



Frozen Future

Shell and the US offshore Arctic

On 29 January 2015, Royal Dutch Shell confirmed that it intends, subject to regulatory approval, to resume its US Arctic drilling programme at a cost for 2015 of at least \$1bn.¹ This briefing examines Shell's Arctic experiences to date and outlines key operational and economic issues. We suggest questions investors should ask Shell, to understand whether the company has adequately assessed the various risks it faces.

To date, Shell's Arctic programme has been a failure despite capital expenditure (capex), in excess of \$6bn. 2012's drilling season beset by multiple operational failings (and heavily criticised by two official US government reports) was followed by a 'pause' for 2013 and a forced reversal of 2014 plans because of a US court decision.²

Industry attitudes towards Arctic drilling have changed. Statoil³, Conoco-Phillips,⁴ and Total⁵ have stepped back from US Arctic oil projects for cost, and regulatory reasons. In December 2014 Chevron put its plans to drill in the Canadian Arctic 'on hold indefinitely' owing to 'economic uncertainty in the industry.'⁶ Yet, despite announcing cuts to capital expenditure, Shell remains committed to its intensely scrutinised and

high-cost, high-risk Arctic programme.

Although Shell presents its decision to return to the Arctic as primarily dependent on regulatory approval, the US Arctic Ocean presents almost a perfect storm of risks. These include a requirement for a long-term capital-intensive investment for uncertain return, a uniquely challenging operating environment, a lack of extraction and spill response infrastructure, and intense media and public scrutiny. The US government estimates a 75% chance of a major spill over the lifetime of a project⁷ while US government funded research from September 2014 raises serious concerns over the ability to deal with such a spill.⁸

Major risks for investors

1. High capital expenditure for uncertain return
2. New research raises serious concerns over the ability to deal with major Arctic spill
3. Continued public, media, and civil society scrutiny.

Economic Risks

Shell's on-going commitment to the Alaskan Arctic is part of a company-wide strategy with a heavy focus on exploration. Shell has consistently outspent its peers in exploration. According to Shell's annual reports, between 2010 and 2012 Shell doubled its exploration spend to US\$8.7 bn. Yet with the most prospective and low-cost regions of the world already tapped, new frontiers will deliver ever diminishing returns.

After becoming Shell Chief Executive in January 2014, Ben van Beurden responded to investor demands for more focus on profitability by promising a new era of greater capital discipline. Exploration spending is the most growth-focused element of capex. Shell has not yet released its 2014 exploration spend, but indicated in the Q3 earnings call that it was likely to be similar to the high levels of 2012 and 2013.²⁷

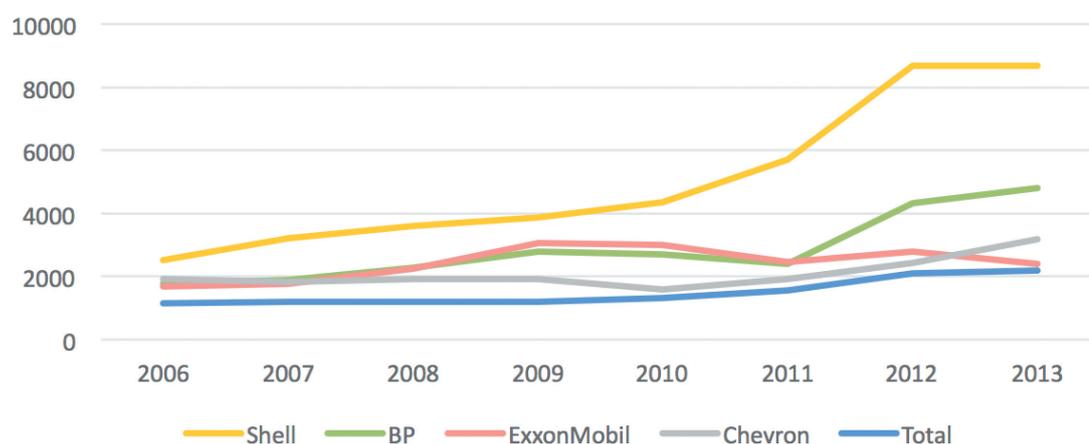
The Arctic provides an illustration of the weaknesses of Shell's exploration emphasis. Shell has spent at least \$6 billion on leases and exploration in the Chukchi and Beaufort Seas off of Alaska, yet not a single well has been completed. At the 2014 Q4 results presentation Ben

van Beurden said any development could only be profitable in the case of "a multi-billion barrel discovery".²⁸

