

DECARBONIZATION INITIATIVES BY OIL MAJORS

— DIFFERENT APPROACHES BETWEEN EUROPE AND THE US —

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SUMMARY

- Initiatives taken by oil majors¹ to reduce greenhouse gas (GHG) emissions have extended from reducing their own direct emissions to reducing the emissions of their entire supply chain (Scope 1-3²).
- Developments in Scope 3 initiatives are different between European and US companies. European companies have set a net-zero target for Scope 1 to 3 and started launching low-carbon projects focused on using renewable energy as an alternative to oil. Meanwhile, companies in the US are mainly commercializing CCS or CCUS to reduce carbon emissions while maintaining existing businesses.
- This is presumably due to the difference in decarbonization policies between Europe and the US. As the US rejoined the Conference of the Parties (COP) in February 2021 and declared its NDC (nationally determined contribution), developments in the US will be closely watched.

1. RECENT DECARBONIZATION INITIATIVES IN THE WORLD

The 26th United Nations Climate Change Conference of the Parties (COP26) was held in November 2021. On the positive side, the outcomes contained a statement saying that countries “pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels,” which was the main topic of discussion at the conference. This is one step further from the Paris Agreement, aimed at “holding the increase in the global average temperature to well below 2°C above pre-industrial levels.”

The US, Europe, and other countries have acted to achieve this goal, leading various countries to propose NDCs. Today, it is seen that if those NDCs are fully met, the level of temperature rise will be limited to 1.8°C by the end of the century.

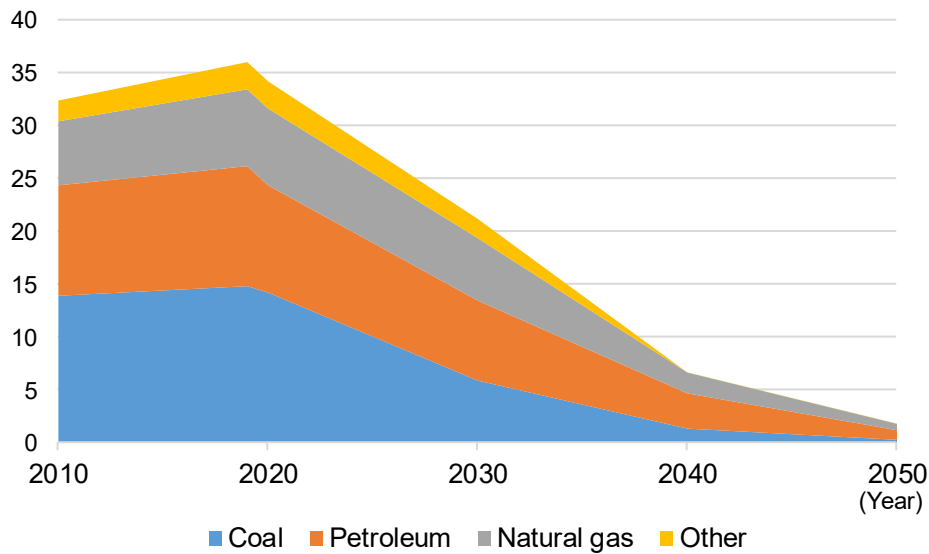
Carbon dioxide emissions are the cause of the increase in temperature. A look at the amount of carbon dioxide emitted by different types of fuel indicates that a total of about 17 gigatons was emitted from oil and natural gas in 2020. This accounts for about half of the global emissions from energy and industry (Figure 1). Shell alone had supply chain emissions (Scope 1-3) of about 1.4 gigatons in 2020, about 4% of the total. For the oil majors, GHG emissions from the use of oil and gas by others in the supply chain are indirect emissions that fall under Scope 3. Without effort to reduce these emissions, it is difficult to achieve the COP26 target. The oil majors are following the regulations based on the NDCs declared by each country and working to reduce their emissions to continue sustainable growth.

¹ In this report, oil majors are defined as Western companies with sales worth approximately 10 trillion yen or more (five companies: ExxonMobil, bp, Shell, TotalEnergies, and Chevron).

