Executive Summary

- **Background on Shell’s climate letter:** On May 16th 2014 Royal Dutch Shell issued a public letter “in response to enquiries from shareholders regarding the ‘carbon bubble’ or ‘stranded assets’ issue.” In partnership with Ceres, CTI has been active in coordinating such shareholder efforts via the Carbon Asset Risk Initiative, an international group of 75 institutional investors (representing more than $3 trillion in assets) that aims to spur 45 of the world’s largest fossil fuel companies (including Shell) to address financial risks to their businesses as a result of efforts to reduce consumption of carbon-based fuels. On May 8th 2014 ETA-CTI also produced a suite of documents centered on the theme of carbon asset risk for oil company capital expenditures, which focused on the potential for wasted capital and capital management discipline.

- **Taking stock of Shell’s positions:** We welcome many of the positions that Shell articulates in its letter. For example, Shell both acknowledges the need for “a more robust and thoughtful societal debate on addressing CO₂ emissions” and describes Shell’s management as “preparing the company for when legislation and markets will support more significant action to mitigate CO₂.” In other areas, however, we believe an alternative perspective is warranted. In the spirit of furthering the dialogue between investors and companies on carbon asset risk, this note analyzes and responds to what we view as the most important points that Shell makes.

- **“Stranded assets” involve risks to shareholder value:** Many of Shell’s conclusions rest on the following syllogism: over the coming decades the world will continue to consume fossil fuels; therefore fossil fuels will be produced; therefore existing fossil fuel reserves (or at least Shell’s reserves) will not be “stranded.” Any fossil fuel reserves that are producing can indeed not be “stranded” in the strict sense of becoming unusable (i.e. becoming “unburnable carbon”). **Inasmuch as any of the risks that Shell highlights (e.g. oil price volatility,**

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Key Takeaways & Recommendations

- **CTI’s emphasis on “stranded assets” reflects the financial risk to fossil fuel investments in a low-carbon scenario**

- **For Shell and other oil producers, such risk exists because of (1) the potential for global oil demand to begin declining within the next 10-15 years (even without robust climate policies); and (2) the 15-20 year lead times required to bring many newly discovered resources online**

- **In addition to addressing risks to proven reserves, oil companies ought to examine and disclose demand/price/carbon risks to all potential future production (i.e. Estimated Ultimate Recovery)**

- **To help shareholders to assess risk, oil companies ought to disclose estimated breakeven oil prices (BEOPs) of all new projects**

- **Shell’s $107 bn of potential capex (2014-25) on high-cost ($80/bbl+ BEOP) oil production ought to be a focal point for engagement with investors over capital discipline and management**

- **Shell should provide more detail on the role of CO₂ prices in its project evaluations**

- **Shell’s long-term energy outlooks ought to more seriously consider the implications of a 2°C climate scenario**

9th July 2014
inflation in capital and operating costs, poor recovery rates, carbon pricing, etc.) diminish the financial returns from production, however, even producing reserves may still destroy value for shareholders. Ultimately, as analysts we believe that such destruction of shareholder value is the key risk implied by the term “stranded assets.” Even more important is the potential for resources to become low-return assets through future capital expenditures.

- **Reserves and resources – our focus on Estimated Ultimate Recovery (EUR):** In discussing the topic of carbon asset risk, Shell asserts that its proven reserves of oil and gas will not be stranded as a result of efforts to mitigate climate change. A relatively short “proved reserves life” – reserves divided by production – does indeed reduce the exposure of Shell’s proven reserves to the potential for lower demand and prices for oil and gas. Current proven reserves, however, will not account for the entirety of Shell’s potential production over the coming decades. Even the 11.5 years of proved reserves will actually take place over a longer period than the simple ratio suggests. Therefore for any major oil company to maintain current production levels over the next decade and beyond, a wider scope than just proved reserves need to be considered. Focusing on proven reserves is too narrow our view. **Our recent Carbon Supply Cost Curves: Evaluating Financial Risk to Oil Capital Expenditures** report captured this by focusing on breakeven oil prices (BEOPs) for Estimated Ultimate Recovery (EUR) from all potential asset types - a category that is broader than the proven reserves that Shell focuses on. Our focus in terms of Shells portfolio of EURs in this note is concentrated on oil.