Even with an oil find, Shell would depend on high oil prices to justify extraction from the Chukchi Sea prospect. These prices would be determined by the oil market in the 2030s, which depends on both highly unpredictable technological changes in transportation efficiency and government policies to address global climate change. Effective climate regulation would involve reducing oil demand and result in lower oil prices, almost certainly making Arctic oil extraction unfeasible. Economic analysis by the International Energy Agency (IEA) suggests Shell appears to be gambling on a lack of effective climate regulation, an outcome that the IEA considers unlikely. According to the International Energy Agency, over two thirds of known fossil fuel reserves must remain unburned if national policies to limit global warming to below two degrees centigrade are to be met.²⁹ This means that a large portion of global fossil fuel reserves are at risk of becoming stranded assets as the world

Source: company annual reports

Exploration expenditure in US\$ million



moves to address climate change.

As policy progressively encourages reductions in emissions³⁰ and stimulates new investment in clean energy technologies,³¹ the viability of long-range exploration in high cost locations such as the Arctic seas appears risky.

Questions for Shell

- What is the company's anticipated total capital expenditure - exploration, development and extraction - for the lifetime of the company's offshore US Arctic projects?
- Since 2010, your annual exploration expenditure (combining both expensed and capitalized portions) has roughly doubled compared to pre-2010. Has the value of discoveries followed suit?
- What is the company's response to the fact that the Bureau of Ocean Energy Management (BOEM), in its official environmental impact statement, states it does not foresee any oil production from Shell's leases?
- Will the company provide public information demonstrating the robustness of the company's Arctic projects against a range of oil price and demand scenarios?
- What is Shell's assumed breakeven oil price for US Arctic projects?

regulatory fines and prolonged litigation in a variety of courts from a myriad of claimants, Shell would also likely face uncertain impacts on share price and credit ratings, unprecedented reputational damage, and a threat to its ability to do business in the US.

At present, it is far from clear that Shell has adequate physical or financial oil spill response plans. In fact, there is no available information about how the company would address the financial implications of a major spill.

The Bureau of Ocean Energy Management estimated that there is a 75% chance of a large spill (over 1000 barrels) during the lifetime of exploration and extraction in the Chukchi Sea.³²

In September, an independent spill response gap analysis for the US Arctic Ocean funded by the Bureau of Safety & Environmental Enforcement (BSEE) was published.³³ This study analyses 'how often a particular response tactic could be expected to be ineffective or impossible to deploy based on historic environmental conditions in a certain area'.³⁴ It is important to note that the study assumes "that adequate equipment and trained personnel are available on-scene: it does not attempt to analyze the resources available, deployment of resources both in-region and from other locations, or the quantity or exact type of resources needed"³⁵. It therefore does not consider the complete picture but hypothesizes a spill response scenario under ideal operational and logistical conditions.

Even in such a hypothetical scenario, key findings of the oil spill response gap analysis include:

- In summer, the application of dispersants from a vessel is the tactic least likely to be precluded by environmental conditions.
- In winter, in-situ burning is the least

Oil Spill Response

The potential financial impact of a major oil spill in arctic waters has not yet been assessed by Shell. In addition to significant financial penalties in the form of cleanup and remediation costs (compounded by the practical challenges involved),

likely to be precluded in both locations, though it would still be impossible more than half the time and does not include the collection of burn residue. It's important to note that the authors of the study state that there are no other feasible options in winter – just in-situ burning and to a significantly limited extent. If Shell's oil spill response plan (OSRP) relies on the deployment of multiple tactics in winter to ensure maximum recovery, this will run contrary to the expert view.

