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THE ROAD NOT TAKEN

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Shell CEO, Ben van Beurden, startled the world earlier this year. In a speech to the Energy Institute in London he urged his industry colleagues to be less 'aloof' from the public debate on climate change.

This was not a problem for Shell most of those involved in this debate had noticed. Nor was this a casual intervention. He reiterated themes he had first advanced at Columbia University last September just before the UN climate summit in New York.

Discerning the true purposes of someone in Mr van Beurden's job is not easy. Concealing your hand in plain view is an essential skill for success at his level in the corporate world. It would be unwise to take his call for a more 'balanced' debate at face value. The unexpectedly rapid collapse in the oil price has unsettled the oil industry, unnerving the investors on whom it depends for the vast flows of capital needed to maintain production.

Oil industry leaders deeply believe that governments will not meet their obligation to keep the eventual rise in global temperatures below two degrees. They view this goal as unrealistic. But they have been disturbed by the ability of the stranded assets debate to generate sustained headlines. They foresee more confidence shaking headlines running all year as December's climate conference in Paris approaches. It is time to steady the ship.

The primary purpose of the van Beurden speech – there are many secondary purposes – is to create a persuasive narrative to keep investors aboard during a turbulent year. 'Don't worry, we have thought this through', is the reassuring message to investors, 'your money is safe with us.' This may not work. The combination of market, political and climate forces buffeting the oil industry warrants a more penetrating look at its road ahead.

Veterans in the industry know one thing for certain. The oil price will go up and it will go down. The trick is to know when. The blinding fog of opinion released by the current turmoil in the oil market reveals just how hard it is to perform. 'I do not know' is a tough sentence for anyone to say - impossible for an expert. However, one really significant thought is emerging through the fog.



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If we succeed in avoiding dangerous climate change then the price of oil will go down permanently. Keeping the climate safe means building a carbon neutral global energy system by the middle of the century. Exactly what that system will look like remains to be seen. A lot of new energy technologies will be developed and deployed over the next twenty five years.

But at least one feature of a carbon neutral global energy system is already certain. It will not contain several billion internal combustion engines. Our vehicles will be moved by electrons not molecules. But, if molecules are not driving our cars what are the oil companies selling? Whatever it is, it will not be petrol, the top and most valuable end of the oil barrel. Take away the top of the barrel and the rest of it is worth a lot less so its price will fall.

The current fluctuations in the oil price offer us a look down the road to keeping the rise in global temperatures below the 2°C threshold of danger. It is a path with a lot of twists and turns: some foreseeable, others surprising; some accidental, others carefully constructed.

One of the foreseeable twists is that the price of oil will rise again from today's low. The oil majors had already begun reducing capital spend before prices fell off a cliff last year. They have now accelerated that reduction. This will constrain supply in the medium term and so drive prices up again; when, by how much and for how long is unknown.

Welcome to the world of volatility. In an increasingly turbulent world where the cost of capital has only one way to go this is not a great incentive for investment in high risk, long life projects with a big gap between spend starting and revenues flowing. Our previous experience with oil price spikes is that the steps people take to reduce their exposure to them continue long after the prices fall. The demand reduction often becomes permanent.

The upside of the price fall for governments, especially at a time of stuttering growth, is that it puts money directly into the pockets of people who will spend it. But it has to be paid for; in this case by the loss of jobs, tax revenues and dividends. These are the consequences that spooked the British government into immediately looking for ways to prop up its ageing North Sea oil industry.

The view further down the road from this point is chilling if you are the Chancellor of the Exchequer. Britain is committed to meeting its obligations under the Climate Act and playing its part in keeping the climate safe globally. It has led the drive to build an ambitious global regime to manage climate change.

But success in avoiding dangerous climate change will mean eventually giving up the £25 billion a year in revenues the Treasury gets from vehicle excise duty alone as well some £30 billion in corporation tax from the oil and gas sector.



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Furthermore, two companies, Shell and BP, between them provide about 20% of all the pension fund revenues. This, too, will go.

