Accela Research

CLIMATE TRANSITION ANALYSIS

EUROPEAN MAJORS' 2023 AGMS: PROGRESS TOWARDS LOW CARBON

April 2023

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1. EXECUTIVE SUMMARY

INTRODUCTION

The 2023 AGM season for European oil and gas majors marks the third year since climate transition plans were first put forward to shareholders in 2021. At that time, setting scope 1 and 2 emissions reduction targets and 2050 net zero aspirations were the norm, with little offered in terms of concrete business strategies for evaluation.

Since then, the economic context for oil and gas has dramatically changed. Energy demand has recovered from the effects of Covid-19, with companies reporting record cash flows as oil and gas prices hit five-year highs. Policymakers looking to address energy security have accelerated renewables targets for 2030. Meanwhile, the remaining carbon budget for a 50% likelihood of limiting global warming to 1.5°C continues to run out. The remaining 380 Gt CO_2 will be exhausted in nine years at current rates.[1]

Against this backdrop, a group of Dutch investors, including PGGM, Achmea Investment Management, Pensioenfonds Rail & Openbaar Vervoer, MN, and APG Asset Management engaged Accela Research to review the climate transition plans of five European oil and gas majors to understand how companies are positioned comparatively in terms of low carbon transition strategies for a 1.5°C-aligned future. Our report provides a fresh, detailed look at BP, Shell, Eni, TotalEnergies and Equinor's:

- emissions reduction targets, performance and outlook,
- corporate capital allocation across business segments (upstream, midstream/downstream, low carbon), and
- low-carbon products against the ambition required for limiting warming to 1.5°C.

An overview of the climate transition plans of Chevron and ExxonMobil is provided in the appendix.

KEY FINDINGS

In defence of dividends and valuations as hydrocarbon producers, European majors are turning to increasing oil and gas production. Despite higher cash flow, current capital expenditures remain concentrated in upstream production at $9 bn (FY22 peer average), as compared to low carbon portfolios of $3 bn (FY22 peer average). Companies have set low carbon production targets in areas where they believe they have a natural advantage (bioenergy, hydrogen, carbon capture, utilisation and storage (CCUS)). However, there is less evidence that companies are prepared to incubate and forge new capabilities for a low carbon economy.

European majors have set high growth targets for low carbon to FY30, but most energy portfolios will remain in oil and gas production this decade. Taken as a share of energy produced by FY30, we estimate company portfolios will remain ~70-90% oil and gas production, compared to 10-30% low carbon alternatives. Companies are providing more quantitative FY30 plans for new energies, beyond their high-level ambition to achieve net zero by 2050. Between FY22 and FY30, most have set high growth targets for increasing bioenergy production (rising from a low base to ~7 times current production), but strategies for renewable energy generation are mixed. Of the European majors, TotalEnergies is the only company with a significant target of 100 GW of installed capacity by FY30.

Companies must demonstrate they can generate a material part of their earnings (~30%) from low-carbon businesses for investors to value and reward them differently. Simply maintaining the resilience of

[1] Global Carbon Project, (2022).

hydrocarbons through a defensive approach will not create long-term value for shareholders or align with the goals of limiting warming to 1.5°C. Companies should clearly articulate where they see opportunities within low-carbon value chains and their expected returns. Currently, BP is alone among peers in providing its Internal Rates of Return (IRR) and guidance on earnings for low-carbon fuels. Companies looking to increase their future valuation through low-carbon growth engines must better quantify their competitive advantage and how their investments contribute to decarbonisation.

COMPARATIVE PERFORMANCE

In general, we found that even though existing company strategies are not ambitious enough to align with the pace of transition necessary for limiting warming to 1.5°C, BP is currently leading among peers in committing to decrease investment for hydrocarbons. It also sets an example among peers in providing internal investment cases for low-carbon fuels, with quantified FY30 targets for hydrogen, bioenergy and renewable energy.

Table: European majors' comparative performance

	BP	Shell	Eni	Total Energies	Equinor	Lead	Lag
Who has the most ambitious targets? (FY19 base)							
Net Carbon Intensity	-15-20%	-19%	-15%	-20%	-20%	Tied	**ENI**
Absolute, Scope 1 and 2	-50%	-48%	-70%[2]	-44%	-44%	**ENI**	Tied
Absolute, Scope 3	-20-30%	n/a	-34%[3]	-4%	n/a	**ENI**	Tied
Who has reduced emissions most? (FY19-22)							
Net Carbon Intensity	-3%	-3%	-3%	-6%	-2%	**TTE**	**EQNR**
Absolute, Scope 1 and 2	-41%	-28%	-20%	-12%	-23%	**BP**	**TTE**
Absolute, Scope 3	-18%	-24%	-17%	+7%	+1%	**SHEL**	**TTE**
Who will reduce oil and gas production?							
Oil and gas production FY22-30	-11%	+13%	+17%	+12%	flat	**BP**	**ENI**
Who is investing most in low carbon?							
Low carbon capex % total FY22	24%	17%	8%	25%	14%	**TTE/BP**	**ENI[4]**
Low carbon capex % total FY25-30	44-50% Transition Growth Engines	50% including operating expenditure	20% FY26	33%	30-50%	**BP/ EQNR**	**ENI**

Source: Company data, Accela Research estimates

On the other hand, Eni appears to lag behind peers in demonstrating a pathway towards achieving its ambitious plans for scope 1, 2 and 3 absolute emissions reduction between FY25-35. Currently, its net carbon intensity reduction is the lowest of the majors, and it plans to increase its oil and gas production the most between FY22 and FY30. This demonstrates a large gap between target setting and action. The table below compares the European majors' climate targets, emissions performance and medium-term outlook for oil and gas production, as well as their capital allocation plans for FY30. Overall, we note that current

[2] Eni's scope 1 and 2 target as an average of FY25 (40%) FY35 targets (100%).

[3] Eni's target for scope 1, 2 and 3.

[4] Eni capital expenditure (capex) excludes acquisitions and bioenergy, whereas peers include both.

scope 3 emissions reduction has been the result of portfolio optimisation, rather than a considered phase-down of hydrocarbon production.

RECOMMENDATIONS

Based on a comparative view of these companies' performance against targets, we provide the following recommendations for European majors seeking to align portfolios with a 1.5°C future.

Table: European majors' summary recommendations

Company	Recommendations
BP	• Build on its strong renewables pipeline (43 GW) to improve its FY30 target for renewable generation, which appears lowest at 10 GW. • Increase the ambition of its scope 1 and 2 emissions reduction targets, having already achieved 41% of its 50% for FY30. • Expand its scope 1, 2 and 3 absolute target to include traded products. • Better articulate its strategy for how it will achieve its FY30 net carbon intensity target. • Quantify the emissions impact of its plans for near-field exploration, run-off of existing assets and divestments.
Shell	• Commit to reducing oil and gas production and introducing a scope 3 reduction target in alignment with 1.5°C. • Quantify and confirm its production targets for low-carbon fuels, such as hydrogen and renewable energy, and any reliance on offsets to meet targets. • Better articulate its visions for generating value from low-carbon fuels by providing internal hurdle rates for investments. • Provide capital expenditure and operational expenditure guidance for low-carbon solutions. • Like BP, quantify the emissions impact of its plans for near-field exploration, run-off of existing assets and divestments.
Eni	• Commit to reducing oil and gas production and introducing a scope 3 reduction target in alignment with 1.5°C. • Improve its existing capital allocation and production guidance for low-carbon alternatives to demonstrate it can meet its ambitious emissions reduction targets (~80% reduction in total emissions by FY40). • Improve disclosures, investment thesis and targets for low-carbon fuels.
Total Energies	• TotalEnergies needs to improve its performance on emissions reduction. Between FY19 and FY30, its scope 1 and 2 emissions have decreased the least, while its scope 3 emissions have increased most. • Commit to reducing oil and gas production and introducing a scope 3 reduction target in alignment with 1.5°C. • Improve its accounting methodology for emissions to include the sale of third-party products. • Reconsider its accounting approach for estimating avoided emissions of LNG sales.
Equinor	• Increase its renewable generation ambition with stronger linkages to hydrogen production to reach its FY30 net carbon intensity target. • Commit to reducing oil and gas production and introducing a scope 3 reduction target in alignment with 1.5°C. • Improve its methodology for emissions to include the sale of third-party products.

Source: Company data, Accela Research estimates

ABOUT ACCELA RESEARCH

Accela Research is a new, dedicated, not-for-profit climate transition research and advisory group, founded by Shu Ling Liauw, Marina Lou and Rohan Bowater (previously Global Climate Insights). This report follows on from Global Climate Insights' previous 2022 AGM Oil & Gas Sector note and takes a deeper dive into the existing plans and capabilities of oil majors in their transition away from hydrocarbon production.

2. GREENHOUSE GAS EMISSIONS

Across the European majors we assess in this report (BP, Shell, Eni, TotalEnergies and Equinor), this section provides:

- An examination of current methodologies for calculating emissions footprints.
- An estimation of underlying emissions based on oil and gas sales.
- A comparison of existing targets and each company's emissions reduction.

EMISSIONS METHODOLOGIES

A comprehensive and reliable disclosure of greenhouse gas (GHG) emissions is the crucial foundation of a credible strategy for addressing climate change. Although we have seen a large improvement in emissions reporting in FY22, there remains a significant disconnect between financial reports and emissions. Based on current reporting, it is difficult to verify emissions footprints using the volumes disclosed in company financial accounts. To identify material inconsistencies, we have reviewed the emissions methodologies used by each company. An overview of the differences for the most material items is in the table below.

KEY FINDINGS

- BP, Shell and Eni appear to have the most comprehensive emissions accounting methods, disclosing scope 3 emissions associated with all oil and gas sales, including third-party products and traded oil and gas.
- In contrast, TotalEnergies and Equinor's disclosures only include scope 3 (category 11) for sales of oil and gas that they produce.
- Crude oil sales to third parties are included for Shell and Eni.

Table: Emissions methodology high-level comparison

	Shell	BP	Eni	TotalEnergies	Equinor
Scope 1 - Operational					
Scope 2 - Location-based					
Scope 3 - Production					
Scope 3 - Third-party (well-to-wheel)					
Scope 3 - Physically traded					
Scope 3 - Crude oil sales					

Source: Company data, Accela Research estimates

UNDERLYING EMISSIONS

Within the scope of this report, we provide a high-level verification of emissions footprints by estimating emissions relating to oil and gas sales.

Sales disclosures are not consistently reported amongst majors. We estimate total oil and gas sales by comparing production and purchases (inputs) with reported oil and gas sales (outputs), as disclosed in companies' quarterly and annual financial reports. Lifecycle emissions of these products are estimated using industry standard emissions factors.

KEY FINDINGS

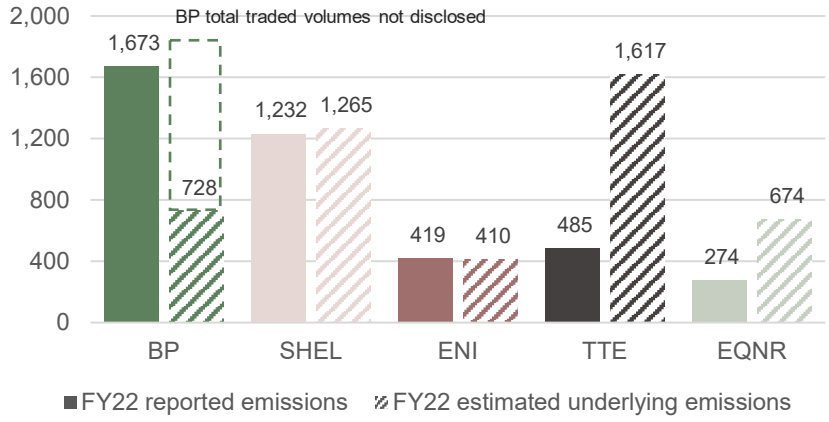
- Shell and Eni appear to have the most comprehensive combination of emissions methodologies and disclosure of sales, where reported emissions broadly align with estimates of underlying emissions from sales.
- While BP does provide a relatively complete disclosure of emissions, it is not possible to verify and reconcile this with its total sales volumes, particularly regarding the full scope of traded oil and gas.
- TotalEnergies and Equinor's emissions disclosures show the largest gap in relation to the underlying emissions of their sales volumes. This is consistent with our analysis of GHG emissions methodologies.

Table: Estimated total oil and gas sales (k boe/d)

Company	FY20	FY21	FY22
BP	3,853	3,917	4,027
Shell	6,555	6,235	5,979
Eni	2,563	2,662	2,395
TotalEnergies	8,285	8,621	9,089
Equinor	4,033	3,986	3,929

Source: Company data, Accela Research estimates

Chart: FY22 comparison of disclosed GHG emissions to underlying lifecycle emissions for oil and gas sales (Mt CO_2e)



Source: Company data, Accela Research estimates

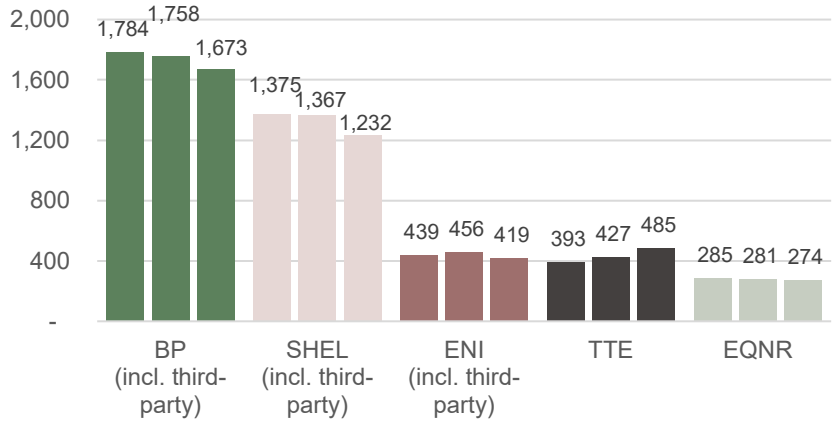
Shell and Eni appear to have the most complete disclosures with reported and underlying emissions broadly aligned. TotalEnergies disclosed to underlying emissions is lowest at 30%, followed by Equinor at 41%.

BP's traded oil and gas disclosure makes it difficult to verify emissions.

EMISSIONS PERFORMANCE AND TARGETS

In this section, we provide a review of current emissions performance against targets. Across majors, total GHG emissions declined 5% between FY21-22. This was driven by: Shell -10%, Eni -8%; and BP -5%, Equinor -2%. In contrast, TotalEnergies emissions increased 14%. BP and Shell have the largest disclosed GHG emissions footprint (1.7 Gt CO_2e and 1.2 Gt CO_2e), partly reflecting more comprehensive disclosure.

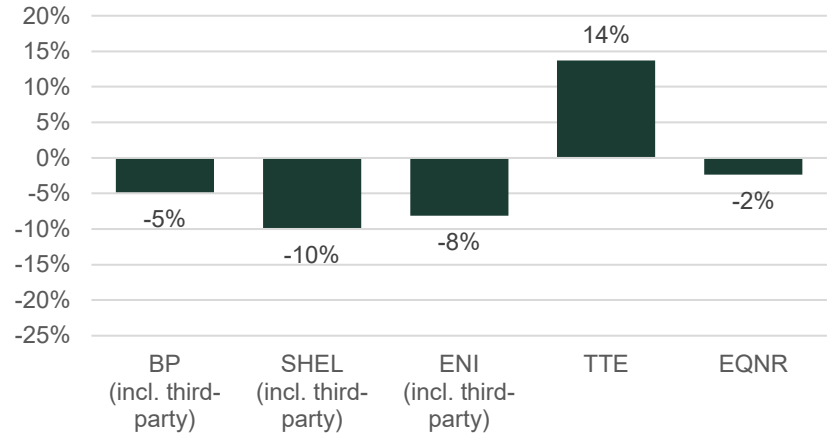
Chart: FY20-22 GHG emissions footprint disclosed (scope 1, 2, 3, Mt CO_2e)



Shell and BP have seen a continued decline in emissions over the last three years, driven largely by divestments.

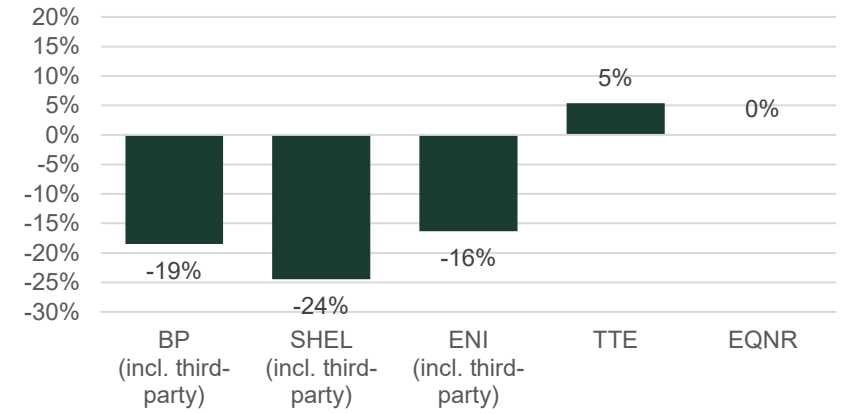
This contrasts with TotalEnergies, which has increased emissions.

Chart: FY21-22 growth in GHG emissions footprint (scope 1, 2, 3, CO_2e, %)



In FY22, TotalEnergies emissions increased 14%, compared to a decline across peers. Shell's emissions declined by the most, at -10%.

Chart: FY19-22 growth in GHG emissions footprint (scope 1, 2, 3, CO_2e, %)



Since FY19 BP, Shell and Eni's disclosed emissions have declined by over 16%. This excludes the impact of Russian divestments for BP.

Equinor's emissions have stayed flat at FY19 levels, while TotalEnergies' have increased 5%.

Source: Company data, Accela Research estimates

EMISSIONS REDUCTION TARGETS

Each of the majors have set absolute scope 1 and 2 targets, and net carbon intensity targets for FY30. In absolute terms:

- Eni is the only major to set a scope 1, 2 and 3 target at ~–34% by 2030 (re-based to FY19).
- BP and TotalEnergies have set a separate target for scope 3 emissions associated with upstream production. TotalEnergies' target is vague, targeting less than 400Mt CO_2e (~-4% if 400Mt is achieved).

As current scope 1 and 2 targets only account for a small fraction (5-8%) of the total GHG emissions footprint of each company, they will have a limited effect on supporting global emissions reduction. For example, Shell's scope 1 and 2 emissions represent ~5% of its total absolute GHG emissions.

