy Sources**

05

**Kazakhstan's Updated Nationally Determined Contribution (NDC)**

+

**more policies and degrees**



# Collaboration with UNECE and ESCAP to develop SDG7 road map

The Government of Kazakhstan has expressed its interest in the NEXSTEP initiative to develop an SDG 7 Road Map for Kazakhstan. This Road Map development is being supported by the United Nations Economic Commission for Europe (UNECE) in collaboration with the United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP).

The NEXSTEP tool (National Expert SDG 7 Tool for Energy Planning) is aimed to identify energy transition pathways for Central Asian countries in the context of the 2030 Agenda and the Paris Agreement. NEXSTEP uses the Low Emission Analysis Platform (LEAP) for modelling energy transition scenarios. LEAP is a widely used tool developed by the Stockholm Environment Institute (SEI), which is utilized to develop scenarios for the energy sector policy analysis and Nationally Determined Contribution (NDC).

NEXSTEP modelling utilizes data collected from the national level that includes bottom-up energy demand and intensity data for the demand sectors (i.e., residential, commercial, transport, and industry), macroeconomic and demographic data such as the country's GDP, projected GDP growth rate, population data, and projected population growth rate.



# Actions undertaken and plans

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## Step 1

Inception workshop was held in Astana on February 2023 with key stakeholders

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## Step 2

Data collection by the National Consultant in Kazakhstan and development of Kazakhstan Scenario Highlights

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## Step 3

Second National Workshop will be organized in Astana on November 9 in Ritz Carlton Astana (online and offline)

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# Contact information

We thank you for your continued support in our efforts to contribute to the SDG7.

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