Of course, as oil company CEOs keep reminding us, we still need energy. We will have to replace the oil and gas we are no longer burning with something. This will provide taxes and dividends and jobs. But they will not be the same jobs, for the same people, with the same skills in the same places. So there will also be a significant social adjustment cost for retraining and relocating a displaced workforce. There will, of course, be dividends and taxes but they may not be so abundant or so easy to realise. This prospect will not be welcome to Her Majesty's Treasury which could well become a major obstacle on the road to 2°C.

But hanging on to business as usual also has risks for the economy. The current oil price fall is partly a consequence of Saudi Arabia's willingness to use its market power. As the world's lowest cost major oil producer this power remains. It can be used to drive prices up as well as down. The availability of unconventional oil from North America masks, but does not eliminate, the consequences of political disruption to supply from Libya, Syria, Iran, Nigeria, the Sudans and Iraq. Geopolitical risks to the economy are much harder to anticipate than climate risks

There are other bumps in the road to business as usual in an oil dependent economy. The trajectory of future demand is also becoming less certain. The amount of fuel consumed by light duty vehicles in the US has declined 11% since 2004. Without confidence that projected demand will materialise, oil companies will be unwilling to make the risky, high cost investments necessary to sustain the current level of taxes and dividends anyway. So abandoning your climate goals will not necessarily keep the money flowing.

In the OECD countries, demand for energy started levelling-off before the 2007 financial crisis halted growth and depressed wages. This accelerated the take up of energy efficiency measures that had long been available but ignored by governments and businesses alike. US primary energy consumption has now fallen 18% since 2004. The restored political momentum for building a European Energy Union is driven primarily by fears over the availability of Russian gas. These were high before Putin invaded the Ukraine. They are higher now. This led to the EU prioritising energy efficiency in managing this geopolitical exposure.

The oil companies – and the International Energy Agency – expect surging demand in the emerging economies to more than make up for this drag on demand. BP recently published their Energy Outlook for 2035. It is as good an expression of oil industry orthodoxy as you could wish for and projects oil demand to rise 0.8% a year for the next twenty years. All of this demand is projected to come from the non-OECD countries. If BP are right, then the taxes and revenues will be safe but the climate will not.



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Underlying this orthodoxy is the belief that population will go up, energy demand will go up, oil production will go up and the planet's temperature will go up. In this comforting modellers' fantasy there is no connection between rising temperatures and rising oil production. The two numbers head skywards on parallel tracks. None of the models used to project future oil demand, including that of the IEA, incorporate any impact of rising temperatures on growth.

This stems from the widely held misconception that the economic impacts of a changing climate are some way off in the future. The current rise of just less than 1°C globally – a much greater rise in some places – is already a significant drag on the economy. We have simply failed to measure it yet. But the global growth the oil companies, and Finance Ministries, are counting on, depends entirely on rising real incomes in the bottom two quartiles of the population in the emerging economies.

These are exactly the incomes that will be rapidly and harshly hit by the food and water price spikes and extreme weather events that will be ever more frequent as we move from 1°-2°C and beyond. There has been little growth of any kind in hurricane-devastated Tacloban since 2013. The price of water has risen so high in Sao Paulo this year that water tankers are subject to armed hijacking. If the projected growth is diminished by a changing climate then the oil demand projected to accompany it will not appear. If the oil demand does not appear, the oil price will fall. If the price falls, investment will too. The further you look down the 'business as usual' road the less navigable it looks.

So, is there a better route than this cannibalistic spiral where your growth eats the climate and the climate eats your growth? Fortunately, there is. But it means taking charge of our path to the future and transforming the global energy system.

There are no technological obstacles to building a carbon neutral energy system by the middle of the century. We already have enough technology to do it now. And we will have more and cheaper technologies in the years to come. Nor is there an economic obstacle. Getting off the 'business as usual' death route will cost more than staying on it. At first. But the additional costs of carbon neutrality are off-set very quickly by the avoided costs not having to find, lift, transport, refine and burn the oil. The IEA estimates that the additional cost of a staying below 2°C, \$44 trillion, will be comfortably offset by these savings of \$115 trillion.

