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# In the pipeline

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Which oil and gas companies are preparing for the future?  
**Executive Summary**

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CDP's sector research for investors provides the most comprehensive climate and water-related data in the market. CDP's team of multi award winning analysts, takes an in-depth look at high impact industries one-by-one, starting with the automotive industry, electric utilities, diversified chemicals, diversified miners, cement, steel, and now oil and gas.

The full report is available to CDP investor signatories and includes detailed analysis and methodology. In addition, a separate engagement booklet providing further detail on company specific engagement ideas will be available to CDP signatories on request in early 2017.

**For more information see:**

<https://www.cdp.net/en/investor/sector-research>

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# Linking emissions-related metrics to earnings for oil and gas companies

- ▼ This report introduces CDP's League Table for oil and gas companies, highlighting company performance across a range of portfolio, emissions and water-related metrics which indicate carbon risk preparedness and highlights earnings risks for oil and gas companies.
- ▼ Highest ranked companies are **Statoil**, **Eni** and **Total**.
- ▼ Lowest ranked companies are **Suncor**, **ExxonMobil** and **Chevron**.

## Overview

This report, covering oil and gas companies, is the latest in a series of investor-focused reports covering high emitting sectors. CDP has previously published reports on other sectors, the most recent being auto manufacturers (March 2016), cement companies (June 2016) and steel companies (October 2016)<sup>1</sup>. Each report features a CDP League Table that ranks companies in an industry grouping on a number of emissions and water-related metrics relevant to that industry. When taken in aggregate, we believe these metrics could have a material impact on company earnings and therefore investment decisions, as the world transitions to a low-carbon economy.

The CDP oil and gas League Table ranks 11 of the largest (by market capitalization) and highest-impact publicly listed oil and gas companies.

With the Paris Agreement having entered into force on 4th November 2016 and the Task Force on Climate-related Financial Disclosure (TCFD) due to publish its Phase II report in December 2016, there is now increasing pressure on oil and gas companies to show portfolio resilience and adapt existing business models to align with a transition to a low-carbon economy, which, analysis demonstrates, will require a significant reduction in the overall use of fossil fuels.

The oil and gas industry is amongst the most emissions intensive and, when the emissions impact of its products are considered, collectively accounts for approximately half of global carbon dioxide (CO<sub>2</sub>) emissions<sup>2</sup>, with about 90% of these emissions coming in the downstream use of hydrocarbons (Scope 3 emissions). Nine of the 11 companies in this report disclose their Scope 3 emissions from the use of sold products, Occidental and Suncor do not. Collectively, the nine companies' Scope 3 emissions totalled 3.5 Gigatonnes CO<sub>2</sub>e<sup>3</sup>. The industry is also a significant source of methane emissions (CH<sub>4</sub>), a greenhouse gas with a global warming potential significantly higher than that of CO<sub>2</sub>.

The oil and gas industry holds a key supply role in the wider energy flow system and therefore changing demand and technological dynamics in key fossil fuel

use industries such as transport (oil) and electricity generation (gas) will have significant repercussions for oil and gas companies. The dramatic fall in oil price since June 2014 as well as the emergence of stranded asset concerns, ever closer peak oil demand forecasts and higher carbon regulatory compliance costs have also highlighted the importance for capital discipline from oil and gas companies.

This report assesses which companies are best preparing for a transition to a low-carbon economy which entails global net zero carbon emissions post-2050.

### Scope of report:

There are five key areas of assessment in our League Table for oil and gas companies:

- ▼ **Fossil fuel asset mix:** Production and reserve splits of companies across hydrocarbons are indicative of whether companies are beginning to align themselves with a low-carbon transition. Companies with gas portfolios are potentially poised to benefit from more robust demand levels in its role as a bridging fuel to displace coal in electricity generation, whilst those more reliant on oil production may be at greater risk of regulatory change and technological disruption impacting demand.
- ▼ **Capital flexibility:** Exploration and production costs, portfolio reserve life and financial gearing point towards the flexibility of a company's financial position and capital allocation. This is increasingly important to weather the current environment of low oil prices as well as allow for the diverting of funds from hydrocarbon extraction.
- ▼ **Climate governance and strategy:** Companies that are stress-testing their portfolios, internalising climate change considerations into decision-making, aligning executive remuneration with climate objectives and positively engaging with policymakers are better preparing themselves for a low-carbon energy transition. We also examine which companies are investing in new low-carbon assets and R&D (including CC(U)S).

