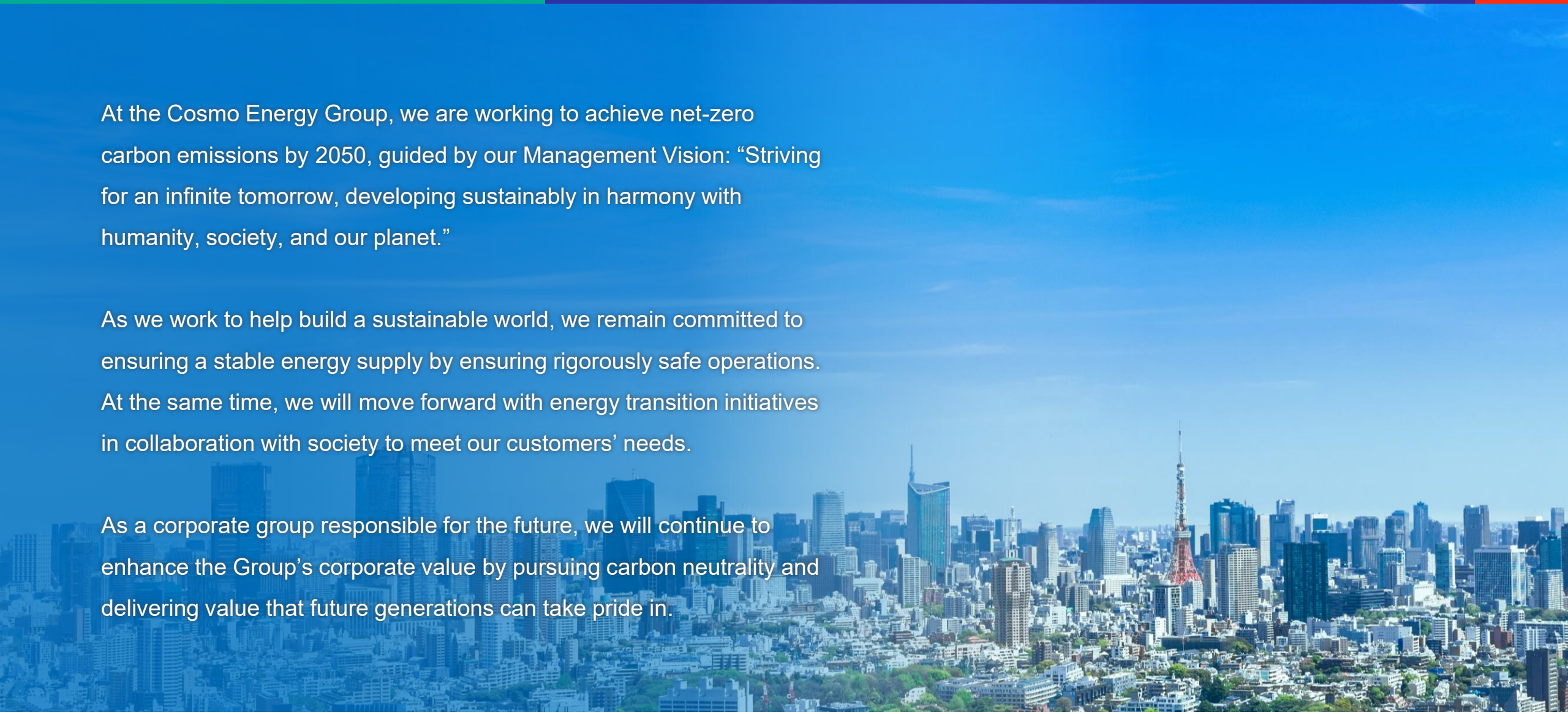
The Cosmo Energy Group
Roadmap for Achieving Net Zero Carbon by 2050

Revised June 18, 2026

Cosmo Energy Holdings Co., Ltd.

Scope of data coverage :
Cosmo Energy Holdings. and its subsidiaries (Cosmo Oil, Cosmo Oil Marketing, Cosmo Energy Exploration & Production, Maruzen Petrochemical, etc., as well as subsidiaries).

Our Approach to Carbon Neutrality



At the Cosmo Energy Group, we are working to achieve net-zero carbon emissions by 2050, guided by our Management Vision: “Striving for an infinite tomorrow, developing sustainably in harmony with humanity, society, and our planet.”

As we work to help build a sustainable world, we remain committed to ensuring a stable energy supply by ensuring rigorously safe operations. At the same time, we will move forward with energy transition initiatives in collaboration with society to meet our customers’ needs.

As a corporate group responsible for the future, we will continue to enhance the Group’s corporate value by pursuing carbon neutrality and delivering value that future generations can take pride in.

Three Social Scenarios

With external factors affecting society and the economy expected to fluctuate even more significantly, we have envisioned multiple possible futures and developed three different social scenarios in order to respond flexibly to unpredictable situations. By using multiple scenarios, we will advance climate change response strategies that address uncertainties such as rapid environmental changes and unforeseen risks.

