

20 July 2020
Sustainability

European oil & gas majors

The road to a green business model



Before Covid-19, climate change and the trend towards a more sustainable world was already gaining importance. For example, according to the Eurobarometer from last March, 91% of European citizens said they found climate change to be a serious problem in the EU, and 83% said European legislation is necessary to protect the environment. Adding to the pressure from citizens and environmental organisations, investors have also started to demand that oil & gas majors take climate change and sustainability into consideration. With the tremendous impact of the Covid-19 pandemic on oil prices, which had been depressed for some time already, European energy companies have announced new business strategies which include a shift towards greener business models. Carbon capture and storage, renewables, biofuels and electric vehicle charging stations are on the map. Other low carbon activities and products, such as hydrogen, are being considered. According to the European Union and its hydrogen roadmap, hydrogen could make up to 24% of the European energy mix by 2050.

Nadège Tillier

Senior Credit Analyst, Utilities
Amsterdam +31 20 563 8967
nadège.tillier@ing.com

Steven Trypsteen

Economist
Brussels +32 2 547 33 79
steven.trypsteen@ing.com

Oil & gas majors' ambitions

Dealing with the carbon footprint

In the last few months, European oil & gas majors have announced new strategic plans for their businesses focusing on sustainability goals. Worldwide, more than 80% of energy is still derived from hydrocarbons, including oil (32%), coal (27%) and natural gas (22%) according to the International Energy Agency. Oil activities and products are directly and indirectly responsible for c.28% of total CO₂ emissions globally, according to the IEA. When natural gas is included, the share climbs to 54%.

54% of worldwide CO₂ emissions are derived directly and indirectly from oil and natural gas products

However, upstream flaring activities “only” represent 1% of total emissions. Most of the carbon emissions linked to oil do not come from energy companies themselves but from the utilisation of their oil products by third parties. Should the sector just consider remedies for its own operations (Scope 1 and 2 carbon emissions) or should it also tackle carbon emissions from its products used by other industries (Scope 3)?

- **Scope 1:** carbon emissions produced by the direct operations and facilities of a company
- **Scope 2:** carbon emissions produced by the energy and heat used to run operations and facilities

For energy companies, Scope 1 carbon emissions can be tackled by capturing methane flaring emissions, for instance. Companies can also purchase decarbonised energy to operate their sites and facilities and/or implement efficiency measures to reduce energy consumption to cope with Scope 2.

Scope 3 has now been taken into consideration by energy players

The inclusion of Scope 3 (carbon emissions produced by the consumption of energy products) into the sustainability goals of oil and gas majors has been a point of debate. Oil & gas companies have limited power in regard to these indirect emissions. An absolute zero emissions strategy would require them to completely stop their production and sale of oil & gas products, which is not their plan. In part, Scope 3 emission remedies could come from the sale of decarbonised products (i.e. biofuels, renewable energy).

The net zero carbon emissions goal communicated by oil & gas majors is derived from a model taking into account the whole value chain in which the companies evolve. This includes their own actions such as carbon storage, bio-products and planting additional trees which absorb the equivalent amount of carbon emissions that their activities and products create. The net zero concept also includes the remedies put in place by third parties (i.e. the capture of carbon emissions from gas power plants, cleaner transportation vehicles etc...).


The net zero carbon emissions ambition is in line with the Paris Agreement, which aims to limit the increase in temperature to 2C⁰. The agreement includes reducing hydrocarbons consumption by decarbonised energy as well as mitigation measures to compensate the carbon emissions that will still be produced.

Scope 3: carbon emissions produced by the consumption of energy products sold to third parties

Carbon emissions reduction targets

The table below offers a review of carbon emissions reduction by European oil & gas majors.