- The analysis portrays the very different conditions in an Arctic summer and winter, indicating the need for very different planning and approaches based on seasonal conditions. Shell's OSRP will need to demonstrate this 'very different planning'.
- The analysis also does not fully estimate the extent to which a response tactic would be effective, such as on-water recovery rate or in-situ burn efficiency.

At the time of writing, Shell's worst-case scenario planning is based on the questionable assumption that those types of mechanical recovery equipment would recover 95% of a major spill before it could reach the shoreline³⁶ – a clean-up rate that has not been achieved for any large spill anywhere to date. Less than 10% of spilled oil was recovered using these techniques after the Deepwater Horizon and Exxon Valdez spill.³⁷

The infrastructure to mount a large-

scale response to an oil spill in the Chukchi Sea simply does not exist. The nearest major road system is more than 500 miles away as the crow flies. There are no hotels or other housing capable of accommodating thousands of responders. The nearest Coast Guard station is roughly 1000 miles from the likely drilling sites.

Questions for Shell

- Given the remoteness of the Chukchi Sea drilling sites and the lack of accommodation for responders to a spill what are Shell's specific plans for managing the logistics of a response to a major spill?
- What is Shell's response to the US government commissioned report's findings regarding oil spill response capability?
- The report finds that even in the case of a winter spill, all other spill response tactics other than in situ burning are ineffective more than 90% of the time. In light of this, why is Shell confident that it can deal with such a spill?



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Management Risk

Shell's US Arctic programme began in 2012 with its drilling rig the Noble Discoverer dragging its anchor. On 8th December 2014, the owner of the rig and Shell's contractor, Noble Corporation pleaded guilty to felony charges relating to safety environmental and record-keeping violations aboard the Discoverer during the 2012 drilling season and paid a fine of \$12.2 million.³⁸ The running aground of the Kulluk and the failure to receive timely certification for vital safety equipment were also due in large part to failings by contractors. This pattern of contractor failings raises concerns about the adequacy of Shell's contractor management and oversight.

US government criticisms of Shell

Two official reports - one from the US Department of Interior (DOI)³⁹ and the other from the US Coast Guard⁴⁰ - are highly critical of Shell's 2012 operations and raise questions about Shell's appreciation of the unique operating challenges in an arctic environment and about Shell's contractor oversight.

DOI Review of Shell's 2012 Alaskan Arctic Offshore Drilling Programme - 8 March 2013

Key findings

Lack of Preparation

The Review states on page 23: "In submissions to the Department of the Interior, Shell consistently underestimated the length of time required to complete each step of its drilling operations. The timelines provided by Shell proved to be unrealistic and did not account for complications and delays that should be budgeted for when operating in the Arctic."

Contractor Oversight

There were "significant problems with contractors on which Shell relied for critical aspects of its programme"⁴¹. The Review describes the problems with contractor management and oversight as "the most significant shortcomings in Shell's management systems."⁴²

Pursuant to the DOI report, Shell is required prior to resuming operations in the US Arctic Ocean to present a third-party audit of its management systems including, but not limited to, its Safety and Environmental Management Systems program to ensure that the management and oversight shortcomings identified with the company's 2012 operation have been addressed and that the company's management structure and systems are appropriately tailored to Shell's Arctic exploration program. If completed, this audit has not been made publicly available.