1. Previously published reports include: auto manufacturers (Feb 2015 & Mar 2016), European electric utilities (May 2015), chemicals companies (Aug 2015) and diversified miners (Nov 2015)

2. Calculated using IEA and EDGAR carbon emissions data.

3. Based on the report sample company CDP responses.

▼ **Emissions and resource management:** We assess emissions intensity of hydrocarbon production as a proxy for operational carbon efficiency and undertake analysis on company management of extraction and production by considering methane emissions and flaring levels. Poor management of natural gas resources represent lost revenue and compromise the fuel's emission advantages relative to coal.

▼ **Water resilience:** We analyze company exposure to localized water stress issues on a facility-by-facility basis across onshore upstream production and downstream refining assets. Ongoing water supply continuity risks can cause interruptions to production or require capital expenditure to rectify.

The summary League Table below initiates CDP investor coverage on the oil and gas industry. It is based on detailed analysis across a range of carbon and water-related metrics, which are aggregated to assign an A to E grade to each company across each key area. The League Table and accompanying analysis is to be updated periodically to monitor company progress as well as account for significant changes in market or regulatory conditions.

We also include, for reference, each company's 2016 CDP Performance Band based on responses to the CDP climate change questionnaire. CDP is to move to sector based questionnaires in Q4 2017 with associated scoring methodologies in Q1 2018 as part of the 'Reimagining disclosure' initiative<sup>4</sup>.

### Condensed summary of the League Table for oil and gas companies

League Table rank	Company	Country	Market cap 2016 (US\$ billion)(i)	Production 2015 (million boe/d)	2015 Emissions (S1+2 CO <sub>2</sub> million tonnes)	League Table score	Fossil fuel asset mix	Capital flexibility	Climate governance and strategy	Emissions and resource management	Water resilience	CDP Performance Band (ii)
1	Statoil	Norway	50	1.8	16.6	3.75	B	B	A	A	D	A-
2	Eni	Italy	54	1.7	38.8	3.98	B	A	B	B	D	A
3	Total	France	116	2.3	41.8	5.00	B	C	C	B	E	B
4	Shell + BG	Netherlands	194	3.7	81.2	5.07	B	D	B	C	D	A-
5	BP <sup>(iii)</sup>	UK	101	2.3	55.8	5.17	A	C	C	D	E	B
6	Occidental	USA	55	0.67	14.1	6.78	D	A	E	E	C	C
7	Petrobras	Brazil	44	2.6	77.7	6.83	D	E	D	D	B	A-
8	ConocoPhillips	USA	52	1.6	25.8	6.84	D	C	E	C	A	B
9	Chevron	USA	185	2.5	61.0	6.87	D	C	E	D	D	B
10	ExxonMobil	USA	356	4.1	126.0	6.90	C	B	E	E	C	C
11	Suncor	Canada	43	0.58	20.5	7.39	E	E	C	C	B	B

Weighting

30% 20% 20% 20% 10%

(i) Source: Bloomberg (YTD average 2016)

(ii) CDP Performance Band shown for reference only

(iii) BP analysis excludes Rosneft

We highlight the following companies, which collectively represent US\$246bn<sup>5</sup> in market capitalization, as non-responders to CDP's 2016 climate change questionnaire and are therefore not included in this report. We encourage investors to raise this lack of transparency over carbon and water reporting practices in discussions with company management.

