

The Sakhalin experiment

Results and prospects

According to the Strategy for the Socioeconomic Development of the Russian Federation with Low Greenhouse Gas Emissions until 2050 and the Climate Doctrine of the Russian Federation, Russia is to achieve carbon neutrality by 2060.

THE GOAL OF THE SAKHALIN EXPERIMENT



Sakhalin region is to become the first carbon-neutral region of Russian Federation no later than **31.12.2025** (carbon neutrality is a state of balance between anthropogenic greenhouse gas emissions and their absorption, in which the mass of anthropogenic greenhouse gas emissions does not exceed the mass of their absorption for a calendar year).

Period of the experiment: **01.09.2022 – 31.12.2028**

Source: Federal Law No. 34-FZ of 06.03.2022

OBJECTIVES OF THE SAKHALIN EXPERIMENT



1. Stimulating the implementation of technologies for reducing greenhouse gas emissions and increasing their absorption
2. Formation of a system of independent verification of carbon reporting
3. Carbon trading and emission allowances mechanism formation



Sakhalin region has become the first and so far the only Russian region on whose territory an inventory of greenhouse gas emissions and absorption has been carried out and a comprehensive document for planning and implementing climate policy in the field of reducing greenhouse gas emissions is in force - **the Climate Experiment Program 2022-2028**.

Achieving **carbon neutrality** is the ambitious expected outcome of the Program. However, an equally important task of the experiment is **to test new mechanisms and instruments of the carbon regulation**. Sakhalin acts as a testing ground where carbon regulation mechanisms and decarbonization technologies are tested, and experience is accumulated for the development of climate policy in other regions, taking into account their socio-economic and environmental-climatic characteristics.

WHY SAKHALIN REGION



1. Stand-alone energy and transport infrastructure
2. The fuel and energy complex dominates in the structure of the gross regional product and the region's budget revenues, which is typical for the Russian economy as a whole
3. Diversity of natural and climatic conditions and ecosystems
4. Access to Asia-Pacific markets where carbon regulation is already in place and there are prospects for harmonizing approaches and implementing carbon unit trading
5. The presence of socially and environmentally responsible companies that share the principles of sustainable development and meet ESG criteria

KEY PERIODS IN THE IMPLEMENTATION OF THE SAKHALIN EXPERIMENT



RESULTS OF THE EXPERIMENT



1. A system for managing the climate agenda at the regional level has been built and a regulatory framework has been developed in the area of mandatory carbon regulation

- Responsible bodies, their roles and functions have been identified, including the body authorized to implement the experiment and other institutions implementing climate and sustainable development policies
- Federal Law No. 34-FZ "On conducting an experiment to limit greenhouse gas emissions in certain constituent entities of the Russian Federation" has been approved
- The procedure for classifying legal entities and individual entrepreneurs as regional regulated organizations within the framework of the experiment has been approved
- Methodological recommendations for organizing discussion hearing of the Program and quotas have been approved
- Rules for calculating and collecting fees for exceeding greenhouse gas emission allowances have been approved
- Methodology for determining projected greenhouse gas emission allowances has been approved
- The rate of payment for exceeding the greenhouse gas emission allowances has been approved
- The Rules for the submission of carbon reporting by regional regulated organizations have been approved
- The methodology of the climate project on coastal-marine wetlands (salineted) and the methodology for assessing the absorption capacity of forest ecosystems based on the results of the state inventory have been approved



2. The first regional program for conducting an experiment to limit greenhouse gas emissions has been developed in the Russian Federation

- In 2022 a methodologically sound climate program was developed and approved, based on CO₂ models by sectors, a portfolio of decarbonization projects was formed in such areas as energy, housing and communal services, transport, etc., which implies a reduction in greenhouse gases of about one million tons of CO₂-eq. in 2022-2028
- Regional authorities implement measures in the program areas and monitor performance indicators on a quarterly basis



3. A comprehensive inventory of greenhouse gas emissions and absorption has been carried out

- In 2022 the first comprehensive regional inventory of greenhouse gas emissions and absorption for 2019-2021 was conducted in Russia, agreed with Roshydromet
- The preparation of a regional inventory of greenhouse gas emissions and absorption in the Sakhalin Region is currently carried out on an annual basis.



4. A system for verifying carbon reporting and quoting emissions from regional regulated organizations has been put into operation

- An initial selection of regional regulated organizations was carried out, within the framework of which more than 300 of the largest companies operating in the Sakhalin Region were assessed in 2022, of which 50 were included in the experimental program at the first stage
- From July 1, 2023, regional regulated organizations annually prepare verified carbon reporting in the GIS "Energy Efficiency"
- For the first time in Russia, greenhouse gas emission allowances for 2024-2028 were set for 35 companies. If a company does not comply with the allowances, it either buys the missing carbon units or pays a fee to the regional budget for each ton of CO₂-eq. above the quota. The fee rate for 1 ton of CO₂ is 1 thousand rubles.