- **Business as usual just carries the risk forward:** We would also note that an ongoing "business as usual" investment program merely transfers value from “low carbon risk” proven reserves to future resources. These will face a steadily rising financial risk from action on climate change. Shell’s comment that its proven reserves are not at risk of "stranding", interpreted as value destruction, should provide little assurance to investors concerned about long-term value creation. Value will only be preserved – and stranded assets avoided – if the cash flow from today’s proven reserves is not redeployed to new resources. If it is, the risk is just carried over. Accordingly, we regard Shell’s apparently reassuring comments about the period that its reserve base is exposed to any price risk associated with action on carbon as a narrow interpretation.

- **High BEOP projects can destroy value for shareholders:** One of the reasons that Shell’s returns were lower in 2013 than they were in 2009 despite a near $40/bbl rise in oil prices is that many of the projects it developed turned out to be high cost and so diluted the group’s average returns. In simple terms, it started chasing volumes at the expense of shareholder value. CTI’s breakeven oil price (BEOP) analysis provides a clear way of assessing which of Shell’s potential projects are most likely to be at risk of destroying shareholder value. *(Carbon Supply Cost Curves* defined BEOP as the equivalent Brent oil price that is needed to deliver an asset-level net present value of zero assuming a 10% discount rate.) Its analysis looked at breakeven oil prices for Estimated Ultimate Recovery (EUR) from all potential asset types - a category that is broader than the 25 years of proven and probable reserves and contingent
resources that Shell quotes. It concludes that Shell continues to move forward with some investments with BEOPs that are so high that returns are extremely vulnerable to cost escalation or price weakness. These include but are not exclusively tar sands. It appears that for some projects, Shell continues to chase volumes at the expense of value.

- **Disclosure of break-even oil prices (BEOPs) will help investors to evaluate risk:** When evaluating the competitiveness of an oil company’s portfolio, financial analysts frequently focus on the breakeven oil price (BEOP) of potential projects. Our recent *Carbon Supply Cost Curves* defined BEOP as the equivalent Brent oil price that - considering all future cash flows (i.e. costs, revenues, government take) - is needed to deliver an asset-level net present value (NPV) of zero assuming a 10% discount rate. Knowing the BEOP levels of projects greatly helps investors to gauge risks to the profitability of future production. To aid in such analysis, we believe that Shell and other oil companies ought to more regularly include estimated BEOPs alongside the standard project information such as expected lifetime production, expected in-service date, etc.

- **15-20 years from discovery-to-first oil necessitates assessment of longer-dated risks:** Shell’s “illustrative project economics” suggest that new oil projects take 2-3 years to develop (i.e. to begin producing oil) and, on a discounted cash flow basis, break even after 7-8 eight years. This timeline for project development, however, ignores delays in project sanction (i.e. between discovery of oil and a Final Investment Decision to proceed with development), which are generally at least 3-5 years (and for larger deepwater projects can approach 7 years). Moreover, once sanctioned, many technically complex projects (e.g. deepwater, oil sands, or extra heavy oil projects) take 4-5 years to bring online; including typical project sanctions delays, this stretches out the timeline from discovery-to-initial production to 10 years in a best case and 15-20+ years for larger and more complex projects. Recent examples of long lead times for Shell projects to achieve initial production the Kashagan mega-field in the northern Caspian Sea (13 years, with the project now offline due to leaking pipelines) and the Tempa Rossa heavy oil field in Italy (26 years). **Lead times from discovery-to-initial production of 15-20 years suggest that current exploration capex is being invested in potential projects with production starting as far out as 2030, exposing such projects to long-dated demand/price risks that could materialize in a low-carbon scenario.**