### Non-responders to CDP

Organisation	Country	Market cap 2016 (US\$bn)	First year approached by CDP	Public disclosure of carbon emissions	Business activities
Saudi Aramco	Saudi Arabia	N/A	2016	No	State-owned oil and gas company of Saudi Arabia
Rosneft	Russia	50.6	2007	Partially	Integrated oil and gas company, majority owned by Russia
PetroChina	China	195.3	2006	No	Listed arm of state owned oil and gas company China National Petroleum Corporation (CNPC)

Source: CDP

4. <https://www.cdp.net/en/articles/media/press-release-cdp-announces-new-sector-focused-investor-strategy>

5. Average 2016 year to date market capitalization taken from Bloomberg.

## Key findings

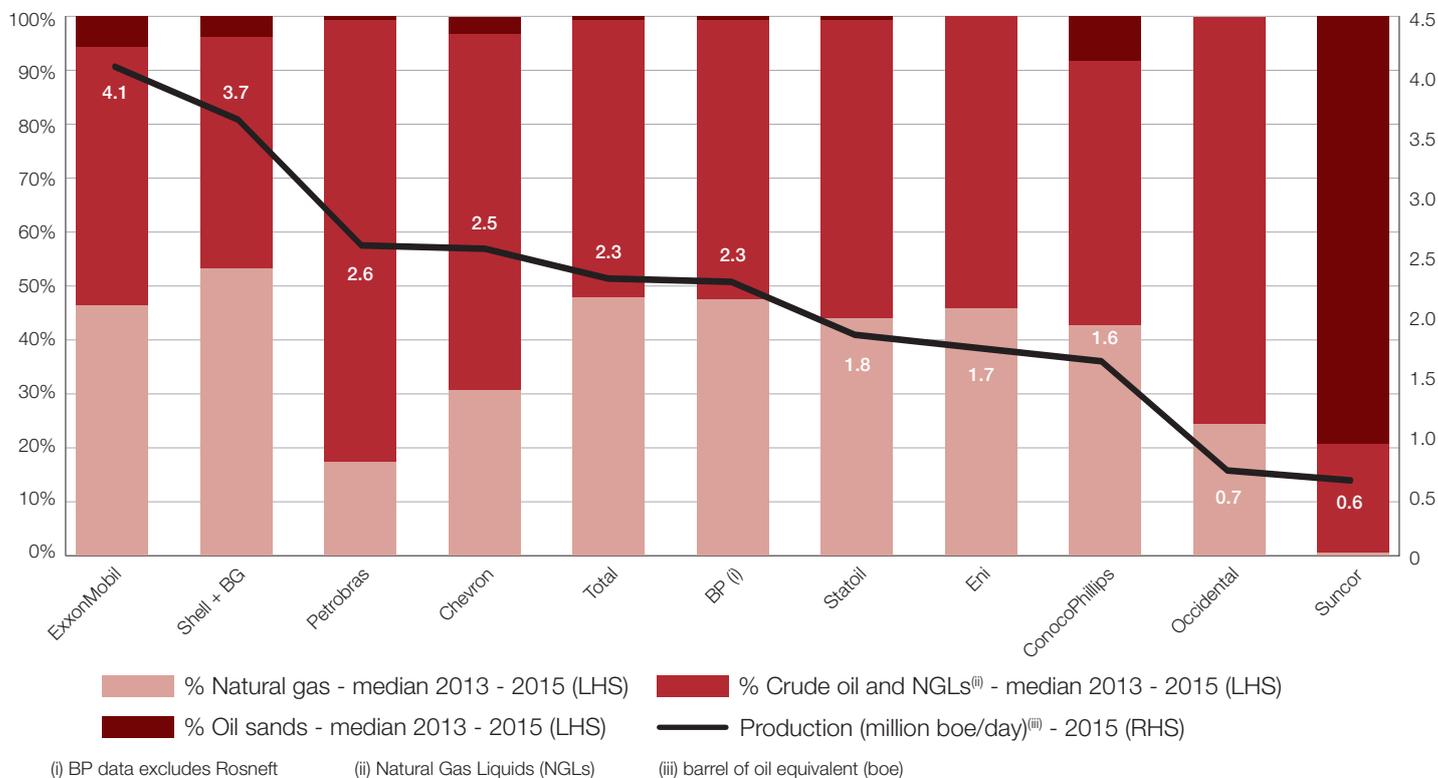
- ▼ Clear transatlantic divide with European majors coming out on top across most key areas. Current European majors' portfolios have higher percentage of gas relative to their American peers and some are showing signs of tilting operations further towards gas. Differing exposure levels to risky oil sand resources is further evident across the geographical split.
- ▼ The divide is also highlighted in terms of climate governance and strategy: US firms such as Chevron and Occidental tend to shy away from joint public statements supporting climate policy and legislation.
- ▼ European companies are more active in the low-carbon space, investing more in alternative energy and low-carbon technology (including battery development and carbon capture use and storage (CC(U)S)).
- ▼ Company low-carbon spend is dwarfed by upstream capital expenditure. For the 11 companies in this report total capex for 2016 is expected to be approximately US\$160 billion, with only an estimated 1.5% in low-carbon investment. Oil and gas companies risk missing out on low-carbon energy growth in the coming decades.
- ▼ Oil and gas majors face key short and long-term strategic decisions to secure their future business models, including improving capital discipline and rebalancing portfolios in the coming years and considering wider diversification or managed decline over the coming decades. (See "What is the future for majors?" on page 24 of the report for more information).
- ▼ Current business models continue to rely heavily on finding and proving reserves. This resource-ownership focus is unsustainable and will need to adapt for a low-carbon transition. Traditional industry performance metrics (and their interpretations) such as Reserve-Replacement-Ratio and Reserve-Life are potentially outdated with peak oil demand expected to occur within the coming decade and investors might reconsider their importance.
