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Oxford ENERGY FORUM

A QUARTERLY JOURNAL FOR DEBATING ENERGY ISSUES AND POLICIES

Issue 84 May 2011

The events that took place in the Middle East and North Africa (MENA) in the opening months of 2011 have marked a watershed in the history of the region. Spontaneous, grass-root coalitions of mostly young people, united by shared grievances and helped by new means of civic organisation, have succeeded where nominal opposition movements – civilian and armed – have hitherto failed miserably. They have carved out a sense of political existence for the oppressed majority, and in doing so have forced long-serving despots out of office, shaken the existing socio-political order in the region, and challenged longstanding outside assumptions about the philosophy and practice of politics in the MENA region. The contributions to this issue of Forum on the groundbreaking political developments in the Middle East point unanimously to the long-term uncertainty that is likely to characterise the nature of politics in the MENA countries and their relations with foreign governments and businesses. The energy sector, where the importance of the region in global markets is most significant, will not be immune to these changes.

Robert Mabro argues that, in the absence of likely fundamental changes to the prevailing oil market fundamentals, the geopolitics of the region and its interaction with the rest of the world will likely have the most influence on oil prices going forward.

In terms of gas supply, North Africa is a particularly important player, especially for southern Europe. If the disruptions to North African gas supply since the eruptions of the uprisings have had a relatively limited effect on the fundamentals of the European gas market, their impact in the longer run may be different. Hakim Darbouche argues that politics – already a relatively important determinant of gas development policy – will play an even greater role in the short term. Changes (or lack thereof) of pricing, investment and export policies will reflect this impact the most, negatively affecting the prospects of North African supply in the medium to long term.

In Libya, where the most dramatic events have taken place since the eruption of revolt in the region, the fallout for the hydrocarbons industry has international and domestic dimensions. While the former has received more international media attention, John Hamilton's contribution focuses on the domestic side, highlighting the humanitarian

CONTENTS

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dimension of interruptions to Libya's energy sector, as well as its being the focus of the confrontation between the rebels and the Gaddafi forces and the risks this poses for Libya's oil sector, the industry and the international community.

This is a concern echoed by Helima Croft and Amrita Sen, but because of its potential implications for the all important, oil-centred power nexus USA-Saudi Arabia-Iran, as well as for existing fault-lines in Iraq, the situation in Bahrain is given far more significance in their contribution.

The contribution by Emma Murphy takes us back to where it all started, Tunisia. Many, inside and outside the country, have high hopes for the 'Tunisian Revolution' and the advent of democracy, but questions about the transition and challenges ahead deserve full attention and Murphy provides useful pointers.

The recent disconnect between Brent and WTI which saw the price differential between the two benchmarks reach more than $15 per barrel has raised many questions. Edward Morse argues that there is little mystery about the recent dislocation: due to logistical bottlenecks, crude oil supply has become congested in the US Midcontinent. He warns that there is no short-term fix for this problem and the disconnection between the two benchmarks is likely to worsen before it improves. What is needed is to reconnect the WTI to global markets, which could be achieved by reducing the inflows of oil from Gulf Coast to the US Midcontinent.

Bob Levin warns against the 'various *ex cathedra* pronouncements about benchmarks'. He argues that explanations attributing the WTI-Brent disconnect to capacity constraints in storage are misguided. Unlike the Brent market, there is much information disseminated about US market fundamentals and as such US oil prices embody the best reflection of global oil market fundamentals. He considers that WTI disconnecting from Brent in the first quarter of 2009 'was a sign of health'.

On 22 February 2011, the International Energy Forum turned a new page with the adoption of the Charter that helped define its role and mission. This states that the fundamental objectives of the IEF are to foster greater mutual understanding and awareness of common energy interests, promote a better understanding of the benefits of stable and transparent energy markets, and to narrow the differences among energy producing, consuming and transit Member States.

Bassam Fattouh and Coby van der Linde note that the adoption of the new charter has been *one* of *many milestones* achieved and the conclusion must be that the last two decades have been positive for the consumer–producer dialogue. However, there is a risk that in an attempt to avoid contentious issues, key concerns such as oil price stability, investment and climate change will become marginalised. They conclude that the future of the dialogue will depend on Member States' willingness to engage in issues that lie at the heart of their energy concerns, and whether they succeed in relating them to the wider context of political, economic and social security and the climate change challenge.