Three Envisioned Scenarios

Scenario (Blue)

- Political: Decarbonization policies slowing
- Economic: Chronic inflation and yen depreciation
- Social: Public backlash against rising energy costs
- Technical: Persistently high costs for renewables and next-generation energy

In Japan

CO_2 emissions as of 2040

50% reduction (vs. FY2013)

Corresponding external scenario:

- IEA Current Policies Scenario (CPS)

Scenario (Turquoise)

- Political: Decarbonization policies maintained but (partial) slowing
- Economic: Hybridization of energy markets
- Social: Polarization of awareness and behavior toward decarbonization
- Technical: Wide disparities in the pace of technological progress across sectors

In Japan

CO_2 emissions as of 2040

62% reduction (vs. FY2013)

Corresponding external scenario:

- IEA Stated Policies Scenario (STEPS)

Scenario (Green)

- Political: Robust decarbonization policies to achieve net-zero carbon emissions by 2050
- Economic: Green investment drives economic growth
- Social: Climate change threats become common knowledge
- Technical: Breakthroughs in clean energy technology and societal deployment

In Japan

CO_2 emissions as of 2040

73% reduction (vs. FY2013)

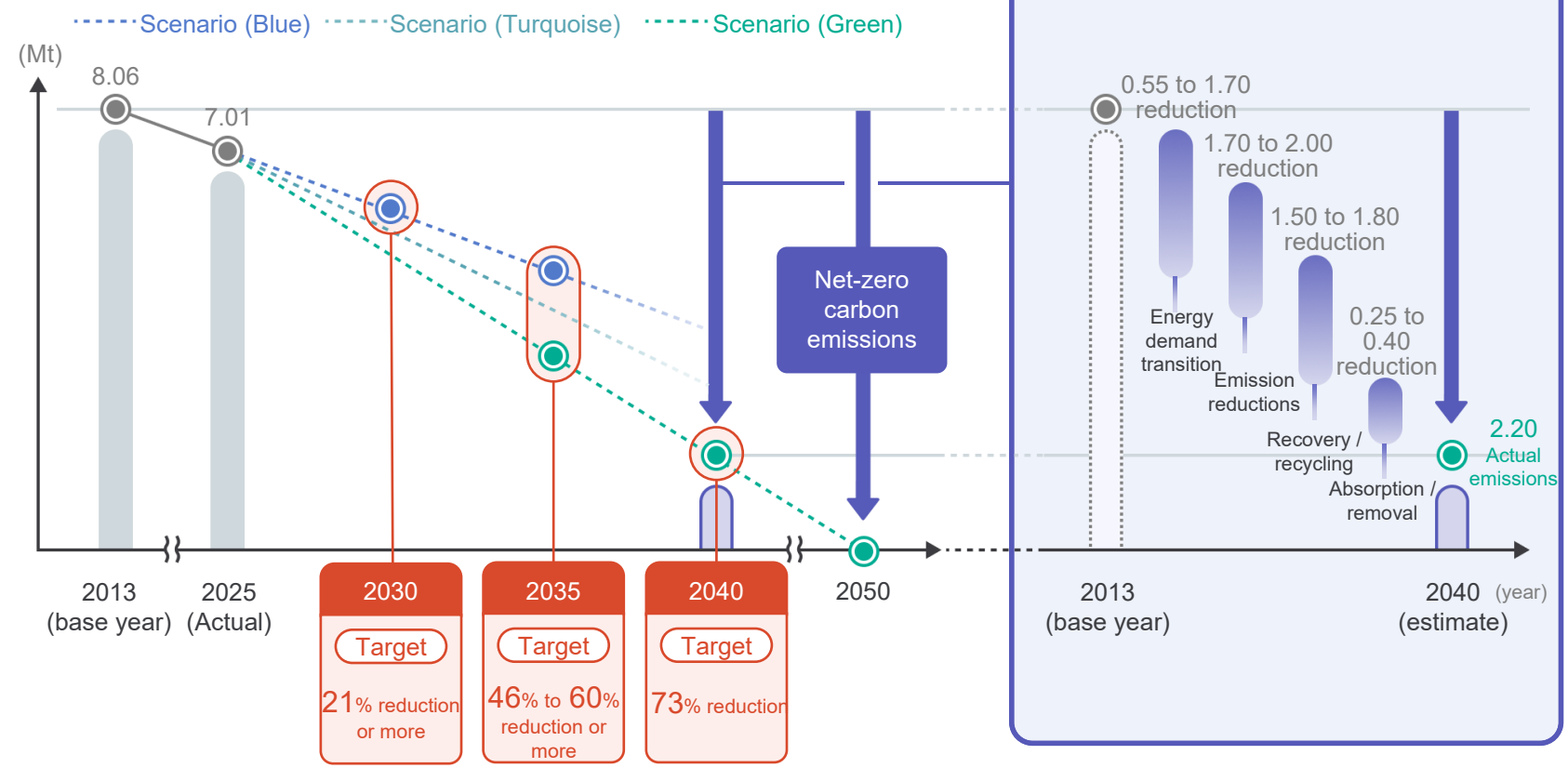
Corresponding external scenario:

- IEA Net Zero Emissions by 2050 Scenario (NZE)
- Seventh Strategic Energy Plan

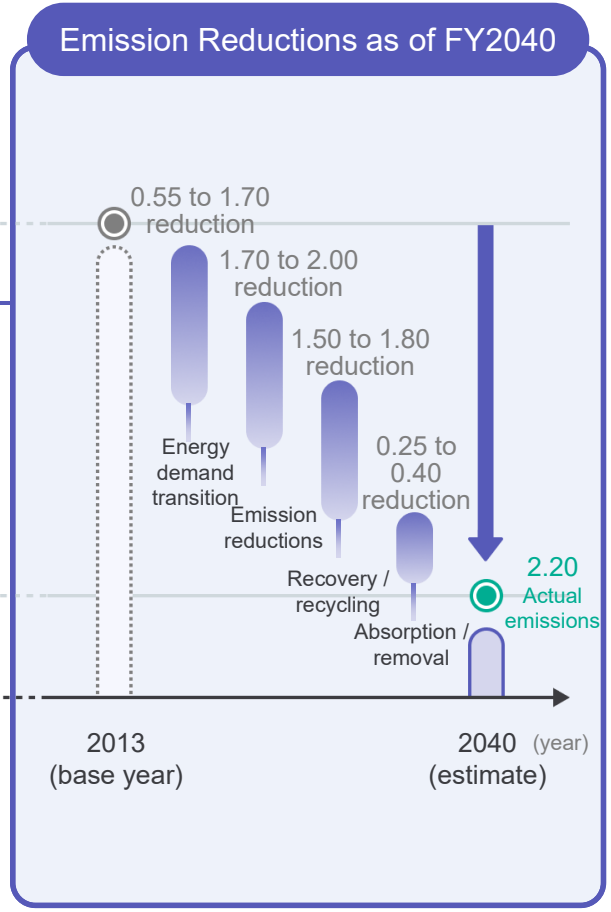
Cosmo Energy Group Greenhouse Gas Emission Reduction Targets

While fulfilling our mission to ensure a stable energy supply, the Group is promoting measures to reduce greenhouse gas (GHG) emissions (Scope 1 and 2), working toward a reduction of 21% or more by fiscal 2030. By fiscal 2050, we aim to achieve net-zero carbon emissions, including Scope 3 emissions, together with the broader society.

Cosmo Energy Group GHG Emissions (Scope 1 and 2)



Emission Reductions as of FY2040



Initiatives

Emission reductions

Scope1

- ✓ Energy conservation activities
- ✓ Fuel transition

Scope2

- ✓ Introduction of and switching to renewable energy
- ✓ Utilization of non-fossil certificates

Recovery / recycling

- ✓ CO_2 capture, utilization and storage (CCUS)

Absorption / removal

- ✓ Creation and use of carbon credits (forest absorption, etc.)

Reducing Greenhouse Gas Emissions Across Society (Carbon Intensity Reduction Targets)

As part of efforts to reduce GHG emissions across Scope 1, 2, and 3 and throughout the supply chain, the Group is promoting reductions in the carbon intensity (CI)[*1] of the energy products it supplies. We will help accelerate the energy transition across society and contribute to realizing a carbon-neutral society through measures such as expanding the use of renewable energy and improving energy efficiency.

Direction of Initiatives Toward FY2040

Carbon-Neutral Fuels

- ✓ **Sustainable aviation fuel (SAF)**: Exploring expansion of supply
- ✓ **Biofuels**: Exploring expanded introduction into gasoline and introduction into diesel, heavy fuel oil C, etc.
- ✓ **Synthetic fuels**: Developing technologies related to e-fuel

Renewable Energy

- ✓ Expanding wind and solar power development
- ✓ Building a long-term, stable supply framework

CCUS

- ✓ Establishing the CCUS value chain

Hydrogen & Ammonia

- ✓ Establishing production and supply systems and promoting utilization

CI Value Reduction Target for Supplied Energy

(vs. FY2024)

15 to 50% reduction

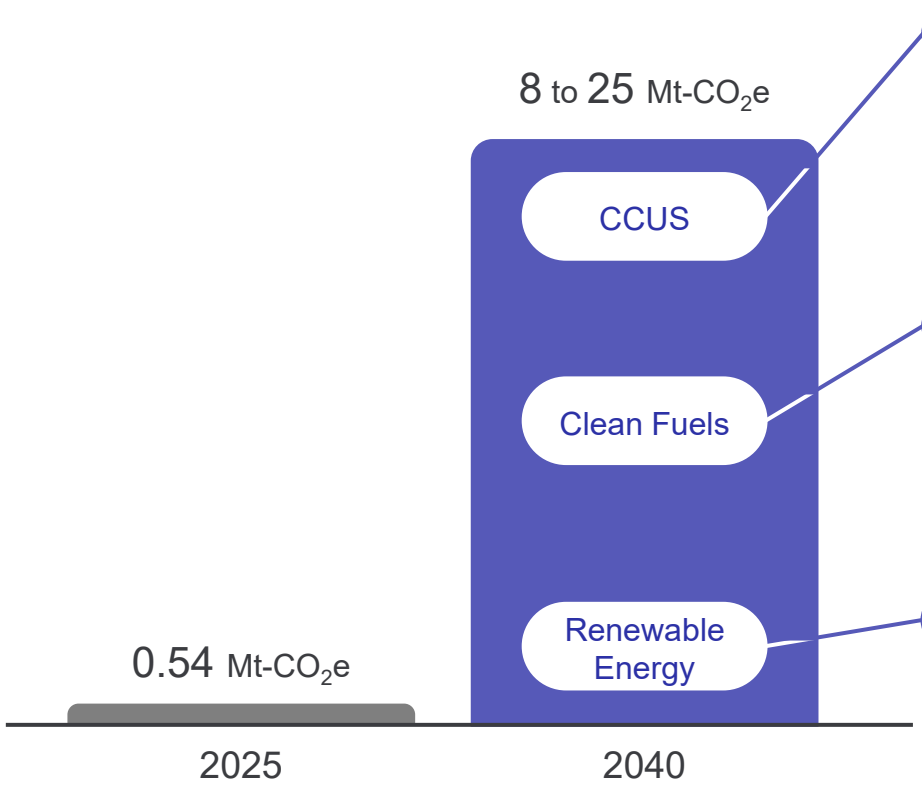
Reduction rates fluctuate based on external environment scenarios.