- ▼ Policy and technology developments in industries and sectors which use oil and gas products are the most likely source of disruption for oil and gas companies. Regulatory action targeting oil use in the transport sector and determining natural gas' role in the changing power generation fuel mix will have knock-on effects for oil and gas companies. Such action is central to the successful implementation of the Paris Agreement despite current policy uncertainties.
- ▼ Companies are currently only obligated to report proved reserves. The absence of robust data on probable and possible reserves as well as the wider company resource base is a significant loss of valuable information to the investor, despite the fact that many of these resources will never see production due to economic, political or technical barriers. (See "Resources vs. Reserves" on page 11 of the report for more information).
- ▼ Low oil prices and increasing climate concerns highlight the importance of capital discipline and financial flexibility amongst companies. Lack of access to resources controlled by national oil companies (NOCs) has lead international oil companies (IOCs) to look at more complex plays and they have become increasingly focused on high-cost, technologically challenging projects. A focus on value delivery over production growth is needed from companies in the industry.
- ▼ Operational efficiency remains an issue in the industry, with the eleven companies in the study losing on average 6% of their natural gas production through flaring and methane venting and leakages. Responsible resource management will affect demand for the sector's products in their downstream use. For example, the lifecycle carbon emissions gains of natural gas over coal in electricity generation are eroded as a result of methane leakage during extraction and transportation to end use.
- ▼ Executive incentive packages are currently heavily weighted to rewarding company performance on hydrocarbon production levels and reserve replacement indicators (only five companies currently have detailed climate-linked performance metrics), which may be inconsistent with long-term shareholder value creation.
- ▼ 40% of onshore oil and gas upstream production is currently located in areas of medium or high water stress which could have implications for future financial performance.

