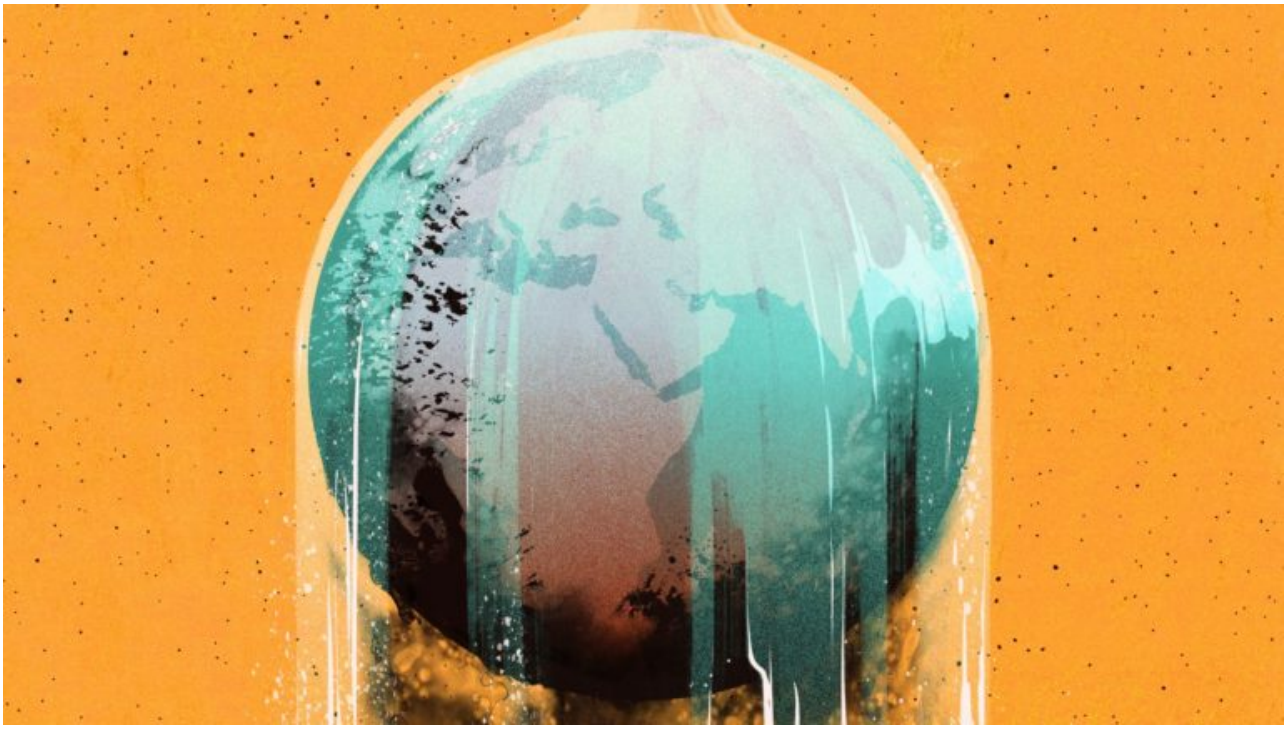
A ‘magic bullet’ to capture carbon dioxide?



CO2 is a powerful warming gas but there’s not a lot of it in the atmosphere – for every million particles of air, there are 410 of CO2.

The gas is helping to drive temperatures up around the world, but the comparatively low concentration means it is difficult to design efficient machines to remove it.

But a Canadian company, Carbon Engineering, believes it has found a solution.

Air is exposed to a chemical solution that concentrates the CO2. Further refinements mean the gas can be purified into a form that can be stored or utilised as a liquid fuel.

Valeura Energy chases big prize in Turkey as West seeks gas alternatives

A C$60mln fund raise last year to help develop the field was heavily backed by UK institutions.

Energy security is a sensitive topic in Europe. Too much dependence on Russian imports has made Western politicians twitchy.

That makes Valeura Energy Inc's (TSX:VLE) plan to develop a potentially huge new deep gas field in Turkey looks very well-timed.