*1 CO_2 emissions per total energy (mega joules) supplied by the Group Target CO_2 emissions
: Scope 1, 2, and 3 (Categories 1, 3, 4, 9, and 11)

Reducing Greenhouse Gas Emissions Across Society (Avoided Emissions)

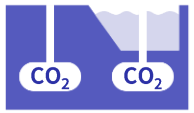
In addition to reducing its own emissions, the Cosmo Energy Group is working to contribute to reducing GHG emissions across society and among customers. By increasing GHG emissions avoided through our products and services, we aim to help build a carbon-neutral society, working together with local communities and other stakeholders.

Direction of Initiatives Toward FY2040



Note: The range of avoided emissions varies depending on external environment scenarios.

CCUS



Reducing emissions to the atmosphere by separating and capturing CO_2 (avoided emissions calculated assuming the use of carbon capture and storage [CCS])

Baseline:
Emissions without separation and capture

Evaluation metric:
Annual CO_2 separation and capture volume

Clean Fuels

Reducing emissions by switching fuels to clean alternatives such as bioethanol, SAF, synthetic fuels, and hydrogen

Baseline:
Life cycle assessment (LCA)-based CO_2 emissions from fossil fuels

Evaluation metric:
LCA-based CO_2 emissions from clean fuel supply

Renewable Energy

Reducing emissions by increasing the share of renewable energy, replacing existing power sources as supply grows

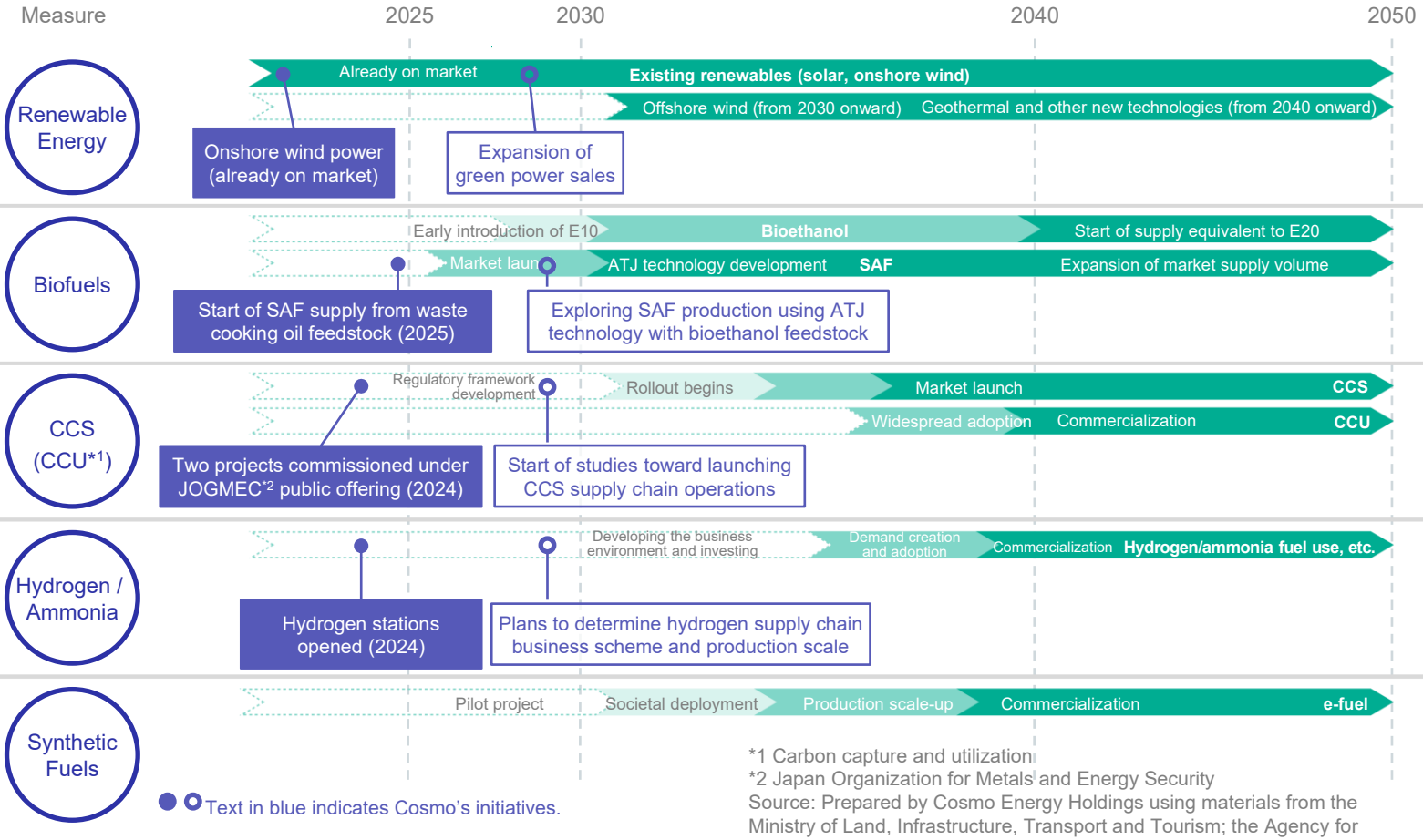
Baseline:
LCA-based CO_2 emissions from the supplied electricity mix

