Extractives Hub

Energy Transition and the Re-making of Liquified Natural Gas

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1. EXECUTIVE SUMMARY

At a time when the global Liquified Natural Gas (LNG) business seems to have settled on the sunlit uplands, dark clouds are moving swiftly, and gathering. Meeting the requirements of net zero by 2050 will require the decarbonisation of LNG, and the current status of natural gas as the cleanest of the fossil fuels is unlikely to see LNG receiving special treatment. Commitments to reduce Greenhous Gases (GHG) emissions by removal or off-setting are being advanced at a time when the fixed arrangements of LNG developments and sale and purchase arrangements are continuing beyond them.

Some companies are changing their strategies and indeed their very businesses towards the agility required to participate in the energy transition as well as continuing to pursue petroleum operations. It can already be seen that business behind confidentiality commitments cannot endure as emissions and financial disclosures become irresistible in the context of measurement, reporting and verification to certified standards. And collaborative working is coming to the fore as the benefit of the greater good comes to challenge individual gain in the context of environmental, social and governance requirements.

Early responses include "carbon-neutral" or "green" LNG although these expressions so far owe more to advocacy than to empirical data or objective information. For an international business with operations in individual nations, there may be few authorities capable of verifying the traditional LNG supply chain. But integration of petroleum production regulations and maritime vessel authorities with climate change institutions is taking place.

And whereas some contemporary LNG developments and sale and purchase arrangements are adapting to recognise the writing that is currently on the wall, many of the existing arrangements on which today's global LNG business is based are fixed in their terms from before the energy transition - and typically without the ability to revisit those terms in the absence of agreement. The experiences of Europe and now Asia suggest that the LNG industry's response in these circumstances is reference to international arbitration and an adversarial testing of the fittest in the context of the continuing operation of their long-term contractual arrangements and their deteriorating (but necessarily continuing) relationship.

This paper considers whether it is now timely, and in the interests of the future of the LNG business, to consider the re-making of existing LNG arrangements in a way that is consistent with the energy transition and the greater good, rather than a periodic testing of transient contractual positions before arbitral tribunals.

2. LNG AND THE SUNLIT UPLANDS

During recent years, the global gas and LNG business has been moved from an established order of predictability to circumstances of rapid change, not least because of the consequences of changing oil and coal markets. Over the last decade, natural gas has increasingly come to displace coal consumption in the large consumer markets of China and India. To some extent it is also displacing oil in these markets, although not yet in relation to most transport uses. More recently, natural gas has increasingly penetrated the energy markets of new jurisdictions such as Pakistan and the Philippines, and adapted its traditional structures, relationships and contractual arrangements to take account of new sources of supply.

The pace and scale of change in the LNG sector, has been remarkable. The development of aggregators, the influence of commodity traders and moves towards floating facilities and smaller-scale developments have had their effect. The moves of the United States of America (USA) towards greater export capacity (to the position where it may soon be looking Qatar and Australia in the eye) have also changed the sector, despite a recent re-setting of the balance sheets (or ownership even) of a number of USA producers. The world's previously segregated, regional markets for natural gas and LNG have moved closer together. Whereas the development of a global gas price (e.g. akin to the global oil price) still seems some way off, the growth of trading hubs and the closer integration of regional pricing and markets are undeniable.

As world economies stutter to absorb the effects of the Covid-19 pandemic and seek to recover lost ground (and even move towards growth again) this pace of development in natural gas and LNG seems to have been showing few signs of abating in relation to the longer term. This year and next look likely to see final investment decisions in relation to substantial new quantities of LNG, with sales being made on many diverse bases to an increasing number of markets. And with financing being raised in many ways, both traditional and innovative. Substantial investment is also being made in shipping vessels and floating facilities in a way that does little to undermine confidence in the sustainability and affordability of LNG.

Many studies and projections are continuing to show a trend of growth in the global market for years to come. There is also evidence of trading initiatives having a greater role within the once-binary buying and selling of LNG with joint ventures, contractual cooperation in matters such as destination flexibility, and greater integration of shipping with trading, including ship storage. The recent mood from significant gatherings of the LNG business

has seemed to be *"onwards and upwards"* with resilience, flexibility and optimism - after something of a (pandemic-induced) hiatus.

Clearly, there is a recognition that global initiatives towards enhanced environmental, social and governance compliance and the requirements of climate change mitigation apply to the LNG business, but there is also an air that those are matters to be dealt with over time. The energy transition may be under way but this expression means different things in different places. In regions where the expression "energy transition" means the replacement of coal or oil by gas, then 2050 and its net zero targets may seem some way away. Regardless of the uncertainties concerning the extent or pace of moves towards a low-carbon future, the role of gas and LNG as enduring participants in that future may seem assured.

