

Sense & Sensitivity:

Maximising
Value
with a 2D
Portfolio

Executive Summary

2D stress tests

With the oil major AGM season now upon us, there are a number of resolutions calling for 2°C stress tests at the company level. This kind of exercise could feed into the system-level approaches that are being considered by the FSB Taskforce on Climate-related Financial Disclosures.

Carbon sensitivity

Continuing Carbon Tracker's focus on upstream capex for new oil and gas projects, we have developed a Carbon Sensitivity Analysis. This brings together low carbon demand scenarios with oil price and discount rate sensitivity to understand how reducing exposure to high cost, high carbon projects can optimise value. Given the unpredictability of oil prices, we believe that a sensitivity approach which incorporates a wide range of oil prices (including those that might be thought unlikely at the time) is valuable.

This analysis aims to show that it can make financial sense for the oil and gas majors to adopt a strategy of aligning their project portfolios to be consistent with a 2°C outcome, rather than pursue volume at all costs.

Value creation in a declining demand and production environment

The key comparison is the difference between the net present value (NPV) of a company's business as usual (BAU) asset portfolio and the low cost subset of that which is consistent with a 2°C warming demand scenario (2D), which implies lower oil production levels for the industry overall. This stress test takes the form of a sensitivity analysis looking at different oil prices and discount rates. The key question is: "Under which parameters is the NPV of the 2D project portfolio higher than that of the BAU project portfolio?"

This has crucial implications for owners who may be surprised at just how much value can be created by oil & gas companies in a carbon-constrained scenario.

2D stress test of new project capex

For the purposes of this exercise, we have examined the portfolios of the oil & gas majors in aggregate, treating them as a single entity. Compared with a BAU portfolio, the oil & gas majors as a group create more shareholder value by managing their future new upstream project developments to be consistent with a 2D demand level at all oil prices up to \$120/bbl (in real terms in today's money, using a 10% discount rate).

Oil price bet

It would only make sense for a company to bet on approving new high cost projects that aren't needed under 2D if its management believed that oil prices would exceed \$120 for significant periods of time. As reference points, OPEC's outlook averages around \$80/bbl to 2040, and the WEO 2015 IEA450 scenario averages less than \$100 to 2040. These outlooks would therefore not match the high price scenario required. With many commentators now discussing a longer term average oil price of \$50-80, far below the levels needed to justify a BAU approach, constraining high cost investment certainly makes sense – as we have seen with the rush to cancel capex on uneconomic developments.

At current oil prices, we estimate that the portfolio of the combined majors' upstream assets would be worth c.\$140bn more with investments restricted to 2D-compliant projects only (using a 10% discount rate). Even at \$100/bbl, with no risk adjustment, their upstream assets are worth \$55bn more under a 2D rather than BAU sanction approach.

For the purposes of this exercise, we have not attempted to look at any other assets the companies may have (for example midstream, downstream or other non-oil and gas interests). We have also not considered uses of capital – in some scenarios, a company with a smaller, lower-cost portfolio might well be able to return more capital to shareholders or invest it in other opportunities.

Dealing with volatility

Furthermore, companies that take a conservative view of project development and thus sanction lower cost projects should show less volatility in their valuations than higher cost companies. Their higher margins mean that cashflows and asset values are less sensitive to changes in oil price changes. Accordingly, they should be lower risk than companies that are less disciplined. Investors in lower risk assets accept lower returns than those in higher risk assets. This is why government bonds have lower yields than junk bonds.

The higher junk yield is needed to compensate for the higher risk of a failure to make interest payments or bankruptcy.

Fossil fuel risk premium

In much the same way, a high cost oil company has a greater risk of failing to pay a dividend or facing bankruptcy. As a result, investors wanting to correctly value low risk companies should use a lower discount rate than they would use for a high cost, high risk investment. Our analysis sets out a method by which a risk-adjusted discount rate or required return can be calculated. We call this the "fossil fuel risk premium" (FFRP) as it captures the risk associated with a company that invests in high cost projects.