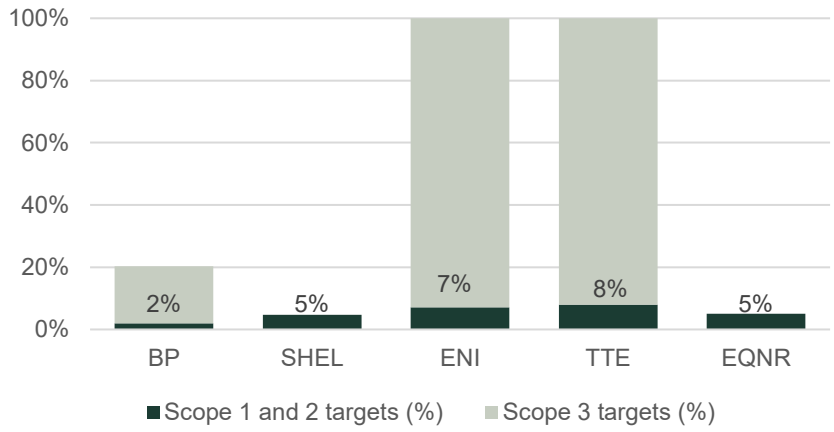
Table: Summary emissions reduction targets (re-based to FY19)

	BP	Shell	Eni	TotalEnergies	Equinor
FY30 targets (FY19 base)					
Absolute emissions					
Scope 1 and 2	-50%	-48%	-70%	-44%	-44%
Scope 3 (upstream)	-20-30%			-4%	
Scope 1, 2, 3			-34%		
Net carbon intensity	-15-20%	-19%	-15%	-20%	-20%
Net Zero by 2050 (Net carbon intensity)	Yes	Yes	Yes	Yes	Yes

Source: Company data, Accela Research estimates

See Appendix for company targets for FY22 to FY50 using company base years.

Chart: FY22 GHG disclosed emissions covered by scope 1 and 2 and 3 (if set) absolute targets (%)



BP and Eni have an absolute target for scope 1, 2 and 3 (BP, upstream only).

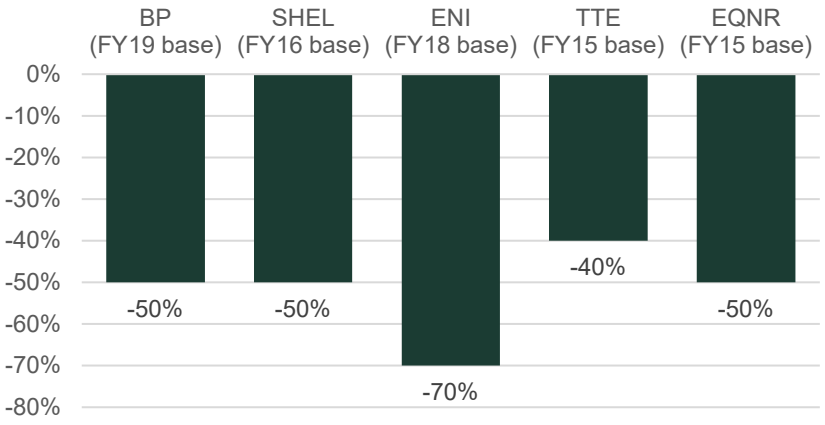
While TotalEnergies has a scope 3 absolute target, it is for a small 4% reduction only.

Source: Company data, Accela Research estimates

ABSOLUTE TARGETS SCOPE 1 AND 2 (NET OF OFFSETS/CCUS)

After company targets are uniformly re-based to FY19, Eni has the most ambitious scope 1 and 2 reduction targets: a 40% reduction by FY25 and 100% reduction by FY35 (averaged to ~70% by FY30). The targets for the other majors are between 45-50% from an FY19 base.

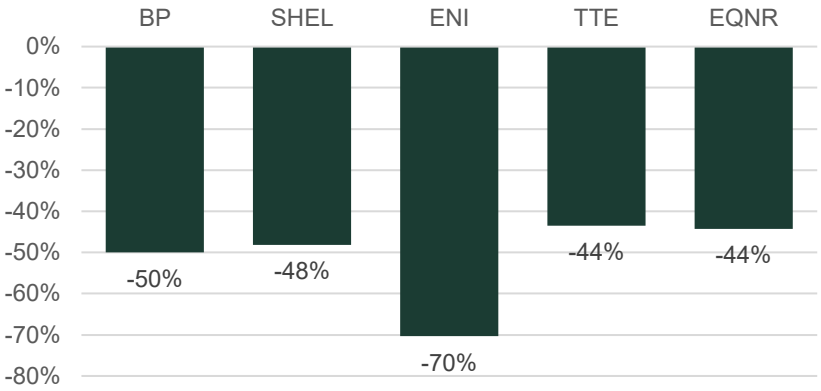
Chart: FY30 absolute scope 1 and 2 emissions reduction targets



BP, Shell and Equinor are targeting a 50% reduction in absolute scope 1 and 2 emissions, while TotalEnergies' target is lowest at 40%.

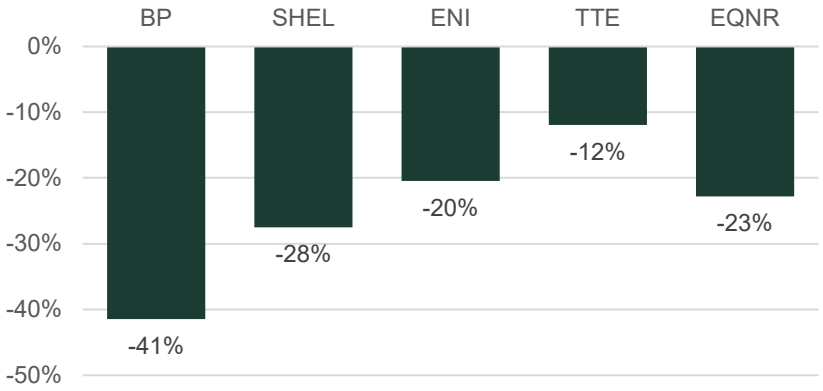
Eni's is highest, assuming an average of its FY25 and FY35 targets.

Chart: FY30 absolute scope 1 and 2 emissions targets (re-based to FY19)



Comparing targets against a common FY19 base shows Eni's target remains the most ambitious.

Chart: Scope 1 and 2 emissions reduction from FY19 to FY22 (%)



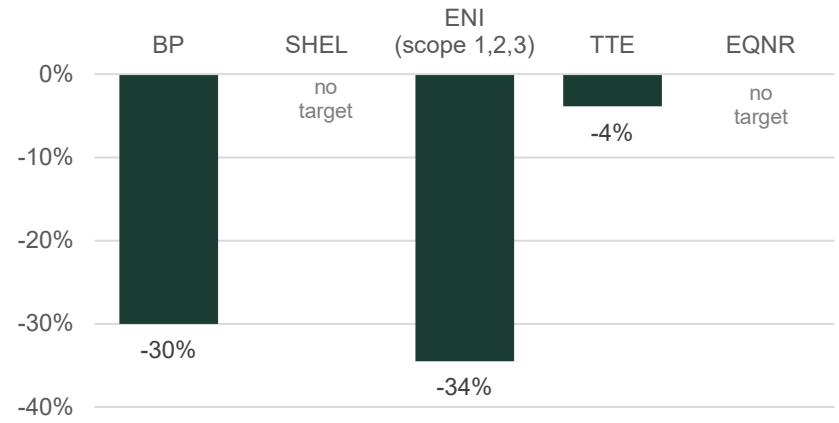
BP has progressed most in scope 1 and 2 emissions reduction, declining 41% between FY19-22. This is followed by Shell's emissions, declining 28%.

Source: Company data, Accela Research estimates

ABSOLUTE TARGETS SCOPE 3

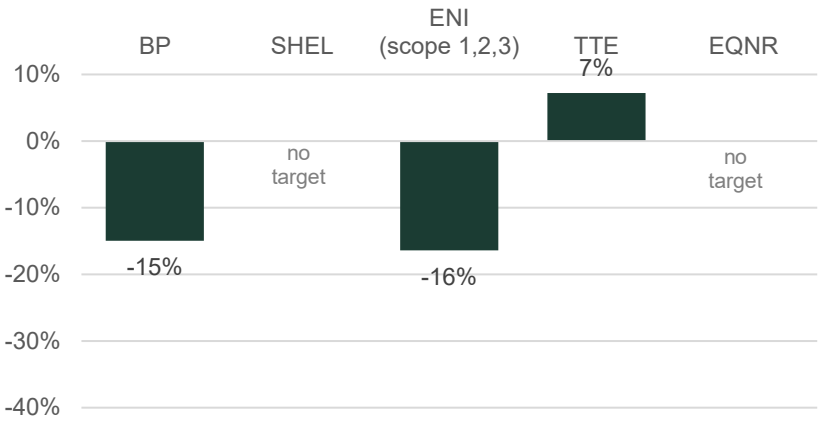
Three of the companies have an absolute scope 3 target. BP is targeting a 20-30% decline in scope 3 for its own oil and gas production, Eni has an ambitious target to reduce scope 1, 2 and 3 by 34%, and TotalEnergies has a small target to decrease scope 3 for its own production to less than 400 Mt CO_2e.

Chart: FY30 absolute scope 3 emissions targets (FY19 base)



BP and Eni have set material scope 3 targets. Eni's target of a -34% reduction is slightly higher than the upper end of BP's target.

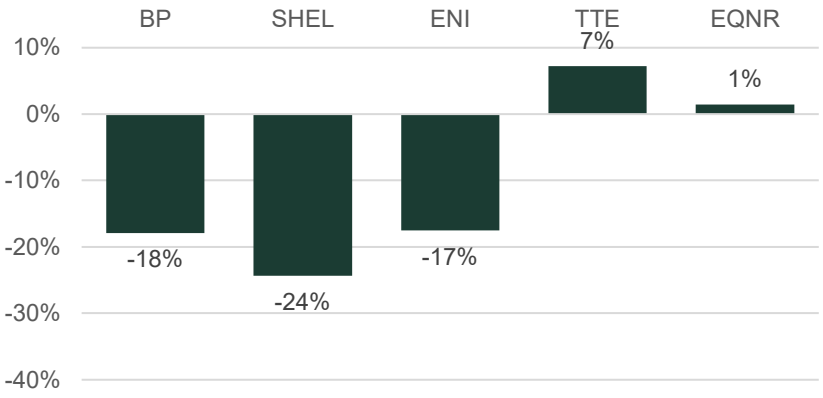
Chart: Scope 3 target, emissions reduction from FY19 to FY22 (%)



BP has achieved half of the emissions reduction required under to reach the upper end of its scope 3 target.
Eni has reached almost half of its scope 1, 2 and 3 target as of FY22.

TotalEnergies' scope 1 and 2 emissions have grown, increasing the task ahead to 11% reduction on FY19.

Chart: Total scope 3, emissions reduction from FY19 to FY22 (%)



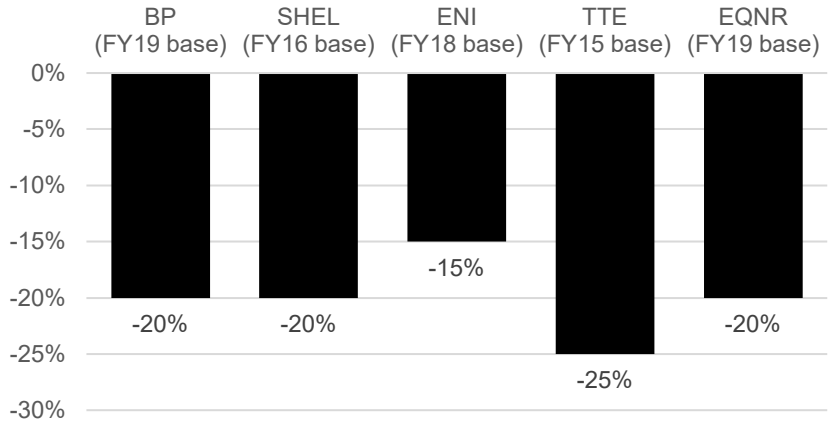
Shell has not set an absolute scope 3 target, but it has achieved the largest decline in scope 3 emissions of all the majors between FY19-22, largely as a result of divestment.

Source: Company data, Accela Research estimates

NET CARBON INTENSITY

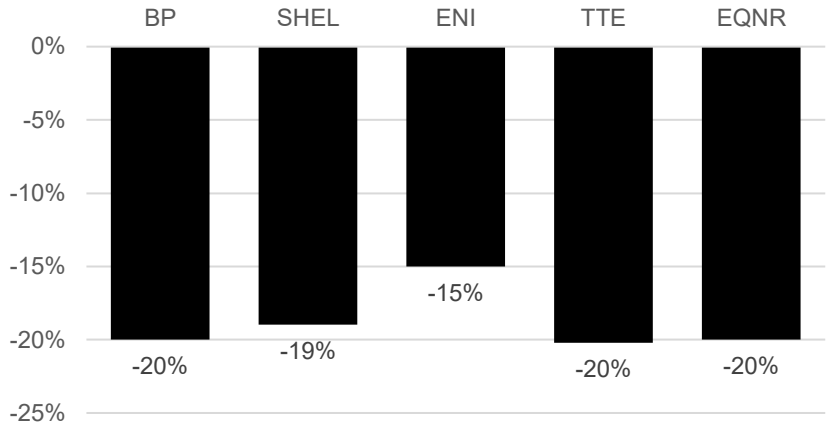
Net carbon intensity targets are similar across the majors, as they all look to reduce by ~20% from FY19. The exception is Eni, which is targeting a 15% reduction. All companies have a goal to be net zero on a net carbon intensity basis by FY50. Overall, Eni has the most ambitious targets for absolute emissions reduction, but the lowest target for net carbon intensity reduction by FY30.

Chart: FY30 net carbon intensity targets



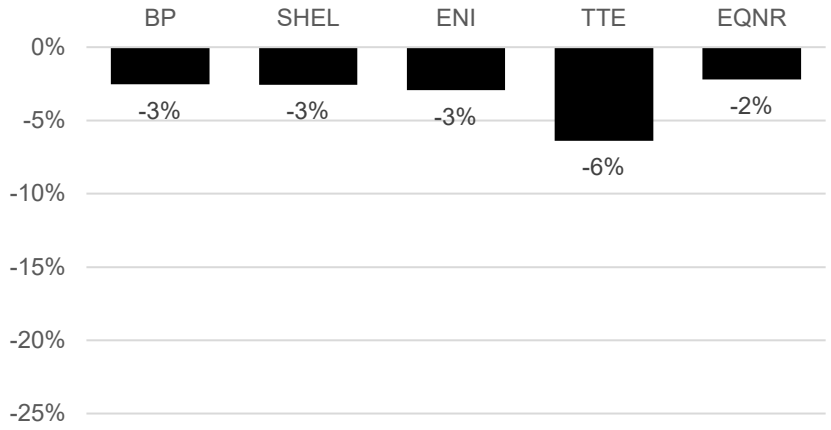
Each company has set targets to reduce net carbon intensity by FY30.

Chart: FY30 net carbon intensity targets (FY19 base)



Eni also appears to have the lowest target after re-basing to FY19.

Chart: Net carbon intensity reduction FY19 to FY22 (%)



From FY19-22 TotalEnergies has seen the largest decline in net carbon intensity, at -6% compared to -2-3% for the other majors.

Source: Company data, Accela Research estimates

CLIMATE ALIGNMENT STATEMENTS

Most European majors have stated that their emissions reduction targets are aligned with limiting warming to 1.5°C. Companies have used a diverse range of metrics to compare their targets to global decarbonisation scenarios. This section provides a review of company methodology for assessing the fitness of their existing strategies.

Key findings:

- Most company statements on 1.5°C are not verifiable due to lack of adequate disclosure for scenario selection and methodology.
- BP leads in providing a quantitative comparison between its oil and gas decline target and the Intergovernmental Panel on Climate Change (IPCC) scenarios, while other companies have limited their comparison to scope 1 and 2 emissions reduction targets.
- Shell's use of IPCC scenario data is the most difficult to verify, given it has presented a filtered and selective view of scenario results without clearly outlining its approach.

Table: Statements regarding climate scenario alignment

	BP	Shell	Eni	Total Energies	Total Energies	Equinor	Equinor
Statement on 1.5°C alignment	Yes	Yes	Unclear	Yes	Yes	Yes	Yes
Indicator of alignment	Oil and gas production	Net carbon intensity	-	Scope 1 and 2	Carbon intensity	Scope 1 and 2	Net carbon intensity
Reference scenario	IPCC (2022)	IPCC (2018)	-	IEA (2022)	IEA (2022)	IPCC (2018)	IEA (2021)[5]
Are the scenarios limited to no or limited overshoot for 1.5°C	No, contains <2°C	Unclear	-	Yes	No, contains <2°C	Yes	No, contains >2°C
Is scenario selection disclosed	Yes	No	-	Yes	Yes	Yes	Yes
Is the method able to be replicated	No	No	-	Yes	No	Yes	No

Source: Company data, Accela Research estimates

[5] Equinor, 2022 Energy transition plan (2022), page 12. The company references the International Energy Agency's (IEA) World Energy Outlook (2021) and its partial substitution method for NCI ambitions. We note that in Equinor's latest Integrated Annual Report (2022), it has reiterated its NCI alignment with the IEA's Announced Pledges Scenario (APS), but it is unclear to which version of the IEA World Energy Outlook this refers.

BP

BP relied on the latest IPCC (2022) scenarios (1.5°C with no or limited overshoot, and well-below 2°C) for assessing the Paris-alignment of its oil and gas decline target. It has commendably presented both a median and interquartile view of these scenarios.[6] Its method and disclosure could be improved by:

- Sharing the exact IPCC categories and scenarios used in making this assessment, as BP has included scenarios for "well-below 2°C". For example, whether it has used C2, return warming to 1.5°C (>50%) after high overshoot (133 scenarios) or C3 limiting warming to 2°C (311 scenarios).
- Differentiating between abated and unabated fossil fuel use. For example, whilst the median decline for gas is -10% by 2030, the IPCC also stated that the median decline for unabated gas (without CCUS) will likely be higher, at -20% by 2030.[7]

SHELL

Shell compared its net carbon intensity to an older, 2018 IPCC Special Report on Global Warming of 1.5°C.[8] Of all the European majors, its method for assessing whether existing targets are Paris-aligned is the most difficult to verify:

- It has constructed its pathway based on filtering out scenarios to ensure targets are aligned with early action and low overshoot[9] scenarios. It does not disclose which scenarios it has "filtered out" and which scenarios were selected for its pathway.
- In constructing its carbon intensity pathway, it has removed outlying values at the top and bottom of the range, which has the effect of narrowing the final pathway. It does not disclose its method or rationale for eliminating outlying values, or why the pathway needed to be narrowed.
- It has not shared the meaning of "upper and lower range" outlined in its findings (for example, whether it is the 5-95% percentile, or interquartile ranges).