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Political Events in the Middle East and their Impact on Energy

Robert Mabro considers a political awakening and its implications for oil

Recent events in the Arab world are challenging an old conventional wisdom that held that Arab populations have come to accept passively, or fatalistically, oppressive regimes that denied them freedom of expression, meaningful participation in the governance of their countries, and in many cases basic human rights.

Another familiar tenet of the political conventional wisdom is that any change in the current political regime in the Arab world will open the door to the Moslem Brothers or to some extremist Islamic group. Regimes have indeed been challenged but so far there has been no successful take-over by Islamic fundamentalists.

"Democracy does not always follow the overthrow of an autocratic regime"

Demonstrations, the occupation of major squares in the country's capital and clear calls for the demise of rulers and the regimes they imposed on their people, occurred in Egypt, Tunisia and elsewhere. In Egypt and Tunisia the rulers were forced to resign. These were extraordinary events. The revolutionary forces were successful in achieving some of their objectives in those countries where the army or the police refuse to fire on their own people. Alas, this is not the case everywhere. In Libya, for example, the security forces do not seem to be hindered by such inhibitions. Much depends, of course, on the composition of these forces. Where mercenaries rather than nationals are used it is easier for governments to be repressive. Yet there are cases where security forces staffed by nationals have shot nationals involved in peaceful protests.

The question, however, is whether significant, permanent regime changes have occurred. This is not yet very clear. In some instances leaders or their cronies have gone away, but the same old repressive institutions have too often survived.

Democracy does not always follow the overthrow of an autocratic regime. Autocracy sometimes emerges again soon after the demise of a given autocratic rule. Democracy involves a specific political culture, also a number of favorable political factors that may not exist, or more often are not strong enough to withstand opposite pressures. The French Revolution removed a monarchy but was followed soon after by Napoleonic rule. The communists in Russia removed the tsarist regime but that historic event was followed by the emergence of Stalinism, an autocratic and very cruel regime.

Yet something has changed in the Arab World, and this cannot be concealed by the pathetic attempts of some governments to bribe their citizens with handouts or to deceive them with cosmetic changes to the prevailing political system. The rich countries with small populations can afford some handouts, but this is not the case everywhere. Anyway, the idea that you can buy loyalty, support or indeed anything that has moral value with a distribution of cash is plainly wrong. And the recourse by some rulers to removing the prime minister or dismissing unpopular ministers, whether they are corrupt or not, does not go far enough. This measure is not convincing when corruption reaches people whose status is higher than that of these ministers.

What people do want is a change of regime, not simply a change of faces on the television screens.

The new phenomenon has demographic and cultural foundations. Most of the present regimes are old. Socialist regimes emerged in the 1950s or the1960s, often backed or led by a military junta, or by some groups enjoying the support of one or the other super-power – particularly the Soviet Union. Others that rely on tribal loyalties are even older, and usually enjoy the support of the West. They pay for the support received not with cash but by importing military hardware, goods and services, and offering military bases.

"The idea that you can buy loyalty, support or indeed anything that has moral value with a distribution of cash is plainly wrong"

There is a lethal discrepancy between the rates of change involved in these different systems. The old regimes have not changed very much, but the societies they rule did. The changes were particularly significant in the attitudes, motivations, behaviour, of the new generations with access to the internet and to cultural developments in the world.

It is not evident that rulers and their governments have fully understood the nature and the scale of these changes. And in any case it is not evident where they are perfectly aware of what is going on, and their implications, that their response will be either commensurate or relevant. They may not be able to respond effectively because this would involve sacrifices to cherished interests that they are not prepared to make.

Globalisation is as much a cultural as an economic phenomenon. In fact

economic globalisation has been in existence for a long time thanks to the historical development of international trade, imperialism and other linked factors. One can argue that cultural globalisation has recently received a significant boost from the development of information technology.

The Arab youth with access to the new global culture have become frustrated by the constraints that society and governments have erected around them. In many countries the frustration of the youth is compounded by the economic burden of unemployment prevailing in most of the Arab countries, including in the oil-rich ones.

"So far, the wind of change has not blown over the major Arab oil countries with the notable exception of Libya"

What are the implications of these changes to the oil policies of the exporting countries of the Middle East? One can take the comforting view that, as countries, irrespective of their political regime, need revenues, nothing much will happen in the longer run. This may be true but the path to the stable long run may be paved with obstacles, crises and much instability.