Evaluation metric:
LCA-based CO_2 emissions from renewable electricity

Process for Achieving a Carbon-Neutral Society

While advancing renewable energy initiatives, one of the Group's strengths, we will also pursue the supply of SAF and biofuels in step with advances in decarbonization measures, as well as demonstration projects and technological development in areas such as CCS, hydrogen/ammonia, and synthetic fuels — always with an eye on the future.

Japan's Decarbonization Roadmap



Text in blue indicates Cosmo's initiatives.

*1 Carbon capture and utilization
*2 Japan Organization for Metals and Energy Security
Source: Prepared by Cosmo Energy Holdings using materials from the Ministry of Land, Infrastructure, Transport and Tourism; the Agency for Natural Resources and Energy; and other sources.

Policy Trends

- Maximize the introduction of renewable energy as a main power source
- Target: 36–38% share of renewable energy by 2030

- Start supply of E10 gasoline by FY2030.
- Supply SAF for at least 5% of domestic jet fuel by 2030.

- Support establishment of the business environment under on the CCS Business Act (enacted in 2024), including a licensing system for storage operations, etc.; Provide support across the entire value chain for advanced projects targeting the start of CCS operations in the early 2030s.

- Promote efforts for building supply chains, lowering costs, and expanding use under the Hydrogen Society Promotion Act (enacted in 2024).

- Promote support for technology development and R&D to achieve commercialization by the early 2030s.

Initiatives to Reduce Greenhouse Gas Emissions

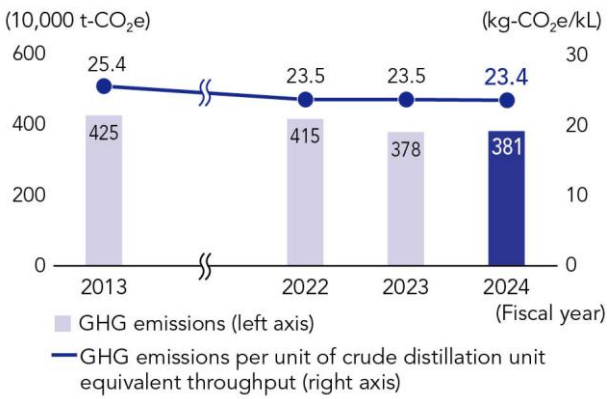
The Cosmo Energy Group aims to achieve net-zero carbon emissions by 2050 and is taking actions such as conserving energy at its refineries and running service stations on renewable energy-derived electricity. We will continue working to further reduce the environmental impact of our energy use.

Scope 1

Energy conservation at refineries

At our refineries, we are working on initiatives such as installing energy-saving equipment and optimizing equipment operations. GHG emissions intensity improved by approximately 9% compared to FY2013 (as of FY2024). We will continue to focus on energy conservation by employing high-efficiency equipment and pursuing energy-efficient operations.

GHG emissions at refineries and GHG emissions per unit of crude distillation unit equivalent throughput



Scope 2

Running service stations on renewable energy-derived electricity

The service stations and vehicle inspection facilities operated directly by Cosmo Oil Sales Corporation, totaling 603 locations, run on electricity effectively derived from renewable energy. Through an integrated Group-wide effort from renewable energy generation to usage, we have achieved zero CO_2 emissions from electricity at our service stations.

Integrated Group-wide renewable energy power supply

Efforts in CCS/CCU

We are looking into CCS/CCU as part of our efforts to reduce emissions while fulfilling our responsibility to ensure a stable energy supply. We are developing a value chain focused on reducing CO_2 emissions by separating and capturing CO_2 emitted from refineries and other facilities, while also assessing the feasibility and investment profitability of CCU technologies for the effective use of CO_2.