TOTALENERGIES

TotalEnergies compared its scope 1 and 2 target to the International Energy Agency's (IEA, 2022) Net Zero Emissions by 2050 Scenario, and its lifecycle carbon intensity target to the IEA's (2022) Announced Pledges Scenario. We note that:

- In its 2023 Strategy, Sustainability and Climate presentation, the comparison of lifecycle carbon intensity was based on a "partial substitution methodology".[10] The company has not provided disclosure on its calculation method, and this caveat was not mentioned in its Sustainability Report which featured the same figure.
- The IEA (2022) Announced Pledges Scenario results in a temperature increase of 1.7°C by 2100, which is not aligned with the Paris Agreement's higher ambition of keeping warming to below 1.5°C.[11]

[6] BP, Sustainability Report 2022 (2022), page 24.

[7] IPCC, Climate Change 2022: Mitigation of Climate Change Technical Summary (2022), Chapter 3, page 353.

[8] Shell, Energy Transition Progress Report 2022 (2023), page 12.

[9] The period of time when warming increases past the 1.5°C temperature before it reduces.

[10] TotalEnergies, Strategy, Sustainability & Climate (2023), page 21.

[11] IEA, World Energy Outlook (2022), page 21.

EQUINOR

Equinor's use of IPCC scenarios in comparison to its scope 1 and 2 target was the most transparent among peers. It clearly indicated the scenario ensemble, the number of scenarios selected, as well as the metric by which it has compared against scenarios. Its evidence for Paris-alignment is weakened by the fact that it has chosen to compare:

- Its limited scope 1 and 2 targets to global emissions reduction from the older IPCC (2018) report.
- Its carbon intensity against the older IEA (2021) Announced Pledges Scenario, which results in a temperature increase of 2.1°C by 2100.[12] We note that in its latest Annual Report, a similar figure was provided without a clear reference to the IEA's World Energy Outlook 2021, whereas most of its commentary references the World Energy Outlook 2022.

Additionally:

- Similar to TotalEnergies, it has used a "partial substitution method" for calculating its net carbon intensity, but the company has not provided disclosure on its method or assumptions for this calculation.[13]

[12] IEA, Scenario trajectories and temperature outcomes (2021). "In the APS, the faster reduction in CO_2 emissions to around 21 Gt in 2050 has little impact on the year in which 1.5°C is exceeded, but the rise in temperature in 2100 would be restricted to around 2.1°C".

[13] Equinor, 2022 Energy transition plan (2022), page 12.

3. CAPITAL EXPENDITURE

One of the challenges of assessing the quality of company transition plans is that these are long-term aspirations with unclear near-term milestones (e.g., net zero by 2050). Furthermore, as we have seen this year with BP's emissions reduction targets, climate transition plans, just like corporate plans, are subject to change. In our view, assessing investment gives the clearest picture of the speed of transition, including the rate at which low-carbon fuels are being scaled to displace fossil fuels.

In this section, we review the capital expenditure (capex) of the European majors between FY19-22, compare changes in the financial capacity and strength of the companies (from FY19 when climate targets were first announced) and assess which company is investing most in low-carbon, upstream and midstream/downstream business segments.

KEY FINDINGS

- Increased oil and gas prices have led to record levels of free cash flow and improved financial strength (lower gearing) for European majors. They are better placed now than in FY19 to increase investment to transition businesses towards low-carbon alternatives.
- However, capital expenditure as a percentage of free cash flow has declined in FY22 in comparison to FY21 for all majors, with the exception of Shell. Peer average capital expenditure to free cash flow was 51% in FY22: Eni was highest at 83%, followed by BP 63%, and Equinor lowest at 31%.

Low carbon

- In FY22, BP, Shell and TotalEnergies spent ~$4 bn in low carbon capital expenditure; Eni €0.6 bn (ex. bioenergy and acquisitions) and Equinor $1.4 bn.
- Low carbon capital expenditure was on average 20% of total FY22 capital expenditure. TotalEnergies had the highest share of low carbon capital expenditure at 25%, followed by BP.
- Shell and Eni (ex. bioenergy and acquisitions) invested 7-9% of free cash flow in low carbon, while Equinor invested just 4%.
- In FY22, there was an increase in bioenergy acquisitions, with BP's $3 bn acquisition of Archaea Energy and Shell's $2 bn acquisition of Nature Energy (completion in FY23).

Upstream

- Between FY19-22, Equinor spent the highest proportion of capital expenditure on upstream production, ranging from 83-89%. This is not surprising for an upstream-focused business model, but demonstrates the large task to diversify that lies ahead for Equinor.
- Despite Eni's reorganisation of its business to accelerate low carbon, it is still supporting significant investment in oil and gas. Eni had the second highest percentage of capital expenditure allocated to upstream: 84% in FY19, declining to ~74%-79% over the following three years.
- Shell has spent the least of peers on upstream of the four years at 49-60% of total capital expenditure. Compared to peers (ex-Shell) over the four years of ~70-83%.
- BP has continued to decrease its share of upstream spend, reducing to 52% of total in FY22.

Midstream and downstream

- In FY22, capital expenditure for midstream/downstream increased from FY21, ranging from ~$300 m to $8 bn. BP was the only major to materially increase investment from FY19.

SEGMENT DEFINITIONS

Within this section we have used the definitions for low-carbon activities provided by each company that best reflect low-carbon investment and are most aligned across the group of majors. We have set out our understanding of the inclusions within each segment based on company disclosure. This is likely a simplified view and we expect there to be variances in how each low-carbon fuel has been defined.

The table below shows the segments we have taken from financial accounts and disclosures to build capital expenditure profiles. Note: Eni's capital expenditure by segment excludes acquisitions and bioenergy. BP and Eni also use different cuts of their business for providing capital expenditure guidance, than those we have used to analyse historical capital expenditure.

Table: Segment definitions – capital expenditure (capex)

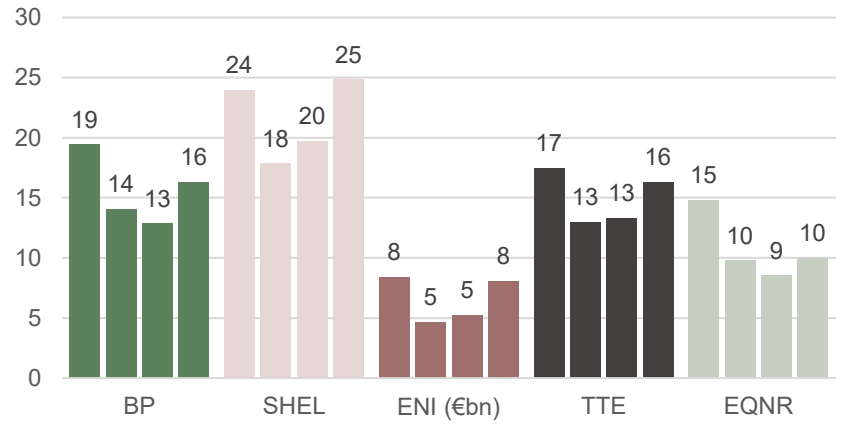
	BP	Shell	Eni (EUR)	TotalEnergies	Equinor
Scope (includes acquisitions)	✓	✓	Organic only	✓	✓
Capital expenditure FY19-22 actual					
Low carbon	**Low carbon activities**	**Low carbon energy solutions**	**Plenitude and power**	**Low carbon energies**	**Renewables and low carbon solutions**
High level inclusions	*Renewables, Hydrogen, CCUS, Power (non-fossil), Bioenergy, EV charging, Future mobility*	*Renewables, Hydrogen, CCUS, Offsets, Power, Bioenergy, EV charging*	*Renewables, Retail supply and energy, E-mobility*	*Renewables, Power, Hydrogen, CCUS, Offsets, Bioenergy, E-fuels*	*Renewables, Hydrogen, CCUS, Low-carbon power*
Upstream	Gas, Oil products and operations	Integrated gas, Upstream	Exploration and production, Global gas and LNG	Exploration and production, Integrated gas (less integrated power)	Exploration and production Norway/ International/ USA
Midstream/ downstream (ex. low carbon)	Group capex - Low carbon - Upstream				
Capital expenditure FY25-30 guidance					
Low carbon	Transition Growth Engine (above *plus* convenience, all power trading)	No guidance	Green value chain (above *plus* bioenergy)	As above	As above

Source: Company data, Accela Research estimates

GROUP CAPITAL EXPENDITURE

Across the European majors, FY22 capital expenditure was 10% lower than FY19. The only major with higher capital expenditure was Shell, increasing 4% on FY19 to $25 bn. Over the next 5-10 years, all the majors (excluding Shell) have provided specific guidance on capital expenditure. This is supported by record free cash flow, which is ~3 times greater than in FY19.

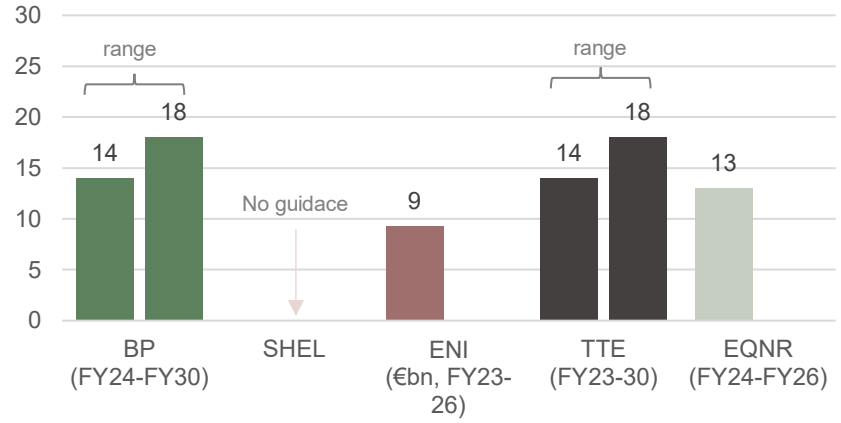
Chart: Group capital expenditure (FY19-22, US$bn, ENI €bn)



Eni had the highest growth in capex in FY22, at 54% on FY21.

Shell was the only major to exceed FY19 capex.

Chart: Group capital expenditure guidance (US$bn, ENI €bn)

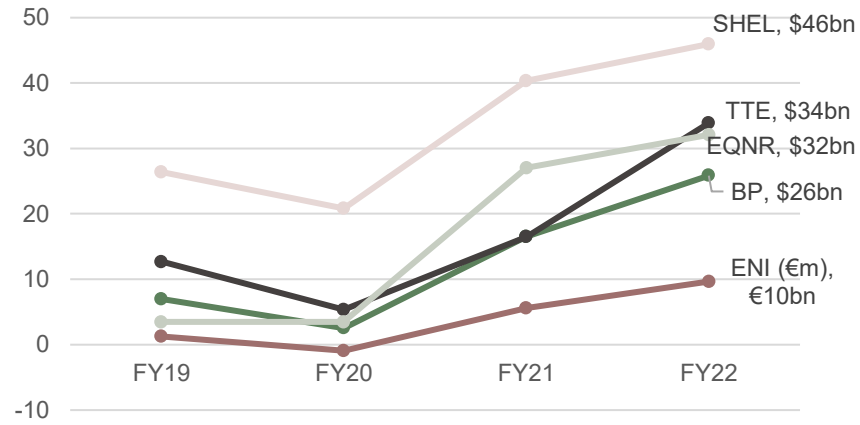


BP and TotalEnergies have capex guidance (including acquisitions) of $14-18 bn to FY30.

Eni and Equinor have increasing capex guidance to FY26.

Shell does not have capex guidance beyond FY23.

Chart: Free cash flow (FY19-22, US$bn, ENI €bn)



All the majors have benefited from higher oil and gas prices with record free cash flow.

Shell's free cash flow is highest at $46 bn.

Eni and Equinor's FY22 free cash flow increased by over 8 times on FY19.

Source: Company data, Accela Research estimates

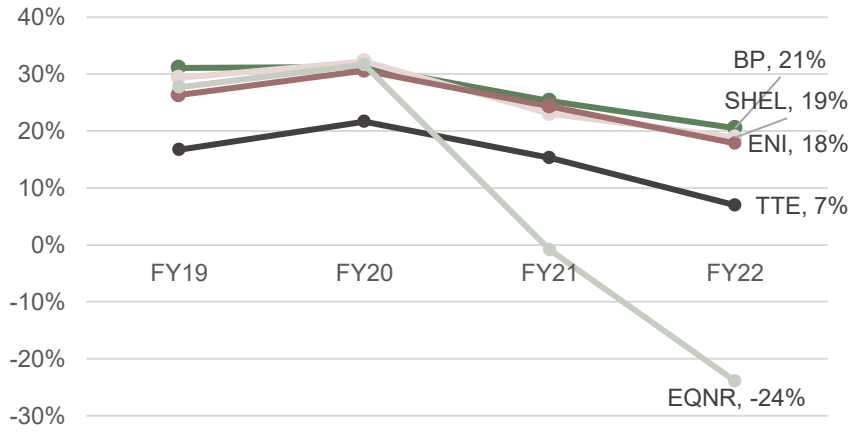
For the majors, FY19 was a period of higher investment, higher gearing (i.e., financial leverage, net debt/(net debt + equity)) and lower free cash flow generation. FY20 saw the impacts of Covid-19 and the impairment

of assets, which further increased gearing. In FY21 and FY22, however, higher oil and gas prices and a focus on lower costs improved cash flow and reduced gearing.

As of FY22, BP, Shell and Eni have gearing in the range of 18-21%, declining since FY20. TotalEnergies' gearing ratio of 7% has reduced in line with peers. Equinor has a negative net debt, driving a negative gearing ratio due to accounting for financial investments in its insurance book.

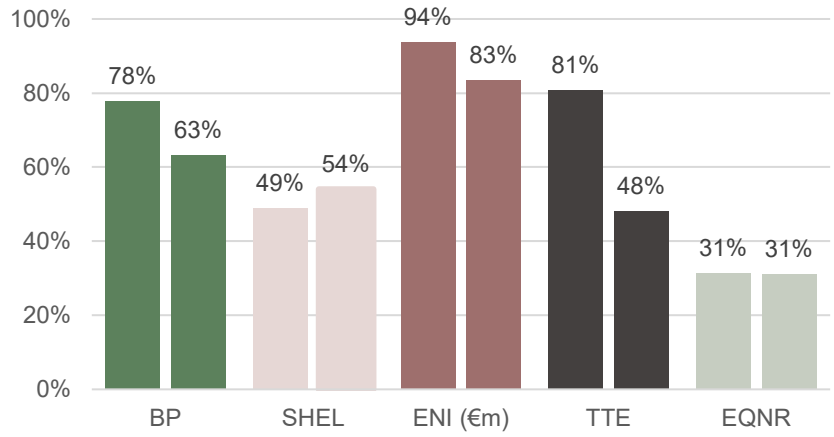
Comparing group capital expenditure to free cash flow shows Eni is investing the greatest share of cash at 83% in FY22, while Equinor appears at the lower end with cash investment at 31%. The higher free cash flow in FY22 has not led to a proportionate increase in capital expenditure across the board. Shell is the only major to have increased investment to free cash flow between FY21 and FY22, albeit from a lower base.

Chart: Gearing (net debt/(net debt + equity), %)



All majors have had declining gearing ratios since FY20.

Chart: Group capital expenditure/free cash flow (FY21, FY22)



Increases in free cash flow have not yet led to an increasing percentage of capex at BP, Eni or TotalEnergies.

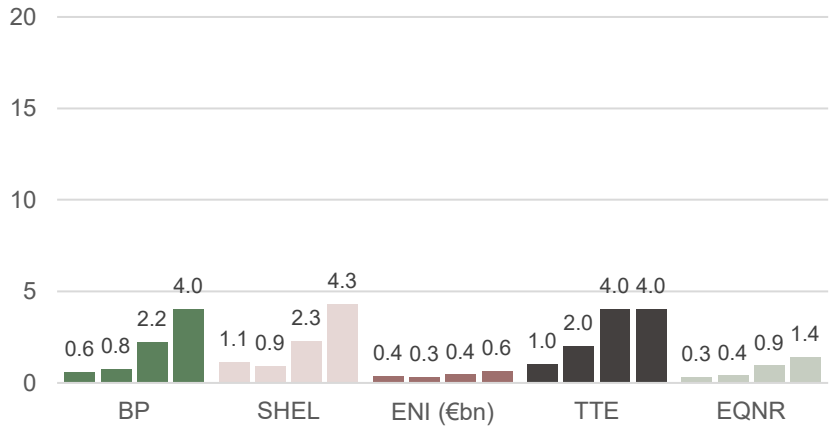
Source: Company data, Accela Research estimates

LOW CARBON CAPITAL EXPENDITURE

The European majors' low carbon capital expenditure (renewables, hydrogen, power, bioenergy – for all except Eni and Equinor) has increased 4 times on FY19, on average. BP's increase has been largest at 7 times FY19, Equinor (5 times FY19), followed by Shell and TotalEnergies (both 4 times FY19). The lowest was at Eni, which saw an increase of 2 times on FY19, although this excludes bioenergy investments which are not separately disclosed (these appear as part of midstream/downstream capital expenditure in our analysis).

Note: Shell's $2 bn acquisition of Nature Energy, the largest biogas producer in Europe, was announced in FY22 and did not complete until FY23. It will be included in FY23 capital expenditure.

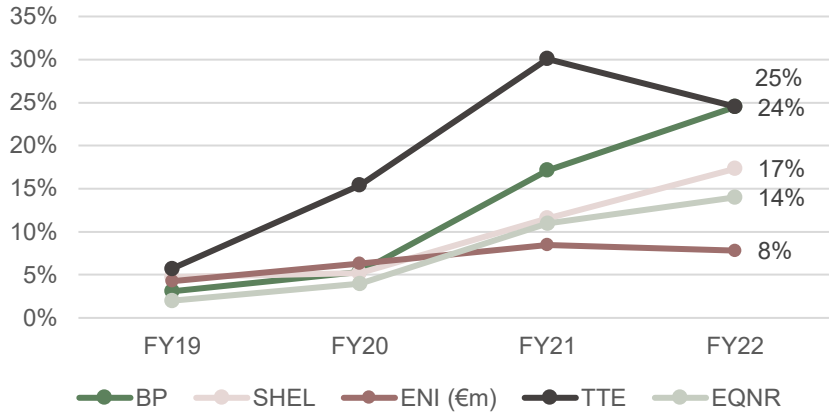
Chart: Low carbon capital expenditure (FY19-22, US$bn, ENI €bn)[14]



In FY22 Shell, BP and TotalEnergies invested ~$4 bn in low carbon capex.

Acquisitions played a key role: BP's $3 bn investment in Archaea Energy, Shell's $1.55 bn investment in Sprng Energy,[15] TotalEnergies $1.6 bn 50% stake in Clearway energy.