So far, the wind of change has not blown over the major Arab oil countries with the notable exception of Libya. In that country oil production before the conflict was 1.6 million barrels a day and is now virtually all cut off. Saudi Arabia has promised to make good this, or any other production loss. Libyan oil, however, is special, because of its fine quality (light and sweet) and its proximity to European markets.

Nothing seems to be happening in Kuwait, Abu Dhabi and Qatar. The prospects are less clear in Oman where demonstrations have taken place with slogans calling for a change of regime. The big question mark arises about Saudi Arabia not because disturbances are occurring there; stability seems to prevail despite the small demonstrations reported to have taken place in some towns. Yet, Saudi Arabia is so important that any risk factor however small carries a much bigger weight than elsewhere.

The question, as regards the oil price, is how will the market that determines it react to all these events? So far the reaction has been somewhat subdued. But this may change suddenly, depending on what will happen to the economic fundamentals of oil supply and demand, to expectations about their future behaviour, or to geopolitical events.

There are no convincing reasons to expect significant changes in the oil supply/demand conditions prevailing today in world oil. It seems therefore that the most significant factors will be geopolitical. We need to watch keenly political and social developments in all the relevant Middle Eastern countries. These are usually difficult to interpret; and making good predictions is an almost impossible task. But the effort is worthwhile. Without it we would be likely to miss the workings of important forces, and our understanding of what is actually happening will be poorer.

Helima L. Croft and Amrita Sen discuss oil and geopolitics: blood and steel

2011 was always going to be a year in which it would be risky to get heavily involved in the oil market without maintaining a fairly strong focus on the key geopolitical developments, rendered more acute in a world of phenomenal demand strength, reduced inventory overhang and less spare capacity. Indeed, even before the upsurge in geopolitical risks, we expected global oil spare capacity to decline steadily out to 2015. With demand having shown no signs of slowing and Saudi output having already risen in response to the demand-led increase in prices, spare capacity in the oil market was down to just over 3 mb/d before the Libyan supply shock hit the market. The large inventory overhang that kept a comfortable cushion at the margin of the market has disappeared, too, with OECD inventories now below the five-year average. Not surprisingly, against this fundamental backdrop, the current plethora of geopolitical events is adding a further layer of instability and volatility to the oil market. However, with some of these issues likely to be a source of long-lasting uncertainty, the rapidly thinning buffer in the oil market is creating an environment for prolonged and heightened volatility.

"the current plethora of geopolitical events is adding a further layer of instability and volatility to the oil market"

The broad sweep of global geopolitical issues appear to be negative in terms of their immediate implications for external investment, while also introducing a wider range of medium-term possibilities given the potential unfreezing of some deeply entrenched elements of the economic and political status quo in some key regions. While the immediate focus of the oil market remains Libya, which has clearly entered a protracted period of civil war that is set to reduce its energy export capacities significantly, there are a series of geopolitical events across this region that have either gone relatively unnoticed or are likely to have a greater longevity than Libya itself. Perhaps amongst all of this, the escalation of tension in Bahrain,

which has reopened and emphasised some deep sectarian tensions, is likely to have the greatest effect. While not necessarily headline-grabbing on a daily basis, Bahrain's importance cascades through its relationship with Saudi Arabia and Iran, and in turn with the USA, thereby having the potential to redefine some key and fundamental relationships both politically and in relation to the oil market. The reshaping of the regional political balance already appears to be as profound as that which surrounded the first oil shock of 1973 and may yet prove as sweeping as the background to the second oil shock of 1978–79. In our view, the regional status quo as it stood at the start of the year has now been disturbed so severely that a swift return to anything approximating it is now impossible.

"While not necessarily headline-grabbing on a daily basis, Bahrain's importance cascades through its relationship with Saudi Arabia and Iran, and in turn with the USA"

Libya: The Immediate Risk

By any credible historical standard, the international system's actions to date on Libya have been swift and encompassing. On 26 February, the Security Council adopted Resolution 1970 imposing an arms embargo and wide-ranging sanctions and referring Libya to the International Criminal Court. This happened with unprecedented speed. More impressive was the fact that the UN Security Council invoked the principle of the responsibility to protect. Clearly, the current situation in Libya involves a protracted period of the country staying away from the oil market, not just due to the oil sector being inwardly constrained because of potential damage and other dislocations, but also due to the complete breakdown of Libya's external relationships. Whether or not external intervention changes the nature of the military disposition of forces on the ground, it seems unlikely to us that it would ease or speed the reincorporation of Libyan oil into the world market. Libyan exports will remain out of the market for this year and possibly for a significant part of next year as well. The loss of Libyan crude is more than just about the loss of 1.3 mb/d of supply; it is the loss of 1.3 mb/d of short haul light sweet crude that now needs to be replaced with the long haul heavy side of medium and sour crude and is thus far from a perfect fit.

