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Climate-related financial disclosure by oil and gas companies: implementing the TCFD recommendations

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Executive summary

This report provides a snapshot of how four energy companies are currently providing effective climate-related financial disclosures.

1 Executive summary

The Oil & Gas Preparer Forum ("the Forum" or "we") is a collaboration between Eni, Equinor, Shell, Total and the World Business Council for Sustainable Development (WBCSD). This report aims to highlight how the four companies are implementing the Task Force on Climate-related Financial Disclosure (TCFD) recommendations today and gives practical examples of effective climate change disclosure. The Forum received valuable input from the TCFD Secretariat and representatives of a limited number of financial institutions and other users.

The TCFD describes an illustrative implementation path of how preparers and users could increasingly adopt the recommendations. While corporate reporting on climate change is still evolving, this report provides a snapshot of how four energy companies are currently providing effective climate-related financial disclosures. The Forum also considers how reporting may continue to develop in future, with wider engagement from other companies in the energy sector and users of these disclosures.

Twenty years ago, companies were challenged to calculate and report their operational greenhouse gas emissions. Since then, the focus has shifted to the strategic implications of climate change and, consequently, approaches to governance and risk management. Today the emphasis is on the inclusion of more financially-oriented disclosures in financial filings and more forward-looking analysis of the business implications of climate change.

The challenge now is to provide disclosures that are relevant and useful and are consistent and comparable among companies within a sector.

Section 2 explains the background and purpose of the Forum's work. Section 3 considers effective climate-related disclosure practice and other overarching issues such as the placement of such disclosures. Section 4, the main body of the report, is an illustrated guide to reporting in each area of the TCFD recommendations: governance, strategy, risk management and metrics and targets. In Section 4, we provide examples of current disclosures by the Forum members, highlight challenges we have identified and suggest opportunities for the further development of corporate climate reporting to align better with the TCFD recommendations. Section 5 provides high-level conclusions and suggestions for further work.

During the course of its work, the Forum consulted informally with a limited group of self-selected users of climate-related financial disclosures, consisting mainly of environment, social and governance (ESG) analysts. The purpose of the consultation was to seek general views from those users on the TCFD's recommendations, based on a pre-defined list of questions. Their perspectives have been synthesized for the purposes of this report and are presented anecdotally in the "user perspectives" sections of the report. In view of time constraints, the limited group of users has not been consulted on the way in which the user perspectives are presented in this report. Readers should recognize the limited nature of the engagement with users. This report has been prepared by WBCSD based on input from Forum members and the TCFD's areas of focus:

Governance – Investors want to see that climate change is considered appropriately when a business makes strategic decisions. The examples illustrate the companies' approaches to disclosing climate change governance from the Board level down. Where climate change issues are already integrated into robust overall governance processes, governance disclosures made in the ordinary course of reporting might provide much of the information recommended by the TCFD.

Strategy – The TCFD recommends that companies identify climate-related risks and opportunities over the short, medium and long term and quantify their impact on the business, including analyses of the resilience of their strategy to those risks. The progression of disclosure in this area is clear – from identifying risk through to assessing resilience – and this is likely to warrant particular attention in the future as preparers and users move along the implementation path.

Achieving consistent and comparable scenario analyses will be challenging given the range of views on the pace and implications of the transition to a low-carbon economy. Against a background of such significant uncertainty, scenario analyses should be used to inform strategy and assess near term resilience rather than as forecasts.

Disclosures should also be accompanied by appropriate cautionary language to explain this uncertainty.

All Forum member companies use energy transition scenarios to inform choices and strategic decisions. The companies provide detailed disclosures of the inputs to and outputs of their scenario analyses including strategic responses to the low-carbon transition such as changes in portfolio mix or investment in new technologies. Evidence of resilience to climate change risks can also be found in conventional measures such as capital and cost base flexibility, reserve life, capital allocation plans or R&D spending - although these may not necessarily be labeled as specifically climate-related.

Risk management – The examples in this report show how risk management processes, internal controls and external assurance practices are already disclosed in Forum members' mainstream reports. Where climate change is already integrated into a company's overall risk management process, separate or additional disclosures that specifically address climate-related risk management processes are unlikely to add value.

However, information about how they are applied, such as stress-testing new projects against the risk of carbon pricing and identifying the relative significance of climate change in relation to other risks is helpful.

Metrics and targets – Although there is clear progress in identifying and reporting climate-related metrics and targets within the Forum members' disclosures, the TCFD's work highlights the need for a progression from operational to more financial measures. As disclosures develop in this area, we anticipate greater linkage and coherence between operational metrics such as GHG emissions, water usage, energy usage, strategic targets, management of risks and opportunities and financial metrics.

As we are only part of the way along the TCFD's "implementation path," Section 4 considers possible next steps in climate-related disclosure. These include more standardization of metrics (to support greater comparability among oil and gas companies), particularly those that convey the financial implications of climate change.

Other next steps could relate to disclosing business resilience to potential climate change risks, managing opportunities, and improving the connectivity of financial and other information within reports so that its overall relevance to climate analysis is clear.

Analyzing and disclosing business resilience to different climate-related scenarios is considered one of the more challenging areas of the TCFD's recommendations. As many variables are needed to illustrate resilience over the longer-term, the complexity, uncertainty and lack of consistency between companies of these scenario analyses can limit their value to users. Further work is required to determine whether and to what extent longer-term resilience assessments can be developed in order to make them comparable and meaningful to users.

Enhancing climate-related disclosure in the future will need ongoing interaction between users and preparers of information along the implementation path. We look forward to that interaction. The foundations of effective disclosure practice are already firmly in place.

② Introduction

The TCFD Oil and Gas Preparer Forum was established in October 2017 by the World Business Council for Sustainable Development (WBCSD) with input from the TCFD Secretariat. The Forum's objectives are to review the current state of climate-related financial disclosures, to identify examples of effective disclosure practices and make proposals on how disclosures may evolve over time.

2 Introduction

BACKGROUND TO THE FORUM, ITS MEMBERS AND PURPOSE

The TCFD Oil and Gas Preparer Forum was established in October 2017 by the WBCSD with input from the TCFD Secretariat. The Forum's objectives are to review the current state of climate-related financial disclosures and to identify examples of effective disclosure practice consistent with the TCFD's recommendations. In addition, the Forum aims to make proposals on how disclosures may evolve over time. In doing so, the Forum has sought to apply the seven principles of effective disclosure that form part of the TCFD recommendations (Figure 6, page 18, TCFD Final Report).

The Forum is made up of representatives from Eni, Equinor[1], Shell and Total (collectively referred to as "the Forum" in this report) and its work is coordinated by WBCSD. Membership in the Forum was deliberately restricted to a small, manageable number of oil and gas companies because of the limited time the Forum had to complete its work. Forum members include companies whose senior management has made public statements of support for the TCFD's work and welcomed the initiative to further enhance transparency regarding climate-related financial risk.

During the course of its work, the Forum consulted informally with a limited group of self-selected users of climate-related financial disclosures, consisting mainly of environment, social and governance (ESG) analysts. The purpose of the consultation was to seek general views from those users on the TCFD's recommendations, based on a pre-defined list of questions. Their perspectives have been synthesized for the purposes of this report and are presented anecdotally in the "user perspectives" sections. In view of time constraints, the limited group of users has not been consulted on the way that the user perspectives are presented in this report. Readers should recognize the limited nature of the engagement with users.

FORUM MEMBERS

Stefano Goberti (Eni)
Rosanna Fusco (Eni)
Filippo Ricchetti (Eni)
Hilde Røed (Equinor)
Marc Jacouris (Equinor)
Martin ten Brink (Shell)
Peter Snowdon (Shell)
Ladislas Paszkiewicz (Total)
Bertrand Janus (Total)
Vincent Dufief (Total)

PURPOSE OF AND AUDIENCES FOR THIS REPORT

The report is designed to:

- Reflect the current state of climate-related financial disclosures by Forum companies that align with the TCFD's recommendations.
- Identify challenges associated with responding to the TCFD's recommendations and make proposals about how those challenges might be addressed as well as how disclosures may evolve over time.

The audiences for this report include but are not limited to:

- Oil and gas companies seeking to enhance their climate-related financial disclosures.
- The TCFD, in order to inform their Monitoring Report to the Financial Stability Board in September 2018 and to provide input into any further deliberations on how the recommendations should evolve over time.
- Investors and others using climate-related financial disclosures who seek to understand the current state of climate-related financial disclosure and the scope for development of disclosure practices over time.

[1] Statoil ASA changed its name Equinor ASA to following its Annual General Meeting on 15 May 2018. Examples in this report are based on the company's publications prior to the name change and thus refer to Statoil.

- Organizations the TCFD has identified as making valuable contributions towards adoption of the recommendations. This includes stock exchanges, investment consultants, credit rating agencies, organizations that produce ESG reporting guidance and organizations that develop climate-related scenarios etc. so that they can consider what further work is required to support and enhance climate-related financial disclosure.
- Companies from other industries looking to implement the TCFD's recommendations.

STRUCTURE, SCOPE AND CONTENT OF THIS REPORT

- Section 3 considers certain overarching issues that apply across the reporting landscape and provides Forum members' insights on approaches to address those issues. Section 4, the main body of this report, is an illustrated guide to reporting on each of the TCFD's recommendations: governance, strategy, risk management and metrics and targets. Each section:
  - Summarizes the TCFD's "recommended disclosures" with excerpts from associated guidance, highlighted in pink boxes.
  - Provides commentary on possible responses to the recommendations, including disclosure challenges and possible approaches for addressing those challenges, highlighted under blue headings.
  - Reflects perspectives from users of information, related to the oil and gas industry based on limited, informal consultation with financial institutions, highlighted in turquoise boxes.
  - Shows examples of how current disclosures from Forum member companies respond to the TCFD's recommendations and guidance.

This report is based on a review of current public disclosures by Forum member companies only. A full list of sources for this report is available in Appendix 1 and they are collectively referred to here as "Report Sources."

Examples of disclosure practice that respond to the TCFD's recommendations, guidance and the Fundamental Principles for Effective Disclosure (to the right) are identified in this report. The examples represent an illustrative, non-exhaustive mix of possible responses to the TCFD's recommendations.

The examples were selected by WBCSD in consultation with Forum members based on an assessment of whether disclosures within report sources:

- Respond to one or more of the TCFD's recommendations (as set out in Figure 4 page 14 of the TCFD's Final Report).
- Provide one or more of the information points set out in the Guidance for All Sectors (pages 19 – 23 of the TCFD's Final Report).
- Provide one or more of the information points set out in the Supplemental Guidance for the Energy Sector in Chapter E of the TCFD's Annex "Implementing the recommendations of the Task Force on Climate-related Financial Disclosures."
- Reflect the Principles for Effective Disclosure (below).

Principles for Effective Disclosures

1. Disclosures should represent relevant information
2. Disclosures should be specific and complete
3. Disclosures should be clear, balanced, and understandable
4. Disclosures should be consistent over time
5. Disclosures should be comparable among companies within a sector, industry, or portfolio
6. Disclosures should be reliable, verifiable, and objective
7. Disclosures should be provided on a timely basis

IMPLEMENTATION PATH

The TCFD acknowledges that implementation of their recommendations will take time as illustrated in their "Implementation Path".

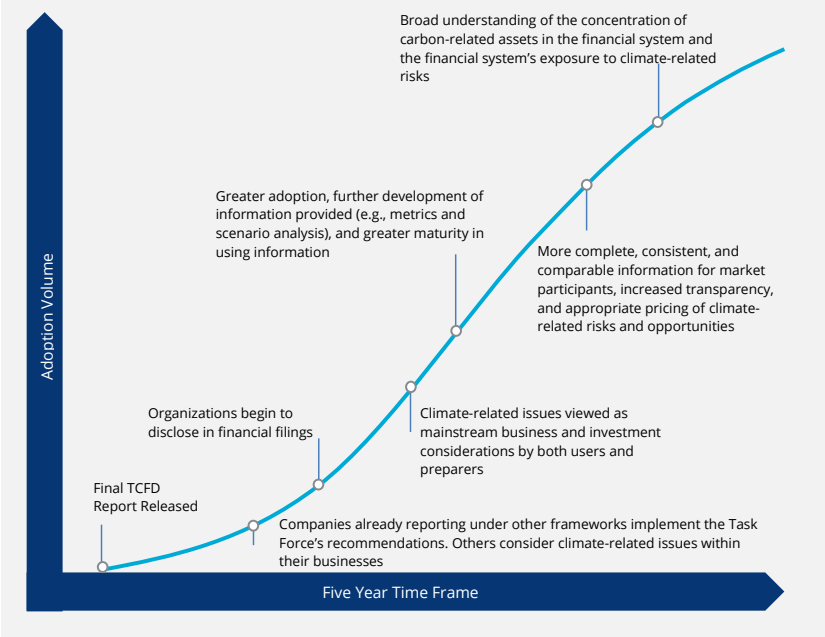
The progression of disclosure content and the quality of information depends on:

- Input from and interaction between the preparers and users of information so that the appropriate balance is found between information needs and the interests of reporting companies, including commercial sensitivities.
- The continuing development of enabling conditions to support effective disclosure including data collection processes, agreed definitions and common methodologies for climate-related financial disclosure, assurance approaches, etc.

Furthermore, progress towards effective disclosure is likely to depend on developments in corporate information, management analysis and the overall quality, breadth and comparability of information:

- Corporate information identifies, describes and provides operational information, for example, about the existence of policies and procedures on governance and management structures. Generally corporate information is taken from the organization's suite of procedural and operational manuals, codes and requirements.
- Management analysis discusses, assesses and analyzes the procedural, strategic, business and financial implications of climate change. Analytical information relies on judgement and is provided at the discretion of the company depending on its particular circumstances, reporting maturity, relevance to the overall report, etc.
- Complementary information enhances the quality, breadth, depth and comparability of information achieved through application of the TCFD's Principles for Effective Disclosure.

Illustrative implementation path



Disclosure recommendations relating to governance and risk management expect or encourage predominantly operational and descriptive corporate information about the processes used by reporting companies to govern and monitor/manage climate change risks and opportunities. Implementation of the TCFD's recommendations on governance and risk management therefore depends on whether the responding company has governance and risk management policies and processes in place and how they are applied to climate-related issues.

By contrast, disclosures regarding strategy, metrics and targets depend on a range of interpretations including management analysis, strategic discussion, some forward-looking assessment and the application of principles to support effective disclosure practice.

Generally, disclosure practice regarding strategy, metrics and targets involves a greater degree of judgement compared with governance and risk management. Hence, the implementation pathway for strategy, metrics and targets disclosure is expected to proceed through more steps and at a different pace than for governance and risk disclosure.

3

Effective disclosure practice: Overarching issues

This section considers some overarching challenges and opportunities associated with climate-related financial disclosures.

3 Effective disclosure practice: Overarching issues

This section considers some overarching challenges and opportunities associated with climate-related financial disclosures, in particular, those related to the TCFD's recommendations.

The TCFD's Final Report recognizes that its recommendations share objectives, processes and content requirements with other disclosure frameworks and mandatory reporting requirements. Therefore, some of the challenges and opportunities associated with implementing the TCFD's recommendations also apply to other disclosure and reporting provisions across the wider reporting landscape.

PLACEMENT

The TCFD recommends that climate-related financial disclosures should be made in mainstream annual financial filings, and that organizations should use the TCFD recommendations to disclose material information where compatible with their national disclosure requirements. Mainstream financial filings typically consist of audited financial results, governance statements and management commentary under the corporate, compliance or securities laws of different jurisdictions.