Indeed, a C$60mln fund raise last year to help develop the field was heavily backed by UK institutions says chief executive Sean Guest.

In view of that perhaps it's not surprising that Valeura intends to list in London in a few months.

That should coincide with the results of a second development well, Devepinar-1, at its Thrace basin acreage known as BCGA.

Valeura already has producing assets in the basin, but Guest says the company's attention is focused on the three deep-well programme at Thrace.

Devepinar-1 is 20Km from the programme's first well, Inanli-1, which hit a huge 1,600m gas column and demonstrated overpressured gas down to 4,900 metres,

The main partner in the deep resources assets at Thrace is Equinor, the former Statoil, which has a 50% stake compared to the Canadian company's 31.5% and Pinnacle's 18.5%.

Valeura is operator, however, and importantly owns the infrastructure in the region so rather being flared off, any gas that flows up during the drilling can be sent by pipe to be sold.

Vast gas column

Estimates currently are that there might be as much as 10trn cubic feet of gas in place in the deep Thrace Basin or enough for up to 40 years production.

Fracking tests are now underway at the first hole, Inanli-1, to demonstrate the gas discovered there is commercial.

Costs for this testing will be carried by Equinor with thier completion to fulfill the earning obligations under the (Banarli) farm-in agreement.

Devepinar-1 and the third well will test the lateral extent of the BCGA play to the western side of the basin.

Guest says that drilling has gone well and it will sit down shortly with Equinor to decide where the final well goes.

Gas shortage

Turkey is very short of gas, he adds, so netbacks (income after costs, transportation, royalties) from any hydrocarbons produced are good.

Valeura already has some producing assets in the country, which were running at the equivalent of 777 barrels per day at the end of 2018.

Received gas prices were C$9 per mcf (million cubic feet) in its latest quarter or the equivalent of C$32.48 per barrel, a 37% rise on the previous year, while for the whole year the netback was C$25.79.

Due to the high lvel of imports, the regional price of gas is what you get in Turkey, he says.

Valeura will have to pay its share of the US$25mln costs of Devepinar-1 and the next well on a pro-rata basis, but it had nearly all of its C$60mln fund raise available at the year end.

Guest adds that the first well in a programme is usually the most expensive as that’s when a lot of different techniques are tested during the coring.

Well-funded

More vertical wells are possible to determine the full extent of the BCGA but he sees Valeura as well-funded until 2020, when the consortium partners will decide on the next phase of development.

That might see an early development phase to genrate cashflow from the most accessible and commercial opportunities.

The Toronto-listed shares spiked higher when Valeura released estimates of the potential of BCGA early tn 2018, but have

eased back as the development drilling has got underway.

Now at C$2.62 per share, Valuera is worth about C$227mln (£132mln), which looks way short of the underlying value if even a modest amount of the gas in place is proved to be commercial.

Valeura will keep its Toronto listing, but the focus will be Europe and given the pressing need for an alternative to Russian gas both in Turkey and elsewhere having a quote in London should do no harm when the results of the next development drill come through.

Vatican Invites Big Oil Back for Climate Change Talks

The Vatican has invited Big Oil bosses for the second time in a year as part of Pope Francis's campaign to counter climate change, according to people familiar with the plan.

Top executives from BP Plc and Eni SpA are among those invited to attend a two-day meeting from June 13, the people said, asking not to be identified before a formal announcement. The officials could meet the Pope on the second day, they said.

Chief executive officers of Exxon Mobil Corp., Eni and BP, along with asset manager BlackRock Inc.'s Larry Fink, attended a similar meeting last year, in which they agreed the world needed to transition to lower-carbon fuels while ensuring adequate supply. Since then, little progress has been made on some of the key points agreed at that meeting, such as carbon pricing.

The Pope's spokesman declined to comment when asked about this year's meeting.

