



Engagement with the Environment

As our management vision states, "Harmony and Symbiosis with the Global Environment," we have been implementing diverse measures to become the world's most environmentally friendly oil/energy corporate group. We are proud to present our environmental measures and initiatives.

Reduction of Greenhouse Gas Emissions

As a part of the new medium-term CSR management plan, we developed the Long-Term Environmental Vision 2030, consistent with the orientation of the global community and the Japanese government toward realizing a sustainable society. In an effort to contribute to reducing CO₂ emissions, we are targeting a 2 million ton (26%) reduction in emissions by FY2030, compared to the level in FY2013. In addition we are targeting a 16% reduction in FY2022, the final year of the plan, again compared to the level in FY2013. The amount of

CO₂ emissions in FY2019 was 6.88 million tons, a decrease of 0.59 million tons from FY2013. Cosmo Energy Holdings acquired a stake in Japan CCS Co., Ltd. in 2008 and has participated in practical application of Carbon dioxide Capture and Storage (CCS) technology aimed at CO₂ reduction. In a large-scale CCS demonstration, cumulative CO₂ injection reached the target of 300,000 tons in November 2019, contributing to CO₂ reduction.

Cosmo Energy Group's CO₂ Emissions (ten thousand ton/CO₂)

	FY2013 Actual	FY2018 Actual	FY2019 Actual	FY2022 Target	Vs. FY2013
Transportation division (crude oil, raw materials and products)	90	81	75	86	-4
Manufacturing division (petroleum and petrochemical products)	676	620	650	598	-78
Other (service stations and research centers)	4	2	2	4	0
Biofuel (with ETBE) ¹	-7	-14	-13	-15	-8
Expansion of renewable energy business (wind power generation) ²	-16	-24	-27	-46	-30
Total	746	665	688	626	-120

¹ The biofuel amount is the amount of CO₂ emission reduction contribution by ethyl tert-butyl ether (ETBE)-mixed gasoline, considered as negative CO₂ emissions.

² Expansion of the renewable energy business has been calculated by using the total power generation volume multiplied by the alternative value for each year. The figure for FY2022 was calculated by using the FY2016 alternative value of 0.587kg-CO₂/kWh.

³ Refer to the Cosmo Energy Holdings' Sustainability website for the differences in the calculating method of CO₂ emission amount by Cosmo Energy Group's CO₂ Emissions and the Environmental Impact of Business Activities, disclosed on the website (Japanese) .

Energy Conservation at Refineries

In FY2019, Cosmo's refineries encouraged energy conservation (full use of the utility balance optimization calculation system at Chiba Refinery and start of operation of the No. 2 cogeneration facility at Sakai Refinery), but the energy consumption rate was almost flat compared to the previous year, due to unplanned suspensions. Concerning CO₂ emissions per unit of crude oil equivalent, throughput improved by 0.6%, thanks to fuel conversion to liquid petroleum gas, which emits less CO₂.

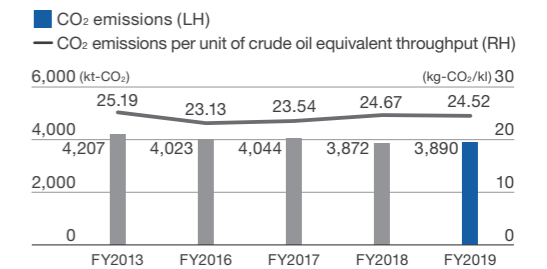
We will continue to strive for energy conservation both physically (high-efficiency equipment) and non-physically (energy-efficient operation).

Reduction in CO₂ emissions by adopting a utility balance optimization calculation system

Refineries use diverse utilities, such as steam, electricity, and fuel to operate equipment. A utility balance optimization calculation system calculates optimal operation to minimize energy costs.

Cosmo Oil first introduced the system at Chiba Refinery in FY2018, then at Yokkaichi Refinery in FY2019, and plans to install it at Sakai Refinery in FY2020 or later. We will expand energy efficiency through use of the system, contributing to CO₂ emission reduction.

CO₂ Emissions and CO₂ Emissions per Unit of Crude Oil Equivalent Throughput



* Because the Sakaide Refinery was turned into a distribution terminal in FY2014, the data has been collected from three refineries since FY2014, compared to from four refineries until FY2013.