The structure and limitations of the mainstream annual financial filing can present challenges for companies when considering which information and how much detail to include in response to the TCFD's recommendations.

Strategies that might assist in addressing those challenges include:

- Agreeing with management the degree of flexibility required to keep the mainstream annual financial filing as concise as possible and to ensure that climate-related financial information is proportionate in relation to other material risks while responding to the TCFD's recommendations.
- Identifying with management and relevant information users where climate-related financial information should be reported in order to maximize its usefulness.
- Considering the advice in the TCFD's Final Report (pages 17 – 18 and 33 – 34) about the circumstances in where it is appropriate to report information outside the mainstream financial filings, in "other" reports.
- Considering whether and how information presented outside the mainstream financial filings should be identified as having the characteristics of information reported in mainstream filings in line with the TCFD's advice that such information should be "subject to internal governance processes that are substantially similar to those used for financial reporting… and would likely involve review by the chief financial officer and audit committee as appropriate" (TCFD Final Report page 34) (Figures 1 and 2).

User perspective:

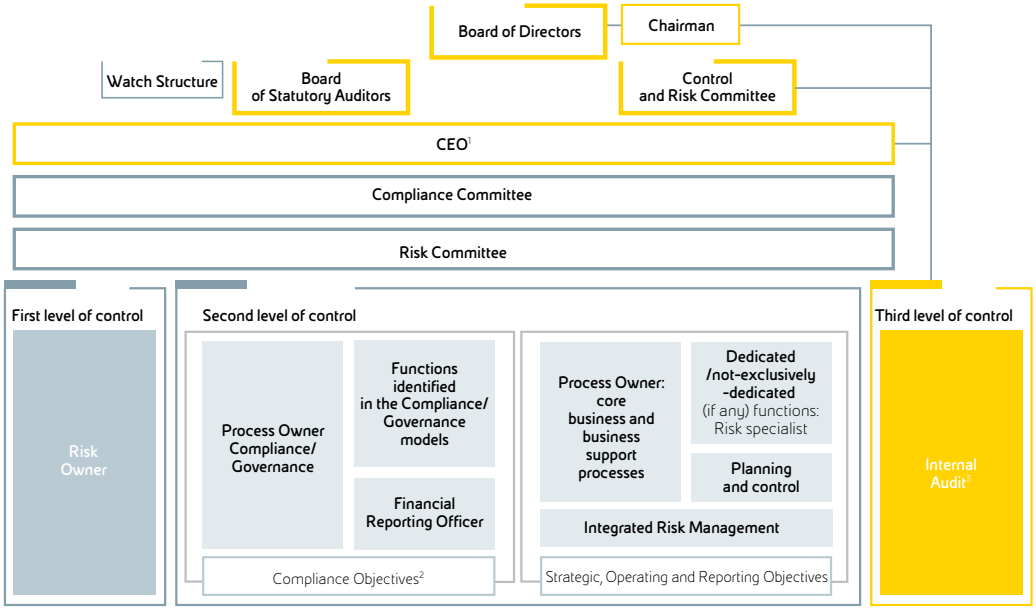
Investors refer to many different sources of information for their decision-making purposes. Mainstream financial filings are an important source of information. However, where it has the characteristics of mainstream information, including relevance, reliability, objectivity, assurability etc., investors accept and rely for their decision-making on information reported through other channels.

Analyst and management day presentations often provide forward-looking and other information that may be difficult to incorporate into financial filings given regulatory requirements or because of efforts to manage the length and volume of mainstream reports – for example on oil and gas "resources." The form, format and types of disclosures provided in these presentations should complement risk factors as well as management's discussion and analysis as described in financial filings.

Figure 1:
Eni's Internal Control and Risk Management System (ICRMS)
Eni website - controls and risks

Controls and Risks

The Internal Control and Risk Management System (ICRMS) is a set of tools, organisational structures, regulations and business rules put in place to facilitate the sound management of the Company in line with the business goals set by the Board of Directors. It provides proper means for the identification, measurement, management and monitoring of risks, while also ensuring that information is circulated as appropriate.



(1) Director in charge of the internal control and risk management system.
(2) Including objectives on the reliability of financial reporting.
(3) The Senior Executive Vice President Internal Audit reports to the Board, and on its behalf, to the Chairman, without prejudice to his functional reporting to the Control and Risk Committee and the CEO, as Director in charge of the internal control and risk management system.

The Eni ICRMS is structured along the following three levels of internal control:

- **first level of control**: identifies, assesses, manages and monitors the risks for which it is responsible, for which it identifies and implements specific management actions;
- **second level of control**: monitors the main risks in order to ensure the effectiveness and efficiency of their management; also responsible for monitoring the appropriateness and operation of controls implemented for the main risks. It also provides support to the first level in defining and implementing adequate systems for managing the main risks and the associated controls;
- **third level of control**: provides independent, objective assurance on the appropriateness and effective operation of the first and second control levels and, more generally, on the Eni ICRMS as a whole.

The structure of the first and second control levels is consistent with the size, complexity, specific risk profile and with the regulatory environment in which each company operates. The third level of control is exercised by the **Internal Audit Unit** of Eni SpA, which, on the basis of a centralised model, performs its controls using a risk-based approach to the overall Eni ICRMS, monitoring Eni SpA and the subsidiaries.

Figure 2:
Equinor (formerly Statoil) - extracts from KPMG's Independent assurance report, 2017 Sustainability Report

Independent assurance report to Statoil ASA
We have been engaged by the management of Statoil ASA ('Statoil') to provide reasonable assurance in respect of the Safety and Environmental Performance Indicators identified below and limited assurance in respect of the information as disclosed in Statoil's Sustainability Report for the year ended 31 December 20i7 ('the Sustainability Report').

Our reasonable assurance engagement covers the following Safety and Environmental performance indicators for the year ended 31 December 2017:

- Safety indicators: Total recordable injury frequency (TRIF), serious incident frequency (SIF), fatalities, oil spills, serious oil and gas leakages.
- Environmental indicators: Greenhouse gas emissions scope 1, control based CO_2, CH_4 emissions, NO_x emissions, energy consumption and SO_x emissions.

The Sustainability Report is covered by our limited assurance engagement. The scope excludes future events or the achievability of the objectives, targets and expectations of Statoil.

Reasonable assurance over the Safety and Environmental Performance Indicators
The procedures selected in our reasonable assurance engagement depend on our judgment, including the assessment of the risks of material misstatement of the Safety and Environmental Performance Indicators whether due to fraud or error.

In making those risk assessments, we have considered internal control relevant to the preparation and presentation of the Safety and Environmental Performance Indicators in order to design assurance procedures that are appropriate in the circumstances, but not for the purposes of expressing a conclusion as to the effectiveness of Statoil's internal control over the preparation and presentation of the Sustainability Report.

Our specific procedures for reasonable assurance on the Safety and Environmental Performance Indicators information as outlined above involved:

- Interviews with relevant staff at corporate, business and local level responsible for providing the information in the Sustainability Report, carrying out internal control procedures on the data and consolidating the data in the Sustainability Report.
- Two visits to production sites aimed at on a local level, validating source data and to evaluate the design and implementation of internal control and validation procedures.
- Evaluating the design and implementation and tests of the operating effectiveness of the systems and methods used to collect and consolidate the data.
- An analytical review of the data and trend explanations submitted by all sites for consolidation at corporate level.

LABELING AND AMPLIFYING EXISTING DISCLOSURES

In the ordinary course of mainstream disclosure, oil and gas companies disclose much of the information investors need to analyze exposure to risk and the resilience of a company's strategy. However, the connection to climate-related risk is not always immediately obvious where disclosures appear under headings related to risk management, financial results, capital discipline, capital flexibility, reserves, resources, production, operations and strategy.

For example, the TCFD's Final Report (page 9) notes that investors find it helpful to understand companies' capital expenditure plans and how the resilience of those plans is supported by organizations' flexibility to shift capital to respond to climate-related risks and opportunities. Some oil and gas companies already provide this information, but within their financial statements and not necessarily with a narrative that shows the relevance of the disclosures to climate change analysis.

Therefore, companies considering implementing the TCFD's recommendations could consider whether existing disclosures on capital flexibility, for example, could be labeled or amplified to show their relevance to climate-related risk and opportunity. The usefulness of disclosures is enhanced by maximizing coherence, integration and connectivity between climate-related information and operational, strategic and financial information.

CAUTIONARY LANGUAGE

Given the high degree of uncertainty around the timing and magnitude of climate-related risks, Forum members highlighted the importance of meaningful cautionary language to accompany more detailed forward-looking disclosures.

Meaningful cautionary language may include a definition of forward-looking statements (e.g. "statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements"). It may include statements identifying related terms and phrases (e.g. "anticipate," "believe," "could," "estimate," "expect," "goals," "intend," "may" etc.). It may also include an explanation of conditions that could affect future expectations (e.g. price fluctuations; changes in demand for products; reserves estimates; environmental and physical risks; legislative, fiscal and regulatory developments including regulatory measures addressing climate change etc.)[2].

CONSISTENCY AND COMPARABILITY

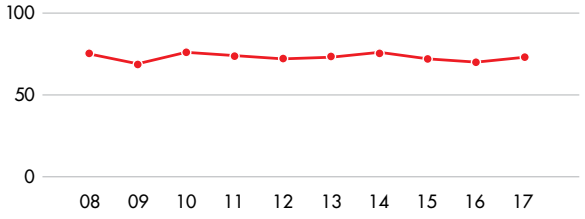
The TCFD's Principles for Effective Disclosure (Principles 4 and 5) stipulate that disclosures should be consistent over time and comparable across organizations within a sector, industry or portfolio. Greater consistency and standardization in climate-related financial information would help investors to compare disclosures. Currently, comparability between companies on some aspects of climate-related financial disclosure is challenging. The TCFD's Implementation Path indicates that consistency and comparability of information between companies needs to develop over time.

However, the TCFD's Principle 4 (Final Report page 4) states that individual companies should use consistent formats, language and metrics from period to period to allow for inter-period comparisons. Figure 3 provides an example of 10 years of comparable GHG emissions data with an accompanying explanation of the scope (including omissions), methodology (including the standard applied and emission factors used) and boundary (equity and operational control basis). GHG emission movements between 2016 and 2017 are also identified and attributed to acquisitions, reduction activities, change in output and divestments.

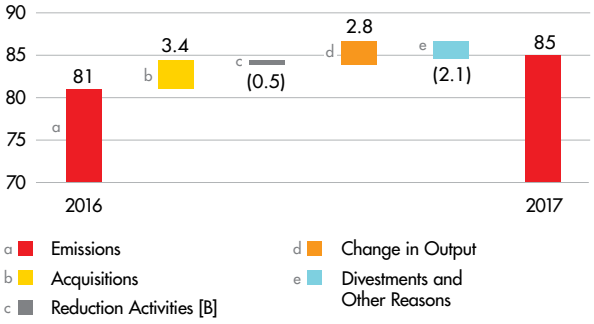
[2] Definitions & examples from Shell's Energy Transition Report - https://www.shell.com/energy-and-innovation/the-energy-future/shell-energy-transition-report/_jcr_content/par/toptasks.stream/1524757699226/f51e17dbe7de5b0eddac2ce19275dc946db0e407ae60451e74acc7c4c0acdbf1/web-shell-energy-transition-report.pdf

Figure 3:
Shell's emissions reporting & GHG breakdown,
Shell Sustainability Report 2017
Shell website - sustainability reporting & performance data

Direct greenhouse gas emissions
million tonnes CO_2 equivalent



GHG movements from 2016 to 2017
million tonnes CO_2 equivalent [A]



[A] Direct and energy indirect greenhouse gas emissions. Numbers have been rounded so some totals may not agree exactly.
[B] Does not include 1 million tonnes of CO_2 captured and sequestered by our Quest CCS project in Canada in 2017.

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Greenhouse gas emissions (GHGs)										
Direct total GHGs (million tonnes CO_2 equivalent) [A]	73	70	72	76	73	72	74	76	69	75
Carbon dioxide (CO_2) (million tonnes)	70	67	68	73	71	69	71	72	66	72
Methane (CH_4) (thousand tonnes)[B]	123	138	132	126	120	93	133	128	127	126
Nitrous oxide (N_2O) (thousand tonnes)	1	1	1	1	1	1	1	2	2	2
Hydrofluorocarbons (HFCs) (tonnes)	23	21	18	16	17	23	22	23	25	23
Energy indirect total GHGs (million tonnes CO_2 equivalent) [C]	12	11	9	10	10	9	10	9	9	n/c

[A] Greenhouse gas emissions (GHG) comprise carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride. The data are calculated using locally regulated methods where they exist. Where there is no locally regulated method, the data are calculated using the 2009 API Compendium, which is the recognised industry standard under the GHG Protocol Corporate Accounting and Reporting Standard. There are inherent limitations to the accuracy of such data. Oil and gas industry guidelines (IPIECA/API/IOGP) indicate that several sources of uncertainty can contribute to the overall uncertainty of a corporate emissions inventory. 2015-2017 emissions are calculated using Global Warming Potential factors from the IPCC's Fourth Assessment Report. Data for prior years were calculated using Global Warming Potential factors from the IPCC's Second Assessment Report.
[B] We have updated our 2015-2016 figures following review of data.
[C] These emissions were calculated using the market-based approach in line with the GHG Protocol Corporate Accounting and Reporting Standard.

GHG breakdown

Emissions by boundary and scope

Below we report emissions on an operational control (100% of emission from companies and joint ventures where we are the operator) and equity basis (equity share of emissions from companies and joint ventures).

The direct (Scope 1) emissions come from the facilities under the operational control or the equity boundary. The energy indirect (scope 2) emissions come from the facilities of others that provide electricity or heat and steam to our operations.

Scope (million tonne CO_2 equivalent)	Operational Control - 2016	Operational Control - 2017	Equity - 2016	Equity – 2017
Direct (Scope 1)	70	73	100	97
Energy indirect (Scope 2)	11	12	13	13

Scope 3 emissions are those emissions that we estimate come from the use of our refinery and natural gas products as reported in the Annual Report.

Scope	Annual Report boundary	Annual Report boundary
million tonne CO_2	2016	2017
Use of our refinery and natural gas products (Scope 3)	600	579

Emissions intensity

Emissions intensity is a measure of the amount of GHG emitted per unit of oil or gas produced by our upstream operations or crude and feedstock refined by the downstream facilities where we have operational control.

Intensity ratio	Units of measure	2016	2017
Upstream/midstream [A]	Tonne CO_2 equivalent / tonne of hydrocarbon production available for sale	0.166	0.166
Chemicals	Tonne CO_2 equivalent / tonne of petrochemicals produced	0.44	0.46
Refineries [B]	Tonne CO_2 equivalent / UEDC™	1.18	1.14

[A] In tonnes of total direct and energy indirect GHG emissions per tonne of oil and gas available for sale, liquefied natural gas and gas-to-liquids production in Integrated Gas and Upstream.

[B] UEDC™ (Utilised Equivalent Distillation Capacity) is a proprietary metric of Solomon Associates. It is a complexity-weighted normalisation parameter that reflects the operating cost intensity of a refinery based on size and configuration of its particular mix of process and non-process facilities.