The technology and the economics of building an oil free future may not be much of an obstacle to getting on to a better road to the future, but the politics are. The current political equation from the top of any government looks like today's fossil winners versus tomorrow's possible carbon free winners. For governments, this is a no brainer. Back today's winners. But the equation is changing. It is becoming today's climate losers plus tomorrow's winners versus today's winners.



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Slowly but steadily the voices of those businesses already having their interests damaged by a changing climate are getting louder. They are the wine and winter sports industries already feeling the effects of a small change in the climate. The property, insurance, construction, tourism, agriculture, water and big retail brand industries are all just beginning to count the cost to them of our dependence on fossil fuels. This year the Bank of England began an inquiry into the impact of a changing climate on Britain's economy as a whole.

And tomorrow's winners are becoming today's winners far more rapidly than anyone forecast. Deutsche Bank have just published a report on solar pointing out that it is now at grid parity in more than 50% of countries and will be so at 80% within two years. In some countries solar electricity is already 40% below the retail cost of electricity. They see no sign that the oil price fall will slow the momentum for the deployment of renewables.

They are not alone, Citi recently announced the establishment of a \$100 billion fund to invest in renewables. The Abu Dhabi National Bank stated that at recent solar prices – which will fall further – even \$10 a barrel oil could not compete with the technology. The fossil fuel consultancy, Wood McKenzie pointed out that solar farms were already cheaper and displacing gas-fired generation in the US despite the low cost of gas. This has implications for the price of oil because the oil majors like Shell are increasingly oil and gas companies – hence the attraction of a merger with BG. Renewables compete directly with gas putting the oil companies' balance sheets under further stress.

The most profound challenge to business as usual for the oil companies and their dependent stakeholders comes from neither governments nor the green NGOs. It comes from the motor industry. All the major motor manufacturers now have a mass market electric car offer. They are all costing the manufacturers money and making little impact in the marketplace. They are being positioned for the moment the huge reduction in the cost of driving a car with electrons rather than molecules outweighs the additional cost of the vehicle. The current oil price fall has put that moment off.

This is reassuring for the oil companies who anyway believe that this moment is a long way off. They may not be right. Half the cars bought each year in Germany and the United Kingdom are fleet cars. A future oil price spike – and there will be one – could well push the capex-opex trade-off past the point from which it becomes sensible for fleet owners to go electric. At that point the take-up of electric vehicles could accelerate to a rate more common in consumer technology than vehicle markets.

Advanced battery technologies are coming to market far faster than was believed possible. Two years ago the IEA estimated cost parity would be reached in 2020 at \$300/kWh. Market leaders got there in 2014. Policy driven markets for electric vehicles in China and possibly India will add to this momentum. The accelerating



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shift to distributed electricity generation will offer additional revenue flows to electric vehicle owners. In these force fields it might not take much of an oil price spike to set off the transformation. If so, it will be market events rather than climate policies that determine the future of the jobs, taxes and dividends the oil industry provides.

What the tale of the twists and turns reflecting on the collapse of the oil price reveals is that a transformation of our route to the future is inevitable. We can try to maintain the carbon intense 'business as usual' path on offer from the fossil fuel companies and the global temperature will rise to levels which will destroy the very economic growth they fuel. Or, we can try to build the carbon neutral road whose course is already visible. On one route risks to both the economy and the climate grow rapidly. The other risks neither.

The real difference is that on the first path we let events shape the route and on the second we must shape it ourselves with a lot of hard political decisions. The promise of the first option is a very disorderly transformation to an uncertain future. The second offers a more orderly transformation to a more predictable future. The first choice is within the current bounds of the politically possible. The second requires that we expand those bounds.

There is a well-known poem by Robert Frost which ends:

“Two roads diverged in a wood, and I –
I took the one less travelled by
And that has made all the difference”

We should follow his advice.