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US Coast Guard investigation into the running aground of the Kulluk -

3 April 2014

Key findings

Failure to demonstrate respect for the unique operating environment

In his comments on the investigation, Rear Admiral Servidio states that “the inadequate assessment and management of risks by the parties involved was the most significant causal factor of the mishap.”⁴³

The Commander of the 17th District states “I feel that an inadequate determination of risk occurred, demonstrating a lack of respect for the unique risks inherent in Alaskan operations.”⁴⁴

Poor planning

The Coast Guard finds that the Shell towing plan was “not adequately reviewed... and lacked the proper contingency planning.”⁴⁵ Shell created a tow plan which addressed individual contingencies but it did not account for multiple and compounding events. This is, however what transpired – the failure of towing equipment compounded by a failure of vessel propulsion. This deficiency in planning is particularly concerning following the Deepwater disaster where the compounding of events was identified as the key issue.

Contractor selection and management

As with the March 2013, Department of the Interior report, the Coast Guard’s findings raise concerns about Shell’s selection and oversight of contractors. The Coast Guard highlights a failure to conduct a thorough assessment of the “performance, operational history, mechanical and physical condition and finally the competence of the personnel of the Aiviq to determine if that vessel was suitable for that role.”⁴⁶

Questions for Shell

- Has the third party audit of Shell’s management systems been completed? If so, will the findings be made public?
- What changes has Shell made to its contractor oversight processes and practices since 2012 to ensure no repeat of the failings by Noble and Superior?
- Is Shell seeking any cost-savings in its US Arctic supply chain? If so, how is Shell ensuring that safety and regulatory compliance will not be compromised?
- Has Shell reviewed its processes for contractor selection in light of the criticisms by the US authorities of its selection of Superior Energy Services and Noble’s felony plea deal? Why is Shell comfortable with retaining Noble as a contractor on its Arctic projects?

Repeated Mishaps

Shell's track record in the US Arctic

28 June, 2012

Shell admits inability to comply with air permission permits⁹

5 July, 2012

Planned commencement date scuppered by ice cover¹⁰

14 July, 2012

Drill ship Noble Discoverer slips its moorings¹¹

30 August, 2012

Shell receives permission for limited preparatory drilling¹²

9 September, 2012

Shell begins preparatory drilling but is forced to stop within 36 hours because of ice incursion into the drilling area¹³

15 September, 2012

Shell's oil containment dome is 'crushed like a beer can' in testing¹⁴

17 September, 2012

Shell officially abandons attempts to drill for oil due to damage to vital spill equipment¹⁵

16 November, 2012

Small fire caused by an explosion reported on Noble Discoverer¹⁶

27 December, 2012

Confirmation that US Coast Guard finds deficiencies on Noble Discoverer¹⁷

31 December, 2012

Shell's drilling rig, the Kulluk, runs aground¹⁸

4 January, 2013

Confirmation that the US Coast Guard has launched a criminal investigation into Noble Discoverer's safety violations¹⁹

27 February, 2013

Shell announces a 'pause' in its Arctic drilling plans for 2013²⁰

8 March, 2013

US Department of the Interior publishes review which is highly critical of Shell²¹

31 October, 2013

Shell announces plans for scaled back Arctic drilling in 2014²²

22 January, 2014

US 9th Circuit Court of Appeals' decision makes 2014 drilling highly unlikely²³

30 January, 2014

Shell confirms it will not drill in 2014²⁴

3 April, 2014

US Coast Guard publishes highly critical report into the running aground of the Kulluk²⁵

8 December, 2014

Noble Drilling LLC pleads guilty to eight felony offences with regard to the Noble Discoverer and pays \$12.2 million in penalties.²⁶ Noble retains its Arctic contract with Shell

Conclusion

Shell's continued commitment to Arctic exploration sits uneasily with its operational track record in the region and with growing industry and investor scepticism about the operational and economic feasibility of offshore North American Arctic oil exploration.

Investors should be concerned that many of those issues which lay at the heart of Shell's 2012 setbacks remain unresolved and that new independent research challenges Shell's claims on oil spill response capability.

And while the risks of such projects are many and identifiable, the potential returns from such projects remain highly uncertain – doubts over the level of commercially recoverable reserves; no substantial extraction likely before 2035; and profitability likely to require unsustainably high oil prices. Investors must question whether this represents an appropriate risk/return matrix

Questions for Investors

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