² Scope 1: Direct GHG emissions by the company; Scope 2: Emissions by the company due to the use of electricity, heat, and steam supplied by others (indirect energy-derived emissions); Scope 3: Indirect emissions not covered in Scope 2. Emissions due to business activities by others in the business’s supply chain.

Figure 1: CO2 emissions by fuel type (NZE scenario)

(G tons)



Note: "Other" will be negative after 2040 and has been set to zero.

IEA data for only the years 2010, 2019, 2020, 2030, 2040, and 2050 have been used, with linear interpolation in between.

Actual data until 2020.

NZE scenario: Net Zero Emissions by 2050 (1.5°C scenario)

Source: Prepared by MGSSI based on IEA's World Energy Outlook 2021

2. SPECIFIC INITIATIVES BY OIL MAJORS

Although every oil major has a different approach to decarbonization, Scope 1 and 2 are common for all, and they are all working to curb and reduce the flaring and methane emissions that occur during the production of crude oil and natural gas. However, the strategies for Scope 3 differ between European and US companies. European companies have set a net-zero target that includes Scope 3 reductions. As such, they have started to launch low-carbon projects that can substitute the oil business in the future, including low-carbon power projects using renewable and other sources of energy. In contrast, US companies are strengthening carbon capture and storage (CCS) and carbon capture utilization and storage (CCUS), which are also effective in Scope 1 and 2 reductions (Figure 2), while mainly maintaining their oil businesses. Specific efforts by each company are as follow:

2.1 LOW-CARBON PROJECTS THAT COULD REPLACE THE OIL BUSINESS

Low-carbon projects refer to (1) low-carbon power business, including renewable energy; (2) natural gas; and (3) low-carbon fuels, such as renewable fuels and hydrogen. European companies are active in this approach. For example, Total changed its name to TotalEnergies at the shareholders' meeting held in May 2021, declaring a shift from its focus on oil to a wide range of energy sources, such as oil, natural gas, renewable energy, electric power, and biofuels. bp has also declared its aim to become an integrated energy company. According to its announcement, the company will reduce oil and gas production by more than 40% and increase the proportion of biofuels and hydrogen as well as electric power, including renewable energy.

(1) Low-carbon power business

Among low-carbon projects, electric power in particular has become a new pillar of business for a majority of European companies. Shell has announced that it will make the integrated power business a key revenue driver to reach net zero. It aims to reduce crude oil production by 1-2% per year and increase power generation from renewable energy sources. The amount of electricity that the company provides per year will increase from the current 230 terawatt-hours (TWh) to 560 TWh (about half of Japan's annual electricity consumption) by 2030, through natural gas power generation, power purchases, and other methods. Similarly, bp has set a goal of

Figure 2: Key decarbonization measures taken by oil majors

Company	Headquarters	Renewable energy			Key measures
		Target	Under development	Status	
					Net zero target Applicable to Scope 1-3. Scope 3: Reduce emissions from products sold not only by the company but also by other companies by 1.7 Gt (2018) by 2050.
Shell	UK	-	3.9 GW net	1 GW net	Measures until 2030 - Strengthen low-carbon power generation businesses using natural gas and renewable energy, and double the amount of electricity that the company provides from 230 TWh to 560 TWh per year. - Strengthen CCS. 25 Mt/year by 2035. - Increase natural gas production. Decrease oil production by 1-2% from 2019. - Increase production of biofuels, hydrogen, and energy from other sources to eight or more times the current level.
					Net zero target Applicable to Scope 1-3. Scope 3: Reduce upstream emissions by about 0.36 Gt (2019) by 2050.
bp	UK	20GW (2025) 50GW (2030)	25.6 GW net	1.9 GW net	Measures until 2030 - 50 GW of renewable energy power generation. - Strengthen the low-carbon power generation businesses using renewable and other energy and double the amount of electricity that the company provides from 250 TWh to 500 TWh per year. - Reduce oil and gas production by more than 40%, from 2.6 mmoed to 1.5 mmoed. - Produce 100,000 barrels of biofuel per day (22,000 barrels in 2019).
					Net zero target Applicable to Scope 1-3. Scope 3: Reduce upstream emissions in Europe by about 0.25 Gt (2015) by 2050. Also become one of the world's top companies in renewable energy.
Total Energies	France	35GW (2025) 100GW (2030)	32.7 GW gross	10.3 GW gross	Measures until 2030 - Renewable energy power generation of 35 GW by 2025 and 100 GW by 2030. - Shift to natural gas and increase biofuel sales by 10% or more per year from the current 3.6 Mt/year.
					Net zero target announced in January 2022 - Applicable to Scope1 and 2. - Accelerate investment in high-yield projects and use the funds obtained to reduce emissions.
Exxon Mobil	US	-	-	-	Measures until 2030 - Plan to invest \$15 billion in low-carbon projects, including CCUS, biofuels, and hydrogen, through 2027. - Announced a proposal for a public-private joint project to increase CCS capacity from the current 9 Mt/year to 50 Mt/year by 2030 and 100 Mt/year by 2040.
					Net zero target announced in October 2021 - Applicable to Scope1 and 2 upstream.
Chevron	US	-	-	-	Measures until 2030 - Reduce the carbon intensity for Scope 1 to 3 by 5% by 2028 compared to 2016. - Leverage CCUS, biofuels, and hydrogen. Plan to increase CCUS capacity from the current 4 Mt/year to 25 Mt/year by 2030.