Fig 1 European oil & gas majors: carbon intensity reduction targets

Carbon intensity reduction targets		Means to reach targets
Medium term	Long term	Projects
 <ul style="list-style-type: none"> Net carbon footprint reduction of 30% by 2035 	<ul style="list-style-type: none"> Net zero emissions by 2050 or sooner 50% cut in the carbon intensity of products BP sells by 2050 or sooner 	<ul style="list-style-type: none"> Install methane measurement at all BP's major oil and gas processing sites by 2023 and reduce methane intensity of operations by 50% Increase the proportion of investment into non-oil and gas businesses over time Studying the feasibility of hydrogen energy production facility A more detailed plan will be delivered to shareholders in September 2020
 <ul style="list-style-type: none"> Absolute CO₂ emissions reduction in Norway by 40% by 2030 	<ul style="list-style-type: none"> Absolute CO₂ emissions reduction in Norway by 70% in 2040 and next to zero by 2050 Net zero emissions globally by 2050 	<ul style="list-style-type: none"> Renewable installed capacity between 4 and 6 GW by 2026 Renewable installed capacity between 12 and 16 GW by 2035
 <ul style="list-style-type: none"> Net zero carbon footprint Scope 1 and 2 by 2040 Eliminate carbon emissions from gas flaring by 2025 Reduce methane emissions from operations by 80% by 2025 	<ul style="list-style-type: none"> 80% reduction in CO₂ emissions in absolute terms by 2050 (scope 1,2,3) 	<ul style="list-style-type: none"> 55 GW renewables 80% of upstream production based on natural gas Bio-refineries in Italy Petrol stations transformed into sustainable fuels and services stations Conversion of chemical sites to produce bio specialities
 <ul style="list-style-type: none"> Reduce operations' carbon intensity by 19% by 2025 (vs. 2010) and 4% in products 	<ul style="list-style-type: none"> Not communicated 	<ul style="list-style-type: none"> Gas share in overall portfolio to reach over 50% Early stage hydrogen projects and gas-powered vehicles Recycling of biogenic and plastic waste Set-up of the OMV New Energy team
 <ul style="list-style-type: none"> Reduce absolute carbon intensity by 10% by 2025 and by 20% by 2030 Reduce routine flaring by 50% and methane emissions by 25% by 2025 	<ul style="list-style-type: none"> Reduce absolute carbon intensity by 40% by 2040 and be net zero carbon neutral by 2050 	<ul style="list-style-type: none"> Additional investments in solar and wind Focus on technology R&D Carbon capture and storage Green hydrogen and e-fuels
 <ul style="list-style-type: none"> Scope 3 emissions reduced by a third by 2030 	<ul style="list-style-type: none"> Net zero emissions globally by 2050 Reduce carbon intensity by 65% by 2050 	<ul style="list-style-type: none"> Reduction of oil production Renewables Bio-fuels Carbon capture and storage Plantation of trees
 <ul style="list-style-type: none"> 15% reduction in carbon emissions by 2030 	<ul style="list-style-type: none"> Net zero emissions from Total's operations globally by 2050 (scope 1 + 2) Net zero emissions in Europe by 2050 (scope 1, 2, 3) 35% reduction in carbon emissions (scope 1,2,3) by 2040 and 60% by 2050 	<ul style="list-style-type: none"> Presently commits 10% of full capex to clean energy solutions and 20% by 2030 Increase presence in renewables with gross capacity of 25 GW by 2025 Increase of gas share in portfolio mix

Source: Company data, ING

In the last few years, most European oil & gas majors have defined sustainable development goals. In recent months, companies have reaffirmed strategic plans and offered more ambitious goals, especially in terms of environmental targets. With the will to be aligned with the Paris Agreement, most European oil & gas majors have announced their intention to be carbon neutral (or net zero emitter) by 2050.

While most European oil & gas majors have established a net zero carbon goal, most of them have also provided shareholders with carbon emissions reduction in absolute terms. For instance, ENI aims at reducing its emissions by 80% by 2050 in absolute terms based on a methodology it developed and verified by third parties. Equinor wants to be a net zero carbon emitter on a global basis but close to absolute zero CO₂ emissions in Norway by 2050. Repsol wants to reduce its CO₂ emissions by 40% by 2040.

In December 2019, Repsol was the first European energy group to announce a net zero carbon strategic plan.

For BP and Royal Dutch Shell, the combination of a strong decrease in oil prices and the new net zero carbon emission goal will lead to a reorganisation of the companies. This will be accompanied by significant job losses in the companies' traditional segments.