For some, natural gas will remain a primary fuel for many decades and will have the role of a bridge fuel towards a low-carbon future. Others see such an ambition (of a global industry presiding over its own extinction) as unworthy of such a noble fuel and see an enduring primacy for natural gas within a low-carbon world; a view buoyed not least by the perceived advantage of natural gas as the cleanest of the fossil fuels.

3. GATHERING CLOUDS, MOVING QUICKLY

But the move from hydrocarbon dependency to the promise of electrons has been accelerating across the globe (albeit at different speeds in different places) and with Europe moving faster than most. Early indications suggest that the effects of the Covid-19 pandemic will not put a brake on this acceleration and may indeed increase it in a number of regions. And natural gas is not immune from the meeting of climate change objectives and the application of Environmental, Social and Governance (ESG) strictures.

International, regional and national laws are proliferating with the aim of slowing or arresting the effects of climate change and the emission of GHG. GHG include carbon dioxide and methane, with carbon dioxide comprising most of these emissions and most carbon dioxide resulting from the burning of fossil fuels. The natural gas business in a broad sense is among the primary contributors to the emission of GHG.

And whisper it quietly but whereas the emissions caused by natural gas at the point of combustion are well below those of coal or oil (giving rise to the epithet of gas as the cleanest of the fossil fuels), the emissions relating to the life-cycle of LNG (production, liquefaction, vessel transportation, regasification and use) are not so different from those of oil or coal. LNG is energy-intensive in its liquefaction and vessel transportation and estimates suggest that more than 10% of the gas delivered at the liquefaction terminal will have been burnt and therefore emitted as carbon dioxide.

Among the steps towards reducing these emissions are the setting of targets and commitments to meeting those targets. Pursuant to the creation of the United Nations (UN) Framework Convention on Climate Change (UNFCCC) for 1992's "*Earth Summit*" in Rio de Janeiro and the subsequent Kyoto Protocol of 1997 and the 2015 UNFCC Conference of Parties 21 (COP21) "*Paris Agreement*", many states are committed to reducing GHG emissions. A target to which a number of states (including Japan and the United Kingdom), and the European Union (EU), are now committed is *"net zero by 2050".* This means reaching a balance between GHG produced and GHG removed from the atmosphere. The two related means of achieving this balance are: the reduction of existing emissions of GHG; and active removal of GHG. A *"gross zero"* target is recognised to be unrealistic and a *"net zero"* target is seen to reflect the necessary off-setting of GHG through forests and oceans as natural carbons sinks. And in a significant step in late 2020, China announced at the 75th session of the UN General Assembly that it is committing to achieve "*carbon neutrality"* before 2060.

The Paris Agreement does not include international shipping, a significant element in the assessment of LNG's environmental footprint. There are though complementary initiatives in relation to the reduction of GHG emissions from international shipping. The International Maritime Organization (IMO) has adopted a strategy in relation to the reduction of GHG emissions from ships by means of use of biofuels and speed reductions. The European Union also supports global action to address these emissions and is taking assertive steps towards not only reductions but also monitoring, reporting and verifying emissions from ships using EU ports.

Among other things, these commitments entail the transition from an energy system based on the burning of fossil fuels to one of lower-carbon energies and more integrated, flexible sources of energy. As well as policy and regulation, influences which are fuelling this move are investor pressures and the perception of the corporate reputational risks inherent in failing to follow this route. Policies towards achieving net zero include the discouragement of using fossil fuels for road transport and power generation and the manufacture of petrol or diesel vehicles. There are also fiscal measures such as subsidies and specific taxation regimes as well as emissions limits and the establishment of funds towards a green and digital economy. Allied to these steps are the increasing publication and benchmarking of data on emissions, flaring and venting. And demands for more.

The pace is quickening in pursuit of these changes, with something of an escalation in declared targets, aims and commitments. And target dates that once seemed distant are advancing. In the words of a paper by Jonathan Stern at the Oxford Institute for Energy Studies in October 2019:

> *"Despite the fact that 2019 and 2020 are likely to see final investment decisions.. on more than 100 (billion cubic metres) of projects, the LNG industry is facing significant challenges related to decarbonisation … In order to meet COP21 targets, unabated gas demand in Europe will need to decline post-2030 (at the latest)…decarbonisation, although yet to be addressed by most LNG projects, should be very much on the radar of new project developers… LNG needs … certified data on carbon and methane emissions from specific elements of the value chain for individual projects. There will be no place in the process for confidentiality; nothing less than complete transparency of data and methodologies will be acceptable…"*

4. DROPS OF RAIN

A number of those in the global LNG business are revising development strategies, contracting strategies and, in the case of several (former) international oil companies, changing the nature of their business fundamentally. And the pressures towards this are many.