4

Effective disclosure practice against the TCFD recommendations

This section is an illustrated guide to reporting in each area of the TCFD recommendations: governance, strategy, risk management, metrics and targets. Commentary on each recommendation is accompanied by examples illustrating some of the current disclosures by Forum members.

4 Effective disclosure practice against the TCFD recommendations

This section provides a commentary and illustrative examples for each area of the TCFD's recommendations. It also highlights some of the challenges associated with climate-related financial disclosure and suggests opportunities for the further development of corporate climate reporting to align better with the TCFD recommendations.

GOVERNANCE

Disclose the organization's governance around climate-related risks and opportunities.

The TCFD recommends that companies:

1. Describe the Board's oversight of climate-related risks and opportunities
2. Describe management's role in assessing and managing climate-related risks and opportunities

Information about the role an organization's Board plays in overseeing climate-related issues as well as management's role in assessing and managing those issues "supports evaluation of whether climate-related issues receive appropriate Board and management attention" (TCFD Final Report p.19).

COMMENTARY

In the first steps on the implementation path, disclosures can focus on describing the process used for governing climate change. Where they are already integrated into a company's overall governance and management processes, a detailed description of the processes used to govern and manage climate change is unlikely to add value to the report and might appear repetitive. This is because where climate change considerations are embedded into governance structures at the Board level, it follows that major decisions take account of climate change. Therefore, provided that the annual report describes the company's governance process and it is clear that it applies equally to climate change, it is not necessary to make separate or additional disclosures about the process used for governance of climate change. However, even where climate change is embedded into governance structures at Board level, a company should be able to illustrate how climate-related information flows up and down the organization between teams involved in these decisions and show succinctly how climate change is integrated into key business decisions.

As disclosure practices develop, information about the process can be complemented with:

- Explanations about whether and how the Board and management integrate processes relating to climate change into overall governance structures.
- Information that enables readers to understand the processes and policies used for climate change governance, why companies have made particular governance choices, how the policies are executed, who is involved and what decisions result from the policies.

Similarly, where climate issues have been fully integrated into broader governance processes that do not change significantly over time, a detailed description of the process might not be required every year.

Major business decisions are based on a range of factors and climate change is one of many important risk factors for oil and gas companies. It can therefore be difficult to attribute Board level decisions solely to climate change issues or to explain specifically how climate change issues are taken into account during decision-making as it is one factor among many. The level of detail disclosed about the relevance of climate change should be proportionate.

User perspective:
Long-term capital holders in particular want the Board to own climate change and to talk about the risks in their governance conversations. We want to see that climate change is considered appropriately in business decision-making and is on the table with other issues when boards make key strategic decisions like new acquisitions.

Examples – Governance

The following Figures provide examples of disclosures that:

1. Outline the process for Board oversight of climate change (Figure 4).
2. Identify roles and responsibilities for climate change (Figure 5).
3. Define the frequency with which climate change is discussed by the Board (Figure 6).
4. Show whether and how oversight and management of climate change risks and opportunities are taken into account in business and strategic decisions, risk management, budgeting, performance and capital expenditure, acquisition and divestment (Figure 7).
5. Describe how management monitors climate-related issues (Figure 7).

Figure 4:
Total's description of climate change oversight, Total Annual Report 2017

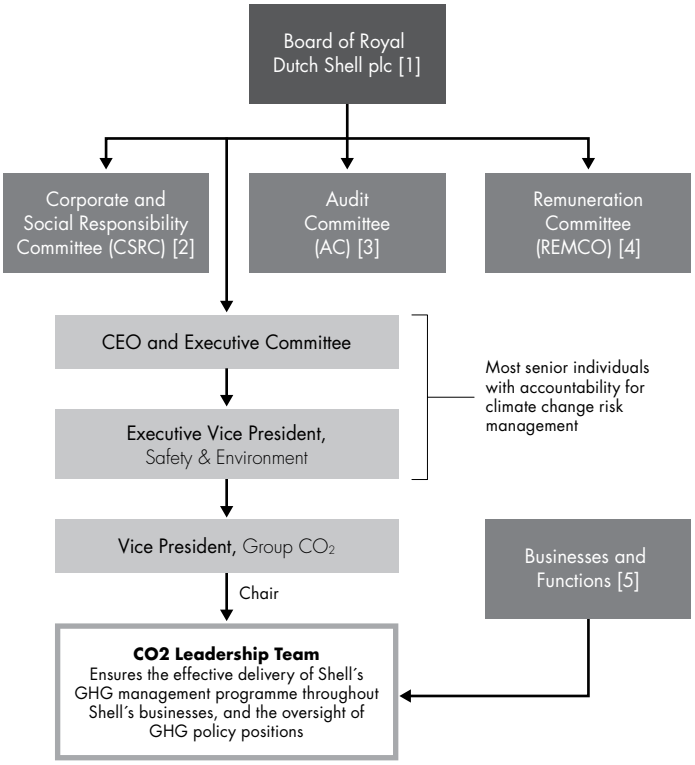
Oversight by the Board of Directors

TOTAL's Board of Directors ensures that climate-related issues are incorporated into the Group's strategy. Since 2008, these major issues for the Group have no longer been treated as one component of environmental risks, but rather on an independent basis. Every year, the Board of Directors reviews the main issues related to climate change in the strategic outlook review of the Group's business segments, which are presented by the respective general management structures.

Also, the Audit Committee does more specific work on the climatic and environmental reporting processes in the review of the performance indicators published by TOTAL in its annual reports and audited by an independent third-party organization. In 2016, the Compensation Committee also decided to introduce changes to the variable compensation of the Chairman and Chief Executive Officer to take better account of the achievement of Corporate Societal Responsibility (CSR) and HSE targets. Finally, in September 2017, the Board of Directors decided to change the regulations of the Strategic Committee in order to broaden its missions in the realm of CSR and in questions relating to the inclusion of climate-related issues in the Group's strategy. This committee is now called the Strategic & CSR Committee.

The Board of Directors is fully mobilized by this issue in order to support the development of TOTAL, and it approved the publication of the first Climate Report in March 2016. This report is updated every year.

Figure 5:
Shell's climate change management organogram, Shell Annual Report 2017



[1] Oversight of climate change risk management.
[2] Non-executive Directors appointed by the Board to review and advise on sustainability policies and practices including climate change.
[3] Non-executive Directors appointed by the Board to oversee the effectiveness of the system of risk management and internal control.
[4] Non-executive Directors appointed by the Board to set the remuneration policy in alignment with strategy.
[5] Responsible for implementing Shell's GHG strategy. They are represented in the CO_2 Leadership Team.

Figure 6:
Equinor (formerly Statoil) disclosure of how the board consider climate-related issues, Annual Report 2017

Statoil regularly assesses climate-related business risk, whether political, regulatory, market, physical or related to reputation, as part of the enterprise risk management process. This includes assessment of both upsides and downsides. Statoil uses tools such as internal carbon pricing, scenario analysis and sensitivity analysis of the project portfolio against various oil and gas price assumptions. We monitor technology developments and changes in regulation and assess how these might impact the oil and gas price, the cost of developing new assets and the demand for oil and gas and opportunities in renewable energy and low carbon solutions.

On a regular basis, the corporate executive committee and board of directors review and monitor climate change-related business risks and opportunities. In 2017, the board discussed climate-related issues in four out of eight meetings (including one risk update), and the safety, sustainability and ethics committee discussed climate-related issues in all of the five committee meetings held.

Figure 7:
Eni's description of governance and management processes and roles, Eni, Path to Decarbonization 2017

BASED ON PROPOSALS FROM THE CEO, THE BOD EXAMINES AND/OR APPROVES:

- **The objectives related to climate change** and the energy transition, as an integral part of business strategies
- The **"GHG Action Plan"** with investments to achieve the objectives of reducing emissions by 2025
- The portfolio of **Eni's top risks** including climate change
- The **Short Term Incentive Plan** with objectives related to the reduction of GHG emissions for CEO and managers with strategic responsibilities
- **Annual sustainability results and HSE reviews**, including performances on climate change
- **Institutional reporting** including the Interim Consolidated Report and the Annual Financial Report (including the consolidated Disclosure of Non-Financial information) and the **sustainability report (Eni for)**
- The relevant projects and their progress, on a six-monthly basis, with **sensitivity** to the Eni and IEA SDS **carbon pricing**
- **Resilience test** on all the upstream Cash Generating Units (CGU) applying the IEA SDS scenario
- **Strategic agreements**, including initiatives related to climate change

On the subject of climate change, the BoD is mainly assisted by three Board committees: Sustainability and Scenarios Committee, Control and Risk Committee and Remuneration Committee. The **Sustainability and Scenarios Committee (SSC)** addresses the integration among strategy, evolution scenarios and business sustainability over the medium to long term and examines the scenario for the strategic plan preparation. Set up in 2014, the SSC was the first example, in the Oil & Gas sector, of an integrated approach in the evaluation of sustainability and energy scenarios. In each of the twelve meetings held in 2017, the SSC discussed issues related to climate change and assessed the consistency of the results achieved with the climate objectives.

Figure 7 (Continued):
Eni's description of governance and management processes and roles, Eni, Path to Decarbonization 2017

Role of Management

Issues relating to climate change risks and opportunities are considered and integrated in all stages of the business cycle, from negotiation to decommissioning. All the company functions, within their area of responsibility, contribute to the decarbonization path. The CEO is responsible for identifying the main business risks, including those connected with climate change, ensuring their assessment and management, and monitoring the progress of mitigation actions. Every year, the CEO assigns Guidelines[7] to each business line and support function for the definition of the strategies in the strategic plan, including those regarding the path to decarbonization.

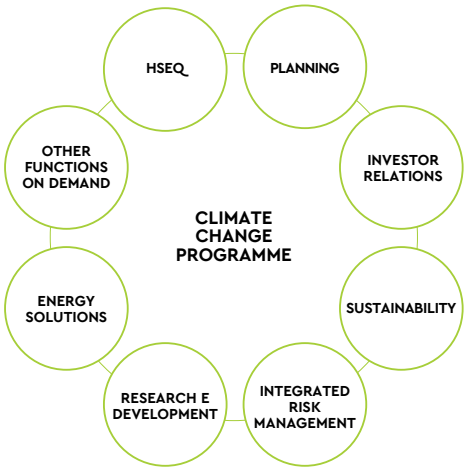
The CEO's Short-Term Incentive Plan (STI) includes objectives associated with climate strategy that are consistent with the guidelines defined in the Strategic Plan. Under the Short-Term Incentive Plan, a portion of the bonus matured is deferred over a three-year period, subject to further performance conditions, in order to assess sustainability over the medium term. In particular, 25% of the STI is composed by environmental sustainability and human capital objective, half of this refers to reducing the GHG emissions intensity rate of operated hydrocarbon production, in line with the 2025 target announced to the market. This objective is also assigned to top management and managers with responsibilities associated with the emissions reduction.

2018 TARGETS FOR THE SHORT-TERM INCENTIVE PLAN WITH DEFERRAL

Economic and financial results (25%)	**Operating results and sustainability of the economic results (25%)**
EBT (12.5%) Free cash flow (12.5%)	Hydrocarbon production (12.5%) Exploration resources (12.5%)
Environmental sustainability and human capital (25%)	**Efficiency and financial strength (25%)**
CO_2 Emissions (12.5%) Severity Incident Rate (12.5%)	ROACE (12.5%) Debt/EBITDA (12.5%)

The **"Energy Solutions" business division**, which reports directly to the CEO, was set up in 2015 to develop renewable energies with large-scale projects. In order to identify new technological, managerial and strategic solutions to support the path to decarbonization, the **Climate Change Programme**, was also set up in 2015, at top management level with a cross-cutting team that reports to a Steering Committee chaired by the CEO.
In 2016, the Programme's objective was updated in order to define a roadmap for the medium-long term decarbonization strategy in line with the Paris Agreement goals.

FUNCTIONS INVOLVED IN THE CLIMATE CHANGE PROGRAMME



The Programme is coordinated by the HSEQ (Health, Safety, Environment & Quality) division, which encompasses a specific competence centre that oversees aspects related to climate change.
In 2016, the Energy Transition Programme was set up under the research and development function to identify the technologies aimed at supporting energy transition. Furthermore, the management is constantly informed about progresses related to the path to decarbonization.

STRATEGY

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy and financial planning where such information is material

This section is divided into two parts. The first considers the initial "recommended disclosure" under the main recommendation on Strategy about the identification of risks and opportunities and the timeframes over which they are expected to materialize.

The second part focuses on the second and third recommended disclosures which deal with:

- The impacts of risks and opportunities on business, strategy and financial planning.
- The reporting company's strategic response to the identified risks and opportunities.
- The resilience of the strategy under different climate-related scenarios.

The organization of this section into two parts is designed to simplify the structure of this report. It is not intended to imply that disclosures in response to the recommended disclosures on strategy should be presented in two parts.

STRATEGY: RISK IDENTIFICATION AND TIME FRAMES

The TCFD recommends that companies:

Describe the climate-related risks and opportunities the organization has identified over the short, medium and long term

"Improved disclosure of climate-related risks and opportunities will provide investors, lenders and insurance underwriters and other stakeholders with the metrics and information needed to undertake robust and consistent analysis of the potential financial impacts of climate change" (TCFD Final Report page 5).

COMMENTARY

As a first step, disclosures can describe the climate-related risks and opportunities that have been identified, together with the time scales over which the risks and opportunities are expected to materialize. As disclosures develop, they can:

- Explain the way in which the company defines short, medium and long term.
- Describe the process used for assessing vulnerability to risk and for identifying material climate-related risks and opportunities.
- Identify the drivers of climate change risk.
- Elaborate on the type of risks (transition and/or physical) and opportunities that have been identified and how they are managed.

User perspective:
Investors find information most useful when it is disaggregated, for example, by upstream and downstream, geography, business segment or division, operated and non-operated activities, entity and facility. They encourage companies to consider segmenting information according to financial reporting practice. However, investors recognize the limitations on segmentation where it threatens commercial sensitivity.

Forum member companies all recognize climate change as a relevant risk factor. As such, they routinely make disclosures about climate-related risks and opportunities in annual reports, investor presentations and other disclosures. Usually, risks and their relative severity are monitored and managed through enterprise risk management (ERM) processes, materiality assessment, business continuity plans and specialist functions.

The TCFD distinguishes between transition risks (e.g. regulatory requirements, carbon prices, new technologies, changes in market demand) and physical risks from climate change. Transition risks are typically more material to Forum member companies and are identified and described in the risk section of their mainstream financial filings. Forum members disclose the safeguards in place to minimize the possibility of physical risks becoming material risks. As physical risks are currently considered less material for Forum members, their disclosure in this area can be more limited, commensurate with the risk level, but explaining how they assess and adapt to such risks.

The complexity and uncertainty associated with climate change can make it difficult to identify where and when specific issues could affect an organization. When defining short, medium and long term, the TCFD recommends that companies "Take into consideration the useful life of the organization's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms." Forum members explained the way in which they define short, medium and long term, specifying the number of years to which the short and medium term applies.

The type of information disclosed about the short and medium term is different from information suitable for disclosure about the long-term. Disclosures relating to the short and medium term provide information about near term financial and operational risks and resilience and can include quantitative information. In the longer-term, climate change presents potential portfolio risk.

However, changes in portfolio mix, business models or corporate structures mean that risk analyses depend on assumptions about how the portfolio, the industry, market and regulatory environment will evolve. Therefore, longer-term views focus on the generally anticipated direction of energy transition and monitoring of external indicators that enable the company to test its assumptions. Disclosures relating to longer-term risk are more likely to be qualitative.