Indeed, even before the military action, Libya was moving on a path, dangerously mirroring Iraq post-1991 and its history of degrading oil sector and causing instability for the oil market, and the military action has simply served to intensify that situation. While direct damage to oil infrastructure from bombings and sabotage remains a possibility, underlying damage to oil fields from the lack of protective measures taken (eg, properly conducted well shut-ins) is the greater risk. The longer the civil war lasts, the more likely it is that reservoir damage accumulates due to lack of maintenance and oil well shut-ins that might at best have been emergency, rather than best-practice, shut-ins, and the greater the threat to energy infrastructure. Indeed, the damage done to Iranian oil fields during its war with Iraq in 1978–79 was far more due to reservoir damage caused by the way that the oil wells were shut down, as well as by the dislocations of people and equipment that followed. Since then, the country has not been able to surpass its 1970s' production peak of 6 mb/d, struggling to top 4 mb/d.

Bahrain–Saudi–Iran–Iraq: The long-lasting risk

While events in Libya have largely dominated the news cycle, the unrest in Bahrain is of far greater importance to strategic balance of power in the Middle East, in our view. The tiny Gulf nation is home to the US Fifth fleet and is connected to Saudi Arabia by the 15-mile King Fahd causeway. Although Bahrain is more liberal socially and more open politically than its Gulf neighbours, it has deep sectarian divisions. The Saudi leadership is particularly anxious given the country's border with Bahrain and the fact that its local Shiite community, while comprising less than 15 percent of the total Saudi population, constitutes a majority in the oil-rich eastern region. The deployment of troops from Saudi Arabia and other Gulf Cooperation Council (GCC) nations to Bahrain has served to deepen the ongoing political crisis in the country and intensify the regional power struggle between Saudi Arabia and the Iranians. The Saudi leadership has become increasingly alarmed by the unrest in the region and is concerned that the Iranians are the principal beneficiary of the tumult.

"The loss of Libyan crude is more than just about the loss of 1.3 mb/d of supply; it is the loss of 1.3 mb/d of short haul light sweet crude"

Despite the growing tensions in Bahrain, our base case remains that Saudi Arabia will weather the current wave of regional unrest relatively unscathed. However, the deteriorating situation in Bahrain still has tremendous implications for the oil market. While not a major oil producer, Bahrain's effect on the oil market reverberates through its relationship with and proximity to Saudi Arabia and, in turn, its relationship with the USA. For much of the twentieth century, the USA was the undisputed economic heavyweight. As a result, key relationships in the world market were defined on this basis. Oil became critical for the pragmatic and strategically significant US–Saudi ties, the world's largest consumer and producer, with for an extended period Saudi Arabia subsidising its oil exports to the US refiners by about $1/bbl compared with Asia. Within its ups and downs, the Saudi–US relationship underlined the principal dynamic in the oil market and close Saudi–US

ties anchored much of the stability in the oil-rich Gulf. The Wahhabi-led monarchy provides about 13 percent of US crude imports and serves as a powerful regional counterweight to Iran, a defiant US foe. Indeed, the US–Saudi relationship is based on common interests that are fundamental and critical to both countries and for the oil market as a result.

"Saudi exports to China overtook those to Europe in 2008 and briefly surpassed that of the USA in late 2009"

For the most part, Saudi–US relations have been built on a longstanding mutual interest in developing the kingdom's immense oil resources. Unlike other countries in the Middle East, Saudi oil was developed entirely by American companies. In 1933, Standard Oil of California obtained a concession from the founder of modern-day Saudi Arabia, King Abd Al-Aziz Ibn Saud. Commercial production began in 1938, but large-scale production was delayed until the end of the Second World War. In 1944, the California Standard-Texaco operation in Saudi Arabia became known as the Arabian-American Oil Company (ARAMCO). Prior to the Saudi takeover in the mid-1970s, ARAMCO was the largest single American investment in any foreign country. For most of the last half century, Riyadh has advocated the use of oil as an important policy tool to safeguard their interests and build up the military and economic strength of Arab states. However, the first chink in that armour appeared shortly after the outbreak of the Arab–Israeli war in October 1973, when Saudi Arabia announced an embargo on oil shipments to the United States for its support to Israel. The embargo was officially lifted a few months later. Another period of disagreement between the two countries also re-surfaced during the US confrontation with Iraq. In spite of these tensions, the overall relationship between Riyadh and Washington has been one of continuous cooperation.