ENI: one of the most detailed sustainability plans

ENI released the most detailed sustainability plan. In February 2020, the oil & gas major published its Long-Term Strategic Plan 2050 and Action Plan 2020-2023. Alongside sustainable targets, the company presented a detailed plan on how it will reach its 80% reduction in absolute carbon emissions by 2050.

- By 2050, ENI's **upstream production will be at 80% natural gas.**
- **Renewables** to grow to 55 GW capacity by 2050 with an expected electricity client base reaching 20 million.
- **Sustainable gas production:** forest conservation and CO₂ capture and storage projects for a total of over 40 million tons/year by 2050. On top of renewables, ENI will produce electricity from gas combined with CO₂ capture and storage.
- **Italian refineries** to be converted into bio-refining sites for the production of decarbonised products.
- **Transformation of traditional petrol stations** into sales service station distributing only new generation sustainable fuels and services.
- Gradual conversion of existing **chemicals sites** to produce more specialties and utilising more bio and plastic recycling technologies.








Low carbon and clean energy activities

Clean energy projects from energy companies such BP, Royal Dutch Shell and Total, are not new. Over time, their involvement has fluctuated between direct action and indirect participation via joint ventures and minority stakes in projects. In 2020, with the exception of OMV, all European oil & gas majors now have some wind and solar renewables that can be expanded in the future. Some players even have a foothold in the utility sector with plans to gain market share.

Oil & gas majors are slowly becoming direct competitors to existing utilities

Some energy companies have already entered the utility sector. With the acquisition of Direct Energie, the formation of Quadran and the acquisition of EDP's Spanish B2C clients, **Total SA** has already shown where its ambition lies in the electricity and gas sector. The French oil & gas major wants to grow Direct Energie's client portfolio from 2.6 million to 7 million in 2022. By acquiring ERM Power in 2019, **Royal Dutch Shell** wants to make Australia its base country for developing its electricity business segment. After disposing of its stake in Naturgy, **Repsol** has become a power generator and retailer in Spain with the acquisition of Viesgo. As for **ENI**, the Italian oil & gas player has entered the French gas retail market and is a retail utility in Italy.

Fig 2 European oil & gas majors: existing zero and low carbon activities

Existing zero and low carbon activities			
	Wind farms	Solar	Other
	<ul style="list-style-type: none"> Wind farms in US and Hawaii with a net generating capacity of 926 MW 	<ul style="list-style-type: none"> Joint venture with Lightsource BP operating in 13 countries 	<ul style="list-style-type: none"> Biopower production operated by BP Bunge Bioenergia Bio-isobutanol via Butamax 505/50 JV with DuPont EV charging in China, UK and Germany
	<ul style="list-style-type: none"> 500 MW offshore installed capacity with farms in Scotland, New York and Germany 	<ul style="list-style-type: none"> JVs with Apodi (Brazil), Guanizul 2A (Argentina) and Equinor Energy Ventures for c.300 MW 	<ul style="list-style-type: none"> Early stage projects into hydrogen production (H21 North of England project, Magnum power plant and H-vision blue hydrogen project in the Netherlands) Production of green-fuel grade petcoke
	<ul style="list-style-type: none"> In 2015, ENI created ENI New Energy business unit C.100 MW installed 	<ul style="list-style-type: none"> 30 MW 	<ul style="list-style-type: none"> Biofuels Gas retail player in France Power and gas retailer in Italy
	<ul style="list-style-type: none"> No installed capacity 	<ul style="list-style-type: none"> Biggest Photovoltaic project in Austria in partnership with Verbund 	<ul style="list-style-type: none"> Recycling of biogenic and plastic wastes
	<ul style="list-style-type: none"> Onshore wind Delta project online in 2020 with a capacity of 335 MW 2 additional projects online from 2023 onwards with aggregate capacity of 1.1 GW Offshore project Windfloat 	<ul style="list-style-type: none"> Starting in 2020, the Valdesolar 264 MW site Between 2021 and 2023, additional 330 MW capacity 	<ul style="list-style-type: none"> Acquired Viesgo's low CO2 emission power assets and client portfolio in 2018. Clients reached 1 million in Spain. Repsol operates 2.9 GW electricity capacity including 2 combined cycle gas power plants with a 1.6 GW capacity and 3 hydropower plants in Spain
	<ul style="list-style-type: none"> Onshore wind farms in US 751 MW offshore wind in NL with the Noorzeewind in operation and 2 wind farms providing power to 850,000 households 1 offshore farm project in US 	<ul style="list-style-type: none"> Started the construction in February 2020 of the 120 MW Gangarri solar farm in Australia 	<ul style="list-style-type: none"> Biofuels Acquired ERM Power Limited in Australia, an electricity retailer in 2019 Car power charging stations
	<ul style="list-style-type: none"> Acquired Direct Energie in 2018 c.1 GW of wind capacity 	<ul style="list-style-type: none"> Formation of Total Quadran including solar activities Installation of solar panels 	<ul style="list-style-type: none"> Total Direct Energie serves c.2 million retail and corporate clients in France and Belgium and operates gas power plants and renewables Biogas and biomass 14 hydro power plants operated by Quadran with a total capacity of 14 GW In May 2020, Total SA acquired EDP's Spanish B2C client portfolio and 850 MW capacity with 2 gas power plants