2D stress test of upstream business model

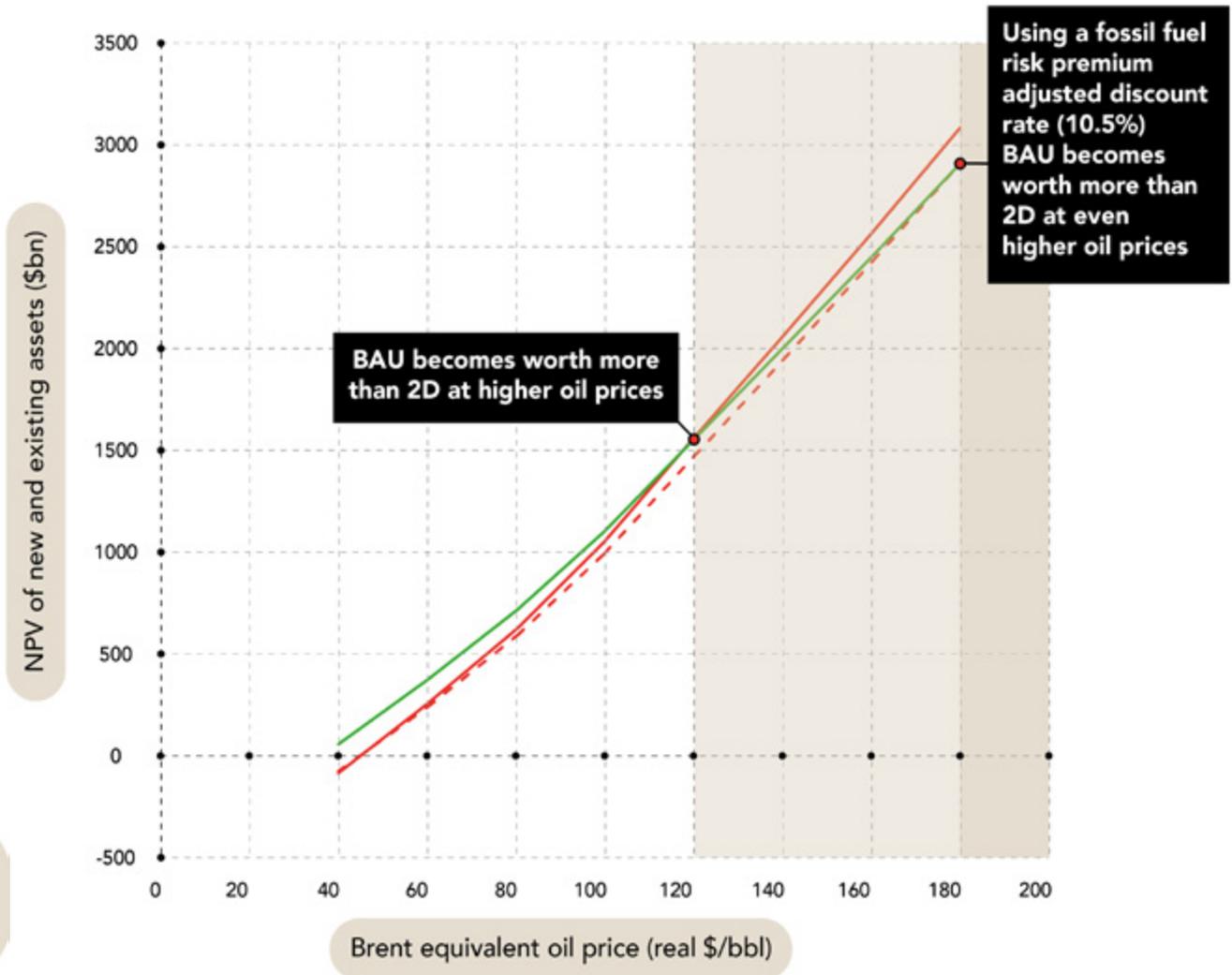
We estimate that, for the majors collectively, the FFRP when applied to all projects (new and existing together) is 0.5% which is added to the standard 10% discount rate.