## Company findings

Rank	Summary
<b>1</b> <b>Statoil</b>	Statoil performs strongly across most key areas. It has the highest percentage of gas in its proved reserve base and has increased the proportion of gas in its production the most in recent years. With a low reserve life (and high percentage of developed proved reserves) it potentially has more flexibility than others to adapt its capital expenditure strategy. The company has the lowest upstream emissions intensity and manages its methane and flaring emissions better than its peers. Statoil has also made recent commitments on low-carbon energy, focusing on offshore wind projects and has assessed the economic impact of the IEA450 scenario on its portfolio.
<b>2</b> <b>Eni</b>	Eni's future potential production is dominated by conventional resources and it currently has no oil sands production. The gas share of its portfolio is set to increase significantly, with large gas projects due to come online in the near future (such as Zohr in Egypt, scheduled for Q4 2017 start-up). Eni plans to spend €1 billion over the next three years on alternative energy, primarily solar projects in Italy, Algeria, Pakistan and Egypt.
<b>3</b> <b>Total</b>	With the ambition of "20% low-carbon assets in 20 years" Total is positioning itself to have a fifth of its portfolio in low-carbon businesses by 2035 and has recently acquired Sunpower (solar panel producer) and Saft (battery manufacturer). The company's hydrocarbon production mix is forecast to be 50% gas by 2020, with a company target of 60% gas by 2035.
<b>4</b> <b>Shell + BG</b>	Shell's acquisition of BG increases its exposure to natural gas and it is the only company that currently produces more gas than oil. Shell has published potential pathways to net zero emissions and has recently set up a "New Energies" division, but InfluenceMap's analysis shows specific opposition towards key policy relating to renewable energy and vehicle emission regulation.
<b>5</b> <b>BP*</b>	BP has the second highest current proportion of gas production and is expected to increase this in the near term with the start-up of large gas projects (such as Shah Deniz stage 2 in Azerbaijan). The company has released its "Faster Transition" scenario for world energy use which details global peak emissions in the late 2020s. At present, it has the largest alternative energy business of the companies assessed but is yet to make any firm commitment on future low-carbon spend.
<b>6</b> <b>Occidental</b>	Occidental performs best in the capital flexibility key area, with the lowest financial gearing of the companies. It currently has no oil sands production and has a lower capital spend intensity than peers. However, the company significantly underperforms in upstream emissions intensity. It has no alternative energy assets but the company is involved in a number of CC(U)S projects, primarily for Enhanced Oil Recovery (EOR).
<b>7</b> <b>Petrobras</b>	With a heavy bias towards oil (current production is 18% gas) and a relatively high reserve life, Petrobras ranks second last for its fossil fuel asset mix. Its emission performance is below average and lacks adequate management of methane emissions. Company strategy is firmly focused on reducing levels of debt, it has the highest gearing of the companies in the report and is currently tackling corporate corruption issues in Brazil.
<b>8</b> <b>ConocoPhillips</b>	ConocoPhillips ranks first for water resilience with the lowest exposure to high water stress regions. The company scores poorly in the fossil fuel asset mix key area, having the second highest proportion of oil sands in its production and proved reserves. However, the company has published four decarbonisation scenarios against which it tests its portfolio.
<b>9</b> <b>Chevron</b>	Chevron performs below average across most metrics. It has the fourth highest upstream emissions intensity; however, it is one of only two companies that managed to decrease its emissions intensity from 2010 to 2015. Today, its portfolio is relatively oil based (only 31% gas) but this is expected to change as large LNG projects Gorgon and Wheatstone come online.
<b>10</b> <b>ExxonMobil</b>	ExxonMobil performs below its peers in its emissions performance and wider climate governance and strategy considerations. Owing to the low-oil price environment, ExxonMobil recently announced that approximately 4.6bn barrels of oil equivalent may be required to be de-booked as proved reserves <sup>6</sup> . The company is also carrying out a wider assessment of its "major long-lived assets". This follows news that in September 2016 the company was being probed by the U.S. Securities and Exchange commission (SEC) over its reserve reporting and asset valuation.
<b>11</b> <b>Suncor</b>	Suncor has the highest exposure to oil sands (circa 80% of its production and 95% of proved reserves). Due to its business model it has the highest upstream emissions intensity of all the companies. It sold its conventional natural gas operations in 2013 and recently acquired Canadian Oil Sands, making it almost entirely an oil player. However, Suncor management has supported a 2016 shareholder resolution on climate issues.

\*Analysis excludes Rosneft

## Company production split by hydrocarbon



## Scope of report: Company selection

We selected the group of companies<sup>7</sup> for our study as follows:

- ▶ Started with the 28 publicly listed integrated oil and gas companies that responded to CDP's 2016 climate change questionnaire.
- ▶ Ranked the companies by market capitalization and Scope 1+2 emissions and selected the top 15. This equates to companies with a total market capitalization of US\$1.4 trillion.
- ▶ Reviewed the business activities and shareholdings of the 15 companies which resulted in the exclusion of:
  - ▶ China Petroleum & Chemical Corporation (no 2016 CDP performance band) due to non-disclosure of emissions data.
  - ▶ Gazprom (2016 CDP performance band 'C') due to lack of overall disclosure.
  - ▶ Imperial Oil (2016 CDP performance band 'D') due to ExxonMobil's 69.6% stake.
  - ▶ Lukoil (2016 CDP performance band 'D') is primarily a domestic Russian producer and supplier.