The interest of Pope Francis, who has made climate change a cornerstone of his papacy, adds to the pressure companies are already facing on emissions. Royal Dutch Shell Plc gave in to demands from investors last year to set short-term climate targets, while BP has said it will disclose more information about the alignment of its business model with the Paris accord. Exxon Mobil has successfully blocked a measure from investors on climate change.

In its strategy update last month, Eni said it will plant 20 million acres of forest in Africa to help offset all carbon dioxide emissions from its oil and gas exploration and production operations by the end of the next decade.

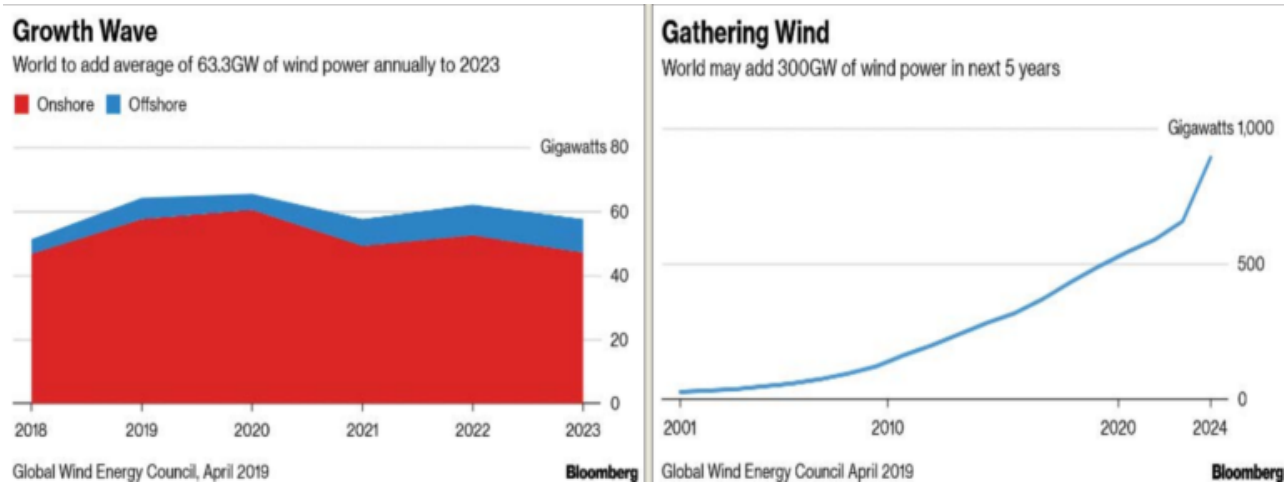
The Pope said in an encyclical letter in 2015 that the science around the topic is clear and that the Catholic Church should view it as a moral issue. The Vatican, which has diplomatic relations with over 180 countries and has permanent observer status at the United Nations, has also fervently backed the Paris climate agreement.

American gas is hot in Shanghai; American prices, not so much

The world wants US natural gas. American prices, though, it can do without. US gas companies at the LNG2019 conference in Shanghai this week have announced deals to sell a combined 4.5mn tonnes of liquefied natural gas a year from proposed multibillion dollar projects. Nearly all of that was sold without a link to the US Henry Hub benchmark, the most-widely traded gas price in the world. The novel price links for US gas included: Japan-Korea Marker: Tellurian Inc agreed to sell Total SA 1.5mn tonnes a year from its Driftwood LNG venture in Louisiana linked to Asian spot LNG marker, which has traded as much as $9 above Henry Hub in the past year. Brent oil: NextDecade Corp will supply Royal Dutch Shell Plc with 1.5mn tonnes annually, for 20 years, linked to the global crude benchmark, which US exporters in the past argued has no connection with gas fundamentals. LNG has traditionally been priced against oil, since the gas market lacked a liquid, global benchmark. The rise of US exports, and the ease of pricing against Henry Hub, was a way to break the link with oil, but left costs dominated by factors unique to North America. “Nobody wants Henry Hub” pricing in Europe, Mark Gyetvay, chief financial officer for Russian LNG developer