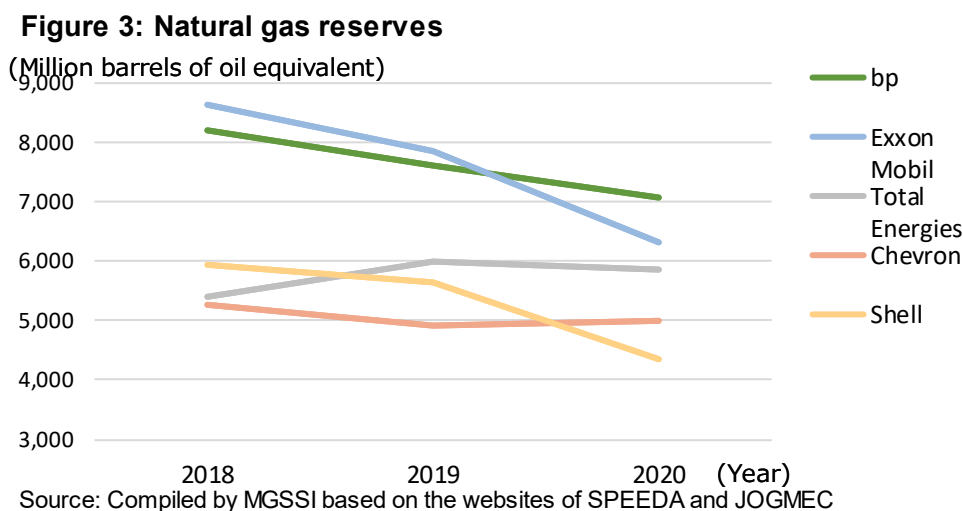
Source: Prepared by MGSSI based on various websites

expanding power generation from renewable energy sources to 50 GW by 2030 and providing 500 TWh of electricity annually. Along these lines, Shell sold its assets in the Permian Basin, the largest oil field in the US, to Conoco Phillips for \$9.5 billion in September 2021, while bp announced the sale of its operations in the US state of Alaska for \$5.6 billion in August 2019. TotalEnergies is aiming to become one of the world's top five companies in the renewable energy sector, with a goal of increasing its renewable energy generation capacity from the current 10.3 GW to 100 GW by 2030. In contrast, US companies have not announced any such goals. Europe has a range of laws and related support systems in place, including the European Climate Law, the Renewable Energy Directive, and feed-in tariff (FIT). The Renewable Energy Directive was updated in July 2021, raising the 2030 target from 32% to 40%. Meanwhile, the US withdrew from the COP, perhaps due to inconsistencies such as changes in policies.

(2) Natural gas

Shell and TotalEnergies, which are engaged in the low-carbon power business, have announced a shift from oil to natural gas. This is because they believe that natural gas power generation is the best way to complement renewable energy sources, which generate power unstably, and that demand for natural gas will increase. TotalEnergies plans to increase the share of natural gas in its sales to 50% by 2030. To strengthen its sales

network, facilities, and reserves, in 2019 the company invested \$500 million in the Driftwood LNG project (US), \$3.9 billion in Anadarko (US) for its operations in Mozambique, and about \$900 million in Adani Gas (India) (Figure 3). Moreover, Arctic LNG 2, Nigeria LNG Train 7, Mozambique LNG, and others plan to double production by 2030. Shell, which is the world's largest LNG dealer when wholesale sales are included, plans to increase its trading volume by expanding its production facilities by 7 megatons per year within 10 years.