Moving beyond direct reductions of GHG emissions, in 2005 the United Nations began initiatives towards understanding the implications of sustainability and the incorporation of these issues in investment decisions. The resulting Principles for Responsible Investment (PRI) were launched in 2006 and more than 3,000 investors with more than $100 trillion[1] have now subscribed to these principles.

They are founded on a view that institutional investors have a fiduciary role in acting in the best long-term interests of their beneficiaries and this includes the incorporation of ESG considerations in aligning investments with the broader objectives of society. The principles include the incorporation of ESG issues into investment analysis, the disclosure of ESG matters in relation to investments and the reporting of progress towards implantation of the principles. In relation to climate change the PRI say:

> *"Climate change is the highest priority ESG issue facing investors. The PRI is working to help investors protect portfolios from risks and to expose them to opportunities in the shift to a low-carbon global economy… Investors are calling out for hard information on the financial impacts climate change will have on companies. The financials define profitability and drive executive remuneration, so ensuring they properly reflect climate-related risks is crucial. Investment decisions, both by companies and investors, depend on the numbers disclosed in the audited financial statements… PRI anticipates the investors will have a multi-faceted need for meaningful ESG data in the future – supporting both risk and return investment decision-making and assessing the sustainability performance of corporate entities"*

The Partnership for Carbon Accounting Financials (PCAF) was established in 2015 by several Dutch financial institutions. Its purpose is to facilitate transparency and accountability in relation to the Paris Agreement for the financial industry, and its creation arose from a recognition that:

> *"Banks represent most of the available capital globally and since the Paris Climate Agreement the largest banks have still invested more than $2.7 trillion into the fossil*

[1] All $ figures quoted are for United States Dollars

fuel sector. This is equivalent to more than $1.5 billion for every day since the end of 2015, with no downward trend and no assessment of the carbon impact of that finance … PCAF is a global partnership of financial institutions that work together to develop and implement a harmonized approach to assess and disclose the greenhouse gas emissions associated with their loans and investments."

The financial institutions that have committed to the PCAF and the disclosure of GHG emissions associated with their portfolio of loans and investments numbers more than 80, having financial assets of some $17.5 trillion.

The Task Force on Climate-Related Financial Disclosures (TCFD) was established in 2015 under the auspices of the G20's Financial Stability Board (FSB) to develop recommendations for more effective climate-related disclosures. One of the primary goals of the TCFD is the availability of more effective climate-related disclosures as a means of promoting more informed investment, credit and insurance decisions. The TCFD has an express commitment to market transparency and stability and promotes the use of metrics and targets.

A number of those in the LNG business are being subjected to growing demands from investors, lenders, governments and regulators to reduce emissions as part of the moves against the effects of climate change and to show ESG compliance more broadly. These demands apply at project level, company level and joint venture level and they apply at all links of the LNG chain from production through to consumption.

There are a number of themes apparent from the expression of net zero targets and the steps to be taken more generally towards reducing GHG emissions and addressing climate change. These include collaboration, disclosure and transparency. For a sector that includes joint ventures and individual operations and spans production, liquefaction, shipping, regasification and supply activities across continents with the benefit of diverse funding and ownership models, those in the international LNG sector are inevitably responding in different ways.

5. UMBRELLAS AND GALOSHES

Many petroleum companies have now expressed their support for the multilateral reduction commitments which have come to be set out in the Paris Agreement. For example, Shell, BP, Equinor and Total have all made individual commitments to net zero by 2050 and are pursuing diversifications towards renewable and emission reductions projects and the acquisition of complementary businesses. As well as reducing GHG emissions, these steps have also placed them well for the offsetting of emissions from their LNG portfolios as well as their broader petroleum businesses.

Also, and as an indication of the greater integration of the industry, the Oil and Gas Climate Initiative (OGCI) has been established as part of the moves towards collective action concerning climate change. The twelve OGCI member companies include BP, Shell, ExxonMobil, Chevron, Saudi Aramco, Petrobras and CNPC among their number and the member companies express that they *"support the Paris Agreement and its aims and are working to accelerate the transition to a low-carbon future".* Among the guiding principles of the OGCI are the further reduction of methane and CO2 intensity in operations, acting as a catalyst for reducing emissions in the petroleum industry and in the wider economy, and publishing accurate and consistent indicators supported by the use of third-party data review.

With the explicit recognition that oil and gas companies have an important role to play in accelerating the transition required to address the climate challenge, the OGCI is guided by the 12 CEOs whose companies constitute its CEO Steering Committee and it is led by a leadership team under the chairmanship of Bob Dudley, former CEO of BP. The OGCI promotes collaborative working in relation to climate change and includes among its objectives: reducing methane emissions, reducing carbon dioxide emissions and removing carbon dioxide.