The TCFD encourages companies to consider providing a description of their risks and opportunities by sector and/or geography as appropriate (TCFD Final Report page 20). Decisions about whether, to what extent and how to segment information will depend on several factors. One is whether it is feasible to disaggregate information on climate-related risks and opportunities in a way that is consistent with the approach to segmenting other information in the mainstream reports. Another is whether there are contractual, practical or legal reasons that prohibit or limit the scope for disaggregation of information.

Examples – Strategy A

The following Figures provide examples of disclosures that:

1. Identify and describe material climate-related risks (Figures 8 & 11), such as regulations significantly affecting the development of projects and the economic value of assets (Figure 9).
2. Identify and describe climate-related opportunities - access to new markets and new technology (such as biofuels markets and carbon, capture and storage technology. (Figure 10).
3. Describe the time horizons over which climate-related risk and opportunities might affect the organization (Figure 12).
4. Describe the process(es) used to determine which climate-related risks and opportunities could have a material financial impact on the organization and how the impact has been assessed e.g. the process for assessing physical risk vulnerability (Figure 13).

Figure 8:
Equinor (formerly Statoil) description of transition risk as a key risk factor, Annual Report and Form 20-F 2017

The transition to a lower carbon economy risks

Market-related risk: There is continuing uncertainty over demand for oil and gas after 2030, due to factors such as technology development, climate policies, changing consumer behavior and demographic changes. Statoil uses scenario analysis to outline different possible energy futures. Technology development and increased cost-competitiveness of renewable energy and low-carbon technologies represent both threats and opportunities for Statoil.

As an example, the development of battery technologies could allow more intermittent renewables to be used in the power sector. This could impact Statoil's gas sales, particularly if subsidies of renewable energy in Europe were to increase and/or costs of renewable energy were to significantly decrease.

On the other hand, Statoil's renewable energy business could be impacted if such subsidies were reduced or withdrawn. As such, there is significant uncertainty regarding the long-term implications to costs and opportunities for Statoil in the transition to a lower-carbon economy.

Figure 9:
Total material financial risks associated with climate change, Total Annual Report 2017

Laws and regulations related to climate change as well as growing concern of stakeholders may adversely affect the Group's business and financial condition.

Global concern over greenhouse gas ("GHG") emissions and climate change, which notably led to the signature of the Paris Agreement on 12 December, 2015 as part of the United Nations Climate Change Conference (COP 21), is likely to lead to further regulation in these areas.

These additional regulatory requirements could lead the Group to curtail, change or cease certain of its operations, and submit the Group's facilities to additional compliance obligations, which could adversely affect the Group's businesses and financial condition, including its operating income and cash flow.

Regulations designed to gradually limit fossil fuel use may, depending on the GHG emission limits and time horizons set, negatively and significantly affect the development of projects, as well as the economic value of certain of the Group's assets.

Internal studies conducted by TOTAL have shown that a long term CO_2 price of USD $40/t[1] applied worldwide would have a negative impact of around 5% on the discounted value of the Group's assets (upstream and downstream)[2]. In addition, the average reserve life of the Group's proved and probable reserves is approximately 20 years and the discounted value of proved and probable reserves with a reserve life of more than 20 years is less than 10% of the discounted value of the Group's upstream assets.

In response to these possible developments, natural gas, which is the fossil energy that emits the least amount of GHG, represented nearly 48% of TOTAL's production in 2017, compared to approximately 35% in 2005, and the Group's objective is to grow this percentage over the long term with the expected growth of gas markets. In addition, the Group ceased its coal production activities and is developing its activities in the realms of solar energy production and energy from biomass (renewable energies).

[1] As from 2021 or the current price in a given country.

[2] Sensitivity calculated for a crude oil price of $60/80/b compared to a reference scenario that takes account a CO_2 price in the regions already covered by a carbon pricing system.

Figure 10:
Total climate change opportunities, Total Annual Report 2017

Climate change also provides TOTAL with opportunities:

- In the coming decades, demand for electricity will grow faster than the global demand for energy, and the contribution of renewables and gas to the production of electricity is essential to the success of the 2°C scenario. This represents an opportunity for TOTAL. Access to energy and decentralized production are part of this opportunity.
- But electricity alone will not be sufficient to meet all the needs, and in particular those of transport: gas and biofuels are amongst the solutions that the Group intends to develop.
- Speeding up the development of CO_2 capture, utilization and storage technologies (CCUS) is a source of opportunities to meet the needs of various industries (electricity generation, but also cement works, steel works, waste treatment, etc.).
- Helping customers to reduce their energy costs and environmental impact also offers opportunities, as part of a trend that will be accelerated by digital technology. TOTAL intends to innovate in order to provide them with new product and service offers that will support their energy options and their usages. The promotion of hybrid solutions combining hydrocarbons and renewables is part of this approach.

  Similarly, services can be offered to optimize energy for industrial sites. The Group aims to develop this approach for industrial and mobility applications.

Figure 11:
Eni's consideration of different climate risk drivers , Eni Path to Decarbonization 2017

RISK DRIVER	RISK FACTORS	MITIGATION ACTIONS
MARKET SCENARIO DRIVER	• Decline in global hydrocarbon demand • Loss of results and cash flow • "Stranded asset" risk • Impacts on shareholders' returns	• Assets resilience to low carbon scenarios • Increasing role of natural gas in the portfolio • Development of renewable energies and green business
REGULATORY DRIVER	• Increase in operating and investment costs • Reduction of oil demand	• Resilience of assets to low carbon scenarios • Energy efficiency initiatives • Commitment to the research on renewable technologies and green business • Sustainable mobility initiatives
TECHNOLOGICAL DRIVER	• Reduction of hydrocarbon demand due to technological breakthrough in the field of electric vehicles or renewables and related economic impacts	• Development of renewable energy and green business • Energy efficiency initiatives • Commitment in research and development • Digital trasformation to support efficiency (e.g. fugitive methane monitoring and preventive maintenance) • Partnership for the development of technological solutions
PHYSICAL DRIVER	• Interruptions of industrial operations • Damage to plants and infrastructures • Recovery and maintenance costs	• Adoption of additional technical measures to protect wells, plants and structures in areas most exposed to extreme events • Introduction of more stringent design and control criteria for new projects, which consider the effects of climate change scenarios • Geographical diversification of the portfolio
REPUTATIONAL DRIVER	• Impacts on stakeholders relations • Impacts on stock price	• Well structured climate change governance • Role and commitment of management • Partnerships to address climate change • Transparent communication of the decarbonization strategy

Figure 12:
Shell's explanation of short, medium and long-term timeframes in its business planning, Shell Annual Report 2017

This is how we describe the different time horizons and the relevance for the identification of risks the business planning:

- Short term (up to three years): detailed financial projections are developed and used to manage performance and expectations on a three-year cycle. This three-year plan is shared with the Board;
- Medium term (three years up to around 10 years): the majority of production and earnings expected to be generated in this period come from our existing assets; and
- Long term (beyond around 10 years): for this period, the current Shell portfolio is not representative of our performance or the potential risks, and questions emerging on the thematic structure of the portfolio guide decision-making and risk identification.

Figure 13:
Total's explanation of how the company assesses asset vulnerability to climate change, Total Annual Report 2017

The Group ensures that it assesses the vulnerability of its facilities to climate hazards so that the consequences do not affect the integrity of the facilities, or the safety or people.

More generally, natural hazards (climate-related risks as well as seismic, tsunami, soil strength and other risks) are taken into account in the conception of industrial facilities, which are designed to withstand both normal and extreme conditions.

The Group carries out a systematic assessment of the possible repercussions of climate change on its future projects. These analyses include a review by type of risk (e.g., sea level, storms, temperature, permafrost) and take into account the lifespan of the projects and their capacity to gradually adapt. These internal studies have not identified any facilities that cannot withstand the consequences of climate change known today.

STRATEGY: IMPACTS OF CLIMATE RISK AND OPPORTUNITIES, STRATEGIC RESPONSE AND RESILIENCE

Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy and financial planning.

Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

"The financial impacts…are driven by the specific climate-related risks and opportunities to which the organization is exposed and its strategic and risk management decisions on managing those risks (i.e.: mitigate, transfer, accept or control) and seizing those opportunities." (TCFD Final Report Page 8).

The TCFD recommends that after a company has set out implications for different climate-related scenarios, it should disclose "how their strategies might change to address potential risks and opportunities" – for example by describing the options they have for bolstering their strategic and business resilience.

COMMENTARY

In brief, companies are encouraged to provide disclosures that reflect the:

- Potential impacts of risks and opportunities on business, strategy and financial planning and how they are factored into decision-making.
- Strategic response to the identified risks and opportunities.
- Resilience of the strategy under different climate-related scenarios.
- How financial planning supports the company's risk mitigation and opportunity realization strategies, for example, by disclosing capital allocation and expenditure plans in place to support their strategies.

Many factors influence and support resilience against climate-related impacts and risks. It can be challenging to identify and provide clear measures and metrics that provide appropriate evidence of how and why the company is resilient to these. Therefore, a range of approaches may be used to assess the potential impacts of climate change on the business and the resilience of the company's strategy to those impacts. Sensitivity analysis is used to demonstrate the resilience of the business to changes in variables such as the oil price or carbon price.

The TCFD recommends that companies take "into consideration different climate-related scenarios, including a 2°C or lower scenario." The purpose of using scenarios is to demonstrate a company's resilience under a range of possible economic, regulatory, social and physical conditions.

Scenarios are not forecasts, they are hypothetical constructs, used to explore critical uncertainties and support internal business decision making. They can be used to look at very specific and immediate situations like political challenges or they can look out over decades to consider the development of the global energy system and the energy transition. Given the primary purpose of using scenarios to support internal decision-making, along with their exploratory and complex characteristics, it can be challenging to provide consistent and comparable disclosures related to scenario analysis.

All Forum member companies use energy transition scenarios, considering different possibilities and their implications, to inform strategic choices in times of uncertainty. In response to the TCFD guidance related to scenario analysis, Forum member companies explain how their business strategies remain resilient to changes in the energy system as the transition progresses.

To help users understand how these conclusions have been reached, companies can provide details of the inputs, assumptions and analytical choices relevant to the climate-related scenarios they use and the analyses they conduct. They can also refer to recognized third-party published scenarios and assumptions. These may include policy assumptions, energy demand projections and technology pathways.

Assumptions and parameters can be tracked and communicated in many different ways. For example, through monitoring, "signposts," "signal tracking" and "event triggers," all of which enable the organization to ascertain which scenarios are becoming more or less dominant over time.

Companies can demonstrate how scenario analysis supports decision-making by describing how financial planning supports their risk mitigation and opportunity realization strategies and how strategies might change to address potential risks and opportunities.

Several of the Forum companies use the IEA scenarios to perform sensitivity analysis. The assumptions underlying these scenarios are publicly available through World Economic Outlook reports that are published by the IEA annually.

The Forum recognizes that scenario analysis can be difficult to compare between companies, in particular where different scenarios are used.

Further, scenario analysis is a complex process that could be challenging and resource intensive for smaller companies. While scenario analysis can be a useful exercise for companies on an individual basis, it is questionable how valuable it is for investor decision-making, given the uncertainty and lack of comparability of the analysis.

Over time, analysts and financial institutions may evolve a practice of performing their own scenario analysis enabling more comparison and control of assumptions.

Today, the most useful disclosures in response to the Strategy recommendation are those that:

- Reflect the potential impacts of climate-related risks and how they are factored into decision-making and strategic responses.
- Demonstrate resilience, capital flexibility and capital discipline. According to the TCFD, "Organizations should consider discussing their flexibility in positioning/repositioning capital to address emerging climate-related risks and opportunities." (TCFD Annex page 48 – Supplemental Guidance for Non-Financial Groups).

Given the long-term nature of scenario analysis, a detailed description of the process and outcomes might not be required every year, provided that there have been no significant changes in the analysis.

User perspective:

Scenario analysis is most useful when:

- It is based on recent or current information and current views of technology development and costs.
- Disclosures are as specific as possible so that, for example, sensitivities to specific inputs are clearly described.
- It is based on defined and recognized third party reference scenarios (such as issued by the IEA) together with associated demand profiles and oil and gas prices.

Companies should be transparent about the thought process, assumptions and approaches used. This could include qualitative descriptions of the categories or variables/parameters used (e.g. technology development/deployment and quantitative information relating to GDP, demographics, energy mix/supply, energy demand/use).

At the moment, the best disclosures have long-term targets, measure progress towards those targets and have some good sensitivity analysis. But most disclosures are not contextualized. Some information is provided about CCS, natural carbon sinks, renewables, chemicals, increase in downstream activity etc. but it is hard for investors to understand how material this is in the context of overall disclosures. A more integrated picture to link strategic discussions and decisions to operations is important.

Investors value financial metrics that help them understand how money is being invested and whether investment decisions support future prospects and value creation in line with the Paris Agreement. Relevant financial information includes capital expenditure plans and commitments, investment in and projected earnings from non-fossil fuel activities, and evidence of capital discipline to control costs and risks.

Capital and cost base flexibility are useful indicators for assessing an international oil company's (IOC) resilience in a time of transition. IOCs are good at giving information about their capital flexibility over 5 years and assessing the effect of dependencies such as the oil price.

What could be better is communicating how capital could be redeployed and the breakdown between committed spend and free spend. Analysts want to understand what value is being generated. Are investments supporting current returns or future prospects? Is the money being spent well? Over time, we would like to know more about the potential for foregone capex, retirement obligations and divestment.

Reserves, production and resources are used for long-term cash flow valuations and the PV10 method of valuation. We would like to complement this with analysis that looks at whether the resource base is consistent with 2ºC transition. However, underlying data is missing and limited, preventing full modeling.

Examples – Strategy B & C

The following Figures provide examples of disclosures that show:

1. Sensitivity to carbon pricing (Figures 14, 15, 16, 18 & 19).
2. Sensitivity to oil price (Figures 15 & 16).
3. Committed and uncommitted capital expenditure (Figures 16 & 18).
4. Reserve life (Figure 14).
5. Descriptions of portfolio optimization (Figures 18 & 19).
6. Management of the cost base (Figures 17 & 19).
7. Internal rate of return (Figure 18).
8. Production forecasts (Figure 19).
9. Breakeven and cost of supply (Figures 17, 18 & 19).
10. Key quantitative assumptions/ parameters: population, GDP, Final consumption (by Carrier) (EJ/year), Primary Energy (by Carrier) (EJ/year), CO_2 emissions and emissions captured (Figure 20).
11. Factors and options that support strategic and business resilience (Figures 21 & 22).
12. The optimization and development of the business, its portfolio (e.g. via ventures into new energies/renewables business lines or diversified downstream product offerings), new capabilities or technologies (e.g. carbon capture technologies) (Figures 23 & 24).
13. Capital allocation and expenditure plans in place to support strategies (Figures 25 & 26).