- **Shell’s strategy emphasizes gas in a very long transition:** Shell discusses the focus on gas as a lower carbon fuel in some detail. Despite the presence of several long-lead time, long plateau projects in Shell’s development portfolio, it appears to believe that any energy transition will be slow enough so that it does not have to influence investment capital allocation in the foreseeable future. We see no signal of a strategy envisaging a measurable reallocation of capex towards low cost, low carbon sources, or a dividend policy that reflects the possible lack of profitable upstream opportunities in later stages of decarbonisation. This implies that Shell management believe they will see signs of change sufficiently early enough to change strategy.
• **Long-term outlook for oil - scenarios of modest growth and significant decline:** Shell’s discussion of “the energy landscape and the 2°C scenario” asserts that (1) “forward-looking outlooks” such as the IEA New Policies Scenario imply a stable long-term outlook for fossil fuels; and (2) a 2°C scenario implies reductions in fossil fuel use of a scale and at a speed that are both unrealistic. We offer a different perspective. On point (1), we note that with respect to oil (the most economically valuable fossil fuel, and the source of a material proportion of Shell’s profits) the IEA’s New Policies Scenario suggests modest growth in global demand after 2020 followed by a decline in global demand from 2035-2050 (with projected 2050 demand only slightly above 2013 levels). More ambitious assumptions about, for example, increases in transport efficiency would accelerate this long-term downward trajectory. With respect to point (2), a 2°C scenario does indeed imply significant reduction in long-term demand for fossil fuels (i.e. 2050 global oil demand of ~50 million barrels per day (MBPD), versus 91.4 MBPD in 2013). Efforts to control global climate change, however, by no means ignore the realities of today’s energy system; for example, in the IEA 2DS scenario 2050 global energy demand is still 40% higher than in 2009, and still met 60% through fossil fuels. **We urge Shell to consider the possibilities for a 2°C pathway more seriously in its own long-term energy outlooks** (for example, by our estimate, Shell’s 2013 New Lens Scenarios have the world on a pathway for roughly 6°C of warming).

• **Potential costs of inaction dwarf those of mitigation:** Shell’s exhortation to frankly acknowledge the "cost to society inherent in large scale shifts of the energy system" reflects a logical and widely-held view about the tradeoffs of mitigating global climate change. Mitigating global climate change will indeed entail upfront costs. We note, however, that the costs of climate mitigation (1) can be highly manageable, with recent estimates from the Intergovernmental Panel on Climate Change (IPCC) suggesting that a 450 scenario will reduce annualized GDP growth through 2100 (relative to a baseline scenario) by fractions of one percentage point (depending on when mitigation efforts begin and the availability of key low-carbon technologies); (2) are better thought of as investments that, in addition to reducing CO₂ emissions, yield additional benefits in the form of fuel savings and cleaner air; and (3) pale in comparison to the costs of inaction, which the 2006 Stern Review of the Economics of Climate Change estimated could be “equivalent to losing at least 5% of global GDP each year, now and forever” – a number that the Stern Review’s lead author has subsequently concluded significantly underestimates potential damages from climate change.

• **Climate policy – “as much about the direction of travel as the speed”:** Shell has misrepresented the IPCC’s research which does not state that the 2 degree target is unachievable. Limiting future global warming to 2°C is a commitment that 193 nations pledged to pursue in the 2010 Cancun Accords. Shell notes, fairly, that many of these nations have yet to enact policies consistent with achieving this goal. As Kepler Chevreux analyst Mark Lewis has observed, however, “global climate policy is as much about the direction of travel as the speed.” From 2007-2012, the share of global GHG emissions subject to national legislation or emission-reduction strategies rose from 45% to 67%. Moreover, the world’s major CO₂ emitters continue to enact significant new policies (e.g. the US EPA’s new proposed CO₂ standards for existing
power plants and the possibility of a hard cap in China in 2016). Rather than simply note how the status quo on global climate policy falls short of ultimate goal, prudent companies will note these steps toward a low-carbon world and consider the consequences for their business models in a scenario where such steps accelerate in the future.