The OGCI also has an investment arm with funds of more than $1 billion to implement and scale low carbon initiatives in oil and gas. Its strategy includes bringing (in collaboration with innovators, investors and governments) new technologies and business models to high-emitting sectors.

Looking beyond this type of initiative, steps towards the reduction of GHG emissions in LNG have taken place at joint venture level, at project level or on the part of individual companies. In earlier times, Norway's Snohvit LNG project implemented Carbon Capture and Storage (CCS) as part of the field's development and this has been operating since 2008. The Gorgon LNG project in Western Australia was required to implement a CCS facility as part

of the development and, despite a lag of several years following the beginning of LNG deliveries, this was commissioned in 2019. A number of liquefaction projects in the United States (including Freeport LNG and Rio Grande LNG) plan to reduce emissions by adopting renewable power generation or revising liquefaction technology. A requirement of compliance with emissions standards as a condition of regulatory approval applies in British Columbia in Canada and emissions offsets and emissions trading are permitted means of achieving compliance.

More recently, a number of companies have come to be sellers or buyers of LNG on the basis of its being *"carbon neutral"* or at least having the attribution of reduced carbon content. One example is Total's sale of carbon-neutral LNG from Australia's Ichthys project to China National Offshore Oil Corporation, which saw emissions being off-set by carbon credits derived from wind energy and forest protection, and Shell's supply of carbon-neutral LNG to North Asia. From the buyer-side, Pavilion Energy has sought proposals for the supply of carbon-neutral LNG and Tokyo Gas is implementing CCS initiatives in relation to some of its regasification facilities.

These examples show that this suggested carbon-neutrality of LNG is being achieved to some extent by reduced emissions in relation to the production, transportation and regasification of LNG, but more so by carbon off-setting, typically relating to forestry and renewable power.

These reductions in carbon content can be achieved in any of the links of the LNG chain: production, liquefaction, vessel transportation, regasification, and use. The ways that those in the LNG business are looking to reduce GHG emissions include feedstock changes to biogas, operational reductions in upstream, pipeline and liquefaction facilities, use of renewable energy-generated power for operations, and carbon capture perhaps with use and storage. Means of offsetting range from purchase of credits from others to participating in offsetting activities such as forestation, renewable energy and carbon capture.

This reduced-carbon LNG is coming to be known as *"green LNG"*, an indeterminate expression meaning different things to different people.

6. "HOW GREEN IS MY LNG?"

For a cargo-based commodity like LNG with its long supply lines and potential series of trading transactions, what does green mean? And the question matters particularly in the context of regulatory regimes which will tend to have a national application rather than assessment by reference to the long supply line of a commodity such as LNG.

A number of studies have considered the measurement of carbon dioxide and methane emissions from the LNG chain, particularly *"fugitive"* methane - meaning methane emissions from equipment leaks, venting and flaring, evaporation losses and accidents and equipment failures. The question of measurement in relation to LNG is common to other hydrocarbons in some respects, but discrete in relation to liquefaction, shipping and regasification. A number of institutions (such as the International Energy Agency) publish estimates of methane emissions, but these have tended to be general and there are not yet transparent publications of measurement and verification.

There are suggestions that the price of delivered LNG is coming to reflect the value of external credits and in these circumstances the credibility of those credits will be increasingly important. Local carbon markets exist in some countries and regions, and the European Union's cap and trade system is an example. The main international carbon market scheme is that established under the UN's 1997 Kyoto Protocol on climate change. However, this has fallen into little use, with doubts about environmental efficacy and suggestions of abuse of the system. The COP 25 conference in Madrid in late 2019 was intended to develop a revised scheme and reporting requirements but the negotiations were inconclusive. To the extent that carbon prices are derived from the activities of this market they do not yet seems to carry the provenance of reliability. And some resource-rich, developing nations already have experiences of the difficulties of capturing the benefits of off-setting arrangements in the context of nascent governance and less-than-transparent measurement, reporting and verification.

To the extent that there is a green LNG market it is young and with few transactions yet. But it is already clear that different LNG sellers and buyers seem to have taken different views concerning the calculation of emissions and savings, and the extent to which their green LNG is constituted by reducing or offsetting GHG emissions, or both. There are examples where simple reduction commitments as said to constitute the green-ness of the LNG and others that allude to reduction certificates, but in relation to a part only of the LNG chain. Yet other examples relate to something as uncertain as the offer of management services to be provided by the LNG seller to assist the buyer in its ESG compliance. The participation of companies such as Shell, BP and Total in the LNG business and also in their diversified

renewable and emission reduction activities is likely to assist them in verifying emission credits as well as gaining benefits in relation to the cost of producing those credits rather than acquiring them. Although an identical product at the point of delivery, their LNG supplies may be seen as a more acceptable product when compared with LNG from existing facilities that does not have the benefit of GHG reduction assurances.