Figure 14:
Total's strategic resilience,
Total Annual Report 2017

The Group's strategy incorporates the challenges of climate change, using as a point of reference the 2°C Sustainable Development scenario of the IEA and its impact on energy markets. The Group ensures sustainability of its projects and long-term strategy relative to climate change issues by the incorporation into financial evaluations of its investments submitted to the Executive Committee a long-term CO_2 price of $30 to $40 per ton (depending on the crude price), or the current CO_2 price if this is higher in a given country. Regulations designed to gradually limit fossil fuel use may, depending on the GHG emission limits and time horizons set, negatively and significantly affect the development of projects, as well as the economic value of certain of the Group's assets. Internal studies conducted by TOTAL have shown that a long-term CO_2 price of $40/t[1] applied worldwide would have a negative impact of around 5% on the discounted present value of the Group's assets (upstream and downstream)[2]. In addition, the average reserve life of the Group's proved and probable reserves is approximately 20 years and the discounted value of proved and probable reserves with a reserve life of more than 20 years is less than 10% of the discounted value of the Group's upstream assets.

[1] As from 2021 or the current price in a given country.

[2] Sensitivity calculated for a crude oil price of $60/80/b compared to a reference scenario that takes account a CO_2 price in the regions already covered by a carbon pricing system.

Figure 15:
Shell's disclosure of the potential impact of carbon and oil price changes on their cash flow and portfolio diversity providing resilience through price cycles, Shell Energy Transition Report

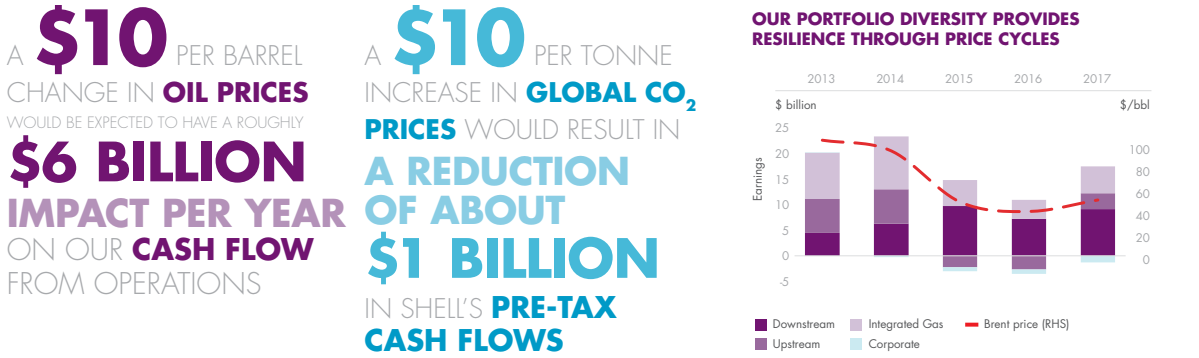
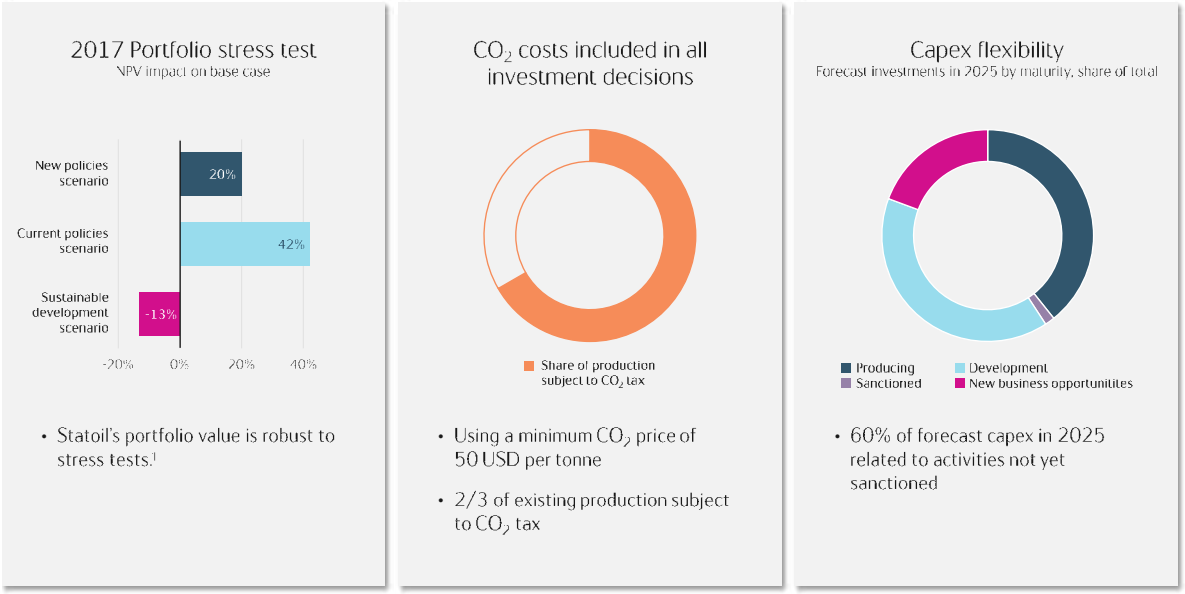
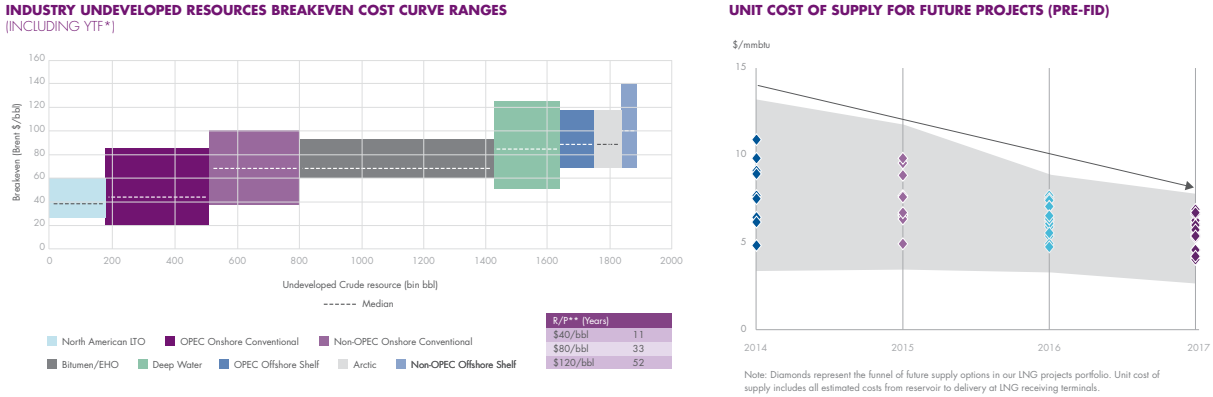


Figure 16:
Equinor (formerly Statoil) stress-testing and flexibility, Socially Responsible Investor Day presentation



1. *Changes in the value of Statoil's project portfolio when replacing internal planning assumptions for prices of oil, gas and CO_2 with those from the IEA, as per its World Economic Outlook 2017 report*

Figure 17:
Shell's illustration of Industry Undeveloped Resources Breakeven Cost Curve Ranges & LNG Unit Cost of Supply For Future Projects, Shell Energy Transition Report



* YTF: Yet To Find
** R/P is Undeveloped Resource volume divided by the current production rate, which gives an indication of future development potential compared to needs. It excludes volumes from already developed fields.
Source: Wood Mackenzie, Rystad Energy, IHS, EIA, NEB (Canada), IEA and Shell internal data/analysis.

Note: Diamonds represent the funnel of future supply options in our LNG projects portfolio. Unit cost of supply includes all estimated costs from reservoir to delivery at LNG receiving terminals.
Source: Shell.

Figure 18:
Eni's Portfolio Resilience, Eni, Path to Decarbonization 2017

Portfolio resilience

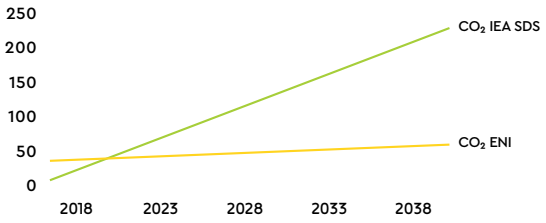
Portfolio resilience is ensured by the regular review of the assets portfolio and new investments in order to identify and assess potential emerging risks associated with changes in emissions regulations and in the physical conditions of operations. The return on the main investment projects is tested using a sensitivity to carbon pricing of 40 $/ton CO_2eq in actual terms in 2015, when the Final Investment Decisions (FID) is made and later during the six-monthly monitoring of projects, based on the following assumptions:

- Eni's scenario of hydrocarbon prices and cost of CO_2;
- IEA SDS low-carbon scenario of hydrocarbon prices and cost of CO_2.

The results of the most recent monitoring have highlighted marginal impacts (-0.8 percentage points) on internal return rates. In addition, the portfolio composition and Eni's decarbonization strategy minimises the risk of stranded assets in the upstream sector, since the break-even price of Oil & Gas projects have been gradually reduced through the optimization of the asset portfolio with the high incidence of conventional gas, near-field exploration and efficiency improvements in development projects. In this regard, the management has subjected to a sensitivity analysis the book value of all CGUs (Cash Generating Units) in the upstream sector, adopting the IEA SDS scenario; this stress test highlighted the substantial retention of the asset book values, with a reduction of about 4% of the fair value.

Having tested its resilience, Eni's flexibility and adaptability are confirmed in the fact that the uncommitted portion of the capital expenditures is 36% in 2018-2021 and equal to approximately 50% with reference to the last two-year period 2020-2021.

CO_2 PRICES USED FOR SENSITIVITY ANALYSIS
($/ton CO_2)



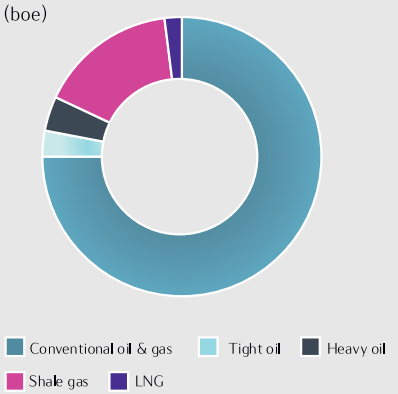
Eni elaborations on IEA data

Figure 19:
Equinor (formerly Statoil) analysis of the impact of the IEA scenarios on its net present value, Sustainability Report 2017

Portfolio stress test

Statoil has for several years tested all investment projects after 2020 against a global CO_2 price of USD 50 per tonne (or higher in countries where a higher price is used and/or predicted) and we have a high share of production with relatively low CO_2 intensity. This makes our portfolio robust against the introduction of higher CO_2 costs in all regions where we are present. Conventional oil and gas is forecasted at 75% of total production in 2025, while heavy oil contributes less than 4%.

Forecast equity production of oil and gas by category in 2025, share of total
(boe)



The analysis conducted in 2017 demonstrated that due to the significant differences in assumptions around oil and gas prices in the different IEA scenarios, the impact on Statoil's net present value (NPV) varies significantly in the various scenarios.[18]

Due to the combination of a high CO_2 price used by Statoil in internal planning assumptions, and a relatively low CO_2 intensity (around half of the industry average[19]) the changes in value are almost entirely driven by the oil and gas price assumptions.

IEA's "New policies scenario" could have a positive impact of around 20% and the "Current policies scenario" a positive impact of around 42% on Statoil's baseline NPV compared to Statoil's internal planning assumptions as of 1 December 2017. The "Sustainable development scenario", which is largely compatible with a global warming of a maximum of two degrees Celsius with 50% probability, could have a negative impact of approximately 13% on Statoil's NPV.

Portfolio optimisation and efficiency improvements have substantially strengthened the robustness of our portfolio during the past few years, and despite the negative impact on NPV in the "sustainable development scenario", we see very limited stranding of assets. Statoil's portfolio continued to improve its robustness in 2017 compared to 2016 – achieving a breakeven oil price of USD 21 per barrel for next generation[20] projects.

[18] The sensitivity analysis has been conducted by replacing Statoil's oil, gas and carbon price assumptions as of 1 December 2017 with the price assumptions in the IEA's scenarios in the World Economic Outlook 2017 report
[19] Source: Association of International Oil and Gas Producers (IOGP) Environmental Performance data 2017
[20] Statoil and partner operated projects sanctioned since 2015 or planned for sanction, with start up before 2022. Volume weighted

Figure 20:
Shell's Sky Scenario Numbers – Total Final (Energy) Consumption (EJ/year) – By Sector & Carrier, Shell - The numbers behind Sky

Sky Scenario World

Year	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070	2075	2080	2085	2090	2095	2100
3 Total Final Consumption - By Sector	(EJ / year)																								
1 Heavy Industry	36.31	37.41	36.74	40.64	43.02	51.22	62.06	67.06	70.09	73.95	76.15	79.38	82.47	85.79	87.40	88.32	87.43	85.09	82.00	79.43	77.21	75.75	74.78	73.81	72.73
2 Agriculture & Other Industry	51.21	48.90	56.55	45.12	44.32	51.42	57.48	59.68	64.31	69.85	73.62	76.66	78.69	80.47	82.43	84.27	85.97	87.06	87.75	87.58	86.81	85.97	85.36	84.71	84.03
3 Services	16.83	17.55	18.83	21.09	23.31	27.01	29.94	31.59	34.73	39.64	44.89	50.75	56.98	64.32	71.86	78.89	85.94	91.43	95.45	97.94	99.50	98.70	97.29	95.87	93.78
4 Passenger Transport - Ship	0.33	0.54	0.50	0.47	0.56	0.64	0.73	0.96	1.02	1.05	1.08	1.11	1.13	1.11	1.09	1.06	1.03	1.00	0.96	0.92	0.88	0.84	0.80	0.75	0.71
5 Passenger Transport - Rail	0.69	0.72	0.85	0.68	0.67	0.72	0.72	0.78	0.81	0.84	0.87	0.89	0.91	0.94	0.97	1.00	1.00	1.00	0.99	0.98	0.97	0.95	0.94	0.93	0.91
6 Passenger Transport - Road	24.14	25.26	28.24	31.31	35.60	40.61	46.29	51.23	55.14	56.71	51.88	51.51	50.12	48.06	47.47	47.58	47.57	46.90	47.51	47.69	47.64	47.73	47.85	47.89	47.87
7 Passenger Transport - Air	4.84	5.32	6.20	6.31	7.50	8.14	8.35	9.68	9.92	10.85	11.38	13.29	15.45	17.58	20.02	22.15	24.51	26.70	29.01	31.08	32.94	34.66	36.34	37.97	39.48
8 Freight Transport - Ship	5.79	5.03	5.91	6.64	7.77	8.84	9.97	10.00	10.62	11.53	12.24	13.04	13.71	14.25	14.68	14.97	15.17	15.25	15.27	15.22	15.14	15.05	14.95	14.82	14.66
9 Freight Transport - Rail	2.49	2.29	1.63	1.26	1.30	1.57	1.43	1.51	1.55	1.57	1.54	1.58	1.65	1.73	1.82	1.89	1.96	2.01	2.06	2.13	2.20	2.28	2.36	2.45	2.54
10 Freight Transport - Road	12.30	13.99	18.91	21.20	24.52	27.49	29.72	34.27	36.96	40.41	42.52	45.72	48.75	51.79	55.40	58.98	62.81	66.31	69.72	72.66	75.12	77.21	79.01	80.54	81.83
11 Freight Transport - Air	1.01	1.19	1.43	1.69	1.97	2.12	2.10	2.50	2.85	3.01	3.10	3.50	3.94	4.35	4.81	5.20	5.65	6.07	6.49	6.84	7.12	7.37	7.62	7.85	8.08
12 Residential - Heating & Cooking	49.27	55.33	58.23	65.08	66.96	69.07	70.73	71.86	74.61	75.27	73.14	71.50	69.00	67.48	66.25	65.71	65.64	65.85	65.87	65.28	64.46	63.02	61.30	59.42	57.24
13 Residential - Lighting & Appliances	3.99	4.84	5.95	7.26	8.79	10.71	12.73	14.10	15.64	17.45	18.70	19.97	20.83	21.91	22.99	24.09	25.10	25.42	25.48	24.92	25.06	25.20	25.13	25.05	24.82
14 Non Energy Use	14.81	16.17	20.00	22.49	25.83	29.89	32.59	35.01	38.38	43.16	47.28	52.82	58.80	64.96	71.59	77.75	83.63	89.18	94.36	99.14	103.57	107.83	111.87	115.72	119.25
Total	224.00	234.54	259.98	271.24	292.11	329.45	364.85	390.21	416.61	445.28	458.39	481.73	502.44	524.75	548.79	571.85	593.39	609.26	622.93	631.82	638.61	642.57	645.59	647.80	647.92

