6.4.4. ENERGY CONSUMPTION AND EFFICIENCY

Different types of ship fuel are the main types of energy resources consumed in production activities of the Group.

Dynamics of fuel consumption in 2017-2019

Type of fuel	2019		2018		2017	
Fuel oil, tonnes	958,550	70 %	1,025,791	72 %	943,112	75.6 %
Diesel fuel, tonnes	203,754	15 %	231,860	16 %	208,690	16.7 %
Gas engine fuel, tonnes	200,475	15 %	166,741	12 %	96,442	7.7 %
Total	1,362,779	100 %	1,424,393	100 %	1,248,244	100 %

Sovcomflot Group is actively engaged in work to implement a state programme for introducing gas engine fuel in the transport sector. In 2019, the share of gas engine fuel amounted to 15% of the total ship fuel consumption against 12% a year earlier. The increase in this indicator is due to an increase in the intensity of liquefied gas transportation and the addition of new-generation LNG fuelled vessels to the Group's fleet. The SCF fleet includes five LNG tankers equipped with LNG powered internal combustion engines and four LNG tankers that also use gas fuel for the ship power plant (steam turbine). In addition, six dualfuel Aframax tankers using liquefied natural gas as the primary fuel were put into service in 2018-2019.

15 %

the share of gas engine fuel in the total amount of ship fuel consumed (vs. 12 % in 2018)

The consumption of energy resources such as heat, electricity, motor gasoline is associated with the operation of the Group's onshore units. Their consumption volume is insignificant compared to consumption volumes of different types of ship fuel. The Group does not consume any types of energy resources other than those listed above.

6.4.5. ENERGY EFFICIENCY INITIATIVES

Energy consumption reduction is conducive to minimising negative impact on the environment. Sovcomflot Group has developed and implemented an Energy Conservation and Energy Efficiency Programme, aimed at promoting the efficient use of fuel and energy resources and improving the environmental sustainability of the fleet.

Energy audits are conducted regularly on the Group's ships. These make it possible to obtain reli-able information on the consumption of fuel and oil and the energy efficiency of ship engines and boilers and to identify opportunities for saving energy and increasing the energy and envi-ronmental performance of ship power plants.

During 2019 Sovcomflot Group continued to implement a number of organisational and technical measures to promote efficient use of fuel and energy resources and improve the environmental sustainability of the fleet:

- Applying slow steaming on ships to reduce fuel consumption and emissions. The results show that operating vessels at low speeds (7-9 knots) with the main engine loads less than 40 % of MCR increases their energy efficiency and environmental compatibility.
- Determining and applying the optimal pitch angle for each vessel during ballast voyage to minimise fuel consumption on the main engine. The optimal trim was determined for each series of vessels by conducting thermal tests at various pitch angles. This measure has been used on the company's ships since 2009.
- Monitoring and optimising energy consumption for heating and ventilation in the ship's living quarters.
- Optimising the power output in navigation and harbour modes.
- Establishing an energy conservation culture on ships.
- Checking fuel and oil consumption meters on ships.
- Monitoring the state of the hull and its timely cleaning. The main engine propeller charac-teristics are monitored. The speed of the ship relative to land and water, weather conditions, and propeller slip are controlled on a daily basis. In some cases, underwater images are taken to evaluate hull fouling.
- Ensuring that the consumption of main engine cylinder oil does not exceed the recommended level.
- Determining readiness of the ship's power plant depending on the harbour accommodation and requiring a minimum number of mechanisms working (instant readiness and readiness at a given time).
- Using innovative lowfriction hull coatings in order to increase the inter-docking period, reduce the hull fouling and eliminate the need for underwater hull cleaning between dockings.
- Replacing incandescent light bulbs with energysaving (fluorescent, including compact fluorescent, and LED) bulbs on a scheduled basis. Placing light sources (local lighting, spot lighting) in an optimal way. Increasing the light output of existing sources (replacing lamp shades, cleaning them, using more efficient reflectors). Using lighting control devices (motion sensors, light sensors, timers).

Sovcomflot Group realises its high responsibility for the quality of the environment and seeks to minimise its adverse impacts on the environment by introducing innovations, reducing energy consumption, and increasing staff qualifications.