Chart: Low carbon segment capital expenditure (% group capex)



BP invested 24% of group capex in low carbon in FY22, increasing from 17% in FY21. TotalEnergies' low carbon capex decreased from 30% in FY21 to 25% in FY22.

Eni's low carbon capex (excluding bioenergy) was broadly flat between FY21-22 at 8%.

Source: Company data, Accela Research estimates

As a percentage of free cash flow, low carbon capital expenditure has been highest at BP, reaching 15% in FY22. TotalEnergies was 24% in FY21, which incorporates the acquisition of a $2 bn 20% stake in Adani

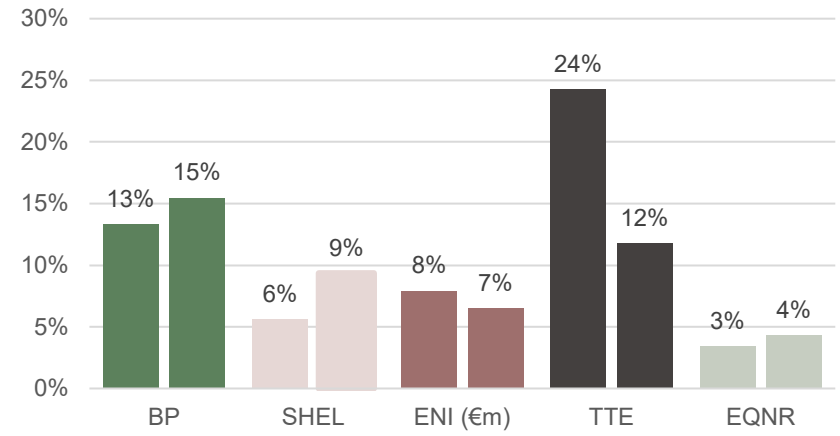
[14] BP's low-carbon activities capital expenditure for FY19 has not been disclosed, therefore we have assumed it is in line with Transition Growth Engine capital expenditure.

[15] Half of the Sprng Energy transaction value is included in cash capex: Shell, Sprng Energy Group, (2022).

Green Energy Limited. In comparison, Shell and Eni invested 7-9% of free cash flow in low carbon, while Equinor invested just 4%.

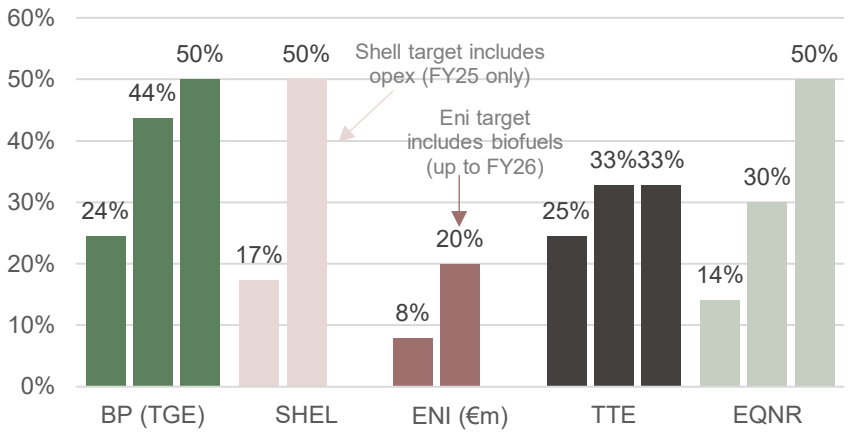
The majors' guidance for low carbon capital expenditure ranges from 20-33% of group capital expenditure by FY25. Including BP, it increases to 44% (incorporates investment in distribution), and to 50% when including Shell's definition of transition which includes capital expenditure and operating expenditure (opex). Shell is the only major that has not provided specific capital expenditure guidance for low carbon. Guidance for FY30 low carbon capital expenditure ranges from 33-50%, although definitions of what is included vary between companies.

Chart: Low carbon capital expenditure/free cash flow (%)



BP, Shell and Equinor's capex to free cash flow increased in FY22, while Eni and TotalEnergies' investment declined.

Chart: Transition investment as % of group FY22 actual, guidance for FY25, FY30



Source: Company data, Accela Research estimates

Equinor's guidance appears most ambitious as it excludes convenience and opex, indicating a higher percentage investment than BP and Shell's guidance.

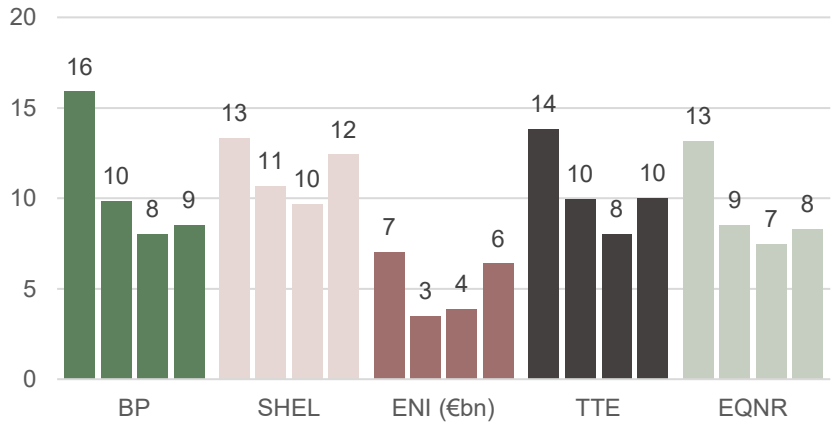
This chart shows BP's investment for Transition Growth Engines, which incorporates low carbon plus convenience.

UPSTREAM CAPITAL EXPENDITURE

Upstream capital expenditure picked up in FY22 after lower spend by the majors during Covid-19 (FY20-21). In FY22, Shell invested $12 bn in upstream, the highest of peers and just 7% below its FY19 investment. In comparison, BP's FY22 investment increase was 45% lower than the $16 bn invested in FY19.

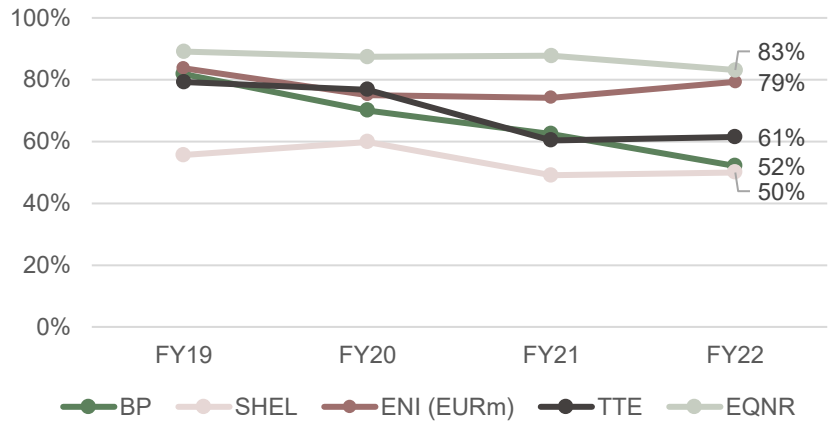
Upstream capital expenditure as a percentage of group capital expenditure ranged from 50-83% in FY22, with Equinor at the upper end, reflecting its focus on upstream and generation. Eni appears second highest with ~80% of FY22 group capital expenditure in upstream. Shell, meanwhile, has consistently had the lowest allocation of capital to upstream at around 50-60%.

Chart: Upstream capital expenditure (FY19-22, US$bn, ENI €bn)[16]



Upstream capex increased ~20% across the majors in FY22. Eni grew its investment by ~65% to €6 bn between FY21 and FY22.

Chart: Upstream segment capital expenditure (% group capex)



BP has continued to decline its share of capex invested in upstream.

Eni upstream investment increased in in FY22 to ~79% of group capex.

Source: Company data, Accela Research estimates

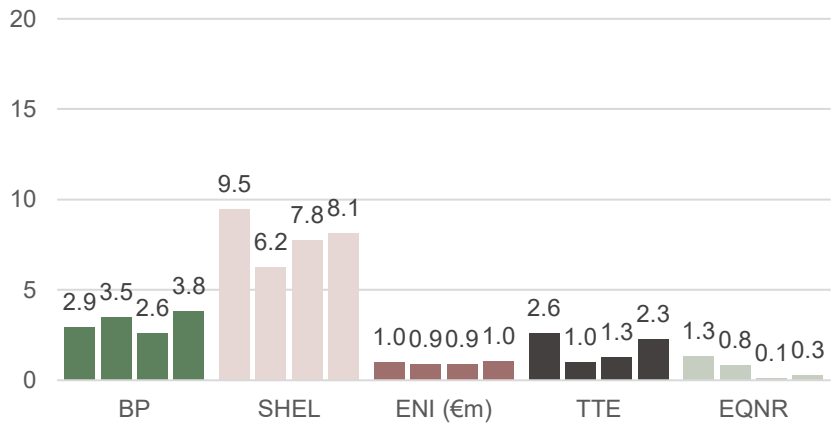
[16] BP's low-carbon activities capital expenditure for FY19 has not been disclosed, therefore we have assumed it is in line with Transition Growth Engine capital expenditure.

MIDSTREAM/DOWNSTREAM CAPITAL EXPENDITURE

Below we have combined our analysis of midstream and downstream operations (also including corporate capital expenditure), excluding capital expenditure in low carbon. Biofuel capital expenditure has been included in this section for Eni only, due to the way it discloses investment.

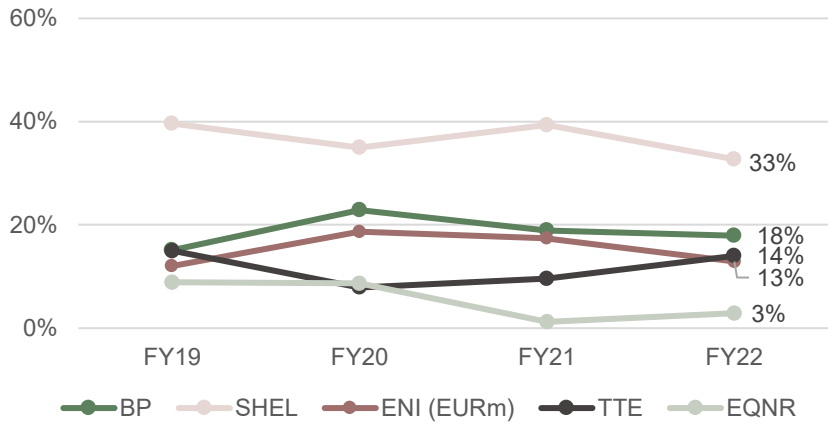
In FY22, capital expenditure for midstream/downstream increased from FY21, ranging from $300 m for Equinor to $8 bn for Shell. As expected, Equinor's capital expenditure is the lowest of the majors at 3% of group capital expenditure in FY22. Shell has invested the most in midstream/downstream capital expenditure, ranging from 33-40% over the last four years. This included Shell's acquisition of 184 fuel retail and convenience sites from Landmark group in the US.

Chart: Midstream and downstream capital expenditure (excluding low carbon, FY19-22, US$bn, ENI €bn)



There is a clear divergence in midstream/ downstream investment. Shell invests multiple times more in capex for midstream and downstream compared to peers.

Chart: Midstream and downstream capital expenditure (% total capex)



Equinor has the lowest capex in midstream and downstream, with BP, Eni and TotalEnergies investing 13-18% of group capex.

TotalEnergies increased its percentage of investment in FY21 and FY22.

Source: Company data, Accela Research estimates

4. DECARBONISATION LEVERS AND ALIGNMENT WITH 1.5°C

In this section we evaluate the credibility of existing company strategies for achieving emissions reduction targets between now and FY30. Where possible, we have considered the technological and mitigation potential of low-carbon alternatives and their respective roles in limiting global warming to 1.5°C.

DECARBONISATION LEVERS SCOPE 1 AND 2

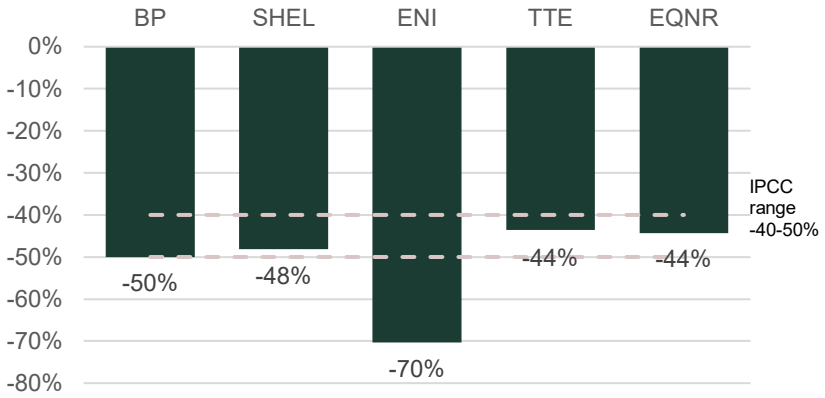
It is now standard among European majors to target absolute scope 1 and 2 emissions reduction by FY30. Each company has stated that it will use a variety of emissions reduction methods, such as:

- Portfolio changes.
- Energy efficiency improvements.
- Fuel switching (including electrification).
- Improving methane management.

KEY FINDINGS

- Current scope 1 and 2 targets are roughly in line with the global emissions decline needed to limit warming to 1.5°C, according to the IPCC, but largely immaterial in comparison to the overall emissions footprint.
- Divestments (portfolio changes) are a material driver of emissions reduction, which should be separately quantified.
- There is a need for greater quantification on how these goals will be met. None of the majors have provided information on:
    - The number of assessed abatement opportunities.
    - The costs and potential abatement using a marginal abatement cost curve.
    - The financial criteria used for selecting specific initiatives.
    - The abatement potential of specific projects.

Chart: FY30 absolute scope 1 and 2 emissions targets (re-based FY19) compared to IPCC ranges



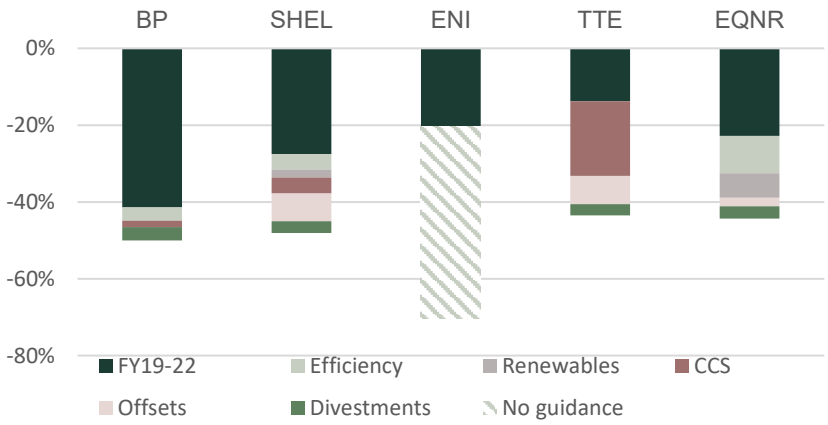
Eni has the highest scope 1 and 2 target.

All company scope 1 and 2 targets appear to fit within the range implied by the IPCC (2022) interquartile range (-40-50%).

Source: Company data, Accela Research estimates

This chart shows the change in scope 1 and 2 emissions required between FY23-30, along with the actual emissions reductions achieved to date (FY19-22) and emissions reduction levers that have been quantified by majors this year.

Chart: Quantification of scope 1 and 2 levers FY19-30



Source: Company data, Accela Research estimates

Shell and TotalEnergies appear most reliant on CCUS and offsets.

BP has the largest reduction attributable to divestments.

Equinor is focused on efficiency and renewables.

Eni's levers are not quantified. It will employ a combination of offsets, efficiency and renewables.

DECARBONISATION LEVERS SCOPE 3 AND CARBON INTENSITY

Tackling scope 3 emissions and emissions intensity requires structural changes to existing business strategies. Companies need to build new, low-carbon profit centres at a rate that matches the ambition required to shift the global economy towards a 1.5°C-aligned future, and they need to reduce oil and gas production due to the necessary constraints of a shrinking carbon budget.

As summarised in the table below, companies are using different levers to decarbonise portfolios, with a view towards leveraging areas of competitive strength, across their upstream, midstream and downstream business segments.

KEY FINDINGS

- The majority of company portfolios will remain focused on hydrocarbon production to FY30. TotalEnergies has the highest ambition for shifting towards low carbon alternatives (33% by FY30), whilst Shell has the least (9% low-carbon by FY30). For Shell, we have assumed it produces 16GW (Shell's FY22 pipeline up to medium maturity) of its 70GW supply target and no hydrogen.
- Current strategies are orientated towards making core hydrocarbon businesses more resilient, rather than finding competitive value in a diverse range of products for a low carbon economy.
- BP is the only company that has committed to declining oil and gas production.
- Shell, Eni and TotalEnergies are all looking to retain oil and gas production, whilst diversifying into new low carbon markets downstream.
- Equinor seeks to leverage its oil and gas upstream operational expertise to focus on offshore wind, carbon capture, utilisation and storage, and hydrogen.

Table: Targeted decarbonisation levers by FY30

Company	Upstream Oil and gas production FY30	Upstream Production of low-carbon fuels	Midstream Low-carbon transport and storage infrastructure	Downstream refining Refining low-carbon fuels	Downstream distribution Customer-facing activities
BP	Decreasing	Renewables, Hydrogen		Bioenergy	EV charging
Shell	Increasing, Shifting portfolio from oil to gas	Renewables (delivery target only), Hydrogen (not quantified), CCUS		Bioenergy	EV charging, Power delivered to customers, Carbon offsets
Eni	Increasing	Renewables, CCUS, Hydrogen (FY50 target)		Bioenergy	EV charging
TotalEnergies	Increasing, Maintaining oil, Increasing gas	Renewables, Hydrogen, CCUS	Electricity storage	Bioenergy	EV charging, Carbon offsets
Equinor	Maintaining	Renewables, CCUS, Hydrogen (not quantified)			

Company data, Accela Research estimates

Table: European majors' energy production portfolio implied by targets

		BP	Shell	Eni	Total Energies	Equinor	Average
FY22							
Renewables	TJ	69,379	70,325	69,320	530,972	18,922	151,783
Bioenergy	TJ	41,031	29,464	21,432	9,552	-	20,296
Hydrogen	TJ	-	-	-	-	-	-
Oil and Gas production	TJ	5,034,162	6,394,324	3,595,830	6,175,920	4,553,974	5,150,842
Total	**TJ**	**5,144,572**	**6,494,113**	**3,686,582**	**6,716,443**	**4,572,896**	**5,322,921**
% oil and gas	*%*	*98%*	*98%*	*98%*	*92%*	*100%*	*97%*
% low carbon	*%*	*2%*	*2%*	*2%*	*8%*	*0%*	*3%*
FY30							
Renewables	TJ	315,360	504,576	473,040	3,153,600	504,576	990,230
Bioenergy	TJ	207,709	196,424	197,350	131,205	-	146,538
Hydrogen	TJ	84,000	-	-	120,000	-	40,800
Oil and Gas production	TJ	4,466,870	7,196,065	4,206,613	6,918,482	4,553,974	5,468,401
Total	**TJ**	**5,073,939**	**7,897,065**	**4,877,003**	**10,323,28**	**5,058,550**	**6,645,969**
% oil and gas	*%*	*88%*	*91%*	*86%*	*67%*	*90%*	*82%*
% low carbon	*%*	*12%*	*9%*	*14%*	*33%*	*10%*	*18%*

Company data, Accela Research estimates

In the next section, we will examine the adequacy of current company targets, performance, strategies and each low-carbon fuel's role in achieving a 1.5°C future.