5. Climate projects are being implemented and carbon units are being issued

- The first climate project in Russia to create a solar power plant on the Kuril Islands was validated and verified, and the first trade transactions with carbon units were carried out, within the framework of which 96 carbon units were registered in the national registry in 2022, 20 of which were sold at a price of 1 thousand rubles.
- The first forest climate project in Russia was launched on the territory of the Poronaisky forestry
- The first RRO climate project for boiler modernization has been validated



6. The preconditions have been created for the development of international cooperation in the climate direction with the countries of the Asia-Pacific region.

EFFECTS



SOCIO-ECONOMIC EFFECTS

Creating favorable conditions for business development and improving the quality of life of citizens. The Sakhalin Region annually improves its position in national rankings. According to the Agency for Strategic Initiatives, the region ranks 4th in terms of investment attractiveness and 9th in terms of quality of life in Russia as of 2024. The region is developing an industrial base in such areas as highly efficient and resource-saving energy, low-carbon transport, recycling and reuse of materials, and energy-efficient technologies.



ECOLOGICAL EFFECTS

According to the results of 2022, the air pollution index in Yuzhno-Sakhalinsk decreased almost 2 times compared to 2020 and amounted to 10.9. The comprehensive indicator "Environmental Quality" reached 127.27, becoming a record and exceeding the federal standard by more than 20%. The trend towards improving air and water quality indicators continues.



CLIMATE EFFECTS

By the end of 2023, net greenhouse gas emissions in the region had decreased by almost 2 times from the baseline level of 2021 (from 1,367 to 732 thousand tons of CO₂-eq.). The experimental program took 1st place in the international competition "Green Eurasia 2024".



TECH EFFECTS

Advanced technologies with low, zero and negative greenhouse gas emissions, including hydrogen, renewable energy and low-carbon energy sources, carbon capture, use and storage technologies (CCUS), absorption of greenhouse gases by ecosystems, reduction of industrial emissions, energy and resource efficiency, etc. The Eastern Hydrogen Cluster is being created. The list of pilot projects of the cluster will include: "Hydrogen Plant", "Hydrogen Train", "Competence Center" and "Hydrogen Landfill".



MANAGEMENT EFFECTS

- Implementation of the climate policy of the Russian Federation, development of the regulatory framework in the field of carbon regulation at the regional level
- Development of a data management system – a comprehensive mandatory inventory of greenhouse gas emissions and absorption, preparation of a greenhouse gas emissions and absorption inventory on an annual basis
- Development of a methodological basis for assessing greenhouse gas emissions and absorption by natural ecosystems
- Implementation of a carbon reporting and verification system, setting emission allowances for greenhouse gas emissions for RROs for the period 2024-2028
- Implementation of climate projects in the Sakhalin Region (RES, forestry project and RRO project in the housing and utilities sector). These projects were the first in their categories in the country, acting as drivers for the development of the carbon market in Russia. Companies participating in the experiment are also initiating climate projects in other regions of their presence
- Training of personnel for work in growing carbon markets in the public sector and in business structures, development of specialized areas of science and education
- Development of international cooperation in the climate direction with the countries of the Asia-Pacific region

RESULTS OF THE IMPLEMENTATION OF THE SAKHALIN EXPERIMENT PROGRAM

Housing and communal services nasification

conversion of boiler houses from coal to gas, modernization of coal boiler houses and increasing their energy efficiency



By the end of 2024, as part of the experiment, 38 municipal and 15 departmental boiler houses will be converted from coal and diesel fuel to natural gas, and three asphalt concrete plants will be gasified. In the Sakhalin Region, 57% of households (4,807 units) have switched to gas heating.

Transport decarbonization

conversion of vehicles to gas turbine and electric traction, development of public transport and electric car sharing



More than 5 800 cars will be converted to gas motor fuel. During the experiment, 253 buses on gas motor fuel were purchased, 420 electric cars and 840 hybrid passenger cars were registered in the region. An electric charging infrastructure has been created, which includes 329 stations. An electric carsharing program is being developed in Yuzhno-Sakhalinsk.

Energy efficiency and energy saving systems improvement

strengthening thermal protection and increasing energy efficiency of buildings, installation of LED lamps, modernization of production with the introduction of energy-efficient technologies and equipment



By the end of 2024, energy-efficient repairs of roofs and facades of 392 apartment buildings will be carried out. More than 12 thousands street lighting fixtures have already been replaced with energy-efficient ones. As part of the implementation of energy saving plans, it is planned to achieve a reduction in energy consumption in the amount of 28 million kWh/year and 123 thousand Gcal/year.

Renewable energy development

increasing the share of renewable energy sources in electricity consumption



In 2022, a solar power plant was commissioned on Iturup Island. As of the end of 2024, the installed capacity of renewable energy facilities will be 9 MW, and the generation of electricity based on renewable energy sources will be 24 million kWh/year, which will reduce greenhouse gas emissions by 18 thousand tons of CO₂-eq./year.

Hydrogen energy development

implementation of pilot hydrogen projects and training of personnel within the framework of the creation of the Eastern Hydrogen Cluster on Sakhalin



In 2024, the first hydrogen test site was opened in the Far East. As part of the experiment, the Eastern Hydrogen Cluster is also being formed, the list of pilot projects of which will include the Hydrogen Plant, Hydrogen Train, Competence Center, and Hydrogen Test Site.