The understanding of the sources and trends in relation to emissions is seen to be a necessary part of designing mitigation and policy steps. The demonstration of ESG compliance is already a requirement of many investors and their number is growing. Credibility in reporting and verification by reference to empirical data is also a growing requirement. And even then, LNG can be seen as difficult in this respect given its long, international supply lines and the diversity of opportunity for removal or off-setting.

Some see that green LNG is developing as a separate, premium product even without a regime to measure, report and verify reductions and a liquid and transparent market in the authenticity and value of GHG emission offsets. It can also be seen as enhancing the ESG credentials of participating companies, even without meaningful verification. But on the basis that *"you can't change what you can't measure"* then how long can this last and what measures are available to bring transparency and objectivity to the verification of green-ness?

7. "IT'S NOT EASY BEING (SEEN TO BE) GREEN"

The fragmented nature of what was once an LNG value chain and the absence of liquidity or a standardised basis for the assessment of green LNG transactions makes it difficult to quantify emissions at each stage and GHG off-setting of them. Existing emission trading schemes are more likely to apply at a national level than they are along a supply chain such as that applying to LNG. But one advantage in making these assessments in relation to LNG is its cargo-based nature and the likelihood of reliably tracing the field and point of gas production. And the liquefaction, maritime and regasification facilities through which it has passed on the way to the point of delivery or consumption. Emission reduction measures by companies are readily measurable but apply only to the part of the LNG chain that the company controls. And asserting the importance of reliable measurement, reporting and verification does not mean that the practical implementation of effective measures will come easily.

The UNFCCC provided the basis for the reporting of information concerning emissions by sources and removal, and the reporting of actions taken. This was to be done through the COP process and included the reporting of emissions and removals to provide reliable, transparent and comprehensive information. These provisions have been enhanced over time to provide for a more comprehensive framework concerning Monitoring, Reporting and Verification (MRV). The Convention's nationally-based arrangements are also subjected to international consultation and analysis to enable the assessment of broad trends and developments. Among its moves towards the reduction of GHG emissions from international shipping, the IMO has adopted measures concerning collection of data in respect of fuel consumption among its steps to enhance the energy efficiency of shipping

For green LNG, there are a number of potential approaches that apply. One of these concerns a three-stage process: the first relating to emissions and applied on a national level, an organisation level and a facility level; the second relating to mitigation actions and applied to emission effects, sustainable development effects and implementation progress; and the third relating to support provided by countries, support received by countries and the resulting effects.

Moving beyond the current ad hoc information and towards credible measurement, reporting and verification in relation to LNG seems likely to require certification. The circumstances of LNG may suggest more than one authority and the extension of certification standing beyond state agencies. And reference to other sectors suggests that the nature and extent of these moves, and particularly their pace, may be taken from the control of those in the

LNG business if they do not seize the initiative and recognise that this is an area where contractual confidentiality may not constitute cover.

The impetus for action in relation to LNG may come from more than one direction: requirements of exporting states as a condition of regulatory approval for example, or of importing states as a condition of (or price for) continued supplies. And given the position of the EU in the vanguard of emissions actions and its role also as the region for LNG sales of last resort, it is unsurprising to see the EU taking policy initiatives. In October 2020, the EU delivered its EU Methane Strategy which relates not only to reducing methane emissions within the EU but also to reducing emissions associated with EU gas consumption. Using its position as a major consumer, the EU is seeking to lead the creation of a multilateral coalition to reduce global methane emissions.

In achieving these aims, the EU's strategy includes enhanced measurement and reporting or methane emissions, the establishment of an independent body (within the UN) to collect, verify and publish information, and external monitoring and surveillance of emissions. The declared intention is to reduce methane emissions associated with EU fossil gas consumption and this includes emissions released outside the EU to produce and deliver fossil gas to the EU. The EU is also looking to create a coalition with China, South Korea and Japan to support a standard for international MRV, including the imposition of default values for those without effective MRV processes, and to gain closer cooperation with the USA and Canada, identified as states already having regimes of methane regulation and emission reduction targets.

It is not difficult to envisage circumstances before too long where cargoes lacking certification by reputable agencies will be at a commercial disadvantage (even taking account of suggested emissions off-sets) or at risk to exclusion from certain markets, regardless of price considerations.

8. COLLABORATION AND INTEGREATION TOWARDS NET ZERO?

In many states and regions, the meeting of climate change and ESG aims seems likely to require greater integration of energy sources and uses than has been the case during the age of petroleum. And greater integration of laws and regulations too. Most states will already have in place laws and regulations, and regulatory bodies, in relation to the petroleum sector. They will also have taxation and fiscal regimes specific to that sector. As steps are being taken towards an energy transition then so states are coming to recognise the related effects among previously separate sectors: for example, the success in promoting electric vehicles is resulting in reduced revenues from hydrocarbon fuel duties.