Use of scenarios in assessing climate ambition

In this section, we draw on findings from IPCC, IEA and BloombergNEF (BNEF) scenarios that illustrate possible pathways towards limiting global temperature rise to 1.5°C between now and 2030. However, we caution that scenarios are a useful but imperfect tool for assessing the level of corporate ambition needed to support the global transition to a low-carbon economy. This is because scenarios, in general:

- Are experimental designs that illustrate an ensemble of opportunities that could be drawn on to decarbonise; they do not indicate a likely or consensus view. In particular, the latest ensemble of IPCC 1.5°C scenarios with no or limited overshoot (C1, 97 scenarios) illustrate a range of possible pathways to achieving 1.5°C, based on different assumptions of costs, technology learning rates and macroeconomic conditions. Not all scenarios achieve net zero carbon emissions in the energy sector by 2050. In comparison, the IEA designed its scenario to ensure the energy sector reaches net zero carbon emissions by 2050, which entails greater renewable energy generation, along with improved energy efficiency and reduced energy demand.
- Vary between the level of temperature limitations and the likelihood of achieving such a limit between now and 2100.
- Are not designed to specifically consider the physical, technological and financial limitations of technologies such as bio-sequestration and carbon capture, utilisation and storage, nor do they consider the equity and justice aspects of a global transition.

Given the wide range of uncertainties facing the global energy system, and the fact that current scenarios at best provide a 50% chance of limiting warming to 1.5°C, we believe the lower range of scenario outcomes should best serve as a guardrail for minimum, rather than maximum, corporate ambition.

OIL AND GAS PRODUCTION

KEY FINDINGS

Increasing oil and gas production is incompatible with the urgent need to decarbonise global power generation and transportation. The necessary rate of decline for oil and gas is influenced by the rate of global coal phase out in emerging economies, and an equitable transition may require a more urgent oil and gas production decline from economically more developed nations.[17] Yet, most European majors plan on increasing oil and gas production until FY30. Of the five companies:

- BP is still leading the way in terms of commitment to reducing production. Its downgraded 20-30% target is roughly aligned to the IPCC's median view of oil and gas decline, but below IEA's view that unabated oil and gas must decline by ~30% by FY30 (from FY21).
- Equinor has stated it will maintain, but not grow, production between now and FY30.
- Shell, Eni and TotalEnergies will likely increase in overall oil and gas production between now and FY30, with some portfolio changes that largely focus on growing shares of gas production.

TARGETS AND PERFORMANCE

The table below summarises the guidance provided for oil, gas and LNG growth from FY25 to FY30. We note that Shell's statements regarding oil and gas production were last provided in 2022 and are likely to be updated this year when Shell's new CEO Weal Sawan presents Shell's updated strategy.

Table: Oil and gas targets FY25 onwards

Company	Metric	Year	Target
BP	Upstream production	FY25	~2,300 k boe/d
	Upstream production	FY30	~2,000 k boe/d
	LNG portfolio	FY25	25 Mtpa
	LNG portfolio	FY30	30 Mtpa
Shell	Oil production - peak	Peak	FY19
	Oil production	FY30	-1-2% decline FY21-FY30
	Gas production/LNG	FY30	55% hydrocarbons from gas; 7 Mtpa new LNG capacity between FY19-25
Eni	Upstream production	FY30	3-4% CAGR FY22-26, plateauing to FY30
	Gas share of production	FY30	60%
	Contracted LNG	FY26	18 Mtpa
TotalEnergies	Oil production	FY30	~1,400 k boe/d
	Oil product sales (not total petroleum sales)	FY30	~1,400 k boe/d
	LNG production (equity)	FY30	40% growth (FY21 base)
Equinor	Oil and gas production	FY30	Maintained until FY30 (2,039 k boe/d in FY22)

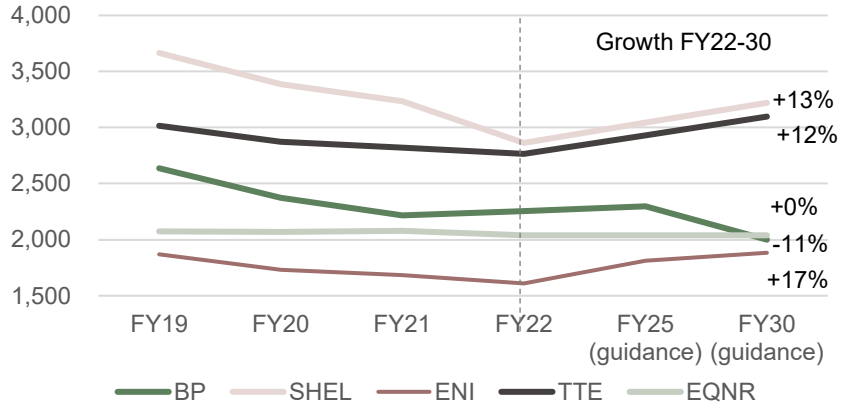
Company data, Accela Research estimates

Taking these guidance statements, we have outlined a potential profile for oil and gas production to FY30. This shows Shell continuing to produce the highest volume of oil and gas to FY30 (13% growth FY22-30),

[17] Muttitt G, et al., Socio-political feasibility of coal power phase-out and its role in mitigation pathways (2023).

followed by TotalEnergies (12% growth FY22-30). Equinor and BP are guiding to a similar level of production by FY30. Eni is expected to have the highest growth in oil and gas production +17% from FY22-30.

Chart: Oil and gas production (k boe/d)



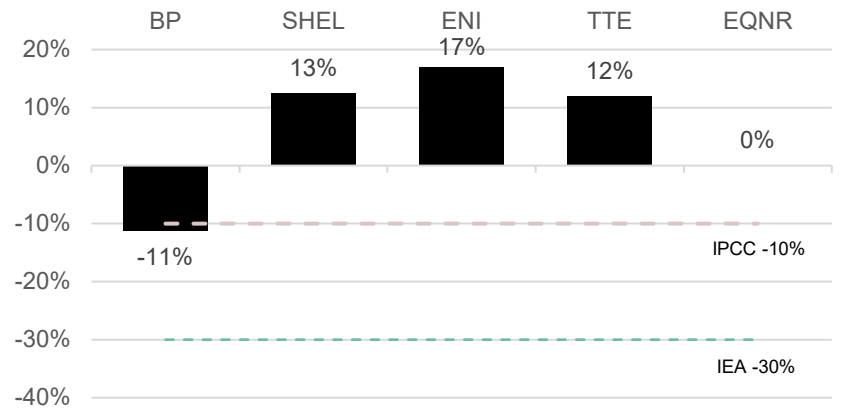
Company production has declined or remained stable in recent years. However, all but BP and Equinor look to increase overall production between FY22-30.

Source: Company data, Accela Research estimates

ALIGNMENT WITH 1.5°C

Expansion in oil and gas production, as well as any associated infrastructure, is not aligned with limiting warming to 1.5°C. The IPCC found that existing and planned coal, oil and gas infrastructure already exceed the carbon budget for limiting warming to 1.5°C.[18] Similarly, the IEA found that no new oil and gas fields can be approved if demand follows a net zero pathway, which requires a significant decline of unabated use of oil and gas.[19] Plans to increase gas production are particularly problematic. In 2022, the IEA updated its views on the role of gas in a net zero pathway to consider the impacts of Russia's invasion of Ukraine. Prior to the update, gas held a larger share of the global energy mix in the short term. Now, the IEA sees unabated gas declining by ~30% between 2021-30 due to energy security supply concerns.[20]

Chart: Oil and gas production guidance FY22-30 compared to IPCC & IEA



All except BP and Equinor have plans to increase oil and gas production, out of alignment with recommendations of the IPCC[21] and IEA[20] (for the IEA, this figure represents the decline of unabated oil and gas demand from FY21).

Source: Company data, Accela Research estimates

[18] IPCC, Climate Change 2022: Mitigation of Climate Change Technical Summary (2022), page 68.

[19] IEA, Net Zero by 2050 (2021).

[20] IEA, World Energy Outlook (2022), page 128.

[21] IPCC, Climate Change 2022: Mitigation of Climate Change Technical Summary (2022), Chapter 3, page 353.

BIOENERGY

KEY FINDINGS

Though oil and gas companies' existing capabilities in refining and distribution of gas give them a natural advantage in expanding the production and sale of biofuel and biogas, the role of bioenergy in achieving 1.5°C alignment is debated. This is due to the uncertainty of its overall emissions impact once competition with food production and its contribution to land use change is considered.[22] Current targets indicate:

- Of the European majors, all but Equinor have ambition to increase bioenergy as a low-carbon energy product by FY30.
- BP, Shell and Eni have all set similar bioenergy production targets to reach ~90 k boe/d by FY30; 5 times, 9 times and 7 times current volumes, respectively.
- Ambitious plans for growing bioenergy production need to be carefully designed to consider the sustainability of feedstock and prioritise decarbonisation of hard-to-abate sectors (such as aviation, shipping and industry).
- As companies try to produce more second-generation materials for fuel production, there might be a shortage of waste and residual oils and fats that are in high demand for making biodiesel, renewable diesel and sustainable aviation fuel.

Bioenergy represents a wide variety of fuels, each with distinct end-use cases and emissions profiles. A more detailed description of companies' plans is necessary to evaluate the contribution that investments will make towards reducing global emissions.

TARGETS AND PERFORMANCE

In the table below we summarise the guidance provided for bioenergy production and supply pre-FY30. For BP, we have assumed the amount of biogas supply that may come from equity production.

Table: Bioenergy targets FY25 onwards

Company	Metric	Year	Target
BP	Biofuels production	FY25	~50 k b/d
	Biofuels production	FY30	~100 k b/d
	Biogas supply volumes	FY25	~50 k boe/d
	- assumed equity		20 k boe/d
	Biogas supply volumes	FY30	~70 k boe/d
	- assumed equity		35 k boe/d
Shell	Bioenergy production (k b/d)	FY30	Produce 8 times more low-carbon fuels by FY30 (2.5 bn litres in 2021, assume ethanol)[23]
Eni	Biorefining capacity	FY25	>3 Mtpa
	Biorefining capacity	FY30	>5 Mtpa
TotalEnergies	Biofuels - SAF	FY30	1.5 Mtpa
	Biogas	FY30	20 TWh/yr of biomethane production
	Biofuels distributed	FY30	15 Mt (from 3.3 Mt in FY22)
Equinor	n/a		

Company data, Accela Research estimates

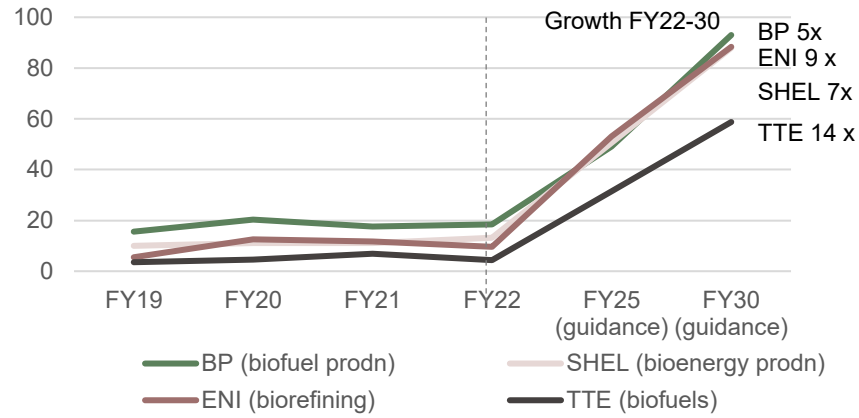
[22] Jeswani, Harish K, et al., Environmental sustainability of biofuels: a review (2020).

[23] Shell disclosed this target in 2022 in its FY21 sustainability report, but it has not appeared in the company's FY22 disclosure.

We have integrated bioenergy guidance statements to estimate a potential profile of bioenergy production up to FY30, transforming the current reported production into thousands of barrels of oil equivalent per day (k boe/d). In cases where the types of bioenergy and the resulting portfolio mix are not specified, it is assumed that the volumes reflect the dominant fuel types of existing and pipeline projects. In FY22, BP seems to have the highest bioenergy production, at 18 k boe/d.

By FY30, BP, Eni and Shell are anticipated to produce approximately 90 k boe/d, while TotalEnergies is expected to produce around 60 k boe/d.

Chart: Bioenergy production targets (k boe/d)



BP, Eni and Shell have guided to similar FY30 production targets in absolute terms (~90 k boe/d).

Source: Company data, Accela Research estimates

STRATEGY

European majors have a natural advantage in developing bioenergy as an alternative product given their:

- existing expertise in liquid fuel and chemical engineering,
- access to business customers, and
- adaptable production process to existing assets and infrastructure.

However, bioenergy's carbon neutrality and its role in the energy transition is debated.[24] Its potential to contribute to a 1.5°C alignment depends critically on:

- source of feedstock,
- conversion pathways,
- energy use for production and transport,
- land use changes, and
- economic alternatives for emissions reduction at its end use.

[24] IPCC, Climate Change 2022: Mitigation of Climate Change Technical Summary (2022), Chapter 7.

The table below summarises the strength and gaps of existing company portfolios.

Table: Comparative strength and gaps of company bioenergy portfolios

Energy	BP	Shell	Eni	TotalEnergies
Biofuel	Biodiesel: Acquired 40% of UK's Green Biofuels for HVO fuels Nuseed: Signed 10-year strategic agreement for non-food cover crop production for biofuels Cherry Point Refinery: Doubling renewable diesel capacity	Raizen: Acquired a 44% stake in Raizen, which delivers 9.5 billion litres of biofuels and 3 billion litres of ethanol in Brazil Energy and chemical parks: Pursuing conversion of refineries including Norco, Scotford, Pernis, Rheinland, Pulau Bukom.	Biorefineries: Operates two in Gela and Venice (Italy) that process vegetable oils into biofuels Feasibility studies: Being conducted for the construction of two new biorefineries	La Mede Refinery: Converted French asset into a biorefinery Fonroche Biogaz: Acquired French company that develops anaerobic digestion units
SAF	SAF: Established strategic agreements with DHL (Germany) and Rolls-Royce (UK) Aberdeen International Airport: Provided the first commercial delivery of SAF	Biofuels facility: Being developed in the Netherlands to produce SAF and renewable diesel using waste and sustainable vegetable oils	SAF: Currently producing at Taranto and Livorno refineries. Plans to expand to Gela and Venice bio-refineries by 2024, with a combined capacity of 200 t/year	Grandpuits: Plans to transform Grandpuits into a biorefinery to produce SAF, renewable diesel and naphtha.
Biogas	RNG: Acquired US producer Archaea Energy	Nature Energy Biogas: Completed acquisition of Danish producer Bio-LNG Plant: Commenced production in the Netherlands	Biogas: Acquired FRI-EL Biogas Holding, with plan to supply over 50 bcm/year when fully operational	Veolia (France): Agreed to produce biogas from waste and water treatment facilities PGB acquisition: Biogas producer based in Poland (announced)
Strength	Feedstock quality: Projects focus on waste and residues or second-generation energy crops to avoid competition with food and land use, and meet greenhouse gas and feedstock policy objectives in the US and Europe[25]	Feedstock quality: Expansion into biogas made from waste and residual products Raizen is expanding into producing biofuel from non-food crops	Palm oil: Ended the use of palm oil at biorefineries in 2022	Palm Oil: Committed to stop sourcing in 2023 and aims to increase the share of circular feedstock to over 75% from FY24 Feedstock quality: Expanding into biogas from waste products with Fonroche Biogaz and Veolia
Gaps	Land Use: Crops like Nuseed may still compete for land use	Sugarcane: Growing sugarcane may compete with land use,	Targets: For biorefinery capacity, rather than production	First-generation feedstock: Reliance on first-generation

[25] IEA, Renewables 2022, 'Is the biofuel industry approaching a feedstock crunch?' (2022).

	if they require "relatively flat, fertile lands"[26] Biomass: Growth on degraded or marginal land can be cost-effective but limited in scale[27] Feedstock demand: Most used waste and residual oils/fats, used as feedstock, are approaching supply limits, according to the IEA[28]	which could lead to a net loss of carbon sinks (deforestation, land degradation) Future physical climate impacts: May affect availability and sequestration potential of organic feedstock. In general, yields are expected to decline in low latitudes and increase in high latitudes		feedstock may have land use change implications, compete with food production, and is likely insufficient for meeting the EU Renewable Energy Directive's emissions reduction requirements[29]

Source: Company data, Accela Research estimates

ALIGNMENT WITH 1.5°C

Net zero scenarios agree that bioenergy demand will likely increase between now and 2030. They differ in the significance of bioenergy growth due to different assumptions on end use uptake, timescale of adoption, and its competitiveness in comparison to other low-carbon alternatives. Of the three scenarios reviewed, BNEF has the lowest demand assumptions for bioenergy, and IEA the highest.

Today, the amount of global bioenergy produced is estimated at 41 EJ (18.4 M boe/d), mostly for modern bioenergy (excluding the traditional use of biomass for cooking). In comparison to global growth over recent years, company targets are orders of magnitude higher than what the global scenarios indicate is necessary for alignment with 1.5°C (each company is starting from a relatively low base, looking to grow 7 times to ~90 k boe/d by 2030). These significant growth plans require a system-wide view for targeting customer demands in a net zero economy, to avoid unnecessary land use changes and competition with food production. Companies should prioritise:

- Delivering biofuels to hard-to-abate sectors with limited electrification options, such as aviation, shipping and heavy industry.
- Minimising competition in end uses that have viable low-carbon alternatives, such as biogas for power generation and heating in buildings.
- Consideration of the emissions impact of any land use change in the overall lifecycle of biofuel production.