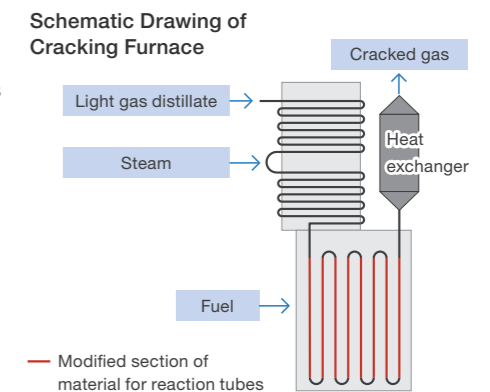
Starting of the No. 2 cogeneration facility at Sakai Refinery for CO₂ emission reduction

In FY2019 Cosmo Oil installed and started operation of the No. 2 cogeneration facility (13,500 kW, 23.6ton/hour) at Sakai Refinery. In addition to power generation, this facility uses waste heat created in the power generation process to produce steam, thereby effectively using energy and contributing to CO₂ emission reduction, in addition to energy saving. We intend to make extra efforts for mitigating environment impact.

* By partial reuse of the existing facility, the facility contributes to establishing a circular society.

Maruzen Petrochemical's Energy-saving Initiative

The ethylene manufacturing facilities of Maruzen's Chiba Plant decompose light gas distillate, a by-product of naphtha cracking, as raw materials. The No. 3 ethylene manufacturing facility was modified to enable raw material decomposition at higher temperature by upgrading the material for reaction tubes used in the cracking furnace, resulting in a more efficient operation, achieving a reduction in energy use equivalent to about 600 kiloliters of crude oil per year.

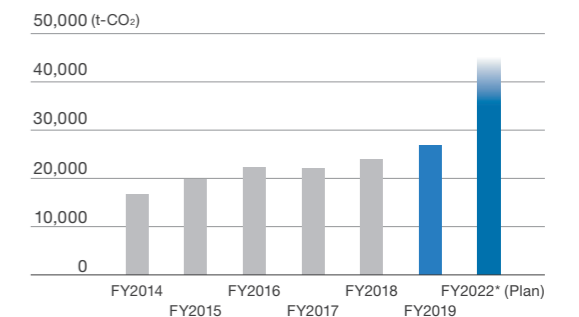


Encouraging the Wind Power Generation Business and Contributing to CO₂ Emission Reduction

Wind power is eco-friendly, clean energy without the need for concern over the depletion of resources or CO₂ emissions. The wind power generation capacity of Cosmo Eco Power Co., Ltd. in the Cosmo Energy Group reached 266,000 kW by FY2019, contributing to CO₂ emission reduction and to improvement in the energy self-sufficiency rate of Japan, which highly depends on imported energy. Our strategy is to continue new investment in onshore wind farms and to enter the offshore wind power generation business early. Through expansion of the wind power generation business, we aim to be beloved by the local community and to contribute to realizing a sustainable society.

* Wind power generation: Calculated using the total power generation volume multiplied by alternative values, such as the actual CO₂ emission coefficient and the adjusted CO₂ emission coefficient of each electric utility for each year.

CO₂ Emission Reduction by the Wind Power Generation





E Engagement with the Environment

Biodiversity Initiatives

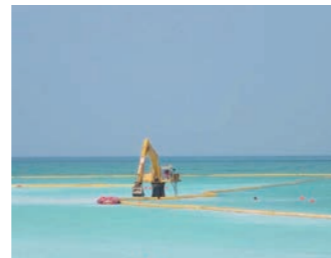
The Cosmo Energy Group regards the preservation of biodiversity as an important theme for corporate and social sustainable growth. We encourage initiatives to understand and reduce the environmental impact of our oil exploration and other businesses and are also engaged in satoyama (village forests) conservation activities, which contribute to the preservation of biodiversity. In addition, we endorsed the “Declaration of Biodiversity by Nippon Keidanren (Japan Business Foundation) and its Action Policy” and are participating in it as a supporting company.