(3) Low-carbon fuels

Electricity is considered a difficult alternative to oil as fuel for aircraft, heavy commercial vehicles, and cargo ships. For these sectors, European companies are more aggressive in developing and increasing the production of renewable fuels and hydrogen than US entrants. By 2030, bp plans to increase its biofuel production to 100,000 barrels per day (22,000 barrels per day in 2019), Shell plans to increase its production of biofuels, hydrogen, and other low-carbon fuels to eight or more times the current level. TotalEnergies plans to increase its biofuel sales volume by more than 10% per year from the current 3.6 megatons per year.

2.2 DECARBONIZATION THROUGH CCS OR CCUS

US companies are focusing on capturing and storing carbon dioxide through CCS or CCUS as part of their strategy to reduce carbon emissions while maintaining profits from existing oil businesses. With more than 30 years of experience, ExxonMobil has captured 120 megatons of carbon dioxide to date, the largest amount in the world, and currently has a storage capacity of 9 megatons/year. The company, in collaboration with related industries and governments, has announced a plan to invest \$100 billion by 2040 to store 50 megatons per year of carbon dioxide by 2030 and 100 megatons per year by 2040 on the seabed of the Gulf of Mexico. In the future, it will work with the government, industry, and others to implement this plan. The company estimates a potential storage capacity of about 500 gigatons (equivalent to about 15 years of global emissions) in the Gulf Coast region of the US and about 300 gigatons in Southeast Asia. Chevron also intends to expand its current recovery capacity of 4 megatons per year to 25 megatons per year by 2030. Among European companies, Shell plans to start storing up to 25 megatons per year by 2035, but the capacity of the other companies is small. This may be attributed to Europe's focus on investing in low-carbon projects that can replace oil.

2.3 STAKEHOLDER RESPONSE TO THE INITIATIVES BY OIL MAJORS

Shareholders, environmental NPOs, and other stakeholders are making various proposals to the oil majors.³ European companies have been showing a commitment to reducing emissions through low-carbon projects, which helped them avoid extreme demands from shareholders and gain support for their climate action plans.

³ "ESG Activists Exerting Greater Influence on Corporate Management—Pursuing Social Interests for Their Self-interest —," Masaru Ohnishi, MGSSI, July 2021

Still, a proposal has recently been made to split up a fossil fuel business with large emissions. Meanwhile, US companies have failed to win shareholder support for their passive stance on decarbonization. For ExxonMobil, three of the four directors nominated by an environmental fund, a shareholder, were appointed at a shareholders' meeting in May 2021. In the same year, at Chevron, approval was made for a shareholder proposal to set a corporate goal of substantially reducing GHG emissions in the medium- and long-term future. Following the US's return to the COP in February 2021 with its official NDCs, Chevron announced its net-zero target for Scope 1 and 2 in October 2021 and ExxonMobil in January 2022. These moves show a change in US companies' attitude towards decarbonization.

3. CONCLUSION

Oil majors are working to not only reduce their own emissions (Scope 1 and 2) but also reduce carbon dioxide emitted through the use of products from sources other than their own company (Scope 3). Scope 3 compliance differs between European companies and US companies. European companies have started strengthening their power business with a focus on renewable energy as an alternative to oil. US companies, on the other hand, are not investing in commercial renewable energy as a mainstay; instead, they are announcing goals to introduce large-scale CCS or CCUS to decarbonize existing businesses. However, the storage capacity currently under consideration will not provide a drastic solution to the carbon problem. This may be because Europe had a wide range of support systems in place, while the US has had inconsistent policies that have changed over time. Europe updated its Renewable Energy Directive in 2021, raising expectations for further increase in investments. With the US's return to the COP, US companies are likely to promote carbon reduction measures. While assessing public opinion and policies carefully, they will probably make such efforts in order to gain the support of shareholders and other stakeholders, and this will require continued attention.