Source: Company data, ING

The European hydrogen roadmap

The European Commission published its [Hydrogen Strategy for a Climate-Neutral Europe](#) on 8 July 2020. The document outlines all the initiatives Europe wants to take to make hydrogen an important part of the energy mix and to achieve carbon neutrality by 2050. The document underlines the major role hydrogen could play in energy transition with a potential share of 24% in the European energy mix by 2050.

24% Potential share of hydrogen in the European energy mix by 2050

The technology could also create as many as 5.4 million jobs for the industry. A number of oil & gas majors have already launched projects to determine the technological feasibility and economics. Beyond the oil & gas industry, hydrogen is also expected to play a major role in other sectors such as transportation, power generation, heating of buildings and feedstock for several industrial segments.

Grey, blue and green hydrogen

“Hydrogen never took off but there is now a renewed interest”

The use of hydrogen as an energy source has been discussed for at least 50 years. It became popular in the seventies during the oil crisis and again in the nineties when climate change

emerged on the political agenda. Some people even talked about a hydrogen economy, but it never took off. Now, there is a renewed interest, as the world is searching for ways to curb climate change, and projections show that hydrogen will become cheaper in the coming years.

Currently, almost all of the 70 million tons of hydrogen that is produced each year is produced via steam reforming, a chemical reaction that emits carbon dioxide (for each tonne of hydrogen, the process emits 7 tonnes of carbon dioxide). The cost of this *grey* hydrogen in Europe is about €1.5 per kilo, but it is highly dependent on the gas price and it does not take into account the costs of CO₂.

There are greener forms of hydrogen, however, but they are currently more expensive. A first alternative is *blue* hydrogen, which is also produced via steam reforming, but the CO₂ emissions are partly captured and stored. According to the European Commission, the price per kilo is about €2 when natural gas is used during steam reforming. A second alternative, dubbed *green* hydrogen, is produced via electrolysis of water, and the electricity used in the process stems from renewable sources. The EC estimates that the price ranges from €2.5 to €5.5 per kilo.

Will green hydrogen become competitive?

The cost of green hydrogen, however, is expected to come down in the coming years. First, the cost of electrolysis equipment has already fallen by 60% in the last 10 years and is expected to be cut in half by 2030 compared to today. Economies of scale is the main driver here. The cost of renewable energy has also come down dramatically in the past decade and there is no sign that this trend is slowing.

Where can we use it?

A crucial issue with green hydrogen, however, is that the amount of energy embedded in it is lower than the amount that was needed to produce it. So why not use electricity in the first place?

A good reason to use hydrogen is the higher energy density compared to batteries. This is useful for longer-distance travel, when recharging is not always possible, for example for planes and ships. Hydrogen could also be used as a storage of renewable energy and to lower carbon emissions during steel production. It could also replace natural gas for heating. The gas grid could even be reused. All these potential uses will help to reduce greenhouse gas emissions in activities where electrification proves much more difficult. Indeed, renewable electricity will decarbonise a large share of the EU energy consumption, but not all of it. And so hydrogen looks like a necessary component in the European strategy to become carbon-neutral by 2050.