• **“Drastic price drop for hydrocarbons” – not a key assumption of carbon asset risk analyses:** Shell’s letter criticizes what it describes as the “drastic price drop envisaged for hydrocarbons in the carbon bubble concept.” CTI has used the concept of a “carbon bubble” to describe the large volume of fossil fuel reserves and resources whose production is incompatible with a scenario of limiting future climate change to below dangerous levels. *We have not, however, advocated or projected any kind of “drastic price drop for hydrocarbons.”* For example, in analyzing risk to upstream oil capex, our recent Carbon Supply Cost Curves report focused on projects that require a Brent-equivalent oil price of $95/bbl or more. Though some $15/bbl below the current Brent crude price, $95/bbl is roughly equal to the average of Brent crude prices (in today’s dollars) from 2007-2013, a period of record-high oil prices. Moreover, *given the ability of much of the world’s oil resources to be developed at prices well below current levels, even small changes in demand can cause the supply cost of the “marginal” barrel to move quite markedly.* This price point also sits within the range used by Shell to screen projects ($70-110/bbl).

• **Shell’s $40/tonne CO₂ price - more clarity welcome:** Shell discloses that it evaluates "the potential economic impact of stricter CO₂ related regulatory changes" by applying a CO₂ price of $40/tonne “as the economic base case across all of our projects.” We interpret Shell’s CO₂ price, however, as applying to upstream emissions associated with extraction. A model that prices in the cost of carbon for extraction but ignores the potential downward pressure on prices that would likely be associated with carbon pricing for end-users seems too narrowly focused to us. It understates the potential threat to returns from Shell’s (and other majors’) projects from action on carbon. We welcome further clarification from Shell on how it uses CO₂ prices in project evaluation.

• **Shell’s potential upstream oil capex - $107 billion on high-cost ($80/bbl+ BEOP) projects through 2025:** The rationale for the Carbon Asset Risk Initiative is to focus on company exposure (including Shell) to future capex on high-cost production. For example, of Shell’s $334 billion of potential upstream oil capex (including the development of prospective resources) through 2025, $107 billion (32%) is associated with projects that have a BEOP above $80/bbl (resulting in a need for market oil prices around $95/bbl in order for project sanctioning to occur). Within Shell’s $107 billion of high-cost potential capex, $77 billion (72%) is associated with undeveloped assets, i.e. fields that are currently either "in discovery" or "undiscovered". The long lead times required to monetize such fields – particularly deepwater/ultra-deepwater and oil sands projects - increases vulnerability to changing demand trajectories.

• **In conclusion, we believe that Shell’s response understates the risk that its business faces from changes in climate policy.** Focusing solely on proven reserves ignores the fact that its resource
base is sufficiently long-life to place production at risk from action on carbon. It also misses the point that under a business-as-usual investment policy, it is merely rolling over its "no action on carbon" bet continuously. We also believe that some of the projects in Shell’s portfolio are at risk of destroying shareholder value given their high break-even prices. We call on Shell to mirror the CTI analysis and provide greater detail of the cost structure of its future developments so shareholders can assess the risk carbon policy changes could pose to their investments. We also call on Shell to renew its focus on value in the context of capital management rather than on volume: some of the projects in its development funnel highlighted by CTI’s analysis appear to be low return, high cost projects.

- **Trivializing the climate issue?:** Discussing the concept of “stranded assets,” Shell’s letter warns of “a danger that some interest groups use it to trivialize the important societal issue of rising levels of CO₂ in the atmosphere.” This appears combative rather than in the spirit of engagement. Fortunately, since the letter’s publication Shell has sought to clarify this comment, as well as its criticism of “alarmist interpretations of the unburnable carbon issue.” We welcome this clarification and note that previously Shell has acknowledged the risks inherent in continuing to devote hundreds of billions of dollars each year to development of new fossil fuel resources. For example, in concluding “Reflections on Development and Sustainability” in Shell’s 2013 New Lens Scenarios, Shell considers the situation with respect to global climate policy developments to be “one of drift, with only small advances taking place while the hard choices are postponed, often for years.” Shell further notes that “the longer the period of drift, the greater the required rest and associated write-off of financial, political, and social capital will be” and asks “are we morally prepared to leave the next generation to deal with this?” [emphasis added]. Recognizing the scope for honest disagreement about the risks to any individual company’s investments, acknowledging the financial consequences and moral implications of the fossil fuel industry’s present course to us provides valid and necessary context for “a more robust and thoughtful societal debate on addressing CO₂ emissions.”
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