ENERGY SAVING AND ENERGY EFFICIENCY PROGRAMMES

KMG has continued its group-wide energy saving and energy efficiency programme, with the Corporate Centre collecting and analysing energy consumption and energy efficiency-related data, monitoring the dynamics, identifying opportunities for improvement, and conducting year-on-year and peer benchmarking.

KMG's energy saving and energy efficiency efforts are based on the methodology set out in ISO 50001 Energy management systems, an internationally recognised best-practice framework for systemic energy management.

Energy saving and energy efficiency programme performance

In 2020, total energy consumption amounted to 156.6 mln GJ, down 14% year-on-year, including 13.2 mln GJ in electricity, 4.2 mln GJ in heat, 1.5 mln GJ in motor fuel, and 137.7 mln GJ in boiler and heating fuel. KMG's total energy consumption is divided between three business segments: Upstream, Midstream and Downstream.

The year-on-year energy consumption decrease was mainly due to reduced gas transportation and lower hydrocarbon production because of the pandemic. In 2020, KMG Group's self-generated energy amounted to 406.0 mln kWh in electricity and 4,096 ths Gcal in heat.

The use of innovative technologies and renewable energy sources is a relatively new yet promising trend in the oil and gas industry.

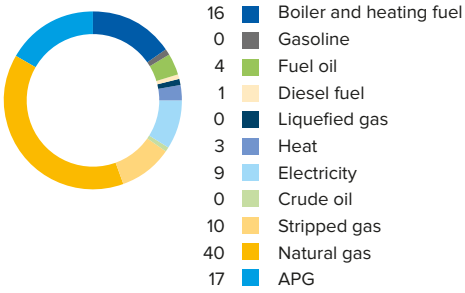
We benefit from a range of renewable energy technologies deployed in previous years at KazTransGas, namely in its subsidiaries Asia Gas Pipeline and Intergas Central Asia, including compressor units driven by DLE turbines; reactive power compensation in electric grids; Waterkotte geothermal heat pumps; monocrystalline solar cells (panels); thermal electric generators (closed cycle vapour turbogenerators) and Capstone modular package power plants; end-to-end automated energy accounting systems, and energy-saving lights.

Total renewable energy generation by the KazTransGas Group in 2020 broken down by source:

- Geothermal energy (heat) generation by heat pumps: 625.8 Gcal
- Electricity generation by solar panels: 111,352 kWh
- Electricity generation by thermal power generating units (TPGU, Rankine cycle): 1,154,510 kWh

In 2020, PKOP solar panels generated 211,000 kWh of electricity for street lighting.

Energy consumption by resource type, %



Energy intensity

In 2020, KMG Group's energy consumption in the upstream sector averaged at 2.2 GJ per tonne of hydrocarbon production, still 46% above the International Association of Oil & Gas Producers (IOGP) average for 2018, i.e., 1.5 GJ per tonne of hydrocarbon production. In oil production, specific energy consumption increase was primarily due to a higher water cut at mature fields, which caused a higher density of the fluid produced and, accordingly, a higher energy consumption for artificial lift.

KMG Group's key strategic energy saving and energy efficiency initiatives include process equipment upgrades, deployment of energy saving technologies, optimisation of heat generation and consumption, and the development of the Group's own generation assets, including APG-fired generation.

In 2020, 55 energy saving and energy efficiency initiatives were implemented. The target annual fuel and energy savings amounted to 0.9 mln GJ, which in physical terms corresponds to 6.9 mln kWh of electricity, 10,300 tonnes of fuel gas, and 11,803,000 m^3 of natural gas.