Oil Development with Consideration for the Surrounding Environment

The Oil Exploration and Production Business involves risks that could affect the environment in terms of its exploration, development, and production processes. We consider environmental preservation activities as a priority issue and are promoting initiatives to minimize environmental impact. Abu Dhabi Oil Co., Ltd. in the Cosmo Energy Group acquired an additional concession area, namely Hail Oil Field, in 2012 and commenced production in November 2017. As the surrounding sea area of Hail Oil Field is located in the UNESCO Biosphere Reserve (UNESCO Eco Park), the development of the oil field required more consideration for the environment than ever.

Prior to the development, an environmental impact assessment was conducted and approved by the government. During the development, a system to inject wastewater, waste soil, sewage-containing water and other waste generated from drilling into the ground was established and a zero-discharge operation that reduced environmental impact was implemented. In addition, silt curtains were installed to prevent pollution of the ocean from dredging and disposed dirt as well as muddy water caused by the construction of an artificial island. Moreover, environmental monitoring of air, water quality, aquatic life, and birds was conducted, which ascertained that the operation was conducted without environmental impact.

Environmentally friendly oil development technology was highly evaluated, leading to the receipt of the FY2018 Achievement Award from the Japanese Association for Petroleum Technology. We will continue to advance oil development with consideration for the surrounding environment.



Installation of silt curtains



Wastewater injection well and cuttings injection well (zero-discharge operation)

Environmental Protection Activities in Oil Producing Countries

On Mubarraz Island, where we have oil pre-treating, storage, and loading facilities, we are involved in wide-ranging environmental protection activities, including the planting of mangroves and other green development, the protection of coral in the sea, and the protection of osprey, a rare bird species.



Planted mangroves



Incoming flamingos



Artificially-raised coral



Osprey

Mubarraz Island Green Development

On Mubarraz Island, fresh water is produced from seawater by water production equipment and is provided to residential facilities and crude oil processing. On an extremely hot and isolated island, fresh water is precious for people and plants. Abu Dhabi Oil Co., Ltd. has been actively involved in green development on the desert island. In order to re-use the precious manufactured fresh water, sewage-containing drainage water is treated and used for watering planted trees. On what was once a

desert island, cultivated trees sway in the wind, improving the work environment.

In addition, we have actively been involved in planting mangroves, which even grow in seawater. Mangroves, some of which have grown as high as four meters, provide relaxing place for employees. They are also become an oasis in the Arabian Gulf, where many migratory birds fly to rest.

“Cosmo no Mori” Satoyama Conservation Activities

The Cosmo Energy Group is undertaking activities to maintain and preserve satoyama near places of business through the “Cosmo no Mori” project and to pass them on to the next generation. Cosmo Oil Chiba Refinery, Sakai Refinery and Cosmo Matsuyama Oil carry out this project twice a year in spring and autumn. In FY2019, 347 employees and their family

members in the Cosmo Energy Group participated (Chiba Refinery suspended its activity in autumn due to typhoons). In addition, Cosmo Oil Sakaide Distribution Terminal is conducting cleaning activities on the Shamijima Coast as part of its social contribution activities for the region and the Sanuki Seto Partnership Project concluded with Kagawa Prefecture.



Sakai Refinery's 18th “Cosmo no Mori” Satoyama Conservation Activities in Higashiyoshino-mura



Cosmo Matsuyama Oil's “Cosmo no Mori” Satoyama Conservation Activities in Kutani Fureai Hayashi

COLUMN Development of Eco-friendly Service Stations

As part of the creation of service stations that are in harmony with the environment, we have installed solar panels and fitted lighting equipment with LEDs. Moreover, in June 2020, we concluded a partnership agreement regarding initiatives aimed at the next-generation mobility society with e-Mobility Power, Inc. The company is developing a charging infrastructure and expanding electric vehicles (EVs) and the agreement is focused on installing rapid charging equipment for EVs at our service stations.

With the signing of the agreement, the two companies will install e-Mobility Power's rapid charging equipment at Cosmo Oil service stations to provide charging services. In addition, by providing new EV user services that combine one of the largest charging networks in Japan with our car life service, we will enhance user convenience and satisfaction. Through these initiatives, we will expand EVs to achieve a society with a lower environmental impact.