MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Russian Atlas of Low-Carbon and Carbon-Free Hydrogen and Ammonia Production Projects

Kaliningrad Region
1. The Kronshtadt Group: Green Hydrogen
2. Rosatom: Green Hydrogen

Republic of Crimea
3. H2: Green Hydrogen

Krasnodar Territory
4. Lukoil: Green Hydrogen

Saratov Region
5. Special Project Company Gornyj: Blue Ammonia

Moscow Region
6. Research and Test Center of Rocket and Space Industry: Green Hydrogen

Leningrad Region
7. Agency for Economic Development of the Leningrad Region: Green Hydrogen
8. Agency for Economic Development of the Leningrad Region: Green Hydrogen
9. Agency for Economic Development of the Leningrad Region: Blue Hydrogen / Ammonia

Republic of Karelia
10. En+ Group: Green Hydrogen / Ammonia

Republic of Tatarstan
11.Tatenergo: Green Hydrogen

Archangel Region
12. Regional Development Agency of the Arkhangelsk Region: Green Hydrogen

Murmansk Region
13. Rusnano: Green Hydrogen
14. Rosatom: Low Carbon Hydrogen
15. H4Energy: Green Hydrogen / Ammonia
16. H2 Clean Energy: Green Hydrogen
17. H2: Green Hydrogen
18. Gazprom Energoholding Group: Green Hydrogen / Ammonia

Komi Republic
19. Komi Center for Entrepreneurship Development: Turquoise Hydrogen

Yamal-Nenets Autonomous Area
20. NOVATEK: Blue Hydrogen / Ammonia
21. Corporation Energy: Blue Ammonia / Hydrogen
22. Corporation Energy: Green Hydrogen
23. Corporation Energy: Blue Ammonia / Hydrogen

Krasnoyarsk Territory
24. North Star: Low Carbon Hydrogen
25. SUEK: Blue ammonia
26. En+ Group: Green Hydrogen / Ammonia

Irkutsk Region
27. En+ Group: Green Hydrogen / Ammonia
28. En+ Group: Green Hydrogen / Ammonia
29. En+ Group: Green Hydrogen / Ammonia
30. H2 Clean Energy: Green Hydrogen

Trans-Baikal Territory
31. Unigreen Energy: Green Hydrogen

Amur Region
32. Agency of the Amur Region for Attracting Investment: Green Hydrogen

Republic of Sakha (Yakutia)
33. NORTH-EAST ALLIANCE: Blue Ammonia

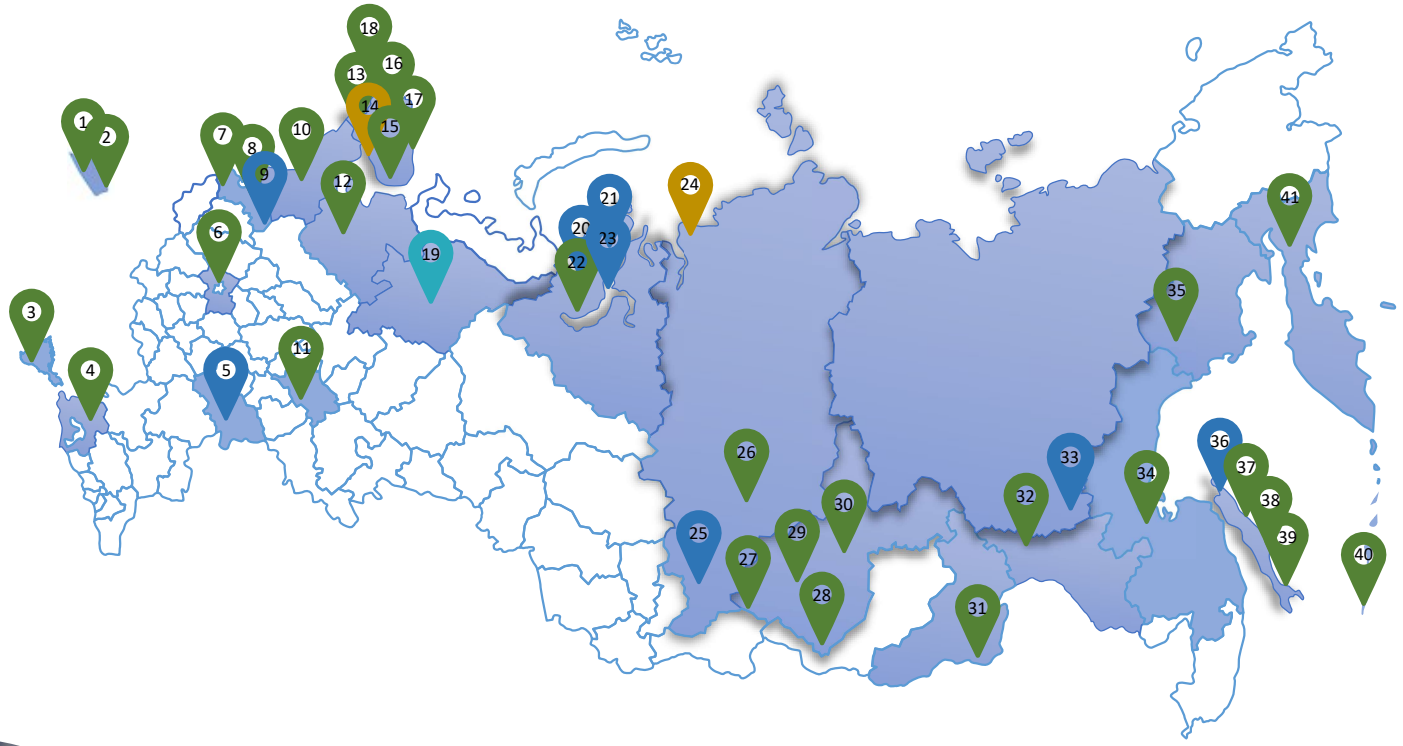
Khabarovsk Territory
34. JSFC Sistema: Green Hydrogen

Magadan Region
35. H2 Clean Energy: Green Hydrogen

Sakhalin Region
36. Rosatom: Blue Hydrogen / Ammonia
37. Rosatom: Green Hydrogen
38. H2 Clean Energy: Green Hydrogen
39. H4Energy: Green Hydrogen / Ammonia
40. H2: Green Hydrogen

Kamchatka Territory
41. H2 Clean Energy: Green Hydrogen

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA



Denis Manturov

Minister of Industry and Trade of the Russian Federation

«The Ministry of Industry and Trade of the Russian Federation in cooperation with industrial and energy organizations have systematized more than 40 projects to produce low-carbon and carbon-free hydrogen and ammonia from various raw materials.

On this basis we created Russian Atlas, which serves as a reference point for investors and mechanical engineers.

Russian hydrogen projects will contribute to the decarbonization of industry, energy and the entire economy».

The Kronshtadt Group: Green Hydrogen

Project description:

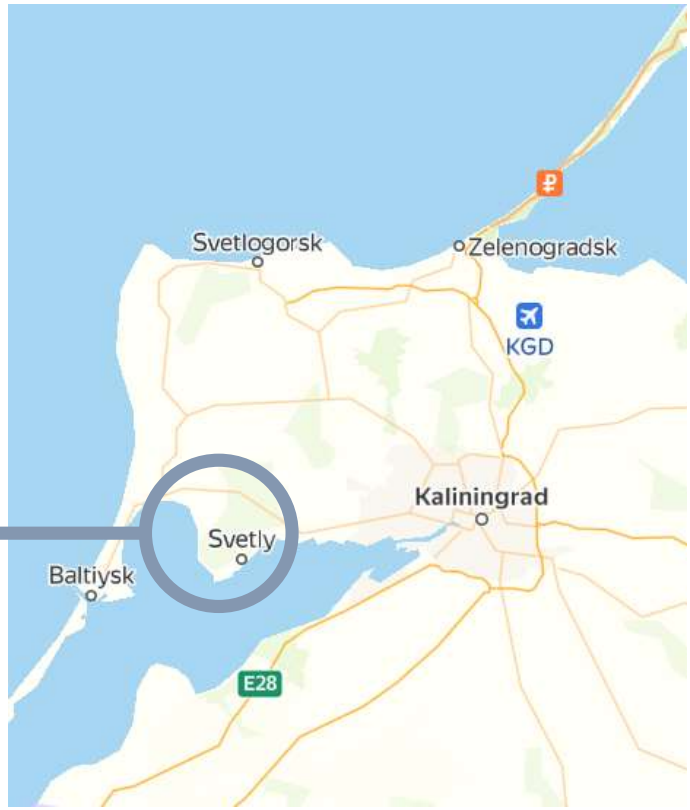
Green hydrogen production via hydro power plant electrolysis

Implementation period: 2023
Location: Kaliningrad Region, the city of Svetly
Target markets: domestic market of Russia, European countries
Production capacity forecast: 2 700 tons of hydrogen per year

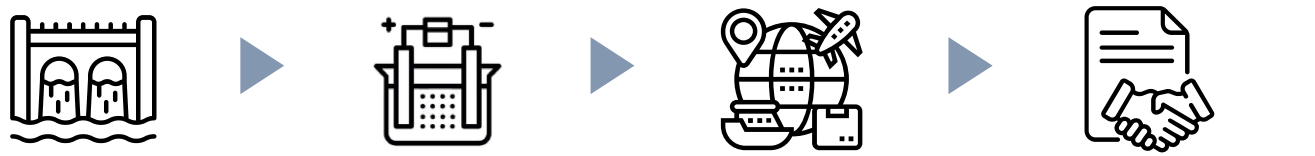
Participants:

- Kronshtadt
- Sodrugestvo
- Atomenergomash
- Others

Svetly (city), Kaliningrad Region



Project scheme:



Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and European countries

Consumption
Long-term contracts with Russian and European customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Rosatom: Green Hydrogen

Project description:

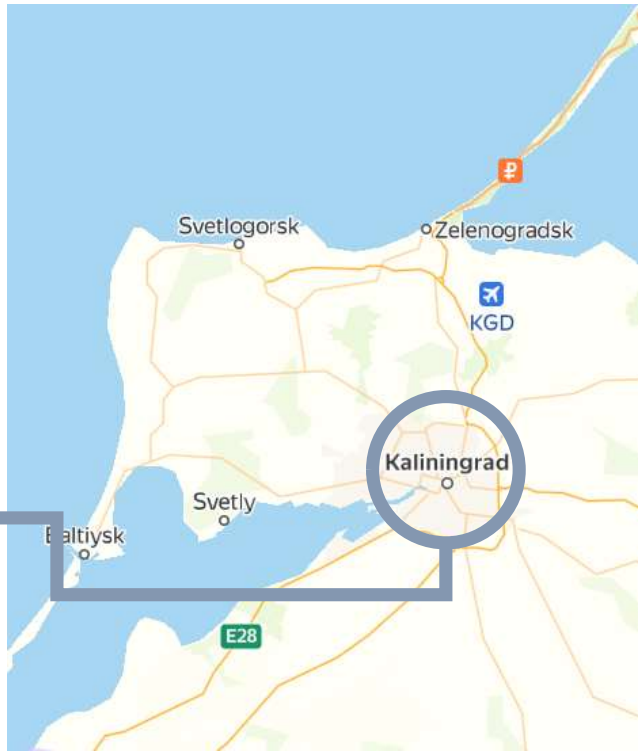
Green hydrogen production via wind power plant electrolysis

Pilot production launch: 2024
Location: Kaliningrad Region
Target markets: domestic market of Russia, European countries

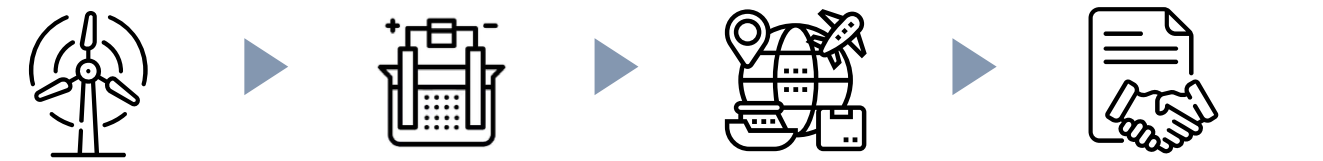
Participants:

- Rosatom
- Others

Kaliningrad Region



Project scheme:



Wind power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and European countries

Consumption
Long-term contracts with Russian and European customers

H2: Green Hydrogen

Project description:

Green hydrogen production via wind power plant electrolysis

Pilot production launch: 2023
Location: Republic of Crimea
Target markets: domestic market of Russia
Production capacity forecast: 10 000 tons of hydrogen per year

Participants:

- H2
- Others

Republic of Crimea

Project scheme:

Wind power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia

Consumption
Long-term contracts with Russian customers

Lukoil: Green Hydrogen

Project description:

Green hydrogen production via solar power plant electrolysis

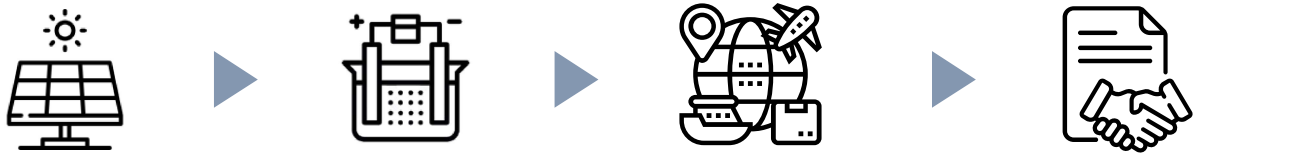
Implementation period: 2023
Location: Krasnodar Territory, the city of Krasnodar
Target markets: domestic market of Russia, European countries
Production capacity forecast: 13 tons of hydrogen per year

Participants:

- Lukoil
- Others

Krasnodar (city), Krasnodar Territory

Project scheme:



Solar power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and European countries

Consumption
Long-term contracts with Russian and European customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Special Project Company Gornyj: Blue Ammonia

Project description:

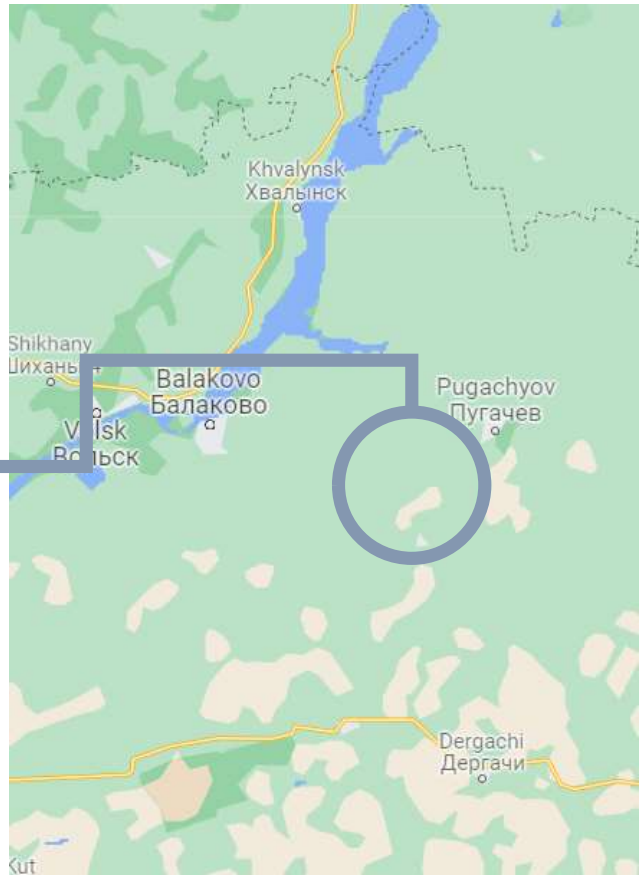
Blue ammonia production by steam conversion of methane with CO2 capture

Implementation period: 2026
Location: Saratov Region, Mikhailovsky village
Target markets: domestic market of Russia, European countries and the Asia-Pacific region
Production capacity forecast by 2026: 20 000 tons of ammonia per year
Production capacity forecast by 2030: 170 000 tons of ammonia per year

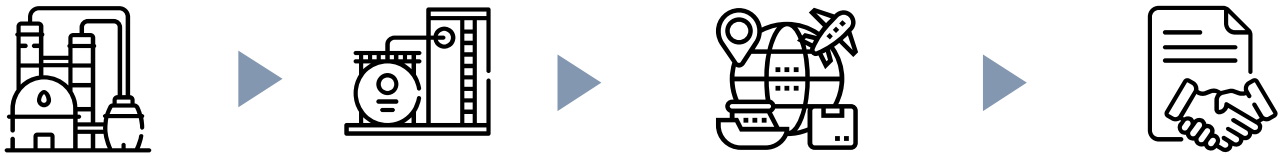
Participants:

- Special Project Company Gornyj
- Others

Mikhailovsky village, Saratov Region



Project scheme:



Steam methane conversion
Blue ammonia production

CO2 capture and utilisation with microalgae

Logistics
Hydrogen transportation to customers within Russia, European countries and the Asia-Pacific region

Consumption
Long-term contracts with Russian, European and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Pilot projects

Research and Test Center of Rocket and Space Industry:
Green Hydrogen

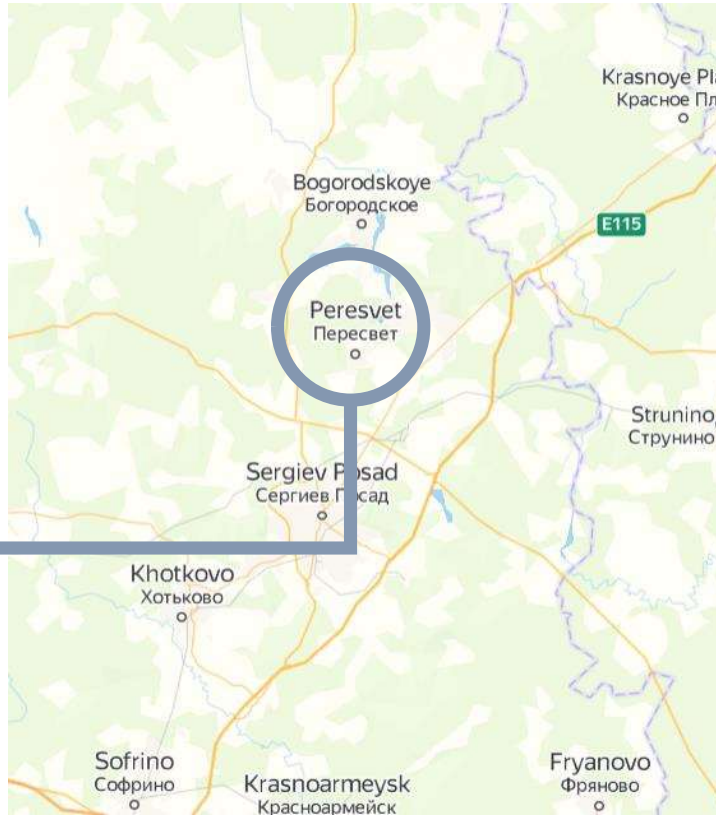
Project description:

Green hydrogen production via the Uglichsk HPP and the Zagorsk HPP electrolysis

Implementation period: 2021
Location: Moscow Region, the city of Peresvet
Target markets: domestic market of Russia
Production capacity: 400 tons of hydrogen per year
Production capacity forecast by 2024: 800 tons of hydrogen per year

Participants:

- Research and Test Center of Rocket and Space Industry
- Others



Peresvet (city), Moscow Region

Project scheme:

Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia

Consumption
Long-term contracts with Russian customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Pilot projects

Agency for Economic Development of the Leningrad Region:

Green Hydrogen

Project description:

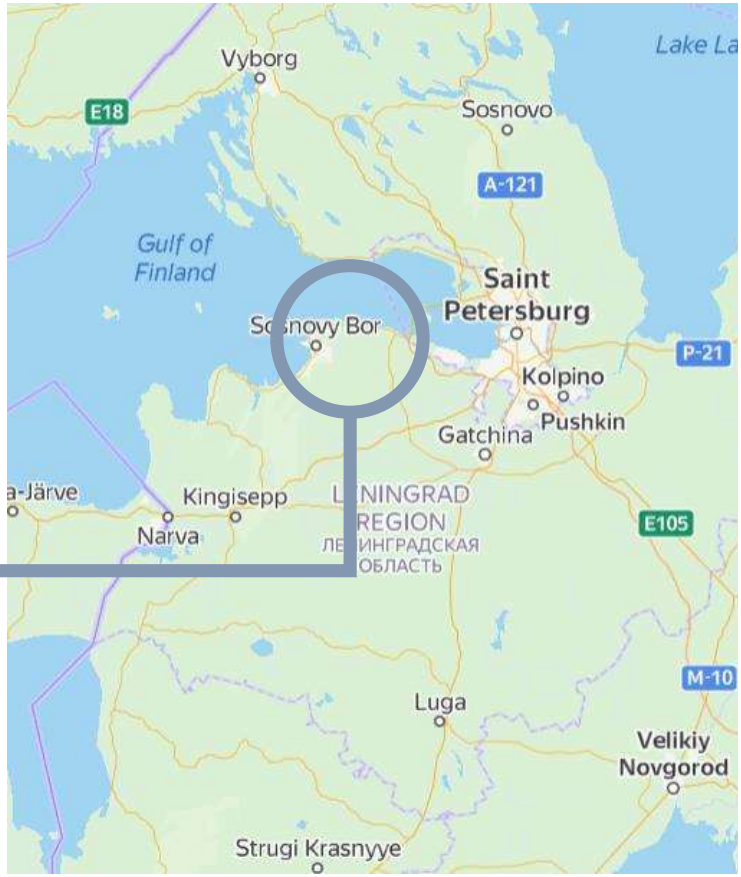
Green hydrogen production via wind power plant electrolysis

Implementation period: 2023
Location: Leningrad Region
Target markets: domestic market of Russia, European countries
Production capacity forecast: 3 500 tons of hydrogen per year

Participants:

- Agency for Economic Development of the Leningrad Region
- Others

Leningrad Region



Project scheme:

Wind power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and European countries

Consumption
Long-term contracts with Russian and European customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Pilot projects

Agency for Economic Development of the Leningrad Region:

Green Hydrogen

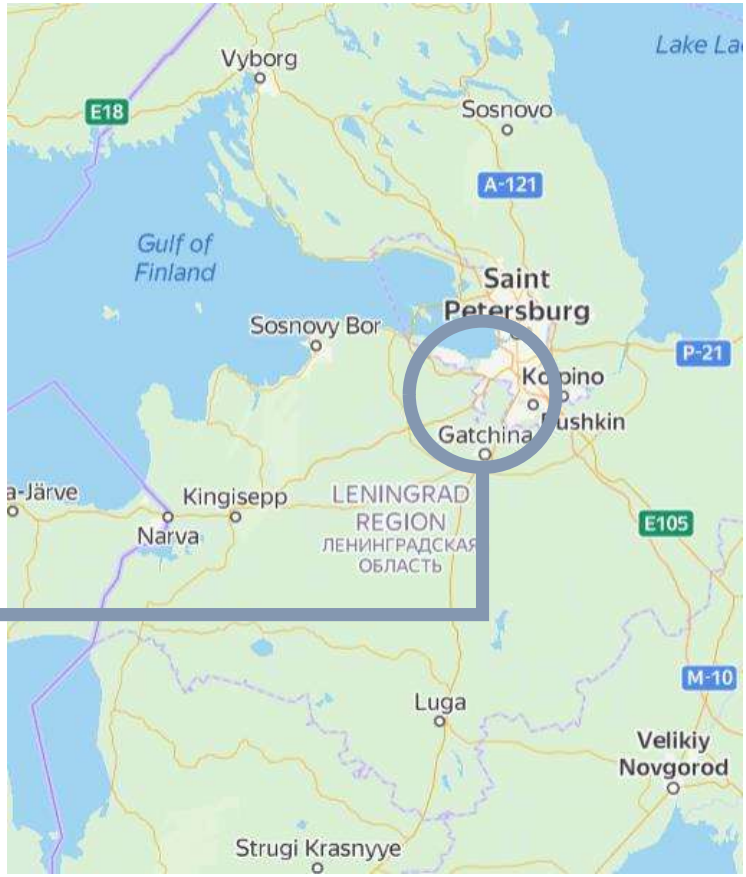
Project description:

Green hydrogen production via small hydro power plant electrolysis

Implementation period: 2023
Location: Leningrad Region
Target markets: domestic market of Russia, European countries
Production capacity forecast: 1 000 tons of hydrogen per year

Participants:

- Agency for Economic Development of the Leningrad Region
- Others



Leningrad Region

Project scheme:

Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and European countries

Consumption
Long-term contracts with Russian and European customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Agency for Economic Development of the Leningrad Region:

Blue Hydrogen / Ammonia

Project description:

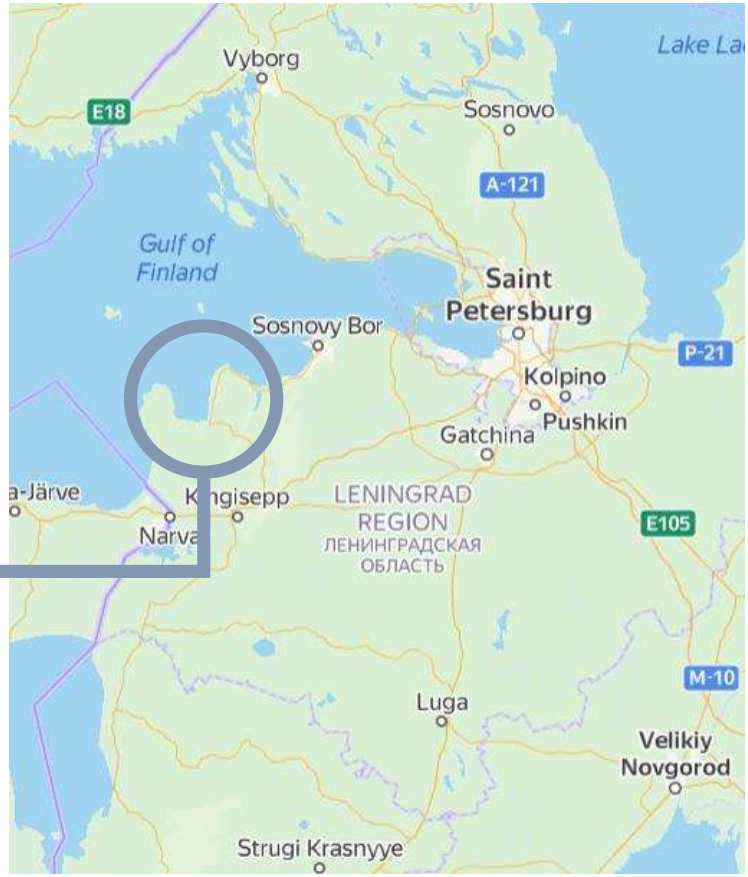
Blue hydrogen / ammonia production by steam conversion of methane with CO2 capture at Gas Chemical Enterprises in Leningrad Region

Implementation period: 2023
Location: Leningrad Region
Target markets: domestic market of Russia, European countries
Production capacity forecast: 1 000 tons of hydrogen per year

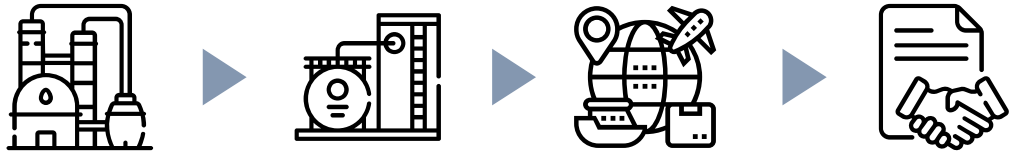
Participants:

- Agency for Economic Development of the Leningrad Region
- Others

Leningrad Region



Project scheme:



Steam methane conversion
Blue hydrogen / ammonia production

Carbon capture

Logistics
Hydrogen transportation to customers within Russia and European countries

Consumption
Long-term contracts with Russian and European customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

En+ Group: Green Hydrogen / Ammonia

Project description:

Green hydrogen / ammonia production via the Ondsk hydro power plant electrolysis

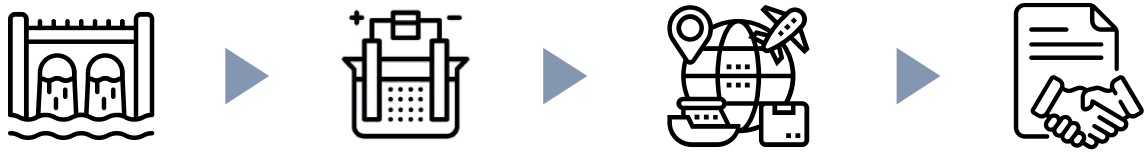
Implementation period: 2024
Location: Republic of Karelia, the village of Kamenny Bor
Target markets: domestic market of Russia, European countries
Production capacity forecast: 5 200 tons of hydrogen per year

Participants:

- En+ Group
- Others

The village of Kamenny Bor, Republic of Karelia

Project scheme:



Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Selection of storage and transportation technology

Consumption
Long-term contracts with Russian and European customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Tatenergo: Green Hydrogen

Project description:

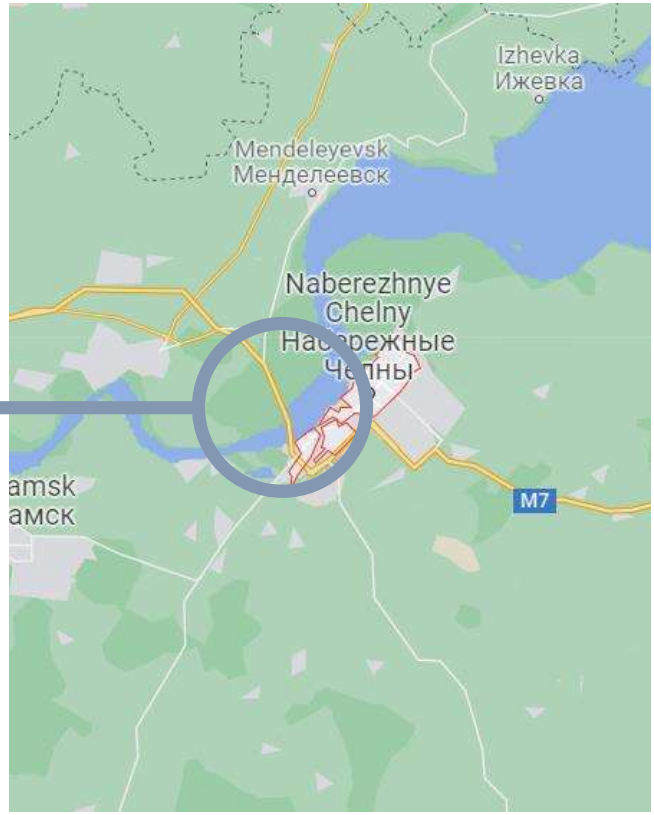
Green hydrogen production via the Nizhnekamsk hydro power plant electrolysis