When this is applied to the full 2D and BAU portfolios of new and existing assets, the analysis suggests that the 2D portfolio outperforms the BAU portfolio at oil prices up to c.\$180/bbl as shown in Figure A.

At \$100/bbl, for example, the 2D portfolio's NPV is \$115bn (or 11%) higher. We expect that the majority of existing oil and gas projects will be needed in a 2D demand scenario.

Our analysis confirms that the bulk of projects not needed under lower-demand scenarios are those yet to be developed—those where capital has not yet been sunk.

Figure A: Carbon Sensitivity of NPV of the majors to low demand, oil price and discount rate



Source: Rystad Energy, CTI analysis

Higher significance at lower oil prices

Under low oil price scenarios, the difference in value is greater - making the choice of business model far more significant. For example, at \$60/bbl, the 2D portfolio (of new and existing assets) has an NPV 43% higher than the BAU at a 10% discount rate. This relative uplift for the 2D portfolio falls to 15% at \$80, and 5% at \$100/bbl. So pursuing a BAU model is tantamount to a gamble on high oil prices.

Table A: NPV uplift of 2D portfolio compared to BAU portfolio (new and existing projects), 10% and FFRP adjusted discount rates

NPV uplift in 2D compared to BAU (%)	Oil price (\$/bbl)							
	\$40	\$60	\$80	\$100	\$120	\$140	\$160	\$180
2D vs BAU (10% discount rate)	-	43%	15%	5%	0%	-3%	-5%	-6%
2D vs BAU (FFRP adjusted, 10.5% discount rate)	-	51%	21%	11%	6%	3%	1%	0%

Source: Rystad Energy, CTI analysis

Demand misread

From a business risk perspective, it makes sense for the industry to take a conservative view of long-term demand. Doing so would lower the risk of oversupply and hence weak prices, which destroy value - as we see in today's oil market.

From a risk assessment perspective, the industry also needs to be sure that it is not collectively overestimating demand, by dismissing future climate policy measures and underestimating rapid advances in technology. Believing in over-optimistic demand forecasts could lead the oil industry to expect the ever-higher oil prices needed to justify a BAU business model. But should demand undershoot those expectations, weak prices are likely to result.

Indeed, in the long term the worst-case scenario for shareholders could be for the oil price to recover without a greater culture of capital discipline being instilled, leading the industry to resume investing for growth on the assumption that ever higher demand lay ahead.

Commodity cycles

Under a low oil price scenario, the oil majors' existing production is likely to remain profitable. For example, we estimate that the average breakeven for existing production is around \$40/bbl. It is the high cost future projects that risk destroying value. Many oil companies and commentators expect oil prices to rise relatively soon. And it is true that during periods of low oil prices, such as the current one, the decline rates of existing fields tend to increase. That should mean the market gradually self corrects. However, such a rebalancing will take longer in 2D rather than a BAU demand scenario because demand levels are lower.

The other side of the equation is of course supply. New projects are being put on hold which should also help correct the market. But with Saudi Arabia continuing to invest despite low oil prices and the revival in the oil industries of Iran and Iraq, this process may well take longer than some of the energy companies expect. A quick bounce back to the high oil prices seen before the recent collapse is by no means a safe bet.

Majors better positioned than other listed companies

The majors have a relatively strong position, because a large proportion of their assets are already producing and so are low cost. They also have new project options with a range of breakevens along the cost curve. However, smaller E&P companies which do not have significant existing production, and those which specialise in higher cost production (e.g. oil sands, deep water) may be more vulnerable.

2D stress test needed to understand potential for increasing shareholder value

The NPV calculations presented here show how sensitivity analysis can be a useful tool for risk management, specifically to understand the impacts of various price and demand scenarios. It may surprise many to find that the majors come out higher value if they align with a 2D scenario, unless oil prices move to historically unprecedented highs. This is why a number of shareholders are asking for this kind of analysis from the companies, to better understand their upstream business strategy.

About Carbon Tracker

The Carbon Tracker Initiative is a team of financial specialists making climate risk real in today's financial markets. Our research to date on unburnable carbon and stranded assets has started a new debate on how to align the financial system with the energy transition to a low carbon future.

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