Novatek PJSC, told reporters on the sidelines of the conference. “Most of these people are not willing to take Henry Hub because they can’t hedge it” against European benchmarks. No global marker has been established amid the robust growth in spot LNG demand and trading, reflecting a desire by buyers and sellers to secure a diversity of pricing options. Trading of JKM futures on the Intercontinental Exchange Inc grew 10-fold between January 2017 and December 2018, while trading of Dutch Title Transfer Facility futures has grown nearly five times faster than US trading in the past two years. Europe has long had domestic gas markets that set prices LNG producers are willing to sell against. But that hasn’t been the case in Asia, where gas markets are typically disconnected and regulated by governments. That’s started to change in the past two years as spot LNG trading in the region increased, bolstering confidence in the JKM price, assessed by S&P Global Platts. Nearly twothirds of the world’s LNG was bought by Japan, China, South Korea or Taiwan last year, according to the International Group of LNG Importers. “We don’t believe LNG should continue to trade on an index to something else. It should be buying and selling on an LNG index,” said Meg Gentle, Tellurian’s chief executive officer. “Today JKM is really the market clearing index. Over time there will be additional LNG price points.” The pricing mechanism that raised eyebrows this week in Shanghai was NextDecade’s Brent-linked deal with Shell. NextDecade CEO Matt Schatzmansaid he wanted to sell against Brent because his Rio Grande LNG venture will rely on gas that’s a byproduct of oil drilling in the Permian Basin, where output will likely increase along with oil prices. Total CEO Patrick Pouyanne said he didn’t understand that logic. “Continuing to price gas linked to oil is somewhat the old world,” Pouyanne said yesterday. “I was most surprised to see new contracts linked to Brent, especially from the US Someone will have to explain this to me.

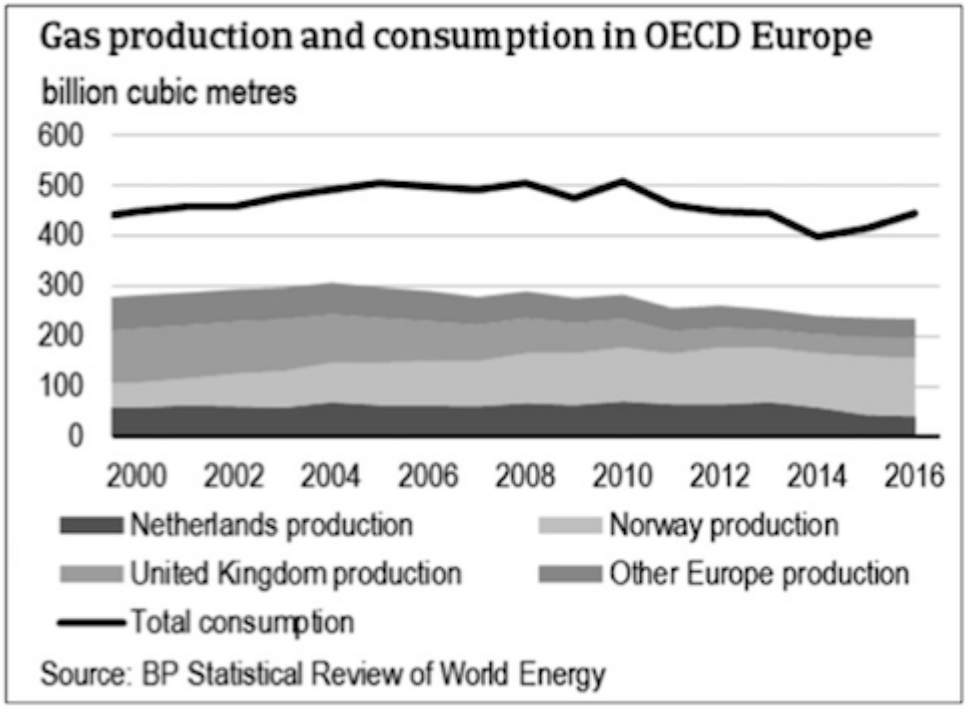
Global wind power may jump 50% in five years: GWEC