The UK is an example of a state with a history of petroleum and which is now moving towards realising net zero. The themes of integration, flexibility and collaboration all feature in its strategies, as do measurement, reporting and verification. Adaptation to the needs of the energy transition is already being seen. For example, reservoirs and pipeline facilities coming towards the end of economic life are being given a new life of CCS operations or hydrogen transmission. There is integrated working among these agencies concerning the development of measures to effect clear and measurable GHG targets, implementation of CCS projects, implementation of integrated operations such as renewable power for oil and gas, and diversity of people and skills across industries – progress is monitored by the collection and analysis of verified carbon dioxide emissions and publication of this information.

Broad measures have been introduced to discourage fossil fuel use in road transport and power generation and the continued use of fossil fuels is being tested against decarbonisation ambitions. In a complementary way, measures such as subsidies and tax incentives have been introduced to promote developments of renewable power and electric vehicles towards the energy transition. The UK is seeing the reduction of GHG emissions from exploration and production facilities by means of operational improvements and use of clean fuels, reduced flaring and venting (carbon dioxide and methane) and abatement actions such as electrifying offshore facilities, localised carbon capture, integrated and shared energy hubs and renewable energy at terminals and processing facilities.

The promise of new developments in the direction of mitigating climate change provide much excitement in their portent of a net zero future. But the petroleum age has been a long one so far and it is not ending soon. This means that many of the structures and contractual arrangements in relation to LNG and other hydrocarbons are of similarly long-

standing and whereas change for the greater good is of undeniable benefit, this is unlikely to be made without trespassing on existing rights and interests, often fondly held. The UK has sought to address these issues already in relation to its oil and gas sector and these arrangements are being revisited in the context of net zero commitments.

In 2016 the UK implemented a strategy requiring petroleum licence holders and owners of facilities to take steps to secure the Maximum Economically Recoverable (MER) petroleum from the UK continental shelf. This MER strategy applies from exploration to decommissioning and imposes overall duties that may be inconsistent with individual rights and interests in a number of cases. The UK's net zero commitments are to be met at the same time as maximising the value of remaining petroleum production under MER and MER is to be revised in a number of respects including the metering and measuring emissions, the use of new technologies in relation to power generation, CCS and hydrogen supply projects, non-discriminatory access to infrastructure, and the promotion of good corporate governance.

The over-arching principle of maximising economic recovery of hydrocarbons is being made to adapt to the aims of the energy transition, as is the long-serving licensing and regulatory regime concerning the production and storage of hydrocarbons. The skills, talents and technologies of those in oil and gas are being adapted towards energy transition. The cross-sector benchmarking that has applied to performance under MER is to apply to net zero commitments, for example in relation to flaring and venting, overall emissions and emission intensity.

9. WHAT NEXT?

It is not clear how much longer LNG will retain its perceived benefits as a climate-friendly substitute for more carbon-intensive fuels as investors, regulators and consumers require ever-greater transparency and actions towards meeting climate change initiatives and ESG obligations. As the traditional LNG chain has fragmented over the last decade or so then so the opportunities for control of reduction and offsetting activities have reduced for many sellers of LNG. Those liquefaction projects that acquire their feed-gas from others will not be able to affect GHG emissions from production operations although they may be able to affect those matters through purchase requirements and disciplines of measurement, reporting and verification: and, of course, price.

If green LNG does come to establish itself as a premium commodity then the requirements of regulation, ESG, lenders and shareholders may make that premium a necessary price to pay.

The moves of Shell, BP, Total, Equinor and others towards becoming energy companies may place them well to create as well as to acquire credits and off-sets. They may also be able to take advantage of the benefits of integrations from upstream to downstream and along the LNG supply line as they respond to changing energy demands and seek to extend gas and power supply closer towards the consumer. These companies are also close to the demands of balancing the requirements of investors and shareholders in relation to climate change with the ability to make distributions and dividend payments consistent with recipients' expectations.

These material changes to the ways in which LNG is produced and bought and sold are taking place in the context of mitigating the effects of climate change and amidst increasing calls for transparency and accountability. They are also taking place in the context of the many long-term contracts such as LNG development and sale and purchase agreements (LNG Agreements) which have long under-pinned global LNG development and trade.

And it is to those LNG Agreements that our attention now turns.

10. NOT TO OVERLOOK THE PRESENT…

Whether as a consequence of Covid-19 or geopolitical movements among China, Russia, Saudi Arabia and the USA, recent times have seen hardship, or distress even, for a number of parties under un-hedged LNG Agreements. To some extent, the recent moves to shorter contract durations (albeit still long-term on most measures) and the implementation of the mantra of "*flexibility, flexibility, flexibility*" have provided elements of relief, as has the presence in the market of portfolio-based LNG businesses.