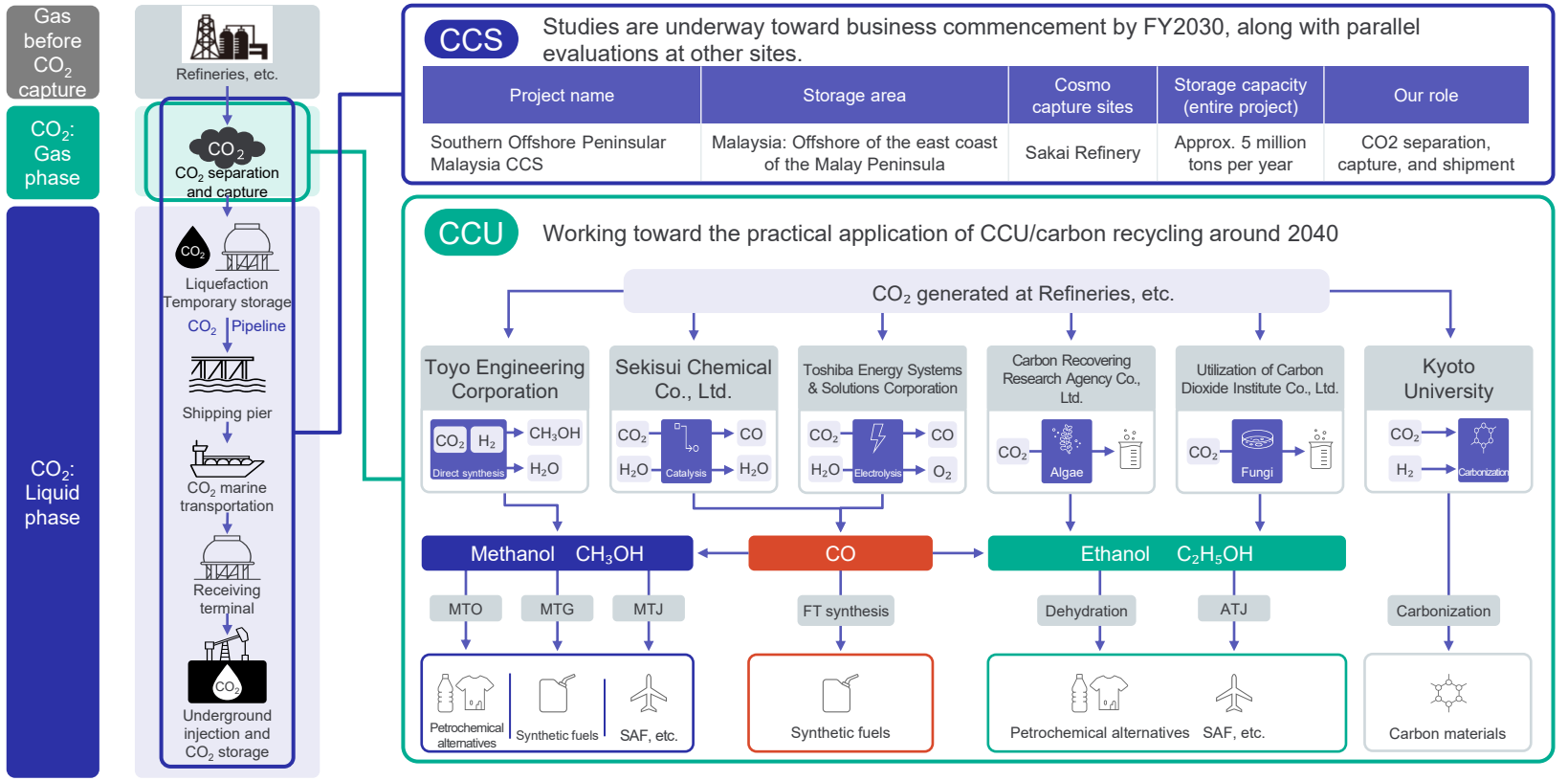
Developing a CCS Value Chain Focused on Reducing CO_2 Emissions and Assessing CCU Technologies for the Effective Use of CO_2

October 2023
- Began joint studies with Kansai Electric Power on CCS value chain design and economic evaluation regarding CO_2 separation/capture, liquefaction/storage, and shipment.
- Began joint studies with Mitsui O.S.K. Lines on marine transport and other aspects of CCS value chain development.

October 2024
- Under open calls by JOGMEC, concluded contracts for CCS design work.

March 2025
- Began joint studies with Utilization of Carbon Dioxide Institute on biological conversion technologies.
- Began joint studies with Shizuoka University on the production of cost-effective green hydrogen through seawater electrolysis.

Developing the CCUS Value Chain



Efforts in the SAF and Hydrogen Businesses

In pursuit of resource circulation and a sustainable society, our SAF business has led the industry in working toward domestic mass production of SAF in Japan, establishing a supply chain from feedstock procurement to SAF production and sales. In the hydrogen business, we have formed a business partnership with Iwatani Corporation and are collaborating to build a hydrogen supply chain.

SAF Business

Achieved the mass production of domestic SAF in Japan; advancing technology development and the adoption of clean fuels

- November 2022: SAFFAIRE SKY ENERGY LLC established toward the large-scale production of domestic SAF from used cooking oil
- January 2025: SAF purchase agreements signed with multiple airlines
- February: Project for SAF production using Alcohol-to-Jet technology selected in Ministry of Economy, Trade and Industry open call project
- April: Supply of Japan's first mass-produced domestic SAF commenced at the Sakai Refinery
- Full-scale implementation of an initiative to collect used household cooking oil began at service stations

SAF Supply Chain Development

Collection Partnered with a wide range of industries on plant operation

REJO INTERNATIONAL / JGC: Collection of waste cooking oil and development of supply sources

Domestic used cooking oil as the primary feedstock

Production SAF production plant completed in December 2024

JGC: Oversight of entire business, unit design and construction

COSMO: Provision of sites and utilities, operation and product blending

Production plant newly built on premises of Cosmo Oil's Sakai Refinery

Sales Started supplying mass produced domestic SAF from April 2025

COSMO: Delivery to airports and sales to airlines

Hydrogen Business

Advancing business partnership with Iwatani Corporation; promoting hydrogen supply chain development