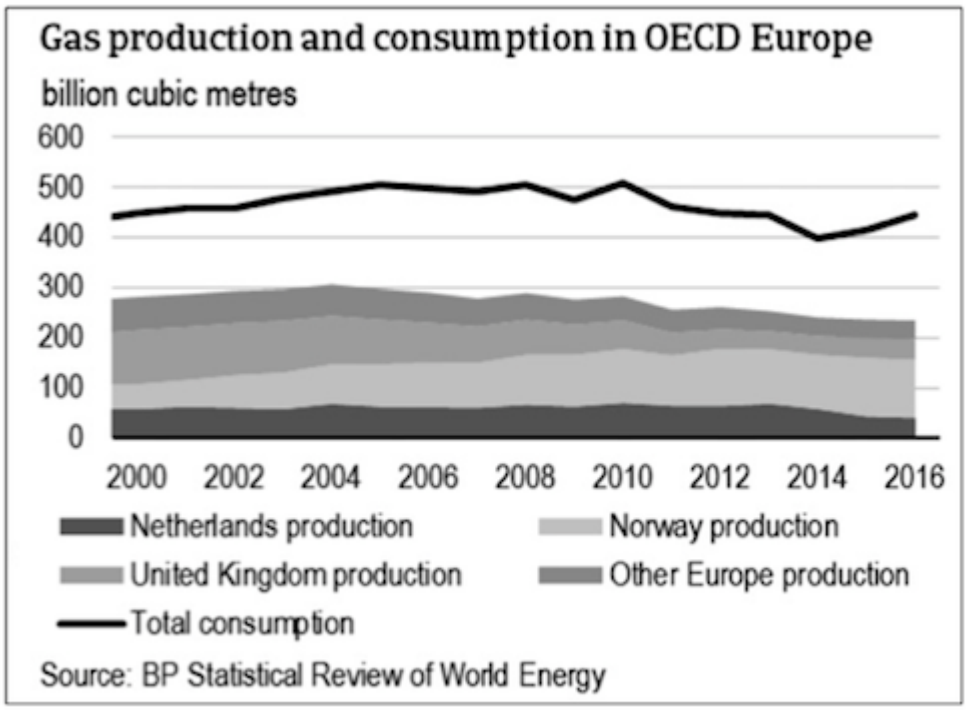
Wind turbine installations are likely to accelerate in the next five years as new markets open across Asia and Africa, jump-starting an industry that to date enjoyed steady but unspectacular growth. Led by China, the US and new markets in South-East Asia, wind installations may grow by 50% in total in the next five years and add 300 gigawatts of power generation capacity, the Global Wind Energy Council, an industry group, said yesterday in its annual report. The South-East region including Vietnam may grow to a 4-gigawatt wind market by 2023, up from 1.5 gigawatts last year, GWEC said. The group identified several new drivers for the industry’s growth in addition to lower turbine prices and government commitments to reduce pollution set out in the Paris Agreement on climate change. It said developers and investors are increasingly tapping finance outside government support wind power. Those include power purchase agreements, enabling a faster roll out of projects both in mature and fledgling markets. The cost of turbines has fallen sharply in recent years, although that trend will probably stabilise in 2019, said GWEC. Global installations of on- and off shore

wind will increase by as much as 65.4 gigawatts this year from 51.3 gigawatts in 2018, the group said. South-East Asia states like Vietnam, Indonesia, Thailand and the Philippines are markets to watch, said GWEC in its report. Urbanization, rapid industrialisation and population growth are encouraging the region’s governments to access clean power, it said.

EU: Between an American Rock and a Russian Hard Place



At this moment, shipped and regasified American LNG stands at a higher price than Russian piped gas. Are there any reliable, affordable alternatives available to Nord Stream 2?



Commentary: The mysterious case of disappearing electricity demand

Electricity is at the heart of modern life, and so it’s easy to assume that our reliance on electricity will increase or even accelerate. However, in many advanced economies the data reveals a surprisingly different story.