Implementation period: 2024
Location: Republic of Tatarstan
Target markets: domestic market of Russia, European countries and the Asia-Pacific region
Production capacity forecast: 2 500 tons of hydrogen per year

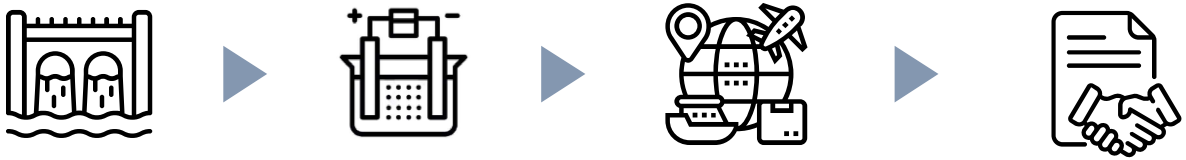
Participants:

- Tatenergo
- Others

Republic of Tatarstan



Project scheme:



Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia, European countries and the Asia-Pacific region

Consumption
Long-term contracts with Russian, European and Asia-Pacific customers

Regional Development Agency of the Arkhangelsk Region:
Green Hydrogen

Project description:

Green hydrogen production via the Mezensk tidal power plant electrolysis

Pilot production launch: 2030
Location: Archangel Region, Mezensky Area, Mezensky Bay
Target markets: domestic market of Russia, European countries and the Asia-Pacific region
Production capacity forecast by 2030: 500 000 tons of hydrogen per year
Production capacity forecast by 2033: 1 million tons of hydrogen per year

Participants:

- Regional Development Agency of the Arkhangelsk Region
- NordEnergoGroup
- Others

Mezensky Area, Mezensky Bay, Archangel Region

Project scheme:

Tidal power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia, European countries and the Asia-Pacific region

Consumption
Long-term contracts with Russian, European and Asia-Pacific customers

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Rusnano: Green Hydrogen

Project description:

Green hydrogen production via the Kolsk wind power plant electrolysis

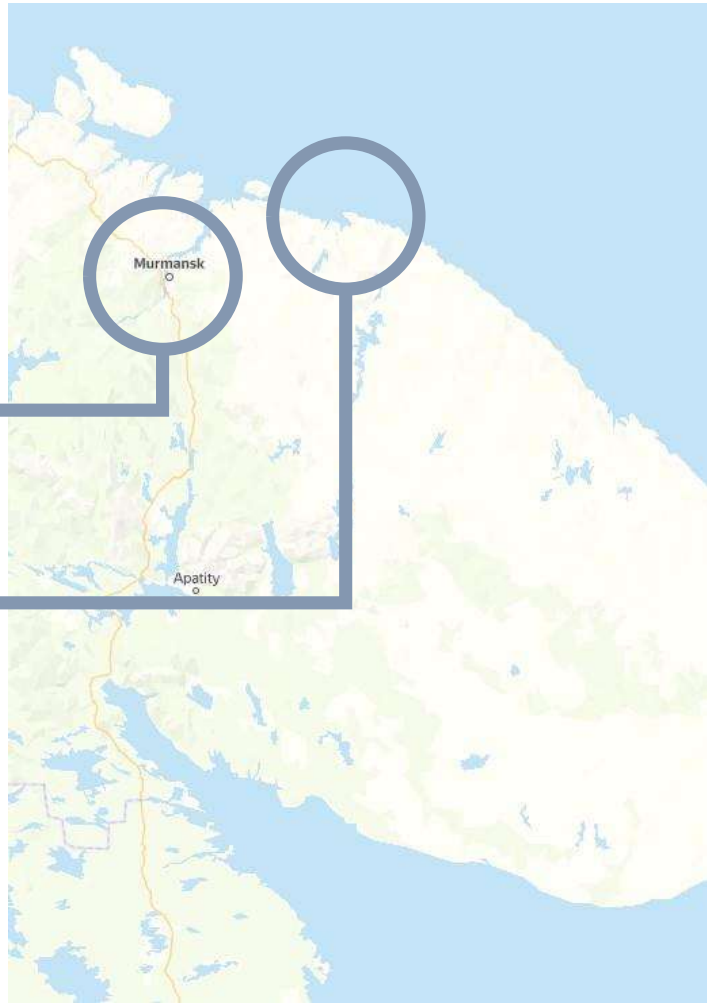
Implementation period: 2024
Location: Murmansk Region
Target markets: domestic market of Russia, European countries
Production capacity forecast: 12 000 tons of hydrogen per year

Participants:

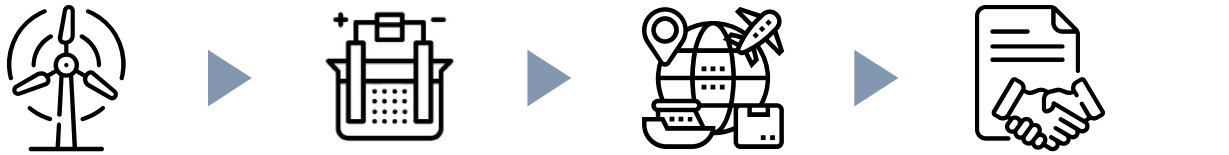
- Rusnano
- Enel
- Others

The Port of Murmansk,
Electrolysis production,
Murmansk Region

The Kolskaya WPP,
Murmansk Region



Project scheme:



Wind power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Selection of storage and transportation technology

Consumption
Long-term contracts with Russian and European customers

Rosatom: Low Carbon Hydrogen

Project description:

Low carbon hydrogen production via the Kolsk nuclear power plant electrolysis

Pilot production launch: 2024
Achieving industrial production capacity: 2030
Location: Murmansk Region
Target markets: domestic market of Russia, European countries
Production capacity forecast by 2024: 150 tons of hydrogen per year

Participants:

- Rosatom
- Others

The Kolskaya NPP, Murmansk Region

Project scheme:

Nuclear power plant
Electricity generation

Electrolysis
Hydrogen production

Liquefaction and storage

Logistics
Hydrogen transportation to customers within Russia and European countries

Consumption
Long-term contracts with Russian and European customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

H4Energy: Green Hydrogen / Ammonia

Project description:

Green hydrogen / ammonia production via hydro power plant electrolysis

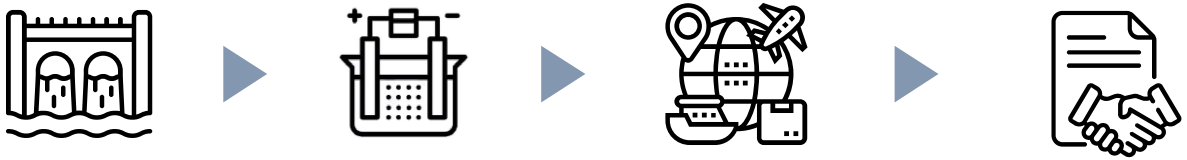
Pilot production launch: 2024
Location: Murmansk Region
Target markets: domestic market of Russia, European countries and the Asia-Pacific region
Production capacity forecast by 2024: 17 000 tons of hydrogen per year
Production capacity forecast by 2030: 170 000 tons of hydrogen per year

Participants:

- H4Energy
- H2Trasition Capital
- Eurasia Mining
- Others

Murmansk Region

Project scheme:



Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia, European countries and the Asia-Pacific region

Consumption
Long-term contracts with Russian, European and Asia-Pacific customers

H2 Clean Energy: Green Hydrogen

Project description:

Green hydrogen production via hydro power plant electrolysis

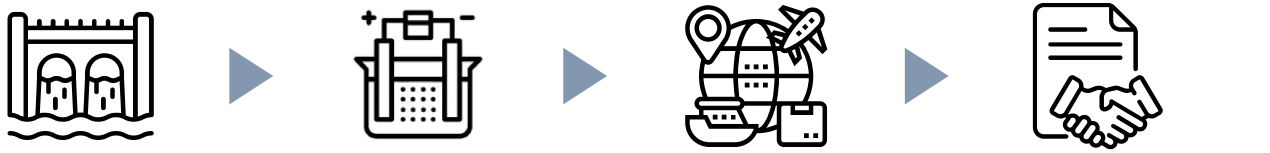
Implementation period: 2025
Location: Murmansk Region
Target markets: domestic market of Russia, European countries
Production capacity forecast: 16 000 tons of hydrogen per year

Participants:

- H2 Clean Energy
- TGC-1
- Others

Murmansk Region

Project scheme:



Hydro plant power
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and European countries

Consumption
Long-term contracts with Russian and European customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

H2: Green Hydrogen

Project description:

Green hydrogen production via wind power plant electrolysis

Implementation period: 2024
Location: Murmansk Region
Target markets: domestic market of Russia, European countries
Production capacity forecast: 10 000 tons of hydrogen per year

Participants:

- H2
- Others

Murmansk Region

Project scheme:

Wind power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and European countries

Consumption
Long-term contracts with Russian and European customers

Gazprom Energoholding Group: Green Hydrogen / Ammonia

Project description:

Green hydrogen / ammonia production via hydro power plant electrolysis

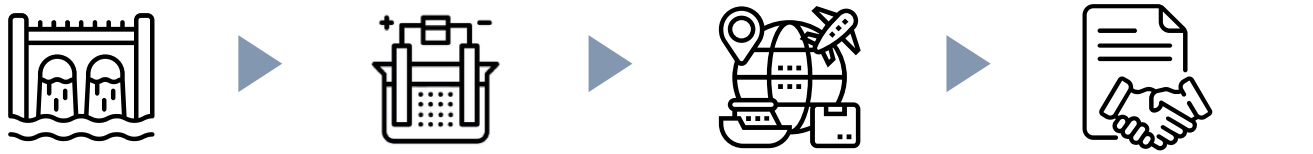
Implementation period: 2024
Location: Murmansk Region
Target markets: domestic market of Russia, European countries
Production capacity forecast by 2024: 2 000 tons of hydrogen per year
Production capacity forecast by 2030: 20 000 tons of hydrogen per year

Participants:

- Gazprom Energoholding Group
- TGC-1
- Others

Murmansk Region

Project scheme:



Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and European countries

Consumption
Long-term contracts with Russian and European customers

Komi Center for Entrepreneurship Development: Turquoise Hydrogen

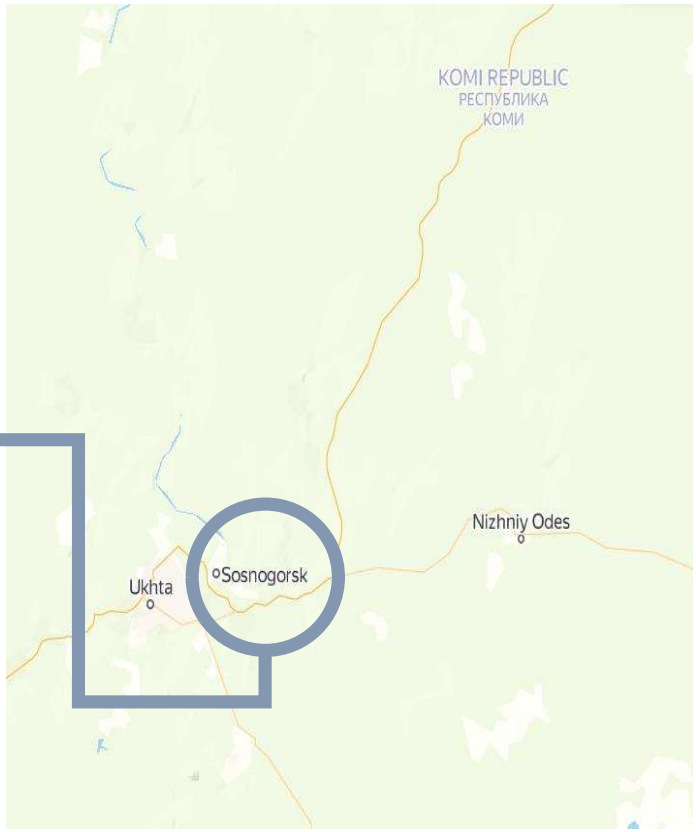
Project description:

Turquoise hydrogen production by methane pyrolysis at the Sosnogorsk GPP

Pilot production launch: 2024
Location: Komi Republic, the city of Sosnogorsk
Target markets: domestic market of Russia, European countries and the Asia-Pacific region
Production capacity forecast: 2 000 tons of hydrogen per year

Participants:

- Komi Center for Entrepreneurship Development
- Others



Sosnogorsk (city), Komi Republic

Project scheme:

Methane pyrolysis
Turquoise hydrogen production

Logistics
Hydrogen transportation to customers within Russia, European countries and the Asia-Pacific region

Consumption
Long-term contracts with Russian, European and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

NOVATEK: Blue Hydrogen / Ammonia

Project description:

Natural gas processing complex with production of hydrogen, ammonia and other low-carbon products using CO2 capture and long-term underground storage technologies

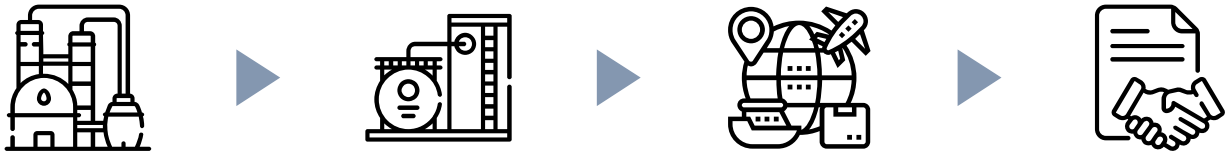
Implementation period: 2027
Location: Yamalo-Nenets Autonomous Area, Yamal Peninsula (Sabetta)
Target markets: domestic market of Russia, European countries and the Asia-Pacific region
Production capacity forecast: 2.2 million tons of ammonia per year

Participants:

- NOVATEK
- Others

The Obsky Gas Chemical Complex, Yamalo-Nenets Autonomous Area

Project scheme:



Refining and gas chemistry

Carbon capture and injection into geological formations

Logistics
Hydrogen transportation to customers within Russia, European countries and the Asia-Pacific region

Consumption
Long-term contracts with Russian, European and Asia-Pacific customers

Corporation Energy: Blue Ammonia / Hydrogen

Project description:

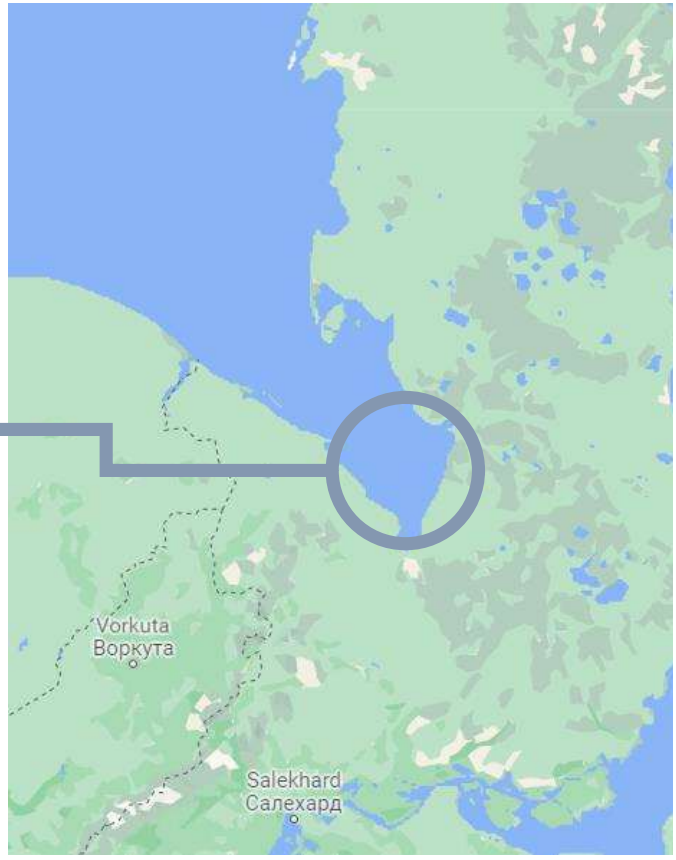
Blue ammonia production by steam conversion of methane with CO2 capture technologies and long-term underground storage

Implementation period: 2025
Location: Yamalo-Nenets Autonomous Area, Baidaratskaya Bay
Target markets: domestic market of Russia, European countries and the Asia-Pacific region
Production capacity forecast: 2.2 million tonnes of ammonia per year

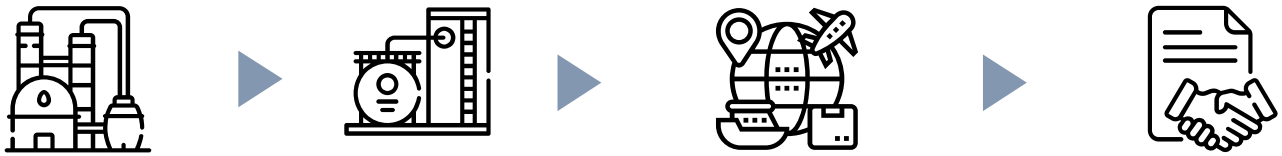
Participants:

- Corporation Energy
- TOYO Engineering Corporation
- ITOCHU Plantech Inc
- Others

Baidaratskaya Bay, Yamalo-Nenets Autonomous Area



Project scheme:



Steam methane conversion
Blue ammonia production

CO2 capture and long-term underground storage

Logistics
Hydrogen transportation to customers within Russia, European countries and the Asia-Pacific region

Consumption
Long-term contracts with Russian, European and Asia-Pacific customers

Corporation Energy: Green Hydrogen

Project description:

Green hydrogen production via wind power plant electrolysis

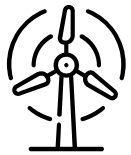
Implementation period: 2025
Location: Yamalo-Nenets Autonomous Area, Baidaratskaya Bay
Target markets: domestic market of Russia, European countries and the Asia-Pacific region

Participants:

- Corporation Energy
- Others

Baidaratskaya Bay, Yamalo-Nenets Autonomous Area

Project scheme:



Wind power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia, European countries and the Asia-Pacific region

Consumption
Long-term contracts with Russian, European and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Corporation Energy: Blue Ammonia / Hydrogen

Project description:

Blue ammonia production by steam conversion of methane with CO2 capture technologies and long-term underground storage

Implementation period: 2026
Location: Yamalo-Nenets Autonomous Area, Seyakha (settlement)
Target markets: domestic market of Russia, European countries and the Asia-Pacific region
Production capacity forecast: 2.2 million tonnes of ammonia per year

Participants:

- Corporation Energy
- TOYO Engineering Corporation
- ITOCHU Plantech Inc
- Others

Seyakha, Yamalo-Nenets Autonomous Area

Project scheme:

Steam methane conversion
Blue ammonia production

CO2 capture and long-term underground storage

Logistics
Hydrogen transportation to customers within Russia, European countries and the Asia-Pacific region

Consumption
Long-term contracts with Russian, European and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

North Star: Low Carbon Hydrogen

Project description:

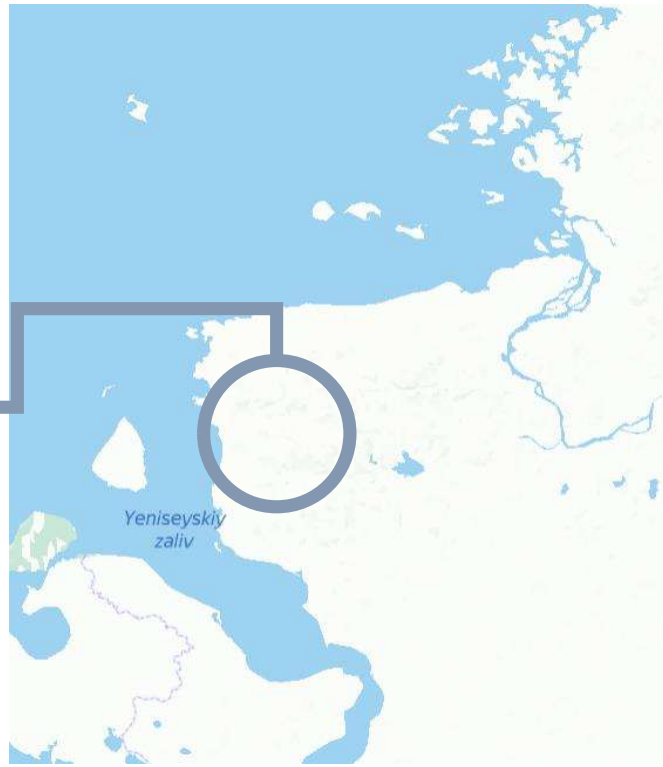
Low carbon hydrogen production via pulverized coal power plant electrolysis

Pilot production launch: 2024
Location: Krasnoyarsk Territory, Taimyr Peninsula, Syradasaysk Reservoir
Target markets: domestic market of Russia, European countries and the Asia-Pacific region

Participants:

- North Star
- Others

Syradasaysk Reservoir, Krasnoyarsk Territory



Project scheme:

Conversion of an industrial product obtained as a result of coal enrichment

Pulverized CPP
Electricity generation

Electrolysis
Hydrogen production

Logistics
Selection of storage and transportation technology

Consumption
Long-term contracts with Russian, European and Asia-Pacific customers

SUEK: Blue Ammonia

Project description:

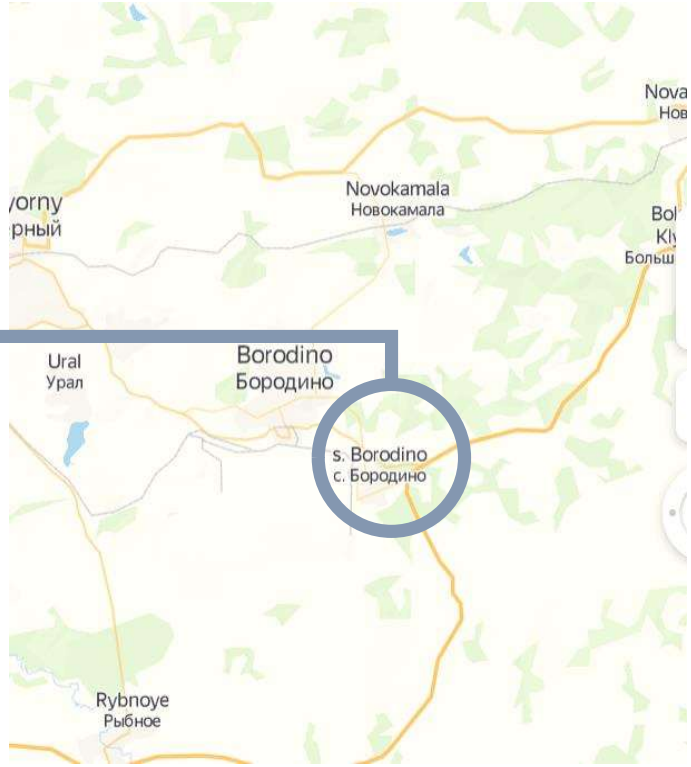
Blue ammonia production by lignite gasification using CO2 capture and injection into oil reservoirs

Implementation period: 2027
Location: Krasnoyarsk Territory
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 800 000 tons of ammonia per year

Participants:

- SUEK
- Others

Borodinsky Razrez, Krasnoyarsk Territory



Project scheme:

Coal gasification
Blue ammonia production

Carbon capture
CO2 injection into oil reservoirs

Logistics
Transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

En+ Group: Green Hydrogen / Ammonia

Project description:

Green hydrogen / ammonia production via the Motyginsk hydro power plant electrolysis

Implementation period: 2030
Location: Krasnoyarsk Territory, Motygino Settlement
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 115 600 tons of hydrogen per year

Participants:

- En+ Group
- Others

Motygino Settlement, Krasnoyarsk Territory

Project scheme:

Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Selection of storage and transportation technology

Consumption
Long-term contracts with Russian and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

En+ Group: Green Hydrogen / Ammonia

Project description:

Green hydrogen / ammonia production via the Bratsk hydro power plant electrolysis

Implementation period: 2024
Location: Irkutsk region, the city of Bratsk
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 3 000 tons of hydrogen per year

Participants:

- En+ Group
- Others

Bratsk (city), Irkutsk Region

Project scheme:

Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Selection of storage and transportation technology

Consumption
Long-term contracts with Russian and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

En+ Group: Green Hydrogen / Ammonia

Project description:

Green hydrogen / ammonia production via the Ust-Ilimsk hydro power plant electrolysis

Implementation period: 2024
Location: Irkutsk region, the city of Ust-Ilimsk
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 5 400 tons of hydrogen per year

Participants:

- En+ Group
- Others

Ust-Ilimsk (city), Irkutsk Region

Project scheme:

Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Selection of storage and transportation technology

Consumption
Long-term contracts with Russian and Asia-Pacific customers

En+ Group: Green Hydrogen / Ammonia

Project description:

Green hydrogen / ammonia production via the Irkutsk hydro power plant electrolysis

Implementation period: 2024
Location: Irkutsk region, the city of Irkutsk
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 4 200 tons of hydrogen per year

Participants:

- En+ Group
- Others

Irkutsk (city), Irkutsk region

Project scheme:

Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Selection of storage and transportation technology

Consumption
Long-term contracts with Russian and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

H2 Clean Energy: Green Hydrogen

Project description:

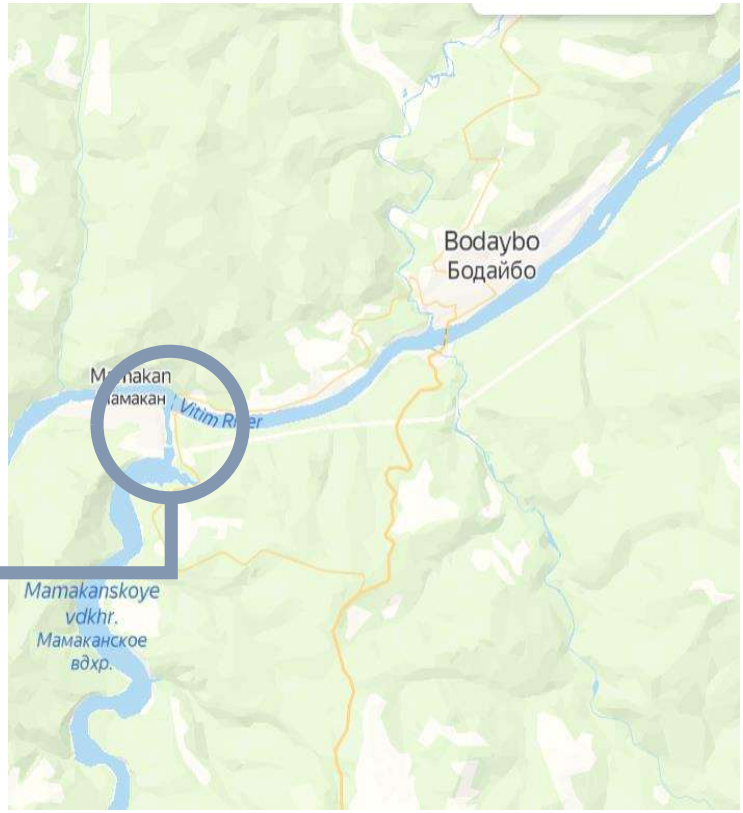
Green hydrogen production via the Mamakansk hydro power plant electrolysis

Implementation period: 2025
Location: Irkutsk Region, Bodaybo Area
Target markets: domestic market of Russia
Production capacity forecast: 6 000 tons of hydrogen per year

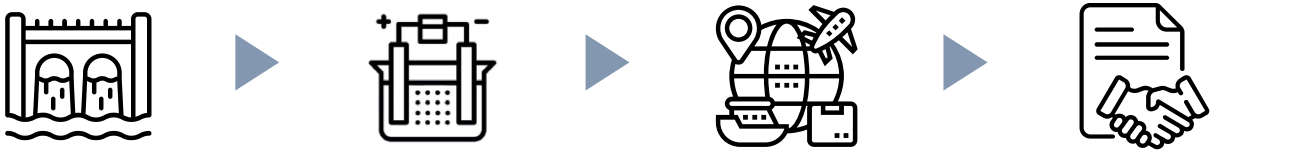
Stockholders:

- H2 Clean Energy
- Polyus
- Others

Bodaybo Area, Irkutsk Region



Project scheme:



Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia

Consumption
Long-term contracts with Russian customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Unigreen Energy: Green Hydrogen

Project description:

Green hydrogen production via solar power plant electrolysis

Pilot production launch: 2023
Location: Trans-Baikal Territory
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 3 200 tons of hydrogen per year

Participants:

- Unigreen Energy
- Special Design Engineering Bureau in Electrochemistry with Experimental Factory
- Others

Trans-Baikal Territory

Project scheme:

Solar power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

Agency of the Amur Region for Attracting Investment:
Green Hydrogen

Project description:

Green hydrogen production via hydro power plant electrolysis

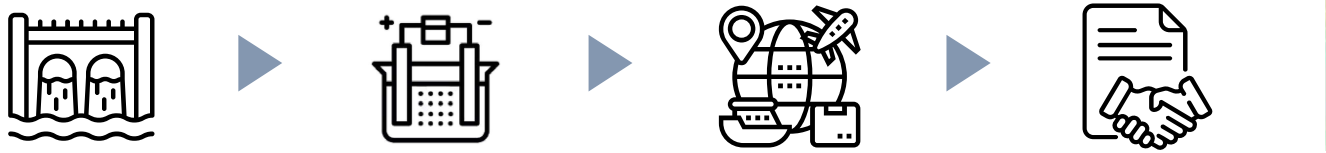
Implementation period: 2027
Location: Amur Region
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 110 000 tons of hydrogen per year