- March 2022: Basic agreement concerning possible collaboration in the hydrogen business concluded with Iwatani Corporation
- 2024: Hydrogen stations opened
  - Heiwajima
  - Ariake
  - Shinsuna (scheduled)
- Began studying commercial viability of a hydrogen business utilizing refinery assets at our Chiba Refinery
- FY2025: Plan to decide on the business scheme and scale of production for the hydrogen supply chain

Hydrogen Stations

2024

Iwatani Cosmo Hydrogen Station Heiwajima

2025

Iwatani Cosmo Hydrogen Station Ariake Bus Depot

2027 (Scheduled)

Artist's impression of Iwatani Cosmo Hydrogen Station Shinsuna (tentative name)

Efforts in Renewable Energy

Expecting long-term growth in renewable energy demand due to the global shift toward decarbonization, we are working to expand our renewable energy supply. Going beyond just power generation, we are integrating the entire supply chain—including supply-demand adjustment, power storage, and electricity sales—to encourage widespread adoption of renewable energy.

Wind Power Generation

Expanding renewable energy supply

Centered on Cosmo Eco Power, which has around 30 years of operational experience, we have expanded the business by leveraging an integrated framework from development to operations and maintenance (O&M). In onshore wind power generation, we are making steady progress toward achieving 440 MW in installed capacity.

	Status	Onshore wind power installed capacity (cumulative)
2024 or earlier	In operation	Approx. 310 MW
2025	In operation	Approx. 353 MW
By 2030	Target	Approx. 440 MW

Iwata Wind Farm

Supply-Demand Adjustment and Storage

Power supply-demand adjustment and battery storage of generated electricity

While the supply of renewable energy is growing, supply and demand mismatches are increasingly preventing the full utilization of its output potential. To address this, we are working to overcome these challenges through power supply-demand adjustment capabilities and the ability to store generated electricity in batteries.

- January 2024: Power storage business validation began at the Research & Development Center and two company-operated service stations
- July 2025: Power storage business validation began at the Yokkaichi Kasumi Power Plant.

Power storage business validation

Electricity Sales

Securing long-term, stable customers through corporate PPAs

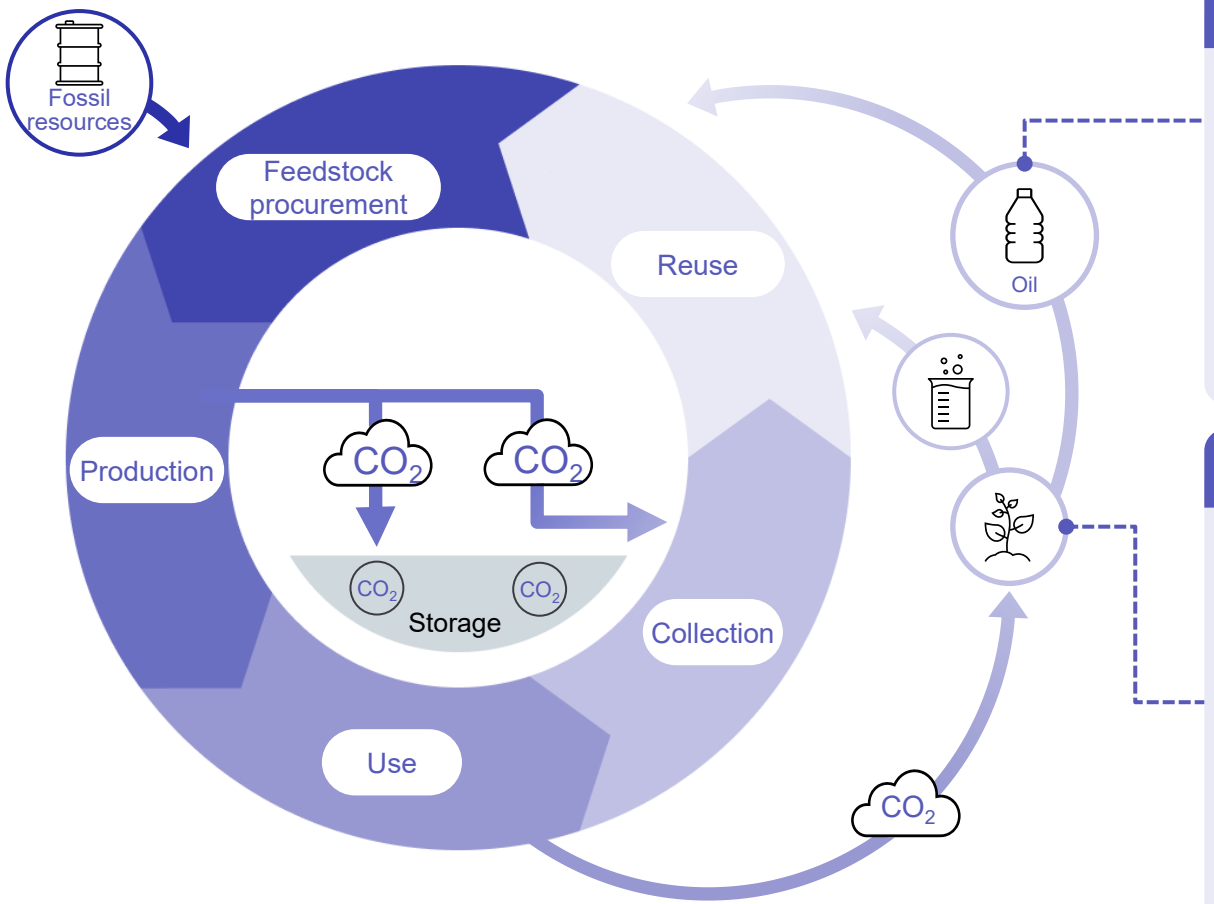
We are working to maximize the value of our electricity by expanding sales of Cosmo Denki (Electricity) Business Green to meet the growing demand for renewable energy, and by securing long-term, stable customers through corporate power purchase agreements (PPAs*1).