As the energy transition gathers pace, the resulting changes to markets are likely to do little to enhance contractual predictability or certainty – market change as well as energy transition now seems inevitable. However, the durations of many of the existing contractual arrangements and related state grants extend for many years/ decades yet. In some cases, the continued production and trading of LNG is already committed to 2040 and beyond, and on fixed terms. These LNG Agreements are likely to come under increasing stress.

Many of these LNG Agreements will be made under a chosen law which is a common law, and often English law. The making of a binding and enforceable agreement under English law depends on the parties reaching agreement through terms which are certain and final. The longer the duration of the intended arrangements and the more uncertain or unpredictable the circumstances of the market in which those arrangements have effect, the more difficult it becomes to have the clairvoyance required to do this.

In the absence of specific wording, English law will be slow to provide relief for a party that considers itself to be suffering hardship or adverse commercial consequences in changed circumstances. It will be equally slow to find that a contract requires variation or has come to an end in changed circumstances, unless specifically provided for. The interpretation and enforcement of contracts, not their making and modification, is the business of the judiciary.

In times of hardship or required contractual change, the troubled party will seek its refuge in the written words of the contract and the other party will seek words to the opposite effect. What they find is likely to have more to do with chance than with provisions intentionally included to address the (usually unforeseen) circumstances which have, in fact, occurred. The vindication of accidental, express contractual rights is likely to be pursued and commercial self-interest may come to subdue the relational influences on which the LNG Agreement was based and which have endured to date. Opportunistic amnesia can tend to subordinate ethical considerations and recall of the circumstances of the contract at the time of its making. The ties of trust, confidence and loyalty, often developed over many years, will come to be stretched.

11. CHANGING CIRCUMSTANCES

Experience shows that LNG Agreements tend not to include provisions providing for generalised re-opening of the parties' bargain. This may be unsurprising where the nature and extent of events that arise to falsify the basis of the parties' bargain will usually be beyond the parties' prediction at the time their agreement is made. To the extent these provisions are present, they will often be cast in general terms and provide for the parties to meet and seek to agree revised contractual terms in the light of the changed circumstances and usually under the discipline of obligations of good faith and reasonable endeavours.

The inclusion of specific wording to address the contractual consequences of a pandemic would have been most unusual before the time of Covid-19. Draft text that does seek to address the contractual consequences of a pandemic on the parties' obligations, rights and liabilities is now beginning to appear in negotiations but agreement on the relevant broad principles (let alone any detailed wording) remains difficult. It seems fanciful that contractual provisions could be agreed at the time of making new LNG Agreements that would identify the circumstances of the energy transition and provide for the contractual consequences and resulting contractual changes.

The consideration of the parties' performance of their obligations under an LNG Agreement in changed circumstances contrasts two established principles of law. On the one side is the sanctity of contract *(pacta sunt servanda*) – the principle that contracts are to be performed in accordance with their terms. On the other is the principle of contracts adjusting to changing circumstances *(rebus sic stantibus).* The potential inconsistency of these two principles is exacerbated in long-term, international arrangements such as LNG Agreements, where, over time, social, political, legislative, economic and cultural changes will often result in changes to the contractual equilibrium on the basis of which the parties contracted. Also relevant are considerations of consistency with the prevailing laws of the relevant states, which may be based on principles of civil law even if the parties to the international LNG Agreements choose the application of a common law to those agreements.

That is not to say that that those in the international LNG business should shy away from the task of effecting enduring commercial arrangements in the current circumstances, however difficult that may appear when characterised in the context of past practices. It is timely to ask how parties to LNG Agreements should now address the increasing demands for de-carbonisation of the international LNG business while having those LNG Agreements remaining sufficiently certain to effect binding, long-term commitments between them. And this is particularly the case with existing LNG Agreements, often with many years still to run

on terms which, with each passing year, are showing signs of increasing divergence from shifting LNG markets, regulations and practices.

Experience suggests that limited revisions to existing LNG Agreements are unlikely to be more than a temporary palliative, demanding early review and adjustment. More compelling in commercial terms might be a concentration on the relational nature of the existing LNG Agreements and their re-casting to reflect (as far as possible) the radical changes to the markets, regulations and societies on which their making was based.

12. SHAKING HANDS WITH CLENCHED FISTS?

The one species of review provision to have become almost common under LNG Agreements is the so-called *"price re-opener"* clause. This might once have been seen as little more than a periodic invitation to re-negotiate the contract's price and some of its terms, but the last decade or so has seen many references to formal dispute resolution in relation to European markets. This trend has recently made its way to Asian markets too. And the means of this resolution has almost always been the adversarial process of international commercial arbitration.