Participants:

- Agency of the Amur Region for Attracting Investment
- Others

Amur Region

Project scheme:



Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

NORTH-EAST ALLIANCE: Blue Ammonia

Project description:

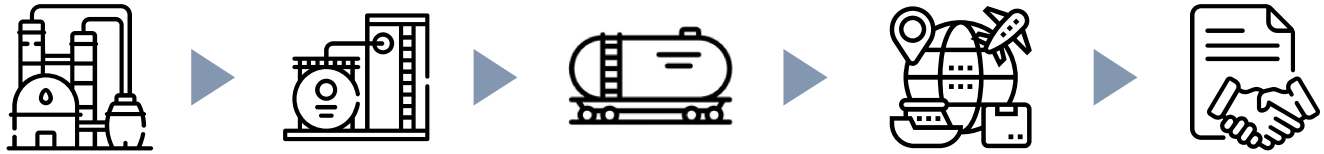
Blue ammonia production based on gas fields with CO2 capture technologies

1st stage implementation: 2026
2nd stage implementation: 2030
Location: Republic of Sakha (Yakutia)
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast by 2026: 3 million tons of ammonia per year
Production capacity forecast by 2030: 6 million tons of ammonia per year

Participants:

- NORTH-EAST ALLIANCE
- Gas production companies in Western Yakutia
- Others

Project scheme:



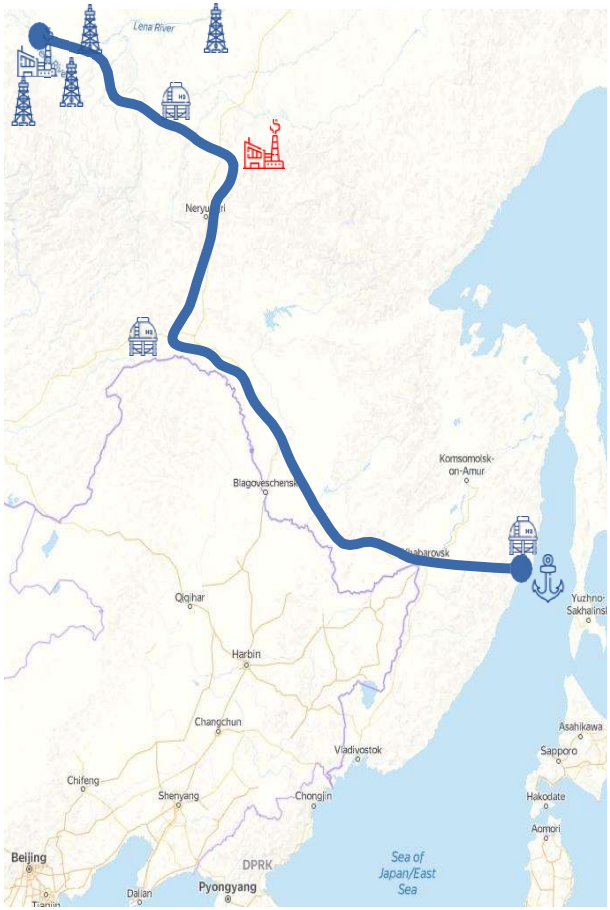
Steam methane conversion
Blue ammonia production

Carbon capture
CO2 injection into oil reservoirs

Logistics
Delivery to the terminal in tanks

Logistics
Transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers



MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

JSFC Sistema: Green Hydrogen

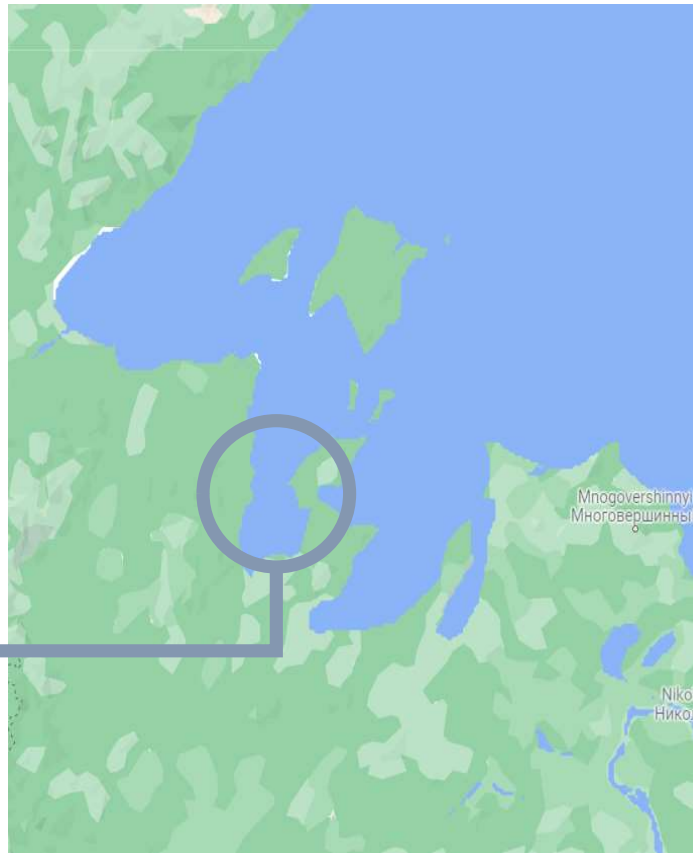
Project description:

Green hydrogen production via the Tugur tidal power plant electrolysis

Implementation period: 2035
Location: Khabarovsk Territory, Tugur Bay
Target markets: domestic market of Russia and the Asia-Pacific region
Production capacity forecast: 350 000 tons of hydrogen per year

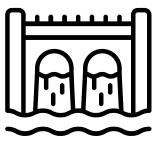
Participants:

- Joint Stock Financial Corporation «Sistema»
- Tyazhmash
- Khabarovsk Krai Investment and Innovation Promotion Agency
- Others



Tugur Bay, Khabarovsk Territory

Project scheme:



Tidal power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

H2 Clean Energy: Green Hydrogen

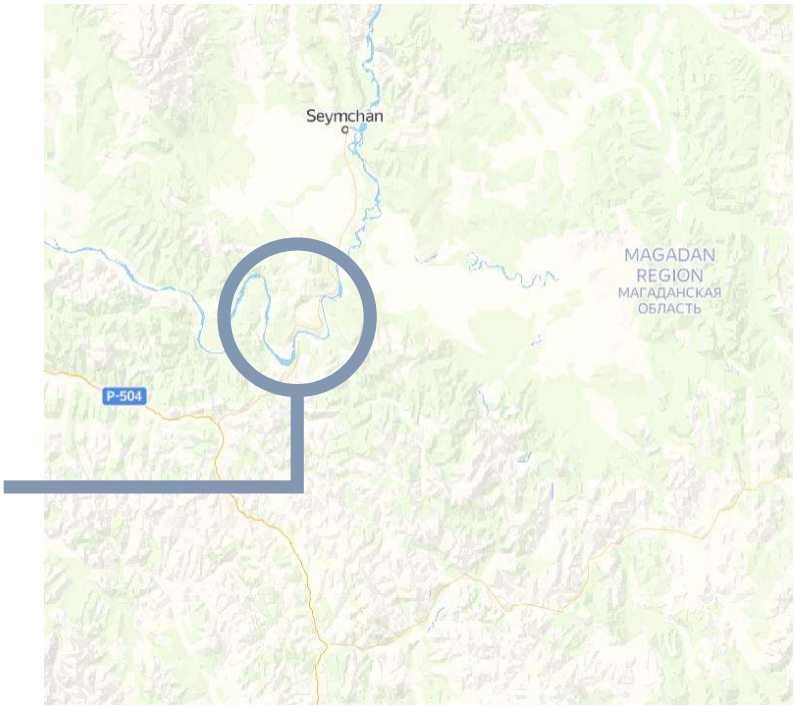
Project description:

Green hydrogen production via the Ust-Srednekansk hydro power plant electrolysis

Implementation period: 2025
Location: Magadan Region
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 16 000 tons of hydrogen per year

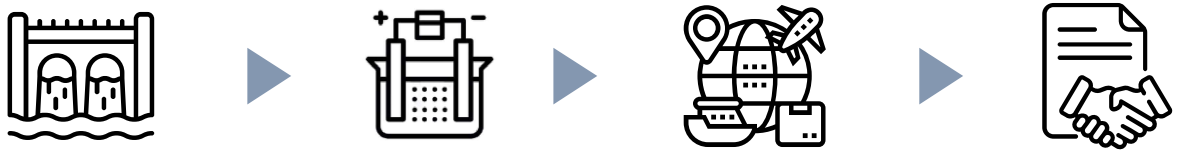
Participants:

- H2 Clean Energy
- RusHydro
- Others



Magadan Region

Project scheme:



Hydro power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

Rosatom: Blue Hydrogen / Ammonia

Project description:

Blue hydrogen / ammonia production by methane steam conversion with CO2 capture

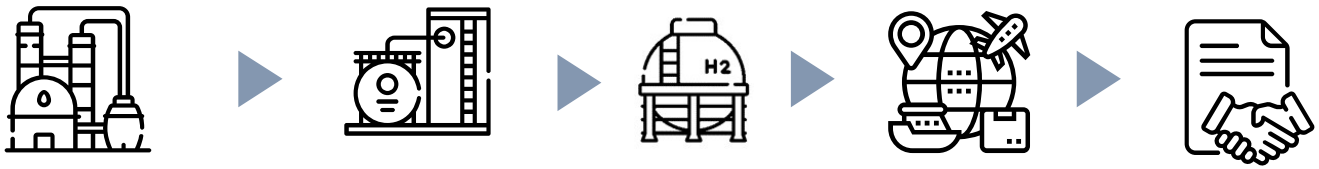
Pilot production launch: 2024
Location: Sakhalin Region, Sakhalin Island
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast by 2024: 30 000 tons of hydrogen per year
Production capacity forecast by 2030: 100 000 tons of hydrogen per year

Participants:

- Rosatom
- Air Liquide
- Others

Sakhalin Island, Sakhalin Region

Project scheme:



Steam methane conversion
Blue hydrogen production

CO2 capture and injection into geological formations

Liquefaction and storage

Logistics
Hydrogen transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

Rosatom: Green Hydrogen

Project description:

Green hydrogen production via wind power plant electrolysis

Pilot production launch: 2025
Location: Sakhalin Region, Sakhalin Island
Target markets: domestic market of Russia, the Asia-Pacific region

Participants:

- Rosatom
- Others

Sakhalin Island, Sakhalin Region

Project scheme:

Wind power plant
Electricity generation

Electrolysis
Green hydrogen production

Liquefaction and storage

Logistics
Hydrogen transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

H2 Clean Energy: Green Hydrogen

Project description:

Green hydrogen production via wind power plant electrolysis

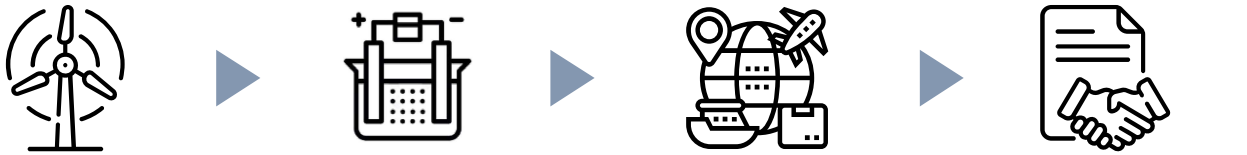
Implementation period: 2025
Location: Sakhalin Region, Sakhalin Island
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 50 000 tons of hydrogen per year

Participants:

- H2 Clean Energy
- Others

Sakhalin Island, Sakhalin Region

Project scheme:



Wind power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

H4Energy: Green Hydrogen / Ammonia

Project description:

Green hydrogen production via wind power plant electrolysis

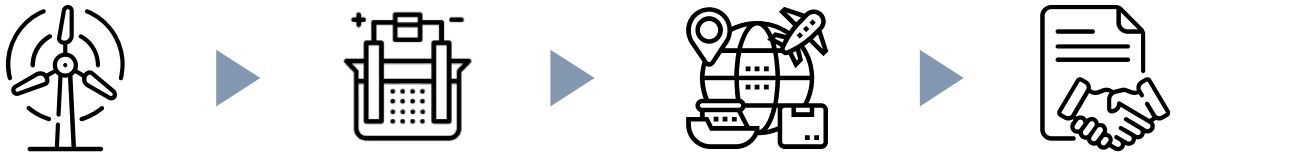
Pilot production launch: 2024
Location: Sakhalin Region, Sakhalin Island
Target markets: domestic market of Russia and the Asia-Pacific region
Production capacity forecast by 2024: 16 000 tons of hydrogen per year
Production capacity forecast by 2030: 150 000 tons of hydrogen per year

Participants:

- H4Energy
- H2Trasition Capital
- Eurasia Mining
- Sakhalin Oil Company
- Others

Sakhalin Island, Sakhalin Region

Project scheme:



Wind power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

H2: Green Hydrogen

Project description:

Green hydrogen production via wind power plant electrolysis

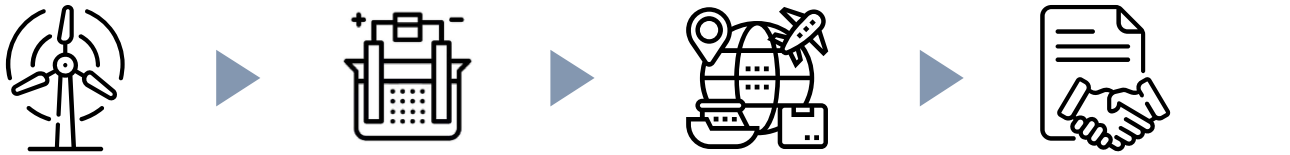
Implementation period: 2023
Location: Sakhalin Region, Kunashir Island
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 10 000 tons of hydrogen per year

Participants:

- H2
- Others

Kunashir Island, Sakhalin Region

Project scheme:



Wind power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA

H2 Clean Energy: Green Hydrogen

Project description:

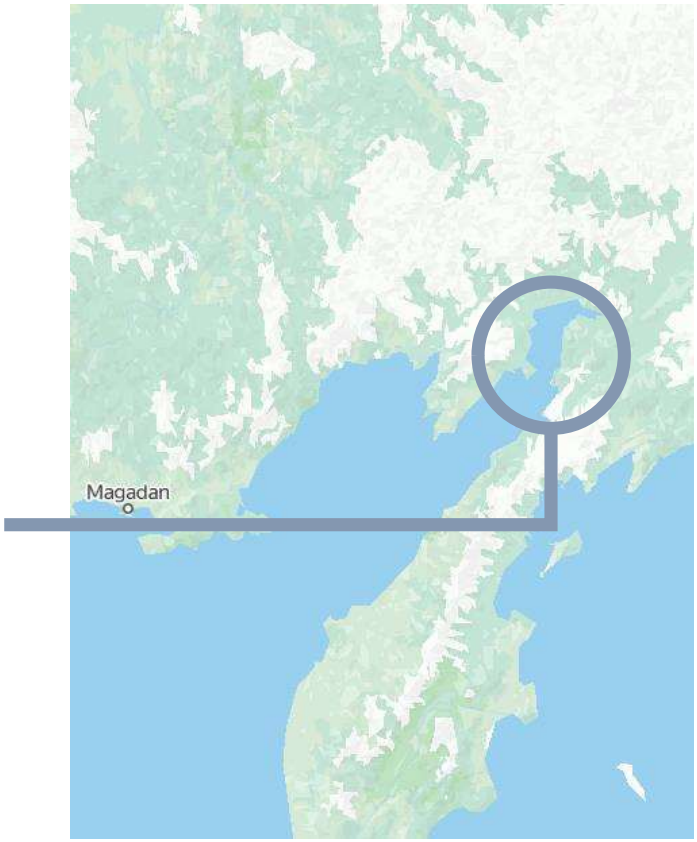
Green hydrogen production via the Penzhinskaya tidal power plant electrolysis

Implementation period: 2031
Location: Kamchatka Territory, Penzhinskaya Bay
Target markets: domestic market of Russia, the Asia-Pacific region
Production capacity forecast: 5 million tons of hydrogen per year

Participants:

- H2 Clean Energy
- Development Corporation of Kamchatka
- Others

Penzhinskaya Bay, Kamchatka Territory



Project scheme:

Tidal power plant
Electricity generation

Electrolysis
Green hydrogen production

Logistics
Hydrogen transportation to customers within Russia and the Asia-Pacific region

Consumption
Long-term contracts with Russian and Asia-Pacific customers

Contact info

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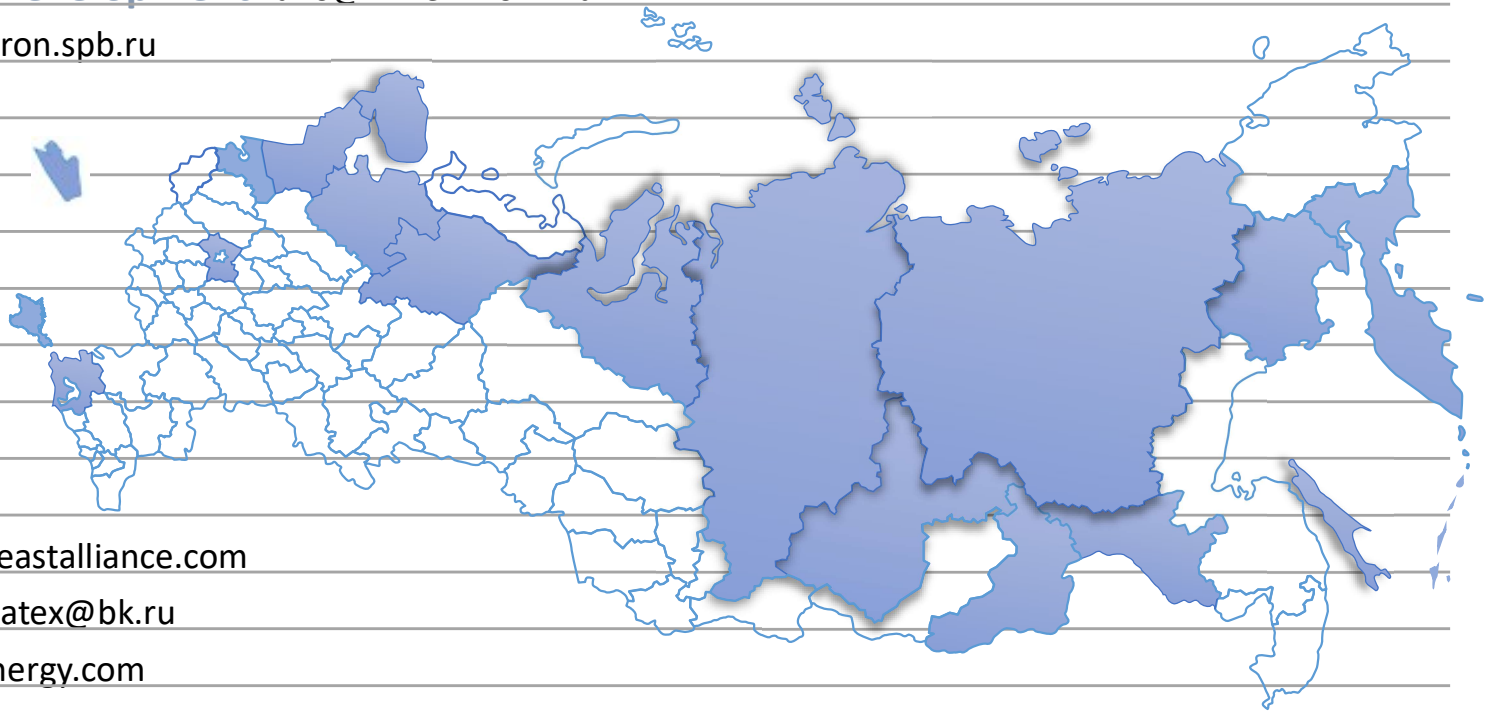

MINISTRY OF INDUSTRY AND TRADE OF RUSSIA