4 Total Final Consumption - By Carrier	(EJ / year)																								
1 Solid Hydrocarbon Fuels	26.96	29.53	29.30	25.78	21.43	31.58	39.46	41.16	40.05	41.78	43.12	45.39	48.93	53.82	57.98	59.30	56.85	52.33	47.49	44.34	42.86	42.55	43.23	44.13	44.85
2 Liquid Hydrocarbon Fuels	96.86	92.61	101.23	107.61	118.60	131.25	137.90	146.23	156.95	164.56	158.34	157.18	154.55	149.56	144.81	140.00	133.74	124.48	115.43	109.70	105.91	103.54	101.92	100.18	97.65
3 Gaseous Hydrocarbon Fuels	41.53	44.86	47.47	51.69	58.37	62.56	71.51	77.10	83.67	87.75	85.05	80.06	73.92	66.31	58.46	52.61	47.84	44.08	43.47	43.49	43.43	43.04	42.74	42.33	41.61
4 Electricity	24.50	28.87	34.82	39.14	45.67	54.51	64.49	72.78	83.26	99.98	120.61	146.88	173.71	204.11	235.56	264.71	294.64	323.21	347.44	361.99	370.17	372.38	371.21	368.36	363.75
5 Hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.14	0.43	1.04	2.18	4.37	8.74	15.20	23.52	31.61	38.70	44.35	49.27	53.89	58.49	63.46	68.81
6 Heat	5.05	6.79	14.17	12.11	10.60	11.16	12.12	12.59	13.36	14.19	14.16	14.02	13.98	13.53	12.51	11.63	10.68	9.62	8.50	7.58	7.26	7.04	6.87	6.74	6.57
7 Biomass - Commercial	7.75	8.61	6.99	7.06	8.62	9.23	10.19	10.99	10.50	10.10	12.34	15.91	18.05	19.84	21.34	22.12	22.09	21.37	20.38	19.53	19.18	19.80	20.93	22.50	24.64
8 Biomass - Traditional	21.34	23.28	25.99	27.86	28.81	29.16	29.18	29.35	28.78	26.78	24.34	21.25	17.12	13.21	9.41	6.27	4.03	2.56	1.53	0.83	0.54	0.32	0.20	0.10	0.04
Total	224.00	234.54	259.98	271.24	292.11	329.45	364.85	390.21	416.61	445.28	458.39	481.73	502.44	524.75	548.79	571.85	593.39	609.26	622.93	631.82	638.61	642.57	645.59	647.80	647.92

Figure 21:
Shell's Strategic approach and investment decision-making, Shell Energy Transition Report

Our strategic ambitions are to be a world-class investment case, to thrive through the energy transition, and to maintain a strong societal licence to operate.

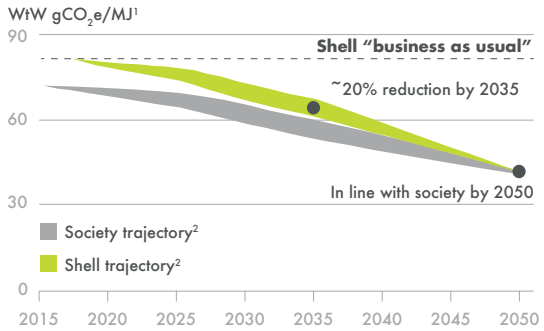
We aim to grow our business in areas that will be essential in the energy transition, and where we see growth in demand over the next decade. We expect these will include natural gas, chemicals, electricity, renewable power, and new fuels such as biofuels and hydrogen. We are also growing our oil business, including in deep water and shales, to meet continued demand.

We assess portfolio decisions, including divestments and investments, against potential impacts from the transition to lower-carbon energy. These include higher regulatory costs linked to carbon emissions and lower demand for oil and gas.

When making investments we consider the following factors to enhance resilience:

- Short-cycle investment and flexibility to allow production to increase or decrease in response to changes in demand or price (for example in Shales);
- Focusing on projects that generate positive cash flow in a short period of time (for example, by adding new wells to existing deep-water fields);
- Improving capital efficiency to lower break-even prices;
- Considering specific performance standards on CO_2 intensity for various asset classes when investing in new assets;
- Deploying technologies to further drive resilience, including the use of CCS and renewables in Upstream assets;
- GHG and energy management to lower CO_2 intensity and potential costs from carbon prices in our operating assets.

Figure 22:
Shell's ambition for a net carbon footprint, Shell Energy Transition Report



1 Net Carbon Footprint measured on an aggregate "well to wheel" or "well to wire" basis, from production through to consumption, on grams of CO_2 equivalent per megajoule of energy products consumed; chemicals + lubricants products are excluded. Carbon Footprint of the energy system is modelled using Shell methodology aggregating life-cycle emissions of energy products on a fossil-equivalence basis. The methodology will be further reviewed and validated in collaboration with external experts.

2 Potential society trajectory includes analysis from Shell scenarios estimate of Net Zero Emissions by 2070 and IEA Energy Technology Perspectives 2017; potential illustrative Shell trajectory.

Figure 23:
Shell's resilience in the medium term to 2030 - developments in retail & chemicals, Shell Energy Transition Report

RETAIL

By 2025, we aim to achieve 40 million daily customers and 55,000 sites around the world, compared to 30 million daily customers in 44,000 sites around the world in 2017. Around half our new sites will be in fast-growing markets such as China, India, Indonesia, Mexico and Russia.

We are making our retail business resilient to potential changes in demand for oil. For example, we plan to increase the contribution of non-fuel retail sales to margins in our Shell-operated retail network to 50%, from about 35% today. This means adding more than 5,000 convenience stores in our network by 2025.

We also plan to increase the portion of our fuels business that comes from low-emission energy solutions to 20% by 2025, from around 7% today.

We have opened more than 20 charging locations – called Shell Recharge – for EVs in the UK and the Netherlands. Together with IONITY, an operator of high-powered charging networks, we plan to offer 500 charge points across 10 European countries, starting with 80 of our biggest service stations in the next two years.

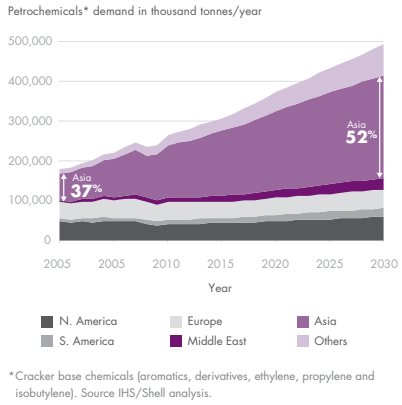
CHEMICALS

We plan to increase earnings in our Chemicals business from $2.6 billion in 2017 to between $3.5 billion and $4.0 billion per year by 2025.

We expect strong demand growth for chemicals in the medium term, mostly because of economic growth and demand for the everyday products that petrochemicals help produce. Chemicals can also help deliver some of the materials that will help the energy transition – such as high-performance insulation for homes and light plastic parts in cars and planes that can help save energy. Petrochemicals are also ingredients for components in energy-efficient lighting and low-temperature detergents.

Since 1998, we have reduced the number of chemicals production sites from 133 to15. Our global asset portfolio now offers both a regional balance and a balanced feedstock exposure. This ensures our resilience in a range of volatile market environments.

CHEMICALS DEMAND OUTLOOK



*Cracker base chemicals (aromatics, derivatives, ethylene, propylene and isobutylene). Source IHS/Shell analysis.

Figure 24:
Shell's illustrative activities supporting their net carbon footprint ambition, Shell Energy Transition Report

Big ambitions

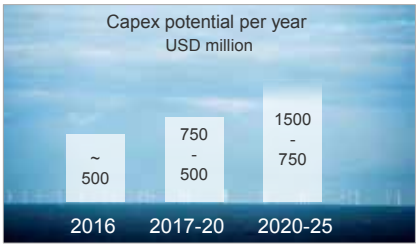
Reducing our Net Carbon Footprint will require us to reduce emissions from our own operations. But most of the reductions will come from changing our portfolio to supply customers more products that produce lower emissions. We will do this in ways that make commercial sense for Shell, in response to changing consumer demand and in step with society's progress.

To give some sense of the scale of the ambition, these are some of the changes that reducing our Net Carbon Footprint to match the energy system by 2050 could mean for our business. And it could mean doing not just one, but all of them.

- Selling the output from 200 large offshore wind farms the size of our planned Borssele wind farm in the North Sea.
- Changing the proportion of gas in the total amount of oil and gas we produce, so that natural gas increases from 50% to 75%.
- Selling the fuel produced by 25 biofuel companies the size of our joint venture Raízen in Brazil.
- Selling enough electricity on our forecourts around the world to meet three times the total demand for power in the Netherlands.
- Developing the capacity of 20 CCS plants the size of our Quest CCS plant in Canada.
- Planting forests the size of Spain to act as a carbon sink for emissions that still exist.

These examples reflect Shell's size and scale in the overall energy system: Shell produces around 1.5% of the world's total energy and we sell about 3% of the total energy consumed. They also provide a sense of the far greater ambition that society has set itself in the Paris Agreement.

Figure 25:
Equinor disclosure planned Capital Expenditure in renewable energies, Capital Markets Update 2017, CEO's presentation

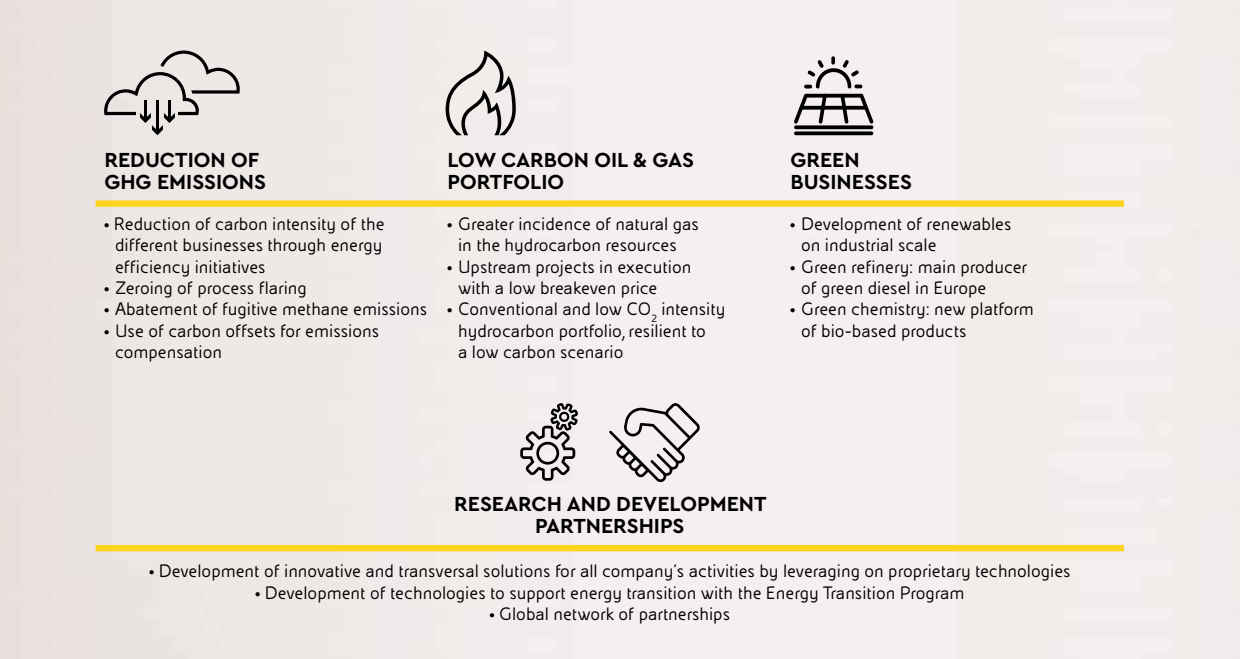


Growth opportunities

- 15-20% of capex in 2030[1]
- Offshore wind and other options
- Low-carbon solutions

[1] Indicative, based on potential future corporate portfolio.

Figure 26:
Eni's decarbonization strategy in response to climate change risks and opportunities, Eni, Path to Decarbonization, 2017



PILLARS OF ENI'S STRATEGY

	COMMITMENTS	TARGETS
REDUCTION IN GHG EMISSIONS	Reduction of GHG emission intensity index (upstream)	2025: -43% vs 2014
	Zeroing of hydrocarbons' volumes sent to process flaring	Zero process flaring by 2025
	Reduction of fugitive methane emissions (upstream)	2025: -80% vs 2014
	Investments in GHG emissions reduction (100% operated activities) - upstream	>€0.55 Bln in 2018-2021
LOW CARBON AND RESILIENT OIL & GAS PORTFOLIO	Promotion of Natural Gas: incidence of natural gas on total equity hydrocarbon resources 3P+ Contingent: >50% at 31/12/2017	
	Portfolio based on conventional resources, competitive even in low carbon scenarios: • upstream projects in execution -> Brent break-even[(a)] price <30 $/bl and internal rate of return equal to 13% (Brent @ 50 $/bl) and to 18% (Brent @ 70 $/bl) with flat scenario from 2018 • portfolio resilience tested on 100% of the upstream cash generating unit to low carbon IEA SDS scenario: fair value reduction of 4%	
GREEN BUSINESS DEVELOPMENT	Development of renewables	2021: 1 GW installed capacity 2018-2021 investments equal to €1.2 Bln 2025: 5 GW installed capacity
	Reconversion of traditional industrial sites in green plants and new chemical platform of bio-based products	Green refinery: Venice, capacity of 560 kton/y from 2021 Gela, capacity of 720 kton/y and completion by the end of 2018 Biobased chemicals: Porto Torres, bio-intermediates production (capacity of 70 kton/y) Porto Marghera, bio-chemicals through the metathesis of vegetable oils 2018-2021 investments equal to approximately € 390 Mln
RESEARCH AND DEVELOPMENT RELATED TO DECARBONIZATION	Research projects on energy transition, renewable, biorefining and green chemistry	2018-2021 expenditures equal to approximately € 280 Mln
MAIN PARTNERSHIPS	Oil & Gas Climate Initiative (OGCI) - new technologies to reduce GHG emissions	$ 10 Mln/year from 2017 for 10 years
	Massachusetts Institute of Technology (MIT)/ Commonwealth Fusion Systems (CFS)	Initial investment equal to $ 50 Mln for the industrial development of fusion power generation technology

(a) Actual Brent price that allows to recover, in the full life, costs, included fiscal costs, and to remunerate the capital employed at the Weighted Average Cost of Capital (WACC).