However, with the growth of China and India, Saudi Arabia has already started to become more diversified in its interactions with other economies. Saudi exports to China overtook those to Europe in 2008 and briefly surpassed that of the USA in late 2009. While the scale of the recession that hit the western world might have exaggerated the pace of this shift somewhat, even following the economic recovery, the lost barrels from the Middle East have not entirely made their way back into the US system. Compounding that effect, the recent unrest in the Middle East and the lack of US support for its staunch ally in Egyptian President Hosni Mubarak has created a concern in Saudi Arabia about the United States' commitment to protecting their interests. Should the Bahrain situation worsen, the already strained Saudi–US relationship could deteriorate even further, with oil markets likely to feel the ripple effects. Despite eroding spare capacity, Saudi Arabia remains the world's only swing producer, possessing the bulk of global spare production capacity (2.6 mb/d of the remaining 3.3 mb/d) and, thus, the last word on any attempt to drive down prices through production increases. That intent to calm global oil markets may well take a backseat under these circumstances, as has been clear in the market over the past month. Before the breakout of the conflicts in the Middle East limited producer control over the upside generating a $100 average was not tenable, given the level of spare capacity available in key producing nations. However, the deterioration in the Saudi–US relationship has re-shuffled those cards, with higher oil prices negatively affecting the US economy not necessarily a key concern for the Saudi kingdom. Indeed, key producers can remain somewhat on the slow side in terms of reining in the upside, with ultimate control re-established at higher price levels than $120 for the OPEC basket, in our view. The present crisis may well worsen, perhaps even to the dimensions of 1973–74 when contradictions of the Saudi–American relationship reached a breaking point as officials in Washington openly threatened the possibility of seizing Gulf oil fields, or even beyond, given the absence of the Cold War framework. If such a scenario arises, the pressure on oil prices will be tremendous. But while the bonds of over half a century were never those of fondness or common outlook, neither side seems able to locate a meaningful alternative to the other. Over the long term, the relationship appears to be guided, as ever, by the relentless logic of energy and security in the hydrocarbon age.

"The repercussions from these revolutions will force new actions and policies globally, from the United States to al Qaeda to every single MENA country"

Developments in Bahrain are also of particular significance as they can open lines of political stress that may find their echo in developments in Iraq and elsewhere. Indeed, the spill-over effect from the situation in Bahrain could well lead to an intensification of the existing fault lines in Iraq, which could make matters an order of magnitude more dangerous. It could once again represent a watershed between what had been a slow but uncertain improvement towards one in which matters might take a sustained turn for the worse. Indeed, the implications for regional stability of some of the extreme possible cases are beginning to represent a non-trivial concern. Some of those cases could involve a failure by the political actors to bridge the sectarian divide or address serious economic grievances, with the potential for some serious long-term regional consequences. In terms of the oil market, the situation remains fluid, but we would not rule out further damage to Iraqi oil output and exports in the coming months, especially given that there has already

been an escalation in violence with attacks at the Daura (110 thousand b/d) and the Baiji (310 thousand b/d) refineries and the Kirkuk-Ceyhan export pipeline.

Conclusion

The political unrest in the Arab world, fuelled by autocratic governments and failing economic, social and political systems, has thus created a series of significant inflexion points in these countries. The demographic and economic challenges faced by many of these governments are substantial. The foundation that has held the region together for the past 30 years has been shaken, and the first cracks that appeared with the uprising in Tunisia and Egypt is now causing widespread ruptures in the region. Of course, a destabilisation or potential discrete change of policy course in the most populous nation in the Arab world is of key significance. Clearly, the contagion has been spreading and the instability in this region is likely to be a major source of lasting unease in the oil market. The repercussions from these revolutions will force new actions and policies globally, from the United States to al Qaeda to every single MENA country. It is a new day in the Arab world as the fight for dignity and self-determination continues to spread. Change is coming: in some places, it will happen quickly; in others, it will evolve over time. Only some of these are immediately quantifiable effects, but most others may not be instantly visible, creating further pressure in an already resource constrained oil market.