Company analysis encompasses both consolidated entities and share of equity-accounted affiliates. Shell has been analyzed in combination with BG owing to the recent acquisition. BP has been analyzed excluding its 19.75% stake in Rosneft (lower than the 20% usually used in equity method accounting), in line with its GHG reporting to CDP.

The chosen 11 companies represent approximately US\$1.25 trillion<sup>8</sup> in market capitalization and account for 62% of the combined emissions (Scope 1+2) of the 28 relevant companies that responded to CDP. The primary business activities of the 11 companies are production of oil and gas.

## Linking our findings to investment choices

We recognize that investment decisions are based on a multitude of different factors and that some of these can be misaligned with emissions-reduction efforts.

Our League Table is not intended to identify definitive winners and losers for investment purposes, but more as a proxy for business-readiness in an industry likely to be impacted by more stringent carbon regulations needed to meet long-term carbon objectives and worsening water security.

We would flag that companies towards the bottom of our League Table are possibly higher risk investments from a sustainability perspective than those towards the top.

7. Including ConocoPhillips which spun off their downstream operations in 2012.

8. Average 2016 year to date market capitalization taken from Bloomberg.

## Methodology

We score each oil and gas company based on a number of different metrics which are ranked and then weighted within each key area (see table below for metric weightings within each key area). We then grade each area from A to E based on these weighted ranks. We calculate the overall League Table score by collating the weighted ranks for each key area.

Each of the key areas has a separate chapter within the full report. We disclose the precise methodology for how we rank each metric in an appendix.

## For further study

Areas for further research include:

- ▾ Peak oil demand and 2-degree scenario analysis.
- ▾ Proportion of company capex which is discretionary and committed relative to total planned spend.
- ▾ Enhanced analysis of company R&D expenditures and low-carbon spend.
- ▾ Analysis of economics of liquefied natural gas (LNG) assets.
- ▾ CC(U)S and net zero emission timeframe analysis.

### A summary of key areas, associated metrics and relative weighting with the League Table

Key area in league table	Link to company earnings	Metrics	Metric weighting within each key area	Key area weighting in overall League Table
Fossil fuel asset mix	Production and reserve split of companies across hydrocarbons will indicate if they are aligning themselves with a low-carbon transition. Companies with gas portfolios will benefit from its role as a bridging fuel to displace coal.	i) Production mix between oil and gas ii) Proved reserves mix by oil and gas	50% 50%	30%
Capital flexibility	Exploration and production costs, portfolio reserve life and financial gearing point towards the flexibility of a company's financial position and capital allocation. This is increasingly important to weather the current environment of low oil prices as well as allow for the diverting of funds from hydrocarbon extraction.	i) Reserve life (R/P) and development status ii) Production costs and capex intensity iii) Finding and development costs iv) Financial gearing	40% 30% 15% 15%	20%
Climate governance and strategy	Companies that are stress-testing their portfolios, investing in new low-carbon assets, internalising climate change considerations into decision-making, aligning executive remuneration with climate objectives and positively engaging with policy makers are better preparing themselves for a low-carbon energy transition.	i) Carbon regulation supportiveness ii) Climate governance iii) Low-carbon and alternative energy spend	40% 30% 30%	20%
Emissions and resource management	We assess emissions intensity of hydrocarbon production as a proxy for operational carbon efficiency and undertake analysis on company management of extraction and production by considering methane emissions and flaring levels. Poor management of natural gas resources represent lost revenue and compromise the fuel's emission advantages relative to coal.	i) Upstream emissions intensity ii) Emissions reduction target iii) Methane emissions intensity and disclosure iv) Flaring intensity v) Lost gas production	30% 20% 25% 15% 10%	20%
Water resilience	Water stress issues at onshore upstream production and downstream refining assets pose risks to production continuity or require significant expenditure to rectify.	i) Water stress exposure ii) Water withdrawal intensity iii) Water disclosure	45% 30% 25%	10%

Source: CDP

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