RISK MANAGEMENT

Disclose how the organization identifies, assesses and manages climate-related risks

The TCFD recommends that companies:

A. Describe the organization's processes for identifying and assessing climate-related risks

B. Describe the organization's processes for managing climate-related risks

C. Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization's overall risk management

COMMENTARY

As a first step, disclosure can focus on a description of the process used for managing climate-related risks and opportunities. As disclosure practices develop, information about the risk management process can be complemented with:

- An explanation of whether and how the processes relating to climate change are integrated into overall risk management structures.
- Information about how the company assesses the materiality and relative significance of climate-related risks in relation to other risks.
- Information about the scope of risk management frameworks (e.g. whether they apply to wholly owned companies, joint ventures, companies in which there is a controlling interest and/or individual assets).
- The tools used for risk identification. For example, at the asset level, tools such as internal carbon pricing and stress-testing against various oil, gas and carbon prices can be used to screen new projects for risk.
- Whether and how screening processes have affected project development plans or other measures put in place to manage climate-related risk.
- Explanation about how policies are used for management of climate-related risks and opportunities, why companies have made particular risk management choices, how the policies are executed, who is involved and what decisions result from the risk management process.

As with governance, if climate-related risks and opportunities are already integrated into a company's overall risk management structures, a detailed description of the processes used to manage these is unlikely to add value to the report and might appear repetitive. This is because where climate change considerations are embedded into overall risk management processes, it follows that major decisions take account of climate change.

Therefore, provided that the annual report describes the company's risk management process and it is clear that it applies equally to climate change, disclosures about climate change risk management processes can be kept concise and cross-reference the company's overall risk management approach for further detail. Similarly, where climate change issues have been fully integrated into broader risk management processes that do not change significantly over time, a detailed description of the process might not be required every year.

Examples – Risk management

The following Figures provide examples of disclosures that:

1. Identify that climate change risk is integrated into the organization's overall risk management (Figure 27).
2. Identify and describe the process for climate change risk management (Figure 28).
3. Outline risk identification processes applied at the asset level (Figure 29).
4. Outline use of impact metrics and prioritization matrices (Figure 30).

Figure 27:
Total's disclosure around the integration of climate risk management, Total, Annual Report 2017

Integration of climate-related risks into global risk management
The risks related to climate issues are part of the major risks identified and analyzed by the Group Risk Management Committee, and they are fully integrated in TOTAL's global risk management process.

Figure 28:
Equinor (formerly Statoil) disclosure around company risk management, Annual Report and Form 20-F 2017

The Board focuses on ensuring adequate control of the company's internal control and overall risk management. The Board conducts an annual enterprise risk management review and two times per year the Board is presented with and discusses the main risks and risk issues Statoil is facing. The Board's audit committee assists the Board and act as a preparatory body in connection with monitoring of the company's internal control, internal audit and risk management systems. The Board's safety, sustainability and ethics committee monitors and assesses safety, sustainability and climate risks which are relevant for Statoil's operations and both committees report regularly to the full Board.

Figure 29:
Shell's disclosure of its climate risk identification processes at the asset level, Shell Annual Report 2017

To test the resilience of new projects, we assess potential costs associated with GHG emissions when evaluating all new investments. Our approach generally applies a project screening value (PSV) of $40 (real terms) per ton of GHG emissions to the total GHG emissions of each investment. This PSV is generally applied when evaluating our new projects around the world to test their resilience across a range of future scenarios. The project development process features a number of checks that may require development of detailed GHG and energy management plans. High-emitting projects undergo additional sensitivity testing, including more detailed economic analysis on local GHG costs, demand sensitivity and the potential for later retrofitting of carbon capture and storage (CCS) facilities. In certain countries, these estimated GHG costs can exceed $100/ton (in real terms) in the post 2030 environment, reflecting our presumption that governments will eventually take aggressive action to regulate GHG emissions in accordance with their Paris Agreement ambitions. Projects in the most GHG exposed asset classes have GHG intensity targets that reflect standards sufficient to allow them to compete and prosper in a more GHG-regulated future. These processes can lead to projects being stopped, designs being changed and potential GHG mitigation investments being identified, in preparation for when regulation would make these investments commercially compelling.

Figure 30:
Eni's integrated risk management model, Eni, Path to Decarbonization 2017

| Integrated climate risk management model

The process for managing the risks and opportunities related to climate change is a part of the Integrated Risk Management (IRM) Model developed by Eni to ensure that management takes risk-informed decisions, by taking into full account current and potential future risks, including medium and long-term ones, in the frame of an integrated and comprehensive approach.

The IRM Model also aims to raise awareness, at all levels, that appropriate risk assessment and management can effect on the achievement of company objectives and values.

RISK ASSESSMENT IN ENI MODEL

- → It is carried out by adopting metrics that take into account the potential quantitative impacts (i.e. economic, financial or operational) as well as the potential qualitative impacts (i.e. on the environment, health and safety, social, reputation).
- → It is based on risk prioritization with the use of multi-dimensional matrices so that the level of each risk is obtained by combining clusters of probability of occurrence and clusters of impact.
- → It includes assessments at inherent level and at residual level, respectively before and after the mitigation actions are implemented.

METRICS & TARGETS

Disclose metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material

The TCFD recommends that companies:

A. Disclose the metrics the organization uses to assess climate-related risks and opportunities in line with its strategy and risk management process

B. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and any related risk

C. Describe the targets the organization uses to manage climate-related risks and opportunities and performance against targets

The TCFD recommends that disclosures should reflect how operational metrics and targets "such as those related to GHG emissions, water usage, energy usage, etc." help to manage climate-related risk and opportunities. According to the TCFD, companies should disclose whether operational targets are absolute or intensity-based and the timeframes over which they apply.

Disclosures about "how performance metrics are incorporated into remuneration policies" help demonstrate the management team's accountability for climate-related issues.

COMMENTARY

Metrics and targets explain how companies measure and monitor their climate-related risks, opportunities and strategies. They can also demonstrate the company's progress in mitigating, managing or adapting to those issues.

It is therefore useful if these metrics and targets are linked to, and help explain, the organization's other disclosures about corporate strategy and risk.

As a first step, disclosures can focus on:

- Operational metrics related to risks and opportunities (GHG emissions, water use etc).
- Metrics used for managing climate-related risks and opportunities (qualitative and quantitative).

The TCFD recommends that emissions data should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions[3].

The most common method for consolidating climate-related data in the oil and gas industry is according to operational boundaries and management control. This reflects, in part, the evolution of Health, Security, Safety, Environment and Social performance management, and legal and contractual requirements. The focus of the TCFD however, emphasizing alignment with financial reporting and analysis, likely means that the equity share approach (based on asset ownership) should also be considered. Scope 1 & 2 emissions can be prepared and reported on both an operational and equity basis.

User perspective:

More operational and financial information will be needed in the future such as power generation from different sources (e.g. gas and renewables), financials specific to the new energy business and non-fossil fuels. Analysts could treat new businesses differently, they might be valued or at least evaluated in a different way.

In terms of opportunities, operational metrics could include renewable energy generation capacity, biofuels production, energy efficiency improvements. For all metrics, companies should seek to provide data "for historical periods to allow for trend analysis." And describe the relevant methodology, boundaries and definitions.

As disclosure practices develop, operational metrics can be complemented with:

- Indications of the financial implications of climate-change risks and opportunities.
- Metrics that support scenario analysis and strategic planning.

Indicators, metrics and targets disclosed should reflect materiality judgements. There are different ways to achieve this. Companies can include a focus on connections between risk management processes, climate-related metrics and indicators and potential financial performance or impact implications (e.g. revenues and expenditures, assets and liabilities, and/or capital and financing). This analysis might include disclosures that connect climate to strategy and financial planning. Metrics could include earning sensitivities, breakeven price, internal rate of return, uncommitted capital expenditure, impact on fair value, cash neutrality and portfolio composition/development including capital expenditure allocated to renewables investment.

User perspective:

Investors express a strong preference for companies to provide quantitative climate-related financial information, supported by explanatory narrative as appropriate. Quantitative information facilitates investors' analyses of price, targets, earnings and production. Quantitative information can also be used to understand historical patterns and estimate future trends.

[3] The second edition of the IPIECA, API and OGP "Petroleum industry guidelines for reporting greenhouse gas emissions" provides extensive guidance on how companies can quantify their emissions. It is aligned with the GHG Protocol.

Examples – Metrics and targets

The following Figures provide examples of disclosures that:

1. Identify emission reductions, flaring, methane emissions and carbon captured (Figure 31).
2. Identify scope 3 emissions including the use of sold products (Figure 32).
3. Demonstrate how operational metrics are used to manage climate-related risk and opportunities through target-setting (Figure 31, 33 and 34).
4. Connect climate to strategy and financial planning (Figures 35 and 36).

Figure 31:
Equinor (formerly Statoil) emission reductions, flaring, methane emissions and carbon captured, Sustainability Report 2017

2017
CO_2 emissions reductions [1]
(thousand tonnes):
(2030 Target: 3 million tonnes [2])
356
(12% of 2030 Target)

2017
Carbon captured & stored
(million tonnes)
2016 - 1.38 million tonnes
Total accumulated to date: 22.3 million tonnes
1.36

2017
Share of flaring that is continuous production flaring [1]
(percentage):
(2030 Aim: eliminate continuous production flaring at our installations by 2030)
2016 - 14 % of total flaring
10%

2017
Upstream flaring intensity
(tonnes per thousand tonnes of hydrocarbon produced) [1]
(2020 Target: 2)
2016 - 2.5 tonnes per thousand tonnes of hydrocarbon produced (Industry average: 12)[3]
2.1

2017
Methane emissions [1]
(thousand tonnes):
2016 - 24.2 thousand tonnes
20.1

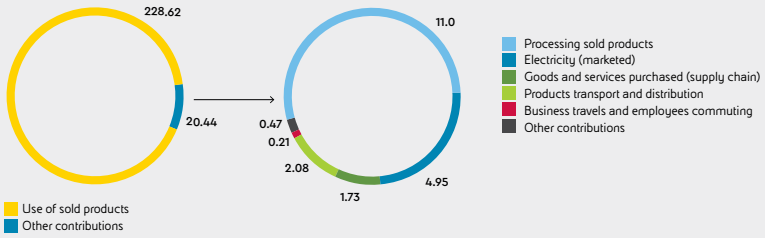
Methane emissions intensity for Norwegian gas to Europe[4]
(percentage):
Upstream and midstream: 0.017%
Downstream: 0.209%
0.226

[1] Statoil operated oil and gas production (100 percent basis). [2] Aiming to achieve, by 2030, annual CO_2 emissions that are 3 million tonnes less than they would have been had no reduction measures been implemented between 2017 and 2030. [3] International association of oil and gas producers (IOGP) Environmental performance indicators. 2016 data. [4] Source: Minimising greenhouse gas emission - greenhouse gas emissions of the Norwegian natural gas value chain 2016, July 2017, Statoil.

Figure 32:
Eni's disclosure of Scope 3 emissions, Eni, Path to Decarbonization 2017

Eni pays particular attention on the emissions impact associated with its activities along the entire value chain (indirect emissions), starting from the supply chain of goods and services for the production process up to the environmental impact connected with the disposal of the finished products.
As regards the emissions resulting from purchases of electricity, steam and heat from third parties (Scope 2) are negligible for Eni (approximately 0.65 $MtCO_2eq$), since electricity is generated inside its plants and the related GHG emissions are included among direct emissions. With regard to the other emissions in the chain (Scope 3), Eni reports them using internationally recognized methods (IPIECA).

SCOPE 3 2017
(Mln ton CO_2eq)



The higher impact, in terms of emissions, of the Oil & Gas sector is associated with the final use of the products sold (natural gas and oil products, such as petrol, diesel and kerosene), that Eni quantifies according to equity hydrocarbon production. In line with Eni's climate strategy, promoting a low-carbon energy portfolio, focused on natural gas and on increased energy production from renewables, together with a strong commitment to R&D aimed at developing technologies and fuels with low environmental impact, will lead to a gradual reduction of the GHG emission intensity associated with Eni products. Further initiatives aimed at promoting a culture focused on energy savings and minimizing the indirect emissions associated with Eni activities are in progress: optimization of the processes associated with product logistics (e.g. optimization of loads and routes), adoption of green procurement criteria for goods and services, sustainable mobility initiatives and the adoption of energy saving initiatives involving employees (company shuttles fueled by methane, special discounts arranged for public transport, smart working and use of videoconferencing for meetings) are just some of the current initiatives that contribute to reducing Eni's carbon footprint.

Figure 33:
Total's disclosure of its routine flaring targets, Total, Integrating Climate Into Our Strategy Report, 2017

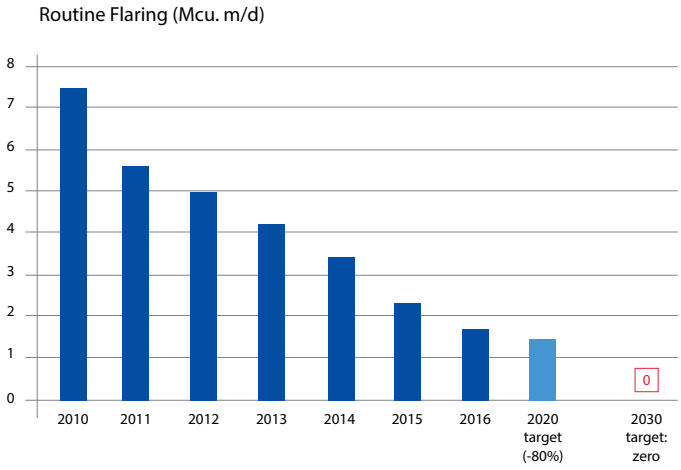


Figure 34:
Total's 2022 target for climate related opportunity, Total Strategy and Outlook Presentation 2017

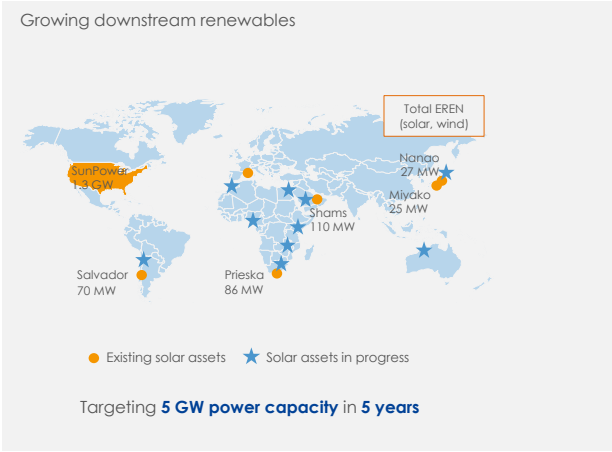
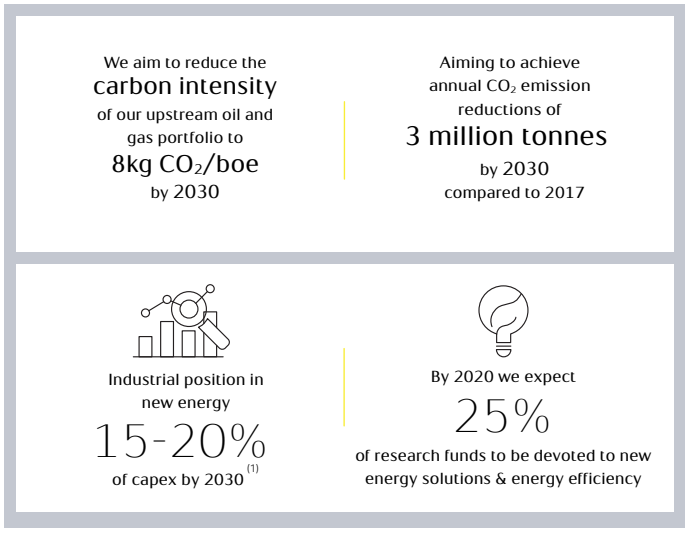