Hakim Darbouche argues that politics are set to play an even more important role in North African gas development after the uprisings

In a region where political change was for decades painstakingly slow – even non-existent – the events of the last four months in the Middle East and North Africa (MENA) have been a shock to the system. The popular uprisings that have so far uprooted long-serving despots in Tunisia and Egypt and are seriously challenging the power grip of autocratic leaders in Libya, Syria and Yemen are a reflection of the new sense of political agency that young people in the region have discovered. This new dynamic will have a transformative impact on the 'social contract' that has defined the nature of politics in MENA countries since their accession to independence, and will in all likelihood affect their relations with foreign governments and businesses, including in the energy sector.

Security of Supply from the MENA Region

As is well known, the MENA region is an important player in global oil and gas markets, accounting for about 60 percent of proven oil reserves and 45 percent of gas reserves. Table 1 provides data on reserves, production, consumption and exports of gas in the region. It has for long been associated with regional conflict and political instability, which have been the main causes of energy security concerns in consuming countries with relatively high dependence on MENA hydrocarbon supplies. The recent revolts have worsened perceptions of political risk in the region, exacerbating western fears of supply disruptions and the withering of upstream investment opportunities for IOCs.

Concerns over the interruption of energy flows from the region have not been totally unfounded: the revolts in both Egypt and Libya – and to a lesser extent Tunisia – have affected oil and gas supplies. Algerian gas shipments through the Transmed pipeline, which supplies Italy with around 32 percent of its pipeline gas imports, recorded a sudden 40 percent dip amid the chaos immediately following the departure of Tunisian President Ben Ali on 14 January, but normal flows resumed shortly thereafter.

In Egypt, fears over the disruption of transit flows through the Suez Canal, through which some 7 percent of global LNG passed in 2010, and the 2.3 million barrels/day (mb/d) Sumed oil pipeline did not materialise. However, an explosion on February 5 at a gas compressor station at El-Arish, in the Sinai, cut off gas supplies to Israel and through the Arab Gas Pipeline to Jordan and Syria. It took more than five weeks for the repair work to be completed and for Egyptian pipeline gas exports to resume, only for a second explosion to take place on April 27 causing another suspension of gas flows.

"What the Libyan disruption did was feed into market concerns about the potential spill-over of unrest into neighbouring Algeria"

Finally, in Libya where the most dramatic events since the eruption of the uprisings in the region have taken place, gas flowing at an annual rate of as much as 9–10 Bcm/yr through the Greenstream pipeline and the 40-year old Marsa el-Brega LNG plant, as well as 1.6 mb/d of oil supply, have been taken out of the market as a direct result of the full-blown confrontation between rebel fighters and government forces and the suspension of IOC upstream activities in the country.

However, if these disruptions vindicated consumer concerns over the security of energy supplies from the

Table 1: 2009 MENA Gas Data (in Bcm)

	Reserves	*Production*	*Consumption*	*Exports*	
				LNG	*Pipeline*
Middle East	**76,124**	**404.0**	**338.0**	**68.3**	**24.5**
Bahrain	90	12.6	12.6		
Iran	29,610	131.2	131.7		5.7
Iraq	3,170	1.2	1.2		
Kuwait	1,784	12.5	13.4		
Oman	980	24.8	14.7	11.5	
Qatar	25,370	89.3	21.0	49.4	18.8
Saudi Arabia	7,920	77.5	77.5		
Syria	280	5.8	7.1		
UAE	6,430	48.8	59.1	7.0	
Yemen	490	0.5	0.1	0.4	
North Africa	**8,264**	**163.0**	**80.0**	**34.4**	**46.5**
Algeria	4,500	81.4	26.7	20.9	31.8
Egypt	2,185	62.7	42.5	12.8	5.5
Libya	1,540	15.3	6.0	0.7	9.2
Tunisia	39	3.6	4.9		
MENA	**84,388**	**567.0**	**418.0**	**102.7**	**71.0**
World	**187,490**	**2,987.0**	**2,940.0**	**242.5**	**664.6**

Sources: BP and Cedigaz

MENA region, they had a rather limited impact on the fundamentals of oil and gas markets. These adjusted fairly flexibly to the loss of output capacity in Libya, by far the most important outage in volume and qualitative terms. What the Libyan disruption did was feed into market concerns about the potential spill-over of unrest into neighbouring Algeria, which exports roughly the same amount of light sweet crude, but supplies Europe with about six times as much gas as Libya. Furthermore, given the unrest in the Gulf countries of Bahrain, Yemen and Oman, there