[26] World Resources Institute (WRI), Avoiding bioenergy competition for food crops and land (2015).
[27] IPCC, Climate Change 2022: Mitigation of Climate Change (2022) Chapter 7, page 644.
[28] IEA, Renewables 2022, 'Is the biofuel industry approaching a feedstock crunch?' (2022).
[29] Jeswani, Harish K, et al., Environmental sustainability of biofuels: a review (2020).

Table: Global 1.5°C scenarios for biofuels by 2030

Scenario	Growth in 2030 (% relating to recent years)[30]	Scenario commentary
IPCC: Primary energy from modern biomass	75% (interquartile range: 55%, 130%)	Bioenergy could be valuable to sectors with limited fossil fuel alternatives (such as aviation, heavy industry, production of chemicals and products). However, bioenergy's long-term role in low-carbon energy systems is uncertain due to the sustainability concerns of bioenergy crops, greenhouse gas emissions associated with increased fertilizer and energy requirements, and the current lack of competitiveness for large-scale production of advanced processes.[31]
IEA: Energy supply from modern bioenergy	86%	In absolute terms, the consumption of bioenergy in end-use sectors remains broadly stable from today to 2050. By 2050, a-third of bioenergy is used in the power sector and more than one-third is used in industry and buildings. Aviation and shipping are the largest contributor to the rise in liquid biofuel demand, as road transport is increasingly electrified.
BNEF: Primary energy from bioenergy	11%	Limited growth in bioenergy for power generation and transport; "eclipsed by the rise of EVs".[32] Contributes 10% to industrial decarbonisation, along with electrification, hydrogen, CCUS and recycling.[33]

Source: Company data, Accela Research estimates

[30] Different base years are provided by global scenarios. Given near-term production remained low between 2019-2021, exact numbers are assumed to be immaterial. Percentage change is provided according to the base years available in the scenarios.

[31] EPA, Economics of biofuels.

[32] BNEF, Race to Net Zero: The Coming Downfall of Gasoline in Five Charts (2022).

[33] BNEF, Net Zero Industry Requires Exponential Growth From Carbon Capture, Hydrogen and Clean Power (2023).

RENEWABLES

KEY FINDINGS

Increasing the share of renewable energy generation and growing electrification are essential for limiting global warming to 1.5°C. European majors have all set renewable generation targets for FY30, but there is a need for clearer definitions and guidelines for company disclosures on the generation, use and delivery of renewable energy. Among the companies:

- Only Equinor has disclosed the commercial terms (reliance on Purchasing Power Agreements and Renewable Energy Certificates) of its renewable energy portfolio.
- TotalEnergies leads in current and future generation of renewables, while BP has the lowest generation ambition.

In addition to investing in renewable energy generation, the energy transition will require investments in balancing options such as storage, transmission and distribution, and demand management. Companies should explore investment opportunities across the system services that greater electrification will entail. While most companies have committed to expanding their share of electric vehicle (EV) charging, with Shell having the most ambitious target of aiming to deliver 2.5 million charging points by FY30, TotalEnergies is the only company to have set a storage target for the same year.

TARGETS AND PERFORMANCE

In our table below we have summarised guidance provided for renewable production and supply pre FY30.

Table: Renewable targets (FY25, FY30)

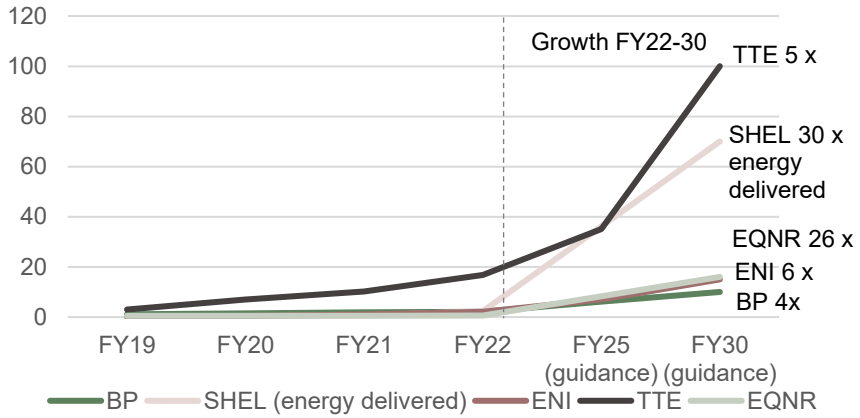
	Metric	Year	Target
BP	Developed renewables to FID	FY25	20 GW
	Developed renewables to FID	FY30	50 GW
	Installed renewables capacity	FY30	~10 GW
Shell	Renewables delivered (GW)	FY30	~70 GW (50 million households)[34]
Eni	Renewables (installed capacity, Plenitude)	FY26	7 GW
	Renewables (installed capacity, Plenitude)	FY30	>15 GW
TotalEnergies	Renewables (gross installed capacity)	FY23	>22 GW
	Renewables (gross installed capacity)	FY25	35 GW
	Renewables (gross installed capacity)	FY30	100 GW
Equinor	Renewables (installed capacity)	FY30	12-16 GW (equity basis)

Source: Company data, Accela Research estimates

We have incorporated renewable guidance statements to outline a potential profile of renewable energy production to FY30. We note that Shell's target is for renewable energy delivered, rather than installed capacity, and is likely reliant on renewables generation within electricity grids. Therefore, Shell's targets may not add as much renewable generation as other companies.

[34] Shell disclosed this target in 2021 in its FY20 energy transition report, but it has not appeared in the company's FY21 or FY22 disclosure.

Chart: Renewable production targets (GW)



TotalEnergies leads with the highest renewable energy target at 100 GW by FY30, having already achieved 20% of its target to date.

Source: Company data, Accela Research estimates

The table below compares renewable energy targets and the current pipeline of majors as of FY22.

Table: Renewables pipeline FY22 compared to targets (FY25, FY30, GW)

Company	FY22 pipeline	FY25 target	FY30 target	FY30 pipeline/targets
BP	43 GW	20 GW FID	~10 GW installed capacity 50 GW FID	86% of FID target
Shell	51 GW	-	~70 GW (50 million households)	73%
Eni	11 GW	7 GW capacity (FY26)	15 GW installed capacity	73%
TotalEnergies	69 GW	35 GW installed capacity	100 GW installed capacity	69%
Equinor	9.5 GW	-	12-16 GW (equity basis)	79%

Source: Company data, Accela Research estimates

- BP is currently leading the majors with 86% of its renewables final investment decision (FID) target achieved. It is important to note that BP's target capacity is solely for a portfolio at the FID level, rather than installed capacity. All other European majors have set higher installed capacity targets than BP.
- Equinor is the closest to BP with 79% of its target within the pipeline. Both Shell and Eni are trailing at 73%.
- TotalEnergies has the most ambitious target among peers. Its pipeline is at 69% of its FY30 target.

STRATEGY

All the European majors have established renewable energy generation targets for FY30. However, to demonstrate the credibility of their claims, these companies should provide clearer definitions and guidelines for what they classify as renewable energy generation and usage. Besides Equinor, which has commendably disclosed the commercial terms of its renewable energy portfolio,[35] no other major has provided sufficient information for assessing the exclusive ownership of renewable generation attributes. This leaves open the possibility that renewable energy certificates (RECs) associated with renewable energy

[35] Equinor, Renewable Energy Asset Facts (2022).

generation could be traded and purchased,[36] even though this has been demonstrated to lack additionality and to threaten the integrity of net zero targets.[37]

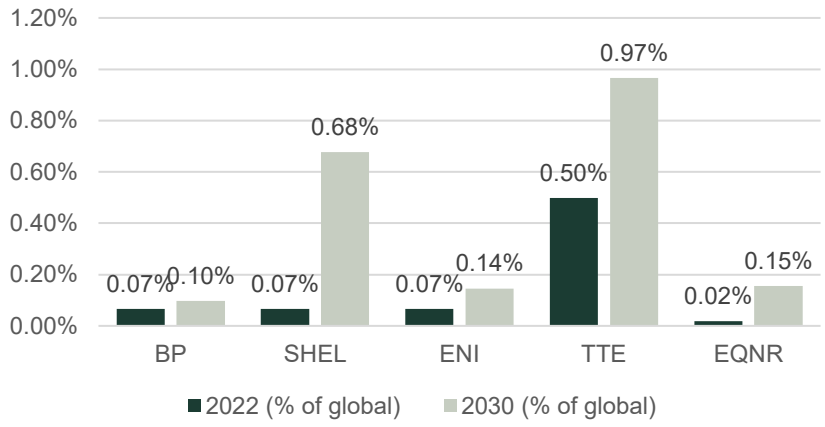
Guidance provided by the RE100 credibility claims paper[38] outlines the following requirements:

- Provision of third-party verified renewable energy usage/generation data.
- Provision of generation and usage claims supported by all attributes to demonstrate that the attributes have not been sold off, transferred or claimed elsewhere. (For example, carbon attributes are sometimes separate from power generation attributes and can be sold off separately in some regions, in which case, ownership and retirement of all instruments need to be demonstrated to make a renewable energy usage claim.)
- Evidence of exclusive ownership and claims on attributes, along with clear disclosure of any limitations on the geography or vintage of renewable energy generation.

ALIGNMENT WITH 1.5°C

Today the amount of renewable energy capacity (not including biofuels) is ~3,100 GW.[39] Scenarios agree that increasing the share of renewable energy generation and growing electrification are essential elements of a net zero pathway. Both the IEA and BNEF see total renewable energy generation reaching over 10,000 GW by 2030, a ~230% increase from current levels. It is also notable that the IEA has suggested that, as of 2022, the announced expansion of solar PV production capacity would be sufficient to achieve its Net Zero by 2050 Scenario, if delivered on time.[40]

Chart: Share of current and future renewable capacity (GW, %)[41]



Source: Company data, Accela Research estimates

TotalEnergies leads in its current and future generation of renewables, however its ambitious plans for FY30 still only account for less than 1% of global generation vs our estimated 3% of oil and gas production by FY30 (IEA NZE).

In comparison, BP has the lowest ambition to grow its share of global generation.

We note that renewable energy generation is just one element of the energy transition. As the share of renewables increase in energy systems, so will the demand for balancing options in the energy systems, such as:

[36] For example, if a company installs 10 GW of solar generation and sells off the renewable energy certificates to a third party, the company may claim 10 GW of renewable energy generation in its target, and the third party may claim 10 GW of renewable energy use for its target, leading to double counting. Similarly, purchasing renewable energy certificates separately to physical power generation does not encourage the additional production of new solar or wind generation.

[37] Bjorn, A, Renewable energy certificates threaten the integrity of corporate science-based targets (2022).

[38] RE100, Making credible renewable electricity usage claims (2016).

[39] IEA, World Energy Outlook (2022).

[40] IEA, World Energy Outlook (2022).

[41] Assumed global capacity is 3,372 GW for 2022 IRENA, 10,349 GW for 2030 IEA's Net Zero Emissions by 2050 Scenario (NZE) (2022).

- Storage.
- Transmission and distribution.
- Demand management.

Investments in electricity generation, including transmission, distribution and electrification, need to reach 2-5 times existing averages. Of the five majors, TotalEnergies is the only company to set electricity storage targets for FY30 (~5 GW).

Beyond renewable energy generation, there is also considerable investment required for the electrification of the transport system. The IPCC estimates that an annual investment increase in transport need to be 7 times above the current average is needed between now and 2030 for scenarios that limit warming to 2°C or lower. The table below outlines existing company targets for electric charging. Of the European majors, Shell has the most ambitious target to operate more than 2.5 m charging points by FY30. Eni is the only major with targets for fusion.

Table: Power delivery targets

Company	Metric	Year	Target
BP	Electric vehicle charging points	FY25	>40,000
	Electric vehicle charging points	FY30	>100,000
Shell	Power delivered (TWh)	FY30	560 TWh of electricity sold by FY30
	Electric vehicle charging points	FY30	Operating more than 2.5 m charging points
	Electricity sales	FY30	Doubling from FY20
Eni	Fusion	FY25	Pilot plant in FY25
	Fusion	FY30	ARC, first industrial fusion power plant, by early 2030s
	Electric vehicle charging points	FY26	30,000
	Electric vehicle charging points	FY50	160,000
	Energy produced	FY22-26	+4-5% CAGR (2022 to 2026)
TotalEnergies	Energy produced	FY30 (FY22 base)	Growth 4% pa
	Electric vehicle charging points	FY30	150,000, increase from >25,000 in 2021
	Net electricity production (equity interest)	FY25	>50 TWh
	Net electricity production (equity interest)	FY30	130 TWh
Equinor	n/a		

Source: Company data, Accela Research estimates

HYDROGEN

KEY FINDINGS

In the long term, renewable hydrogen can be a useful and versatile low-carbon fuel for reducing emissions in difficult-to-decarbonise sectors. However, only a few major European companies have set specific targets for hydrogen production by FY30, and insufficient information is available by which to assess current performance. We find that:

- Hydrogen presents a valuable opportunity for oil and gas companies to leverage their traditional capabilities across the value chain, from upstream production to midstream storage and transport, to downstream customer delivery. Current company plans offer a limited view on where in the value chain companies are prepared to invest in the next 10 years.
- Of the European majors, only BP and TotalEnergies have quantified hydrogen targets for FY30.
- TotalEnergies is best placed to deliver on expanding its renewable hydrogen generation, with its ambitious target for 100 GW of renewable generation by FY30.

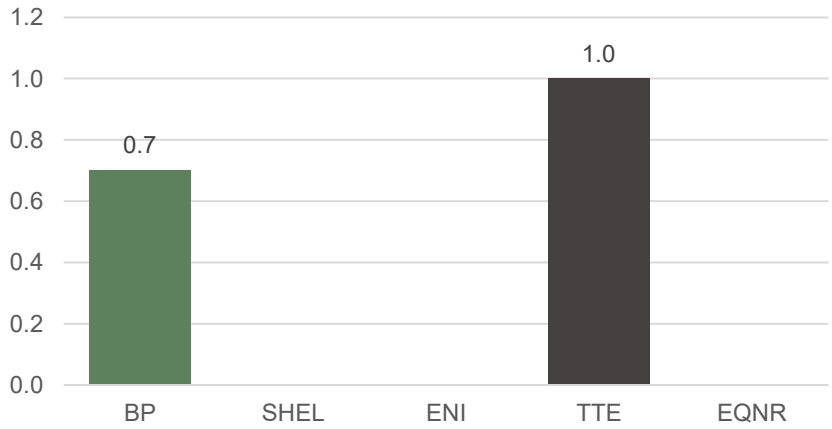
TARGETS AND PERFORMANCE

Table: Hydrogen targets

Company	Metric	Year	Target
BP	Hydrogen	FY30	0.5-0.7 Mtpa
Shell	"Clean" hydrogen (renewables and gas with CCUS) production	FY35	Double-digit (10%) share of global clean hydrogen by FY35[42]
Eni	Hydrogen	FY50	4 Mtpa of low-carbon/green hydrogen
TotalEnergies	Green hydrogen/e-fuels	FY30	1 Mtpa production
Equinor	Hydrogen	FY35	3-5 major industrial clusters for "clean" hydrogen projects, and 10% of the European hydrogen market by FY35

Source: Company data, Accela Research estimates

Chart: Hydrogen production targets FY30 (Mtpa)



Only BP and TotalEnergies have set quantifiable hydrogen targets for FY30. None of the European majors have disclosed progress on production to date.

Source: Company data, Accela Research estimates

Table: FY22 operational capacity and pipelines for hydrogen

[42] This target has not been mentioned by Shell since 2021 and is likely not current. We have therefore not included it in our chart on performance and targets.

*Gross** capacity (Kt pa)	BP	Shell	Eni	Total Energies	Equinor
FY22 operational capacity	**-**	**334**	**-**	**-**	**0.1**
- Renewable	-	5	-	-	0.01
- Gas with CCUS	-	329	-	-	0.1
FY22 pipeline capacity	**2,893**	**4,748**	**5**	**3,446**	**7,105**
- Renewable	2,671	3,649	5	3,353	3,528
- Gas with CCUS	222	1,098	-	93	3,577

Source: BNEF, Company data, Accela Research estimates

*Note: Gross capacity represents overall capacity of projects in which the company has an equity stake.

STRATEGY

Hydrogen has a competitive advantage in decarbonising end-uses that cannot be electrified. Its current use as a feedstock for refining and petrochemical production will likely continue, and there is the potential for hydrogen to play a role in decarbonising industrial heat (e.g., steelmaking) and heavy transport (aviation and shipping). In comparison, it will likely be outcompeted by renewable electricity as a supply fuel for road vehicles and as a substitute for gas in heating buildings. Its potential to reduce emissions depends critically on the ability to scale the production of renewable hydrogen (drive down electrolyser cost), access to transportation and storage and credible end use. Between now and FY30, companies should be focused on:

- Setting distinct targets for renewable hydrogen, gas hydrogen with carbon capture and alternative forms of hydrogen production.
- Increasing renewable generation, in preparation for decreasing electrolyser costs.
- Assessing the required investment in infrastructure for transporting and storing hydrogen to achieve the current targets.
- Securing partnerships with key customers in hard-to-abate sectors, especially steelmakers that have identified hydrogen as a low-carbon solution.

Of the five companies, TotalEnergies is the best placed to grow its green hydrogen production with its leading target for renewable generation.

Table: FY30 renewables target and hydrogen portfolio development across disclosed end uses

	FY30 renewable energy target	Heavy transport (shipping, aviation)	Industrial feedstock and heat (steel)	Road transport
Electrification potential		Low	Low	High - Hydrogen may fill gaps
BP	10 GW	Australian renewable energy hub	Net Zero Teesside Northern Endurance Partnership	
Shell	~70 GW (energy delivered)		Refhyne II (Germany) electrolyser Holland Hydrogen I (FID) NorthH2 Green Hydrogen Hub	Hydrogen retail fuelling sites Hydrogen trucks for rental Green hydrogen supply fuel cells Winter Olympic Games (China)
Eni	>15 GW		Green hydrogen projects at two refineries (Italy)	
TotalEnergies	100 GW	SAF (renewable hydrogen from biogas) at Grandpuits (France) Leuna refinery (Germany)		Hydrogen fuelling sites light vehicles and trucks (Europe)
Equinor	12-16 GW		Gas/renewable hydrogen: Easington (UK) partnership with Centrica, Humber, Rotterdam NorthH2 Green Hydrogen Hub	

Source: Company data, Accela Research estimates

ALIGNMENT WITH 1.5°C

The IEA and IPCC scenarios agree that hydrogen production will likely need to increase from current low levels to approximately 3 EJ by 2030. Estimates of 2030 market sizes for hydrogen vary widely. The IEA estimates that total hydrogen demand should double by 2030 (including from gas, gas with CCUS, and renewables), reaching 180 Mt from current levels of 94 Mt.[43] If we take this as the market size, in comparison:

- BP's target represents 0.39% of the IEA's forecast global market share for hydrogen FY30.
- TotalEnergies' target represents 0.56% of the IEA's forecast global market share in FY30.