*1 A long-term purchase agreement between a power producer and a consumer for renewable energy-derived electricity and its environmental value, or for environmental value alone

Start date	Power plant	Corporate PPA contract partners
May 2024	Himekami	Panasonic Operational Excellence Co., Ltd.
	Himekami	Tokyo Metro Co., Ltd.
November	Goto-Hassakubana	U-POWER Co., Ltd.
April 2025	Chuki	West Japan Railway Company
May	Chuki	NTN Corporation
July	New-Mutsu Ogawara	Amazon

Circular Economy Initiatives

Promoting the circular use of resources and energy is essential to achieving net-zero carbon emissions by 2050. The Cosmo Energy Group collaborates with stakeholders and a wide range of partners to help build a circular society by using valuable resources and energy more efficiently.



Waste Cooking Oil Collection

A resource circulation model made possible by citizen participation

Dedicated collection boxes have been set up at service stations in Tokyo and Osaka to collect used household cooking oil as SAF feedstock. Through citizen participation, we have created a resource circulation model in which used household cooking oil is turned into aviation fuel.

Used cooking oil collection box

Installation example (Self Pure Shinjuku Chuo service station)

Natural Carbon Absorption

Creating carbon credits through forests

We have concluded partnership agreements with the Chiba Prefectural Forestry Cooperative (in Chiba Prefecture, where Cosmo Oil Chiba Refinery is located) and the Wakkanai City Forestry Cooperative (in Wakkanai, home to Cosmo Eco Power's Kamiyuuchi Wind Farm). Through these partnerships, we are advancing the creation and use of carbon credits via forest-based CO_2 absorption, along with forest and environmental conservation efforts.

Other Initiatives

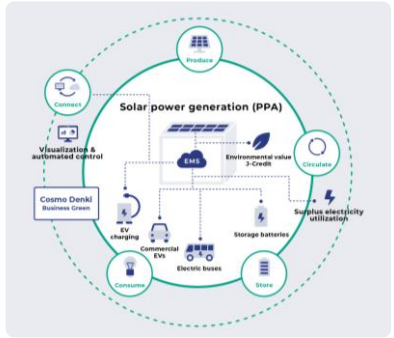
Aiming to achieve net-zero carbon emissions and help build a circular society, we are promoting collaboration with local communities and pursuing DX/AI. In addition to improving energy efficiency based on local characteristics and needs, and achieving both regional revitalization and carbon offsetting, we are further enhancing the efficiency of energy use across the entire supply chain.

Community Partnership Initiatives

Comprehensive support for decarbonization efforts

Leveraging the assets and digital capabilities of Cosmo Energy Group's energy and mobility businesses, we combine solar power, batteries, and energy management systems (EMS) to improve energy efficiency and promote the effective use of renewable electricity, providing comprehensive support for decarbonization efforts.

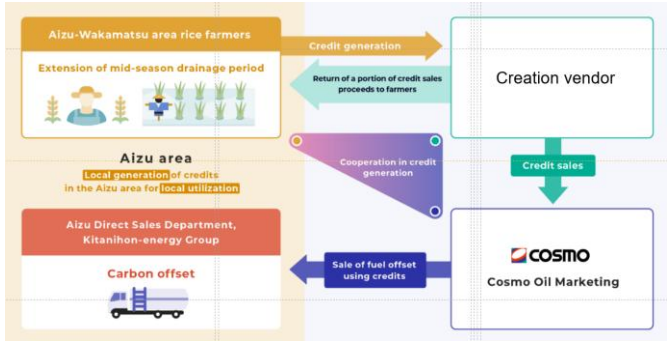
Image of Zero Carbon Solution



Fuel oil offsetting through a local production for local consumption scheme

We offset fuel oil with *Nakaboshi* Credits, which we helped create in the Aizu area of Fukushima Prefecture. Since part of the credit transaction proceeds is returned to local farmers, we are simultaneously promoting carbon offsetting and regional revitalization, while working toward a circular, decarbonized society.

Image of Local Production for Local Consumption Scheme



DX/AI Utilization Initiatives

Logistics optimization through high-precision demand forecasting

In October 2025, we fully deployed a demand forecasting system that uses machine learning to incorporate various factors, including temperature, precipitation, seasonality, and trend elements, to accurately predict service station demand. By reducing excess deliveries and the risk of stockouts, and by enhancing load efficiency, this system helps reduce fuel consumption in logistics and cut CO_2 emissions across the entire supply chain.

Reduction in Planned Delivery Frequency through Use of the Demand Forecasting System
(October 2025 Results)

Deliveries reduced per month	Reduction rate
803	4%