Figure 35:
Equinor (formerly Statoil) carbon intensity, emission reductions, capital expenditure in renewable energies and R&D, Sustainability Report 2017



(1) Indicative, based on potential future corporate portfolio

Figure 36:
Eni's metrics and targets, including climate-related financial metrics, used to evaluate and manage the risks and opportunities related to climate change, Eni, Path to Decarbonization 2017

		2015	2016	2017	Targets
Direct GHG emissions (Scope 1)[a]	(Mtons CO_2eq)	42.32	41.46	42.52	-
of which CO_2eq from combustion and process		32.22	31.99	32.65	-
of which CO_2eq from non-combusted methane and fugitive emissions		2.79	2.40	1.46	-
of which CO_2eq from flaring		5.51	5.40	6.83	-
of which CO_2eq from venting		1.80	1.67	1.58	-
Indirect GHG Emissions (scope 2)		0.62	0.71	0.65	-
Indirect GHG Emissions (scope 3)[b]		248.04	246.38	249.06	-
of which use of sold products		229.14	225.62	228.62	-
GHG emissions/100% operated hydrocarbon gross production (E&P)	(tCO_2eq/toe)	0.177	0.166	0.162	-43% by 2025
GHG emissions/Refinery throughputs	(tCO_2eq/kt)	253	278	258	-
GHG emissions/kWheq (EniPower)	(gCO_2eq/kWheq)	409	398	395	-
Non-combusted methane and fugitive emissions (E&P)	(tCH_4)	91,416	72,644	38,819	-80% by 2025
Volumes of hydrocarban sent to flaring	(MSm^3)	1,989	1,950	2,283	-
of which sent to process flaring		1,564	1,530	1,556	0 by 2025
Equity hydrocarbon production[c]	(kboe/day)	1,760	1,759	1,816	-
Renwable installed capacity	(GW)	0	0	0	1 GW installed by 2021 5 GW installed by 2025
Biorefinery capacity	(Kt/y)	360	360	360	1,280 kt from 2021
of which Venice	(Kt/y)	360	360	360	560 kt/y from 2021
of which Gela	(Kt/y)	0	0	0	720 kton/y from end 2018
Green Investments	(€ Bln)	0.03	0.05	0.11	2018-2021 equal to 1.55
R&D total expenditures	(€ Bln)	0.18	0.16	0.19	2018-2021 € 0.77 Bln
of which related to decarbonization	(€ Bln)	0	0.06	0.07	2018-2021 € 0.28 Bln

a) Direct emissions (scope 1) are 100% on operatorship basis.
b) Indirect emissions scope 3 are estimated on the basis of Eni equity production.
c) Hydrocarbon production from fields fully operated by Eni (Eni's interest 100%) amounting to 137 mln toe, 122 mln toe and 125 mln toe in 2017, 2016 and 2015, respectively.

Other Metrics

Hydrocarbon resources (3P+Contingent) @31/12/2017: % of natural gas	(%)	>50%
Break-even price of overall new upstream projects in execution		Brent <30$/bl
Internal Rate of Return (IRR) of new upstream projects in execution		13% @ Brent 50$/bl flat from 2018 18% @ Brent 70$/bl flat from 2018
Percentage of uncommitted investments: 2018-2021 Strategic Plan	(%)	2018-2021 equal to 36% 2020-2021 equal to 49%
Carbon pricing - Eni scenario	($/ton)	40 $ at 2015 inflated
Stress test: upstream portfolio resilience (100% cash generating unit) based on IEA SDS low carbon scenario		Impact on asset fair value: -4%
2018 Sensitivity: Brent (-1 $/bl)	(€ Mln)	Adjusted operating profit: -310 Adjusted net profit: -175 Free cash flow: -205
Cash neutrality (investments and dividends): Brent price	($/bl)	2017: 57 2018: 55 2021: 50

The table below illustrates a range of useful climate-related metrics that could be disclosed by oil and gas companies in appropriate sections of their public disclosures to demonstrate their performance and progress.

These metrics can be applied to disclose historical data and/or future targets. A number of metrics do not yet have universally accepted definitions, in which case companies choosing to disclose these metrics should explain how they define the metric and associated terminology.

TOPIC	UNIT	SUGGESTED DISCLOSURE	COMMENTS
GHG emissions	Tons CO_2e	Amount of GHG scope 1 emissions in reporting year. Specify scope and boundary (equity/operator).	Operational boundary is the industry norm - not aligned with financial reporting boundary (equity).
GHG emissions	Tons CO_2e	Amount of GHG scope 2 emissions in reporting yea. Specify scope and boundary (equity/operator).	Operational boundary is the industry norm - not aligned with financial reporting boundary (equity).
GHG emissions	Tons CO_2e	Amount of GHG scope 3 emissions in reporting year. Specify scope and boundary.	Operational boundary is the industry norm - not aligned with financial reporting boundary (equity).
GHG emissions	CO_2e/boe; CO_2e/MwH or similar	Industry specific GHG efficiency ratios. Specify scope and boundary (equity/operator).	Allow for company-specific KPIs and targets.
R&D	Currency and/or % of total	Expenditures (Opex) to low-carbon R&D (amount and/or share of total R&D expenditure). Specify definition of "low-carbon" and "expenditures."	Flexible definition of "low-carbon" needed to allow for practical implementation.
Low-carbon investments	Currency (if applicable)	Investment (Capex) in low-carbon alternatives, or indicative breakdown of capital investments into main categories. Specify definitions of "low-carbon" and "investments."	Flexible definition of "low-carbon" needed to allow for practical implementation.
Low-carbon investments	Currency	Revenues from investments in low-carbon alternatives. Specify definition of "low-carbon" and "investments."	May not be practical if this is not aligned with business reporting segments. Allow for flexible definition of "low-carbon" and "revenues," e.g. with respect to revenue from equity accounted companies. Recommendations suggest a clear divide between low-carbon and traditional business, which may not be the case.
Portfolio resilience	Not applicable	Describe portfolio flexibility over time based on capital investment plans. Supporting disclosures could include future capex flexibility overview (committed vs non-committed capex), capital payback periods or return on capital employed.	Relevant timeframes and metrics will differ from company to company. Some elements may be considered commercially sensitive by some companies. Flexibility needed so that companies can choose relevant and non-sensitive indicators.
Portfolio resilience	Currency	Describe current carbon price or range of prices used in investment analysis. Specify scope.	
Portfolio resilience	Not applicable	Describe resilience to a 2°C or lower scenario, and other relevant scenarios (optional). Describe key assumptions of scenarios used. Supporting disclosures could be e.g. carbon price sensitivity and/or oil and gas price sensitivity.	Companies can refer to externally recognized scenarios, e.g. IEA scenarios, or use own scenarios. This information may be better suited in other reports than financial reports due to high uncertainty and long-time horizons.
Water	% of boe	Share of production in areas that have high or extremely high baseline water stress. Specify scope and boundary (equity/operated).	
Water	%	Share of water withdrawn in regions with high or extremely high baseline water stress.	Depending on materiality.

5 Conclusion

5 Conclusion

Oil and gas companies' disclosures, strategies and actions to address climate change receive particular attention given the scale of emissions from the sector. There is already evidence of effective disclosure practice by Forum member companies as demonstrated throughout this report. However, the progression and enhancement of climate-related financial disclosure for the sector is dependent on the continued development of content and complementary information.

Practical steps that companies can take now to enhance their disclosures include:

- Review and identify existing disclosures or internal information sources that could be used to respond to the TCFD's recommendations. In some cases, information already held or disclosed by companies simply needs labeling or cross referencing to highlight its relevance to assessment of climate-related risks and opportunities.
- Assess whether and how cross-departmental collaboration supports integration of climate change issues into governance, risk management, planning and control processes to facilitate enterprise-wide assessment of the operational, strategic and financial consequences of climate-related risks and opportunities.
- Improving transparency and rigor in how climate-related disclosures are prepared. This includes disclosure of the methodologies and operational/organizational boundaries used for reporting, as well as the assurance processes applicable to financial and non-financial information etc.

The TCFD's implementation path for its recommendations could be further supported by action to:

- Develop disclosure practices further in the oil and gas sector and across other industries as necessary.
- Deepen the dialogue between preparers and users to align understanding of the information needs.

ROADMAP FOR DEVELOPMENT OF DISCLOSURE PRACTICES FOR THE OIL AND GAS SECTOR

As indicated in this report, some of the developments that need to take place to support and enhance the progress of climate-related disclosure apply across the reporting landscape more generally. For the oil and gas industry, the near to medium term roadmap for progressing climate-related financial disclosures could include a focus on the communication of resilience to potential climate change risks and improving the coherence and linking of information so that its relevance to climate change analysis is clear.

1. Standardization of measures

Climate-related metrics are currently not standardized. To support comparability among oil and gas companies, standardized methodologies and a common level of disclosure could be developed.

Developments in disclosure practices are dependent not only on oil and gas companies but also on continuing engagement with users. This will help to establish principles for the disclosure of critical assumptions and may also lead to the development of a standardized resilience test for the industry.

2. Communicating resilience to potential climate change risks

According to an informal WBCSD survey, strategy disclosure recommendation 2 (c) which asks organizations to describe how resilient their strategies are to climate-related risks and opportunities, is the most challenging of the TCFD's recommendations.

A two-day conference hosted in London by the TCFD and Bank of England was dedicated to the subject of climate-related scenarios and resilience. Like other sectors, the oil and gas industry regard communication about climate-related resilience as challenging but vital for decision-making and therefore an important focus for the development of disclosure practice over time.

Information about current and short-term resilience is already disclosed by Forum members and includes details of the potential financial impact on the organization, its existing portfolio and strategy, from changes in individual variables such as carbon price.

Longer-term indicators of resilience depend on a wide range of variables and parameters which themselves are subject to considerable uncertainty. Long-term assessments of the energy transition are provided by some oil and gas companies in specialist reports. However, as many interdependent variables are needed to illustrate resilience over the longer-term, the results of these assessments can be uncertain and may be difficult to use for comparison. Further work is required to determine whether and to what extent longer-term resilience assessments can be communicated in a way that is comparable and meaningful to users.

While that work is in progress, oil and gas companies can seek to demonstrate their resilience to climate change by describing the strategy implemented in response to climate change and highlighting their targets and ambitions over the years of implementation. Moreover, companies can describe the flexibility and the adaptability of their portfolio and strategy to these climate-related challenges.

The potential building blocks for communication of longer-term resilience are climate-related scenario analysis, a description of the strategic response, and measures of capital and portfolio flexibility.

The organization's strategic response may include investments that support the transition to a lower-carbon economy. If these are relatively small in the context of the overall business, disclosures about them in mainstream annual financial filings may be limited. However, this information can be useful to investors in assessing the company's long-term strategic response to climate change.

3. Coherence and linking

At this stage in climate-related financial disclosure, information, strategies, results and ambitions relating to climate change are often widely dispersed and disconnected (e.g.: mainstream reports, sustainability reports, submissions to surveys of rating agencies, investor presentations etc.).

Better linking and coherence in climate-related disclosures could be achieved by the following:

- Signposting and navigation tools to show where and how complementary information is reported.
- Connecting a company's performance, targets and ambitions with the level of decarbonization required to achieve national goals or to keep global temperature increase below 2°C.
- Presenting assumptions, results, strategies and actions relating to climate change.

4. Other dependencies for successful implementation of the TCFD's recommendations

- Industry leaders working with users to gain a deeper understanding of their information needs.
- Enabling conditions to support climate-related financial disclosure and ultimately the goals of the Paris Agreement. Many organizations play a role in creating those conditions, including standard-setters who can help negotiate agreed definitions and establish principles for the disclosure of critical assumptions.

The foundations of effective climate-related financial disclosure practice are already firmly in place.

Ultimately climate-related financial disclosure could help to build what Mark Carney described as the "virtuous circle of better understanding of tomorrow's risks, better pricing for investors, better decisions by policymakers, and a smoother transition to a lower-carbon economy."

6 Appendix

REPORT SOURCES

Eni's Path to Decarbonization 2017: https://www.eni.com/docs/en_IT/enicom/sustainability/EniFor-2017-Decarbonization.pdf

Eni's 2017-2020 Strategy, March 2017: https://www.eni.com/docs/en_IT/enicom/investors/2017/2017-2020-strategy/2016-full-year-results-strategy-2017-2020.pdf

Eni's Integrated Annual Report 2017: https://www.eni.com/docs/en_IT/enicom/publications-archive/publications/reports/rapporti-2017/Integrated-Annual-Report-2017.pdf

Eni - Controls and Risks: https://www.eni.com/en_IT/company/governance/the-internal-control-and-risk-management-system.page

Shell Annual Report 2017: https://reports.shell.com/annual-report/2017/

Shell Energy Transition Report: https://www.shell.com/energy-and-innovation/the-energy-future/shell-energy-transition-report.html

Shell Management Day Presentation (2017): https://www.shell.com/investors/news-and-media-releases/investor-presentations/2017-investor-presentations/2017-management-day.html

Shell, The Numbers Behind Sky: https://www.shell.com/energy-and-innovation/the-energy-future/scenarios/shell-scenario-sky.html

Shell Greenhouse Gas Emissions: https://www.shell.com/ghg

Statoil (Equinor) Annual Report and Form 20-F 2017: https://www.statoil.com/content/dam/statoil/documents/annual-reports/2017/statoil-annual-report-20f-2017.pdf

Statoil (Equinor) Capital Markets Update 2017, CEO's presentation: https://www.equinor.com/content/dam/statoil/documents/quarterly-reports/2016/q4-2016/statoil-ceo-presentation-cmu-2017.pdf

Statoil (Equinor) Sustainability Repot 2017: https://www.statoil.com/content/dam/statoil/documents/sustainability-reports/statoil-sustainability-report-2017.pdf

Statoil (Equinor) Socially Responsible Investor Day 2018 presentation: https://www.equinor.com/en/what-we-do/calendar/sri-day-2018.html

Total's Annual Report 2017: https://www.total.com/sites/default/files/atoms/files/ddr2017-va-web.pdf

Total Integrating Climate into Our Strategy Report 2017: https://www.total.com/sites/default/files/atoms/files/integrating_climate_into_our_strategy_eng.pdf

Total Strategy and Outlook Presentation 2017: https://www.total.com/sites/default/files/atoms/files/strategy-outlook-presentation-september-2017.pdf

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Our member companies come from all business sectors and all major economies, representing a combined revenue of more than USD $8.5 trillion and 19 million employees. Our global network of almost 70 national business councils gives our members unparalleled reach across the globe. WBCSD is uniquely positioned to work with member companies along and across value chains to deliver impactful business solutions to the most challenging sustainability issues.

Together, we are the leading voice of business for sustainability: united by our vision of a world where more than 9 billion people are all living well and within the boundaries of our planet, by 2050.

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