The current hydrogen strategies of the European majors lack clarity in their commitments towards the production of renewable hydrogen. A more effective approach would be to strengthen these strategies by incorporating additional commitments towards increasing electrolyser capacity. The current pipeline of announced electrolyser manufacturing capacity is ~134 GW by 2030, which falls short of the 720 GW needed by 2030, according to the IEA's Net Zero by 2050 Scenario. The IEA indicates that any corporate targets on growing electrolyser capacity would likely demonstrate additionality in achieving net zero.

[43] IEA, World Energy Outlook (2022), page 169.

5. APPENDIX

METRICS

$ = US$

k boe/d = thousands of barrels of oil equivalent per day

SECTOR TABLES

PAYBACK PERIOD OIL AND GAS PROJECTS

BP	Shell	Eni	TotalEnergies	Equinor	Chevron	Exxon Mobil
<10 years for upstream oil and refining <15 years for upstream gas		<5 years		2.5 years		

Source: Company data, Accela Research estimates

RETURNS ACROSS PROJECTS

Table: Internal Rate of Return metrics disclosed

Company	Oil and gas	Renewables and power	Bioenergy	Hydrogen	Other
BP	15-20% at $60 bbl	Renewables 6-8% (unlevered)	Bioenergy >15%	Double digit (unlevered)	>15% Convenience and EV charging
Shell	Upstream 20-25% Integrated gas 14-18% Chemicals and products 10-15%	>10%	15-25% for marketing business (inc. sectors and decarbonisation)		
Eni	Upstream 25%	6-8%	Biorefining 10-15%		
TotalEnergies		10% (electricity value chain)			
Equinor	Upstream 30%	Renewables 4-8% (ex. Sell downs and project financing)			
Chevron	Upstream >12% ROCE by 2027 at $60 bbl				
ExxonMobil	Upstream >10% at $35 bbl Product solutions >30%		Low-carbon solutions >10%	Low-carbon solutions >10%	

Source: Company data, Accela Research estimates

OIL AND GAS PRODUCTION

Table: Oil and gas production (k boe/d)

Company	FY19	FY20	FY21	FY22	FY30F	FY19-30 growth	FY22-FY30 growth
BP	2,637	2,375	2,219	2,254	2,000	-24%	-11%
Shell	3,665	3,386	3,237	2,863	3,222	-12%	13%
Eni	1,871	1,733	1,682	1,610	1,883	1%	17%
TotalEnergies	3,014	2,871	2,819	2,765	3,098	3%	12%
Equinor	2,074	2,070	2,079	2,039	2,039	-2%	0%

Source: Company data, Accela Research estimates

OFFSETS

Shell and TotalEnergies have provided targets for use of offsets.

Table: Offset targets

	Year	Target
BP	n/a	n/a
Shell	FY30	120 Mtpa
Eni	n/a	n/a
TotalEnergies	FY50	10 Mtpa
Equinor	n/a	n/a

Source: Company data, Accela Research estimates

CARBON CAPTURE, UTILISATION AND STORAGE

Table: CCUS targets

	Year	Target
BP	n/a	n/a
Shell	FY35	>25 Mtpa by FY35
Eni	FY25	>1 Mtpa
	FY30	~10 Mtpa
	FY23-26	30 Mtpa of carbon gross volume stored by FY30
TotalEnergies	FY50	50-100 Mtpa
Equinor	FY30	5-10 Mt CO_2 transport and storage capacity by FY30

Source: Company data, Accela Research estimates

COMPANY TRANSITION PLANS

BP

AGM date:	27th April 2023	Climate transition plan:	Net Zero Progress Update 2023	Say on Climate Vote:	No

Table: Emissions reduction targets (Mt CO_2e, CAGR from FY22)

	Base year	FY19	FY20	FY21	FY22	Targets FY25	FY30	FY50
Scope 1 and 2 (Net zero operations)								
Absolute target	**FY19**	**54.5**	**45.5**	**35.6**	**31.9**	**43.6**	**27.3**	**-**
% change pa/CAGR			-17%	-22%	-10%	11%	-2%	-
% change FY19/base year			-17%	-35%	-41%	-20%	-50%	-100%
Scope 3 (Production)								
Absolute target	**FY19**	**361.0**	**328.0**	**304.0**	**307.0**	**306.9**	**252.7**	**-**
% change pa/CAGR			-9%	-7%	1%	0%	-2%	-
% change FY19/base year			-9%	-16%	-15%	-15%[44]	-30%[44]	-100%
Net zero sales								
Intensity (scope 1, 2, 3)	**FY19**	**79.0**	**77.0**	**78.0**	**77.0**	**75.1**	**63.2**	**-**
% change pa/CAGR			-3%	1%	-1%	-1%	-2%	-
% change FY19/base year			-3%	-1%	-3%	-5%	-20%[45]	-100%

Source: Company data, Accela Research estimates

Table: Emissions performance (Mt CO_2e)

	FY19	FY20	FY21	FY22
Scope 1 and 2	**54.4**	**45.5**	**35.6**	**31.9**
% change pa		-16%	-22%	-10%
% change from FY19		-16%	-35%	-41%
Scope 3 (Own production)	**361**	**328**	**304**	**307**
% change from FY19		-9%	-16%	-15%
Scope 3 (Third-party sales)	**1,638**	**1,410**	**1,418**	**1,334**
% change from FY19		-14%	-13%	-19%
Total disclosed emissions	**2,053**	**1,784**	**1,758**	**1,673**
% change pa		-13%	-1%	-5%
% change from FY19		-13%	-14%	-19%
Offsets disclosed	not disclosed			

Company data, Accela Research estimates

[44] BP's Aim 2 scope 3 (production) is for a -10-15% reduction by FY25, and -20-30% reduction by FY30. We have assumed the upper end of the range in the table above.

[45] BP's Aim 3 net carbon intensity target is for a -15-20% reduction by FY30. We have assumed the upper end of the range in the table above.

Table: Capital expenditure (US$m)

	FY19	FY20	FY21	FY22	Guidance FY25	Guidance FY30
Low carbon segment (Renewables, Hydrogen, CCUS, Power trading)	**161**	**596**	**1,561**	**1,024**	**3-5 bn**	**3-5 bn**
% of Group	1%	4%	12%	6%		
plus bioenergy, EV charging, future mobility, ex power (fossil fuels) (estimate)	439	154	639	2,976		
Low carbon activity	**600**	**750**	**2,200**	**4,000**		
% of Group	3%	5%	17%	24%		
plus convenience, power (fossil fuels) (estimate)	-	250	200	900		
Transition Growth Engines	**600**	**1,000**	**2,400**	**4,900**	**6-8 bn**	**7-9 bn**
% of Group	3%	7%	19%	30%		
Upstream	**15,887**	**9,841**	**8,018**	**8,505**		
% of Group	82%	70%	62%	52%		
Midstream/Downstream (ex. Low carbon activity)	**2,934**	**3,464**	**2,630**	**3,825**		
% of Group	15%	25%	20%	23%		
Group	**19,421**	**14,055**	**12,848**	**16,330**	**14-18 bn**	**14-18 bn**

Source: Company data, Accela Research estimates

Table: Fuel volumes

		FY19	FY20	FY21	FY22	Target FY25	Target FY30
Oil and gas production	**k boe/d**	**2,637**	**2,375**	**2,219**	**2,254**	**2,300**	**2,000**
% change pa/CAGR			*-10%*	*-7%*	*2%*	*1%*	*-1%*
LNG portfolio	**Mt p.a**	**15**	**20**	**18**	**19**	**25**	**30**
% change pa/CAGR			*33%*	*-10%*	*6%*	*10%*	*6%*
Refining throughput	**k b/d**	**1,749**	**1,627**	**1,594**	**1,504**		
% change pa/CAGR			*-7%*	*-2%*	*-6%*		
Bio energy production	**k boe/d**	**16**	**20**	**18**	**18**	**49**	**93**[46]
% change pa/CAGR			*30%*	*-13%*	*4%*	*39%*	*22%*
Renewable installed capacity	**GW**	**1.1**	**1.5**	**1.9**	**2.2**		**10.0**
% change pa/CAGR			*36%*	*27%*	*16%*		*21%*
Traded electricity	**TWh**	**250**	**214**	**202**	not disclosed		
% change pa/CAGR			*-14%*	*-6%*	*n/a*		
EV Charge points	**No.**	**7,500**	**10,100**	**13,100**	**22,000**	**40,000**	**100,000**
% change pa/CAGR			*35%*	*30%*	*68%*	*22%*	*21%*
Hydrogen production	**Mt p.a**				not disclosed		**0.5-0.7**

Source: Company data, Accela Research estimates

[46] BP's target in this table is expressed in k boe/d, its stated targets are by FY30 100 kb/d of biofuel production and 70 kb/d of biogas supply (we assume production of ~35kb/d).

SHELL

AGM date:	23rd May 2023	Climate transition plan:	Energy Transition Progress Report 2022	Say on Climate Vote:	Yes - Progress

Table: Emissions reduction targets (Mt CO_2e, CAGR from FY22)

	Base year	FY19	FY20	FY21	FY22	Targets FY25	FY30	FY50
Scope 1 and 2 (Operational)								
Absolute	**2016**	**80.0**	**71.0**	**68.0**	**58.0**		**41.5**	**-**
% change pa/CAGR			-11%	-4%	-15%		-4%	-
% change base year			-14%	-18%	-30%		-50%	-100%
% change from FY19			-11%	-15%	-28%		-48%	-100%
Net carbon intensity (Scope 1, 2, 3)								
Intensity	**2016**	**78.0**	**75.0**	**77.0**	**76.0**	**68.7**	**63.2**	**-**
% change pa/CAGR			-4%	3%	-1%	-3%	-2%	-
% change base year			-5%	-3%	-4%	-13%	-20%	-100%
% change from FY19			-4%	-1%	-3%	-12%	-19%	-100%

Source: Company data, Accela Research estimates

Table: Emissions performance (Mt CO_2e)

	FY19	FY20	FY21	FY22
Scope 1 and 2	**80**	**71**	**68**	**58**
% change pa		-11%	-4%	-15%
% change from FY19		-11%	-15%	-28%
Scope 3	**1,551**	**1,304**	**1,299**	**1,174**
% change from FY19		-16%	-16%	-24%
Total disclosed emissions	**1,631**	**1,375**	**1,367**	**1,232**
% change pa		-16%	-1%	-10%
% change from FY19		-16%	-16%	-24%
Net carbon intensity	**78.0**	**75.0**	**77.0**	**76.0**
% change pa		-4%	3%	-1%
% change from FY19		-4%	-1%	-3%
Offsets disclosed	2.2	3.9	5.1	4.1

Source: Company data, Accela Research estimates

Table: Capital expenditure (US$m)

	FY19	FY20	FY21	FY22	Guidance FY25	Guidance FY30
Renewables and energy solutions (segment)	**1,134**	**928**	**2,359**	**3,469**		
% of Group	5%	5%	12%	14%		
plus biofuels, EV charging			(84)	831		
Low-carbon energy solutions	**1,134**	**928**	**2,275**	**4,300**		
% of Group	5%	5%	12%	17%		
plus non-energy products			**4,286**	**3,900**		
Low-carbon and non-energy products			**6,561**	**8,200**	50% of total capex and opex	
% of Group			33%	33%		
Upstream	**13,307**	**10,665**	**9,670**	**12,408**		
% of Group	56%	60%	49%	50%		
Midstream/Downstream (ex. Low-carbon energy solutions)	**9,478**	**6,234**	**7,753**	**8,125**		
% of Group	40%	35%	39%	33%		
Group	**23,919**	**17,827**	**19,698**	**24,833**		

Source: Company data, Accela Research estimates

Table: Fuel volumes

		FY19	FY20	FY21	FY22	Target FY25	Target FY30
Oil and gas production	**k boe/d**	**3,665**	**3,386**	**3,237**	**2,863**		**3,222**
% change pa/CAGR			*-8%*	*-4%*	*-12%*		*1%*
LNG portfolio	**Mtpa**	**36**	**33**	**31**	**30**	**43**	
% change pa/CAGR			*-7%*	*-7%*	*-4%*	*13%*	
Refining throughput	**k b/d**	**2,564**	**2,063**	**1,639**	**1,402**		**1,020**
% change pa/CAGR			*-20%*	*-21%*	*-14%*		*-4%*
Bioenergy production	**k boe/d**	**10.0**	**11.0**	**11.0**	**13.2**		**87.9**
% change pa/CAGR			*10%*	*0%*	*20%*		*27%*
Renewable installed capacity	**GW**		**0.4**	**0.7**	**2.2**		**70.0**
% change pa/CAGR				*59%*	*219%*		*54%*
Traded electricity	**TWh**		**252**	**247**	**243**		**560**
% change pa/CAGR				*-2%*	*-2%*		*11%*
EV charge points	**No.**		**52,000**	**86,000**	**139,000**		**2,500,000**
% change pa/CAGR				*65%*	*62%*		*44%*
Hydrogen production[47]	**Mtpa**	not disclosed					

Source: Company data, Accela Research estimates

[47] Shell announced in 2021 that it would reach a "double-digit (10%) share of global clean hydrogen by FY35". This was not included in its FY21 or FY22 Energy Transition Progress reports, and so has been excluded from this table.

ENI

AGM date:	10th May 2023	Climate transition plan:	Not available as at 21st of April.	Say on Climate Vote:	No

Table: Emissions reduction targets (Mt CO_2e, CAGR from FY22)

						Targets				
	Base year	FY19	FY20	FY21	FY22	FY25	FY30	FY35	FY40	FY50
Scope 1 and 2 (Equity, Eni net carbon footprint)										
Absolute	**2018**	**37.6**	**33.0**	**33.6**	**29.9**	**22.3**		**-**		
% change pa/CAGR			-12%	2%	-11%	-9%		-100%		
% change base year		1%	-11%	-10%	-20%	-40%		-100%		
Scope 1 and 2 (Net - Upstream, carbon only)										
Absolute	**2018**	**14.8**	**11.4**	**11.0**	**9.9**	**5.2**	**-**			
% change pa/CAGR			-23%	-4%	-10%	-19%	-100%			
% change base year		-78%	-83%	-84%	-85%	-65%	-100%			
Net-zero emissions (Scope 1, 2, 3)										
Absolute	**2018**	**501.0**	**439.0**	**456.0**	**419.0**		**328.3**	**227.3**	**101.0**	**-**
% change pa/CAGR			-12%	4%	-8%		-3%	-5%	-8%	-100%
% change base year		-1%	-13%	-10%	-17%		-35%	-55%	-80%	-100%
Net carbon intensity (Scope 1, 2, 3)										
Intensity	**2018**	**68.0**	**68.0**	**67.0**	**66.0**		**57.8**		**34.0**	**-**
% change pa/CAGR			0%	-1%	-1%		-2%		-4%	-100%
% change base year		0%	0%	-1%	-3%		-15%		-50%	-100%
Index - Net carbon intensity upstream (Scope 1 only)										
Intensity	**2014**	**19.6**	**20.0**	**20.2**	**20.6**	**38.8**				
% change pa/CAGR			2%	1%	2%	23%				
% change base year		-96%	-96%	-96%	-96%	44%				

Source: Company data, Accela Research estimates

Table: Emissions performance (Mt CO_2e)

	FY19	FY20	FY21	FY22
Scope 1 and 2 (Operational)	**42**	**38**	**41**	**40**
% change from pa		-8%	6%	-2%
% change from FY19		-8%	-2%	-4%
Scope 3	**459**	**401**	**415**	**379**
% change from FY19		-13%	-10%	-17%
Total disclosed emissions	**501**	**439**	**456**	**419**
% change from pa		-12%	4%	-8%
% change from FY19		-12%	-9%	-16%
Net carbon intensity	**68.0**	**68.0**	**67.0**	**66.0**
% change from pa		0%	-1%	-1%
% change from FY19		0%	-1%	-3%
Offsets disclosed (Mt CO_2)		**1.5**	**2.0**	**3.0**

Source: Company data, Accela Research estimates

Table: Capital expenditure (€m)

	FY19	FY20	FY21	FY22	Guidance FY23-26
Plenitude and power segment (Organic)	**357**	**293**	**443**	**631**	
% of Group	4%	6%	6%	6%	
Upstream (Organic)	**7,011**	**3,483**	**3,880**	**6,385**	
% of Group	77%	69%	49%	56%	
Midstream/Downstream (Organic)	**1,008**	**868**	**911**	**1,040**	
% of Group	11%	17%	11%	9%	
Acquisitions/divestments	**753**	**392**	**2,738**	**3,311**	
% of Group	8%	8%	34%	29%	
Group (Inorganic and Organic)	**9,129**	**5,036**	**7,972**	**11,367**	
Green value chain (Plenitude + Sustainable Mobility)					**€6.5 bn (20% of Group)**

Source: Company data, Accela Research estimates

Table: Fuel volumes

		FY19	FY20	FY21	FY22	Target FY25	Target FY30
Oil and gas production	**k boe/d**	**1,871**	**1,733**	**1,682**	**1,610**	**1,811**	**1,883**
% change pa/CAGR			*-7%*	*-3%*	*-4%*	*4%*	*2%*
LNG portfolio	**Mtpa**	**7.4**	**7.0**	**8.0**	**6.9**	**15.75**	
% change pa/CAGR			*-6%*	*15%*	*-14%*	*32%*	
Refining throughput	**k b/d**	**529**	**480**	**550**	**545**		
% change pa/CAGR			*-9%*	*15%*	*-1%*		
Bioenergy production	**k boe/d**	**5.5**	**12.5**	**11.8**	**9.6**	**53.0**	**88.4**
% change pa/CAGR			*128%*	*-6%*	*-18%*	*77%*	*32%*
Renewable installed capacity	**GW**	**0.2**	**0.3**	**1.1**	**2.2**	**7.0**	**15.0**
% change pa/CAGR			*76%*	*270%*	*93%*	*47%*	*27%*
Traded electricity	**TWh**	**28.28**	**25.33**	**28.54**	**22.37**		
% change pa/CAGR			*-10%*	*13%*	*-22%*		
EV charge points	**No.**		**3,400**	**6,200**	**13,100**	**30,000**[48]	
% change pa/CAGR				*82%*	*111%*	*32%*	
Hydrogen production	**Mtpa**		not disclosed				

Source: Company data, Accela Research estimates

[48] Eni EV charging targets are for FY26.