These arbitrations have shown the difficulty of assessing the effect of the changes giving rise to the application of the reopener, the value of gas in the relevant market and the corresponding changes to be made to the relevant LNG Agreement. These are very high value disputes and have engaged many lawyers, economists and other experts for more than a decade now. The arbitral awards and the process by which they are reached have left some companies uneasy with their participation – throughout this long period of locking horns, the relevant LNG Agreement has, of course, carried on in effect.

The nature and scale of the changes coming to bear on the international LNG business as it adapts to the demands of climate change go well beyond the circumstances of even the most complex of price reopener provisions. But these price reopener disputes provide perhaps to best example for what is likely to be coming. And make it timely to ask if such adversarial means of dispute resolution and contract price re-setting remain appropriate in such relational commerce where confidentiality has been so prized.

13. ANOTHER WAY?

The individuals appointed as arbitrators in relation to LNG Agreement arbitrations tend to be lawyers skilled in the resolving of disputes by reference to past events. This is unsurprising. The usual international commercial arbitration will deal with contractual obligations and their breach, the damage or loss caused to a party by reference to past events, and the resulting remedy or compensation. The typical LNG price re-opener is of a different nature and concerns an absence of agreement in changed circumstances. As such, it is not so much a matter of breach, liability and compensation, but more one of assessing those circumstances and making enduring amendments to the parties' continuing commercial relationship.

On the face of it, this could be seen more as a matter for agreement than dispute. But the partisan positions in the context of the prevailing circumstances will mean that agreement will be difficult to reach, not least because one of the parties will be approaching these discussions from an “entitled” position. In these circumstances, where the parties are unable to reach agreement between themselves, the appropriate reference may not be so much to dispute resolution, but more to a third-party who does not fulfil a judicial role beyond the relationship of the parties, but who derives standing and powers from the words of the parties themselves. And who may be able to encourage regard for the interests of the parties as much as their positions or perceived entitlements.

In the case of an LNG Agreement, divorce will rarely be an option and the parties have necessarily been unable to make pre-nuptial provision for the unforeseeable changes of circumstances. If litigation and arbitration do not provide an environment for the re-capturing of the magic of courtship, then what type of process would be appropriate for the creation of a post-nuptial agreement?

14. WHAT WAY?

For some, a mediated process might provide this forum in circumstances where the parties are seeking to revise their agreement for the future rather than terminate it or settle past differences. An LNG Agreement is a long-term, relational agreement of very high value and an appropriate process may be one where the parties are aided towards a re-casting of their relationship and their paper deal in a way that recognises that past and enhances the commercial interests of both during the remaining period of their relationship.

This could be seen not as a matter of proof among adversaries from comparatively advantaged and disadvantaged contractual positions, but a resetting of the parties' bargain in the circumstances of the day and in the context of potential reference to a third party in the event that renegotiation proves to be unsuccessful. Under this model, the words of a review clause might set out the objectives of the parties in broad but representative principles, and provide specifically for the third party to recognise the nature of its role in the context of a relational contract. The agreement might also set out the nature of the relationship of the parties in the context of their LNG Agreement and their respective commitments as part of periodic recalibration, and might include meaningful commitments towards the adaptation and maintenance of their agreement in the necessarily unforeseeable circumstances of the energy transition.

Given the uncertainty related to LNG's decarbonisation, it may be timely to reflect that English law is showing signs of early steps towards a greater recognition of the significance of relation behaviours and relational contracts. Perhaps it is also timely to consider the benefits of the evolution of contractual relationships and a move towards a form of resolution which is more akin to relational behaviours and the adaptation of enduring contractual relationships over time. The choice of a common law as the governing law of an LNG Agreement owes something to a wish to avoid a third party re-writing the LNG Agreement that the parties will have spent a long time making and which will have come to reflect their intention to remain in a collaborative relationship to mutual benefit over a long term. A number of the provisions that have come to be reflected in LNG price reopeners or review clauses (hardship and good faith, for example) have reference to principles of civil law which are also be a basis of the prevailing law of a number of LNG producer states or consumer states. With the likelihood that integration and collaboration will come to fulfil a greater role as a result of the energy transition, perhaps these principles should also have a greater part to play in relationship re-setting over time.

At a time when a devout common law regime such as English law is showing a greater recognition of the significance of relation behaviours and relational contracts, it seems timely

to consider a complementary, relational form of re-setting the parties' relationship in changed circumstances - rather than descending into a periodic struggle over the transient issues and advantages of the moment at a time when the shifting imperatives of the energy transition are likely to be re-shaping that moment in any case. Perhaps it is timely to consider the benefits of the evolution of contractual relationships in place of a periodic testing of the fittest; and a move towards a form of resolution which is more akin to relational behaviours and the positive adaptation of enduring contractual relationships in times of the energy transition.