What will Europe do?

The European Commission published a three phased roadmap (date). In **phase one**, from 2020 up to 2024, the objective is to install at least 6 GW of renewable hydrogen electrolyzers in the EU and to produce up to 1 million tonnes of green hydrogen. The European Clean Hydrogen Alliance, which brings together industry, public authorities and civil society, will develop an investment agenda and concrete projects. In **phase two**, running from 2025 to 2030, the aim is to install at least 40 GW of renewable hydrogen electrolyzers and to produce 10 million tonnes of green hydrogen. In the **final phase**, from 2030 onwards, green hydrogen should reach maturity and be used in all sectors that are currently hard to decarbonise.

In order to support the investments needed to achieve the above goals, a number of European programmes can be used. It is not yet possible to quantify how much money from these programmes will go to the hydrogen strategy, but the initiatives to support the strategy are certainly eligible:

- **Horizon Europe**, a research and innovation programme, could be used to support research to improve existing technologies.
- The **InvestEU programme**, where one of the key investment targets is sustainable infrastructure, could be used to fund the necessary investment. Moreover, an EU budget guarantee could crowd-in private money.
- The **ReactEU programme**, an initiative to increase cohesion within the Union, can also be used to support the green transition.

“European green ambitions have not been abandoned”

These programmes are cited and some were even upgraded in the recent Next Generation EU, the proposal of the European Commission to add an additional €750bn to the European

budget to kickstart and support the European economy after the Covid-19 shock. The proposal is currently being debated in Brussels. What is on the table is discussed in our piece [here](#).

In our earlier analysis [“Are European governments pushing for a green recovery,”](#) we concluded that the green ambitions in Europe, based on the proposal of the European Commission and what is happening in the largest countries, had not been abandoned due to Covid-19. We believe that the European hydrogen strategy again highlights this point. Indeed, supporting hydrogen fits into the Commission’s sustainability objective and its will to support the European economy after the Covid-19 shock.

Disclaimer

This publication has been prepared by the Economic and Financial Analysis Division of ING Bank N.V. (“ING”) solely for information purposes without regard to any particular user’s investment objectives, financial situation, or means. ING forms part of ING Group (being for this purpose ING Group N.V. and its subsidiary and affiliated companies). The information in the publication is not an investment recommendation and it is not investment, legal or tax advice or an offer or solicitation to purchase or sell any financial instrument. Reasonable care has been taken to ensure that this publication is not untrue or misleading when published, but ING does not represent that it is accurate or complete. ING does not accept any liability for any direct, indirect or consequential loss arising from any use of this publication. Unless otherwise stated, any views, forecasts, or estimates are solely those of the author(s), as of the date of the publication and are subject to change without notice.

The distribution of this publication may be restricted by law or regulation in different jurisdictions and persons into whose possession this publication comes should inform themselves about, and observe, such restrictions.

Copyright and database rights protection exists in this report and it may not be reproduced, distributed or published by any person for any purpose without the prior express consent of ING. All rights are reserved. ING Bank N.V. is authorised by the Dutch Central Bank and supervised by the European Central Bank (ECB), the Dutch Central Bank (DNB) and the Dutch Authority for the Financial Markets (AFM). ING Bank N.V. is incorporated in the Netherlands (Trade Register no. 33031431 Amsterdam). In the United Kingdom this information is approved and/or communicated by ING Bank N.V., London Branch. ING Bank N.V., London Branch is subject to limited regulation by the Financial Conduct Authority (FCA). ING Bank N.V., London branch is registered in England (Registration number BR000341) at 8-10 Moorgate, London EC2 6DA. For US Investors: Any person wishing to discuss this report or effect transactions in any security discussed herein should contact ING Financial Markets LLC, which is a member of the NYSE, FINRA and SIPC and part of ING, and which has accepted responsibility for the distribution of this report in the United States under applicable requirements.

Additional information is available on request. For more information about ING Group, please visit <https://www.ing.com>.