Waste management system development

liquidation of landfills and reclamation of territories, creation of conditions for waste recycling



100% separate waste collection has been ensured. The share of MSW sorting at landfills is planned to increase to 38% by the end of 2024. The capacity of reconstructed and constructed municipal waste treatment facilities is to be increased to 1 million m³/year.

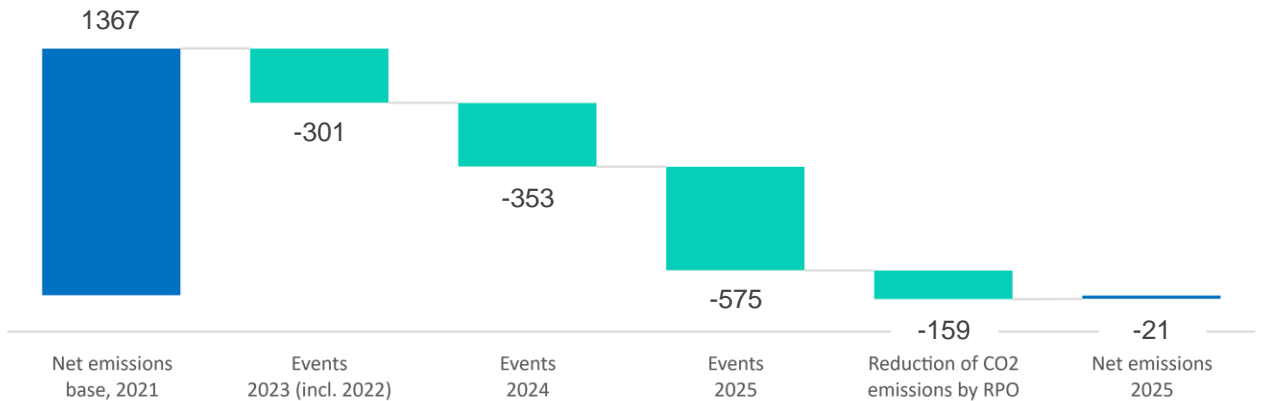
Sustainable management of natural ecosystems

implementation of climate projects on forest restoration and protection, sustainable agriculture, management of wetland ecosystems, development of aquaculture



The area of forest plantations will increase by 8 thousand hectares by the end of 2024. In general, the implementation of measures for sustainable ecosystem management will increase the absorption of greenhouse gases by 350 thousand tons of CO₂-eq./year. The experiment also included the first assessment of the volumes of accumulation and long-term storage of carbon by coastal and marine wetlands.

PRELIMINARY REDUCTION OF GREENHOUSE GAS (GHG) EMISSIONS AS A RESULT OF THE EXPERIMENT, BASIC NET EMISSIONS AND FORECAST VALUES (THOUSAND TONS OF CO₂-EQ.)



Source – Ministry of Ecology and Sustainable Development of the Sakhalin Region, as of the 3rd quarter of 2024

PROJECT EXAMPLES



Climate projects: solar power plant on Iturup Island (Kuril Islands)

The first climate project registered in the carbon unit registry was the construction of a solar power plant with an installed capacity of 250 kW on Iturup Island.

As part of the project, 96 carbon units were put into circulation. The first transactions with them took place in September 2022. Based on the results of the trades between Sberbank PJSC and TAMAK JSC, 20 units were sold at a price of 1 thousand rubles per unit.



Climate projects: modernization of boiler houses in Sakhalin region

The climate project involves modernizing boiler houses that provide centralized heat supply to the Sakhalin Region and converting them from coal to gas.

The project will result in a total reduction in greenhouse gas emissions of 246,967 tons of CO₂-eq. over the period 2024–2034. Replacing coal boiler houses with a boiler efficiency of 60–85% with more efficient gas boiler houses with an efficiency of 94% will also reduce fuel consumption while producing the same amount of energy.



First hydrogen testing ground

The first hydrogen testing ground in the Far East was opened in July 2024. Four pilot hydrogen engineering projects will be implemented at the testing ground:

- the “Ogonki” project for autonomous energy supply of isolated cellular towers along federal highways;
- the “Novikovo” project aimed at replacing part of the diesel generation in isolated and hard-to-reach villages with hybrid local systems using green hydrogen based on renewable energy sources;
- the “EMERCOM” project to create a mobile hydrogen power station platform on a chassis with autonomous power supply and life support systems based on compressed hydrogen;
- the “AZS” project aimed at replacing traditional diesel transport with hydrogen.



Nature-based solutions

In 2023, the first forest climate project in Russia was launched in the Sakhalin Region, within the framework of which about 29 million Daurian larches will be planted on the territory of the Poronaysky forestry on an area of about 6 thousand hectares. The project will be implemented over 79 years (until 2102). The project will ensure the absorption of 1.5 million tons of CO₂-eq.

As part of the experiment, carbon test sites were opened at Sakhalin State University in the Sakhalin Region, and a new method for assessing the absorption capacity of coastal marine wetlands (salineted) was developed.