TOTALENERGIES

AGM date:	26th May 2023	Climate transition plan:	Sustainability & Climate 2023 Progress Report	Say on Climate Vote:	Yes - progress

Table: Emissions reduction targets (Mt CO_2e, CAGR from FY22)

						Targets		
	Base year	FY19	FY20	FY21	FY22	FY25	FY30	FY50
Scope 1 and 2 (Group/Global)								
Absolute	**2015**	**44.3**	**38.4**	**35.4**	**39.0**	**38.0**	**25.0**	**-**
% change pa/CAGR			-13%	-8%	10%	-1%	-5%	-100%
% change base year		-4%	-17%	-23%	-15%	-17%	-46%[49]	-100%
% change FY19			-13%	-20%	-12%	-14%	-44%	-100%
Scope 3 (Group/Global)								
Absolute	**n/a**	**416.1**	**355.0**	**391.2**	**446.0**	**<400.0[50]**	**<400.0**	**100.0**
% change pa/CAGR			-15%	10%	14%	-4%	-1%	-5%
% change FY19			-15%	-6%	7%	-4%	-4%	-76%
Scope 3 (Worldwide oil)								
Absolute	**2015**	**335.0**	**270.0**	**255.0**	**246.0**	**245.0**	**210.0**	
% change pa/CAGR			-19%	-6%	-4%	0%	-2%	
% change base year		-4%	-23%	-27%	-30%	-30%	-40%	
% change FY19			-19%	-24%	-27%	-27%	-37%	
Scope 1, 2, 3 (Europe)								
Absolute	**2015**	**258.0**	**213.0**	**222.0**	**211.0**		**196.0**	
% change pa/CAGR			-17%	4%	-5%		-1%	
% change base year		-8%	-24%	-21%	-25%		-30%	
% change FY19		-38%	-49%	-47%	-49%		-53%	
Lifecycle carbon intensity								
Intensity	**2015**	**66.7**	**63.9**	**63.2**	**62.5**	**60.4**	**53.3**	**-**
% change pa/CAGR			-4%	-1%	-1%	-1%	-2%	-100%
% change base year		-6%	-10%	-11%	-12%	-15%	-25%	-100%
% change FY19			-4%	-5%	-6%	-10%	-20%	-100%

Source: Company data, Accela Research estimates

[49] TotalEnergies target is for greater than 40% reduction, or to reach 25-30 Mt in scope 1 and 2 by FY30. We have assumed 25 Mt by FY30 in our table above.

[50] TotalEnergies target is to reach 400 Mt or less. We have assumed 400 Mt for this calculation.

Table: Emissions performance (Mt CO_2e)

	FY19	FY20	FY21	FY22
Scope 1 and 2	**44**	**38**	**35**	**39**
% change from pa		-13%	-8%	10%
% change from FY19		-13%	-20%	-12%
Scope 3 (Own production)	**416**	**355**	**391**	**446**
% change from FY19		-15%	-6%	7%
Total disclosed emissions	**460**	**393**	**427**	**485**
% change from pa		-15%	8%	14%
% change from FY19		-15%	-7%	5%
Net carbon intensity	**66.7**	**63.9**	**63.2**	**62.5**
% change from pa		-4%	-1%	-1%
% change from FY19		-4%	-5%	-6%
Offsets disclosed				not disclosed

Source: Company data, Accela Research estimates

Table: Capital expenditure (US$m)

	FY19	FY20	FY21	FY22	Guidance FY25	Guidance FY30
Low carbon energies	**1,000**	**2,000**	**4,000**	**4,000**	**4.5-6 bn**	**4.5-6 bn**
% of Group	6%	15%	30%	25%	33% of Group	33% of Group
Upstream	**13,829**	**9,966**	**8,029**	**10,020**		
% of Group	79%	77%	60%	61%		
Midstream/Downstream (ex. Low-carbon energies)	**2,620**	**1,023**	**1,278**	**2,283**		
% of Group	15%	8%	10%	14%		
Group	**17,449**	**12,989**	**13,307**	**16,303**	**14-18 bn**	**14-18 bn**

Source: Company data, Accela Research estimates

Table: Fuel volumes

		FY19	FY20	FY21	FY22	Target FY25	Target FY30
Oil and gas production	**k boe/d**	**3,014**	**2,871**	**2,819**	**2,765**		**3,098**
% change pa/CAGR			*-5%*	*-2%*	*-2%*		*1%*
LNG portfolio	**Mtpa**	**34**	**38**	**42**	**48**		
% change pa/CAGR			*12%*	*10%*	*15%*		
of which equity production	**Mtpa**	*16*	*18*	*17*	*17*		24
Refining throughput	**k b/d**	**1,671**	**1,292**	**1,181**	**1,472**		
% change pa/CAGR			*-23%*	*-9%*	*25%*		
Bioenergy production	**k boe/d**	**3.5**	**4.5**	**6.9**	**4.3**		**58.7**
% change pa/CAGR			*28%*	*52%*	*-38%*		*39%*
Renewable installed capacity	**GW**	**3.0**	**7.0**	**10.3**	**16.8**	**35.0**	**100.0**
% change pa/CAGR			*133%*	*47%*	*64%*	*28%*	*25%*
Traded electricity	**TWh**	**46.0**	**47.3**	**56.6**	**55.3**		
% change pa/CAGR			*3%*	*20%*	*-2%*		
EV charge points	**No.**	**-**	**22,000**	**26,000**	**48,000**		**150,000**
% change pa/CAGR				*18%*	*85%*		*15%*
Hydrogen production	**Mtpa**			not disclosed			**1**

Source: Company data, Accela Research estimates

Additional comments on portfolio mix:

- Energy production to FY30. TotalEnergies plans to increase energy production from 14 PJ/day to 20 PJ/day. Electricity (primarily renewable energy) will account for half of this increase, taking it to 130 TWh, and LNG will account for the balance. Oil production will remain stable.[51]

[51] TotalEnergies, More Energy, Less Emissions: Sustainability & Climate 2023 Progress Report (2023), p.14.

EQUINOR

AGM date:	10th May 2023	Climate transition plan:	Energy transition plan: Progress report 2022	Say on Climate Vote:	No

Table: Emissions reduction targets (Mt CO_2e, CAGR from FY22)

	Base year	FY19	FY20	FY21	FY22	Targets FY25	FY30	FY35	FY50
Net scope 1 and 2 (Operated, Group)									
Absolute	**2015**	**14.9**	**13.6**	**12.1**	**11.5**		**8.3**		
% change pa/CAGR			-9%	-11%	-5%		-4%		
% change base year		-10%	-18%	-27%	-31%		-50%		
% change FY19		0%	-9%	-19%	-23%		-44%		
Net carbon intensity (Scope 1, 2, 3)									
Intensity	**2019**	**68.0**	**68.0**	**67.1**	**66.5**		**54.4**	**40.8**	**-**
% change pa/CAGR			0%	-1%	-1%		-2%	-4%	-100%
% change FY19		0%	0%	-1%	-2%		-20%	-40%	-100%
% change from FY19		0%	0%	-1%	-2%		-20%	-40%	-100%
Upstream CO_2 intensity (kg CO_2/boe)									
Intensity	**n/a**	**9.8**	**8.0**	**7.0**	**6.9**	**8.0**	**6.0**		
% change pa/CAGR			-18%	-13%	-1%	5%	-2%		
% change FY19			-18%	-29%	-30%	-18%	-39%		

Source: Company data, Accela Research estimates

Table: Emissions performance (Mt CO_2e)

	FY19	FY20	FY21	FY22
Scope 1 and 2	**15**	**14**	**12**	**12**
% change pa		-9%	-11%	-5%
% change from FY19		-9%	-19%	-23%
Scope 3 (Own production)	**259**	**271**	**269**	**263**
% change from FY19		5%	4%	1%
Total disclosed emissions	**274**	**285**	**281**	**274**
% change pa		4%	-1%	-2%
% change from FY19		4%	3%	0%
Net carbon intensity	**68.0**	**68.0**	**67.1**	**66.5**
% change pa		0%	-1%	-1%
% change from FY19		0%	-1%	-2%
Offsets disclosed				None disclosed

Source: Company data, Accela Research estimates

Table: Capital expenditure (US$m)

	FY19	FY20	FY21	FY22	Guidance FY25	Guidance FY30
Renewables segment	**175**	**31**	**458**	**298**		
% of Group	1%	0%	5%	3%		
plus CCUS, hydrogen, other low carbon	121	359	478	1,101		
Renewables & Low Carbon Solutions	**296**	**390**	**936**	**1,399**	**3,900**	**6,500**
% of Group	2%	4%	11%	14%	30%	>50%
Upstream	**13,171**	**8,528**	**7,467**	**8,309**		
% of Group	89%	87%	88%	83%		
Midstream/Downstream (ex. Renewables & Low Carbon Solutions)	**1,315**	**844**	**104**	**287**		
% of Group	9%	9%	1%	3%		
Group	**14,782**	**9,762**	**8,507**	**9,995**	**13,000**	**13,000**

Source: Company data, Accela Research estimates

Table: Fuel volumes

		FY19	FY20	FY21	FY22	Target FY25	Target FY30
Oil and gas production	**k boe/d**	**2,074**	**2,070**	**2,079**	**2,039**		**2,039**
% change pa/CAGR			*0%*	*0%*	*-2%*		*0%*
LNG portfolio	**Mtpa**	**n/a**	**n/a**	**n/a**	**n/a**		
% change pa/CAGR							
Refining throughput	**k b/d**	**229**	**213**	**235**	**211**		
% change pa/CAGR			*-7%*	*10%*	*-10%*		
Bioenergy production	**k boe/d**						
% change pa/CAGR							
Renewable installed capacity	**GW**	**0.5**	**0.5**	**0.5**	**0.6**		**16.0**
% change pa/CAGR			*0%*	*0%*	*20%*		*51%*
Traded electricity	**TWh**						
% change pa/CAGR							
EV charge points	**No.**						
% change pa/CAGR							
Hydrogen production	**Mtpa**				not disclosed		Ref.[52]

Source: Company data, Accela Research estimates

[52] Equinor has not quantified its hydrogen target in Mt. It expects by FY35, 3-5 major industrial clusters for "clean" hydrogen projects and 10% of European hydrogen market share by 2035, Equinor (2023), Capital Markets Update and Equinor (2023), hydrogen.

CHEVRON

AGM date: May 31st 2023 | Climate transition plan: Not available as at 21st of April. | Say on Climate Vote: No

Table: Emissions reduction targets (Mt CO_2e, CAGR from FY22)

						Targets	
	Base year	FY19	FY20	FY21	FY22	FY28	FY50
Scope 1 and 2 (Upstream)	Mt CO_2e						
Absolute	n/a	**35.0**	**31.0**	**30.0**	**n/a**		**-**
% change pa/CAGR			-11%	-3%	n/a		-100%
% change FY19			-11%	-14%	n/a		-100%
Portfolio carbon intensity (Scope 1, 2, 3)	kg CO_2e/boe						
Intensity	2016	**72.7**	**71.4**	**71.3**	**n/a**	**71.0**	
% change pa/CAGR			-2%	0%	n/a	0%	
% change base year			-5%	-5%	n/a	-5%	
% change FY19			-2%	-2%	n/a	-2%	
Oil carbon intensity (Scope 1, 2)	kg CO_2e/boe						
Intensity	2016	**33.3**	**28.2**	**28.6**	**n/a**	**24.0**	
% change pa/CAGR			-15%	1%	n/a	-2%	
% change base year			-33%	-32%	n/a	-43%	
% change FY19			-15%	-14%	n/a	-28%	
Gas carbon intensity (Scope 1, 2)	kg CO_2e/boe						
Intensity	2016	**35.9**	**38.6**	**37.9**	**n/a**	**24.0**	
% change pa/CAGR			8%	-2%	n/a	-6%	
% change base year			18%	16%	n/a	-26%	
% change FY19			8%	6%	n/a	-33%	
Refining carbon intensity (Scope 1, 2, 3)	kg CO_2e/boe						
Intensity	2016	**35.9**	**38.6**	**37.9**	**n/a**	**36.0**	
% change pa/CAGR			8%	-2%	n/a	-1%	
% change base year			5%	4%	n/a	-2%	
% change FY19			8%	6%	n/a	0%	

Source: Company data, Accela Research estimates

Table: Emissions performance (Mt CO_2e)

	FY19	FY20	FY21	FY22
Scope 1 and 2	**63**	**56**	**57**	**n/a**
% change pa		-11%	2%	n/a
% change from FY19		-11%	-10%	n/a
Scope 3 (Own production)	**622**	**588**	**621**	**n/a**
% change from FY19		-5%	0%	n/a
Total disclosed emissions	**686**	**645**	**680**	**n/a**
% change pa		-6%	5%	n/a
% change from FY19		-6%	-1%	n/a
Net carbon intensity	**72.7**	**71.4**	**71.3**	**n/a**
% change pa		-2%	0%	n/a
% change from FY19		-2%	-2%	n/a
Offsets disclosed	1	2	13	n/a

Source: Company data, Accela Research estimates

Table: Capital expenditure (US$m)

	FY19	FY20	FY21	FY22	Guidance FY24-FY27	Guidance FY23-28
Other		**239**	**241**	**335**		
% of Group		3%	3%	3%		
Upstream	**14,116**[53]	**7,488**	**6,775**	**9,565**		
% of Group	100%	84%	84%	80%		
Midstream/Downstream		**1,195**	**1,040**	**2,074**		
% of Group		13%	13%	17%		
Group (Organic only)	**14,116**	**8,922**	**8,056**	**11,974**	**13-15 bn pa**	
"Lower" carbon (inc. acquisitions)	**-**	**-**	**1,938**[54]	**2,862**		**~ 1.7 bn pa**[55]

Source: Company data, Accela Research estimates

[53] Segment capital expenditure not disclosed in FY19.

[54] FY21 is estimated from this statement: "During 2021 and 2022, the company spent $4.8 billion in lower carbon investments, including $2.9 billion associated with the acquisition of REG." Chevron FY22 Annual Report (2023), p.32.

[55] "In 2021, the company established planned capital spend of approximately $10 billion through 2028 to advance its lower carbon strategy", Chevron FY22 Annual Report (2023), p.32. It is unclear if this includes acquisitions.

Table: Fuel volumes

		FY19	FY20	FY21	FY22	Target FY25	Target FY30
Oil and gas production	**k boe/d**	**3,058**	**3,083**	**3,099**	**2,999**		**3,799**[56]
% change pa/CAGR			1%	1%	-3%		3%
LNG portfolio	**Mtpa**	not disclosed					
% change pa/CAGR		n/a	n/a	n/a	n/a		
Refining throughput	**k b/d**	**1,564**	**1,377**	**1,479**	**1,505**		
% change pa/CAGR			-12%	7%	2%		
Bioenergy supply (pre FY21)/production (FY22)	**k boe/d**	**68**	**61**	**70**	**43**		**93**
% change pa/CAGR			-10%	15%	-39%		10%
Renewable installed capacity	**GW**						
% change pa/CAGR							
Traded electricity	**TWh**						
% change pa/CAGR							
EV charge points							
% change pa/CAGR							
Hydrogen production (includes gas without CCUS)	**Mtpa**	not disclosed					**150**

Source: Company data, Accela Research estimates

[56] Chevron's target is for a greater than 3% CAGR from FY23-27, we have assumed this continues until FY30.

EXXONMOBIL

Table: Emissions performance (Mt CO_2e, CAGR from FY22)

						Targets	
	Base year	FY19	FY20	FY21	FY22	FY30	FY50
Scope 1 and 2 - linked to intensity target							
Absolute	2016	**109.0**	**102.0**	**103.0**	**103.0**	**93.6**	**-**
% change pa/CAGR			-6%	1%	0%	-1%	-100%
% change base year			-13%	-12%	-12%	-20%	-100%
% change FY19			-6%	-6%	-6%	-14%	-100%
Group intensity - scope 1 and 2 (intensity)							
Intensity	2016	**26.5**	**25.6**	**25.0**	**24.0**	**18.6**	
% change pa/CAGR			-3%	-2%	-4%	-3%	
% change base year			-3%	-6%	-9%	-30%[57]	
% change FY19			-3%	-6%	-9%	-30%	
Upstream intensity - scope 1, 2 (intensity)							
Intensity	2016	**30.1**	**26.7**	**24.8**	**22.9**	**15.0**	
% change pa/CAGR			-11%	-7%	-8%	-5%	
% change base year			-11%	-17%	-23%	-50%[58]	
% change FY19			-11%	-18%	-24%	-50%	

Source: Company data, Accela Research estimates

Table: Emissions performance (Mt CO_2e)

	FY19	FY20	FY21	FY22
Scope 1 and 2	**109**	**102**	**103**	**103**
% change pa		-6%	1%	0%
% change from FY19		-6%	-6%	-6%
Scope 3 (Petroleum products)	**730**	**650**	**690**	**720**
% change from FY19		-11%	-5%	-1%
Total disclosed emissions	**839**	**752**	**793**	**823**
% change pa		-10%	5%	4%
% change from FY19		-10%	-5%	-2%
Net carbon intensity (scope 1, 2, 3)				Not disclosed
Offsets disclosed				Not disclosed

Source: Company data, Accela Research estimates

[57] ExxonMobil's target is for a -20-30% reduction, we have assumed the upper end.

[58] ExxonMobil's target is for a -40-50% reduction, we have assumed the upper end.

Table: Capital expenditure (US$m)

	FY19	FY20	FY21	FY22	Guidance FY22-27
Upstream	**23,485**	**14,431**	**12,254**	**17,002**	
% of Group	75%	68%	74%	75%	
Energy Products	**4,371**	**4,221**	**1,987**	**2,410**	
% of Group	14%	20%	12%	11%	
Chemical Products	**3,265**	**2,716**	**2,025**	**2,965**	
% of Group	10%	13%	12%	13%	
Specialty Products & Other	**27**	**6**	**329**	**327**	
% of Group	0%	0%	2%	1%	
Group	**31,148**	**21,374**	**16,595**	**22,704**	**15 bn (average 3 bn pa)**
Lower emission investments			Not disclosed		

Source: Company data, Accela Research estimates

Table: Fuel volumes

		FY19	FY20	FY21	FY22	Target FY27
Oil and gas production	**k boe/d**	**2,386**	**2,349**	**2,289**	**2,354**	**4,000**
% change pa/CAGR			-2%	-3%	3%	11%
LNG portfolio	**Mt p.a**			not disclosed		**27**
% change pa/CAGR						
Refining throughput	**k b/d**	**4,269**	**4,291**	**4,272**	**3,981**	
% change pa/CAGR			1%	0%	-7%	
Bio energy production	**k boe/d**			not disclosed		**172**
% change pa/CAGR						
Renewable installed capacity	**GW**					
% change pa/CAGR						
Traded electricity	**TWh**					
% change pa/CAGR						
EV charge points						
% change pa/CAGR						
Hydrogen production				not disclosed		

Source: Company data, Accela Research estimates

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