Electricity demand has increased by around 70% since 2000, and in 2017, global electricity demand increased by a further 3%. This increase was more than any other major fuel, pushing total demand to 22 200 terawatt-hours (TWh). Electricity now accounts for 19% of total final consumption, compared to just over 15% in 2000.

Yet while global demand growth has been strong, there are major disparities across regions. In particular, in recent years electricity demand in **advanced economies** has begun to flatten or in some cases decline – in fact electricity demand fell in 18 out of 30 IEA member countries over the period 2010-2017. Several factors can account for this slowing of growth, but the key reason is energy efficiency.

There have been a range of new sources of electricity demand growth in advanced economies, including digitalization and the electrification of heat and mobility. However savings from energy efficiency have outpaced this growth. Energy efficiency

measures adopted since 2000 saved almost 1 800 TWh in 2017, or around 20% of overall current electricity use.

Over 40% of the slowdown in electricity demand was attributable to energy efficiency in industry, largely a result of strict, broadly applied, minimum energy performance standards for electric motors. In residential buildings, total energy use by certain classes of appliances has already peaked. For example, energy use for refrigerators (98% of which are covered by performance standards) is well below the high point reached in 2009, and energy use for lighting has also declined. In the absence of energy efficiency improvements, electricity demand in advanced economies would have grown at 1.6% per year since 2010, instead of 0.3%.

Changes in economic structure in advanced economies have also contributed to lower demand growth. In 2000, around 53% of electricity demand in the industrial sector came from heavy industry, but by 2017 this figure had fallen to less than 45%. Advanced economies now account for 30% of global steel production, for example, down from 60% in 2000, and for 25% of aluminium production, also down from around 60% in 2000.

Finally, electricity demand for heat and mobility increased by only 350 TWh between 2000 and 2017. Today, electric cars represent only 1.2% of all passenger vehicle sales in advanced economies and account for less than 0.5% of the passenger vehicle stock. Since 2000, only around 7% of households in advanced economies have switched from fossil fuels (mainly gas) to electricity for space and water heating purposes, and use of electricity for meeting heat demand in the industrial sector remains marginal. In many regions, the price of electricity relative to fossil fuels limits its competitiveness for heating end-uses.

When we look to the future, the pace of electrification is set to pick-up somewhat in advanced economies. Nonetheless, electricity demand growth is projected to remain sluggish in

the IEA's New Policies Scenario (NPS), as improvements in energy efficiency continue to act as a brake on increasing demand for many end-uses. In addition, fewer purchases of household appliances (most households in advanced economies today own at least one of each major household appliance such as refrigerators, washing machines and televisions), and a shift from industry to the less electricity-intensive services sector, all contribute to lower electricity demand growth.

On average, electricity demand in advanced economies is projected to grow at just 0.7% per year to 2040 in the NPS, with the increase largely due to digitalization and policies that incentivise the use of electric vehicles and electric heating. Without those policies, electricity demand would continue to flatten or even decline in many advanced economies.

There are other factors at play. For example, population growth in many advanced economies is barely exceeded by electricity demand growth, meaning that further growth in GDP per capita does not lead to an increase in electricity demand per capita (as an exception, the industry sector in Korea accounts for a large share of electricity demand, and so it is one of the few advanced economies that sees industry contribute to overall electricity demand growth on a per capita basis).

Ultimately, despite moderate growth in electricity demand, fuel-switching to electricity and energy efficiency improvements in the use of other fuels mean the share of electricity in final consumption is projected to increase to 27% in advanced economies by 2040, up from 22% today.

China urges LNG industry to deepen collaboration

Chinese industry players say LNG will continue to face competition from other fossil fuels and renewables if the industry cannot work together on commercial challenges

LNG’s potential to become Asia’s dominant fuel, as the region transitions away from coal to cleaner energy, will only be realised if the industry can work together to lower costs and overhaul trading conditions, senior Chinese energy officials said at the opening sessions of LNG2019 in Shanghai.

A series of speakers from Chinese national oil companies (NOCs) and senior politicians, including Shanghai mayor Ying Yong, underlined the important role LNG has played in China’s efforts to fight pollution and meet 2020 climate goals. But each also echoed the same concerns over the fuel’s future trajectory.

“Competition from pipelines and renewables is fierce, costs

are still high, and the large scale of the natural gas system is causing bottlenecks", says Yang Hua, chairman of Cnooc. "Some LNG suppliers insist on traditional methods of duration and pricing, and resolution of this will require a joint effort".

China, particularly its coastal areas, is a good example of how quickly LNG uptake can accelerate. Last year 21 receiving terminals imported LNG to help power the country's towns and cities, drawn from a diverse portfolio of 25 countries.

The country is also expanding its LNG import and distribution infrastructure. The ministry of transport plans to quadruple the country's import capacity within the next two decades from its 21 terminals with 2.86tn ft^3/yr (or 221.7mn m^3/d) capabilities to 34 terminals with over 11tn ft^3/yr (or 852.9mn m^3/d).

But as the LNG industry targets further expansion into emerging markets in south and southeast Asia, the speakers said lessons also need to be learned from China's experience.

"LNG demand growth may be subject to price constraints – only acceptable LNG prices lead to sustainable growth", says CNPC chairman Wang Yilin. "Flexibility in trade needs to be strengthened, as more flexible contractual terms will lead to greater liquidity. Suppliers and vendors must jointly support innovation to promote the stability of the market."

Yong also highlighted the importance of LNG to his city of 24mn people, with the same caveats over future growth."For a long time, LNG was constrained by the high cost of its storage and transport. A global LNG market has yet to form and the pricing mechanism does not reflect fundamentals yet," says Yong. The LNG industry needs to work together to reduce costs and improve its competitiveness against other fuels, the mayor adds.

Shell to leave oil lobby group over climate policy concerns

LONDON (Bloomberg) — Royal Dutch Shell's position on climate change is misaligned with about half of the trade associations it's a part of, and the disagreement with one is so severe the company will let its membership lapse next year.

The findings were issued in a first-of-its-kind report on whether the company's association with lobbying groups is undermining its work on climate change. The report is likely to reverberate across the industry, with most of Shell's peers also members of the same groups and already facing enormous pressure from shareholders to line up their business models with the Paris climate accord.

Shell will leave the American Fuel & Petrochemical

Manufacturers association next year because of its climate-change policy stance. It also named nine other groups that it disagrees with, including the powerful American Petroleum Institute and the U.S. Chamber of Commerce, but said it will "engage further" with them.

Organization – Area of Misalignment

American Fuel & Petchem Manufacturers Paris accord, carbon pricing American Chemistry Council Methane rules American Petroleum Institute Methane rules, Clean Power Plan, Paris accord BusinessEurope Carbon trading reform Canadian Association of Petroleum Producers Paris accord, carbon pricing European Chemical Industry Council Carbon trading reform FuelsEurope Carbon trading reform National Association of Manufacturers Carbon tax, CAFE standards, Clean Power Plan U.S. Chamber of Commerce Paris accord, carbon pricing, Clean Power Plan Western States Petroleum Association Carbon pricing, "lobbying approach"

"The publication of this report is a first step to greater transparency around our activities in this area," Shell said in the report. "Shell's investors, and more broadly civil society, must be confident that we engage constructively with others on climate change."

Trade associations have long been a target of environmental activists who support tougher regulation on the industry. Following investor pressure, Shell said last year it would prove through greater reporting that it isn't funneling money into institutions that hinder progress on cutting greenhouse-gas emissions.

Of the nine groups it's misaligned with but will stay a member, Shell only disagrees with some of their positions. For example, it said the API fought to repeal rules around methane emissions in 2017, while the company wanted those to stay.

Shell said it found a "material misalignment" with the

American Fuel & Petrochemical Manufacturers, something it cannot rectify. Unlike Shell, the group neither supports carbon pricing or hasn't publicly supported the goal of the Paris accord, the Anglo-Dutch oil major said.

AFPM works on "myriad issues" for its members, and "like any family, we aren't always fully aligned on every policy, but we always strive to reach consensus positions on policies that are in the best interest of our membership and the communities and consumers that rely on us," Chet Thompson, the group's CEO, said in an emailed statement.

Regulating deep sea mining

Deep sea mineral exploration is one of the most tightly regulated activities in the ocean. Under international law, exploration, as distinct from marine scientific research (which is open to all States), may only be undertaken under a contract with the International Seabed Authority (ISA), an intergovernmental organization based in Jamaica and established by the 1982 United Nations Convention on the Law of the Sea (UNCLOS).

UNCLOS – the 'constitution for the oceans' – took the important step of setting aside the deep seabed beyond national jurisdiction and its mineral resources as the 'common

heritage of mankind’. It gave the ISA the exclusive mandate to manage deep sea mineral resources for the benefit of mankind. As a result, the deep-sea mining regime in UNCLOS is the most innovative legal regime ever designed by humankind for the equitable and sustainable use of natural resources.

This carefully balanced but comprehensive legal regime was created to prevent a scramble for resources by technologically advanced countries in the deep sea, and to ensure that scientific research, exploration and exploitation would benefit all of humanity. It was developed to ensure mining the deep sea wouldn’t take place on a first-come, first-served basis, but rather it would fall under international management with clear global environmental standards.

Over the last 25 years, ISA has developed a comprehensive set of rules dealing with exploration for deep sea minerals. With increasing regulatory certainty, combined with rising mineral prices as demand for so-called ‘green metals’ (the metals needed to support the low-carbon transition such as copper, cobalt and nickel) surges, commercial interest has grown rapidly, particularly over the past five years. Presently, there are 29 active mineral exploration projects in the deep seabed, involving 22 different countries. Commercial exploitation was attempted in the 1970s on a small scale, but has not yet taken place, primarily due to the lack of agreement on international regulations.

Last week, a major step forward took place with the release by the ISA’s Legal and Technical Commission, a 30-member expert body, of its proposals for a draft Mining Code that would allow for commercial exploitation of deep-sea minerals. The Mining Code, which has so far taken five years to develop, including several rounds of global stakeholder consultation, will permit exploitation of the deep sea in a way that balances the need for minerals with rigorous environmental protection. The Code will require States or mining companies planning to undertake activities in the international seabed

area to carry out prior environmental impact assessments, abide by stringent environmental criteria and account for continuing compliance through oversight by independent entities. Unlike comparable activities within national jurisdiction (i.e., up to a country's 200 nautical mile on the continental shelf), which are subject to national regulation which may vary from country to country, these standards are applicable globally.

A unique feature of the regime is that it will require a portion of the financial rewards from mining to be paid to the ISA and then shared with developing countries according to 'equitable sharing criteria'. How big those rewards will be, and how much revenue will in turn flow to the ISA, is still to be decided. In any case, it is likely that profits will be slow to roll in during the early years of exploitation, mainly as a result of the high capital costs of designing and building the specialized ships and collector vehicles that will be needed.

A big challenge here is the question of how to tackle the problem of distributing the financial rewards. UNCLOS calls for, but does not define, equity, a complex idea that resists simple formulations. For many States, the fact that deep-sea mineral resources are the common heritage of mankind suggests a redistribution of income from wealthier States to poorer States, particularly least developed and landlocked States. Others have suggested that intergenerational equity would be better served by the creation of a resource fund, like a sovereign wealth fund, that could be used to support global sustainable development goals.

The Mining Code will be reviewed by the ISA Council in July 2019. The Council, which is made up of 36 member States, has set itself a target of 2020 to finalize the Code. It is important to get it right, and it is true that complex, political, economic, technological, scientific, environmental, social, industrial and legal aspects need to be sensitively

addressed to achieve a commercially viable and socially responsible industry. Nevertheless, I can think of no other activity in the ocean where we have had the chance to put the rules into place before the activity has occurred, and we should take every advantage of this opportunity.

Michael Lodge, International Seabed Authority

With 28 years of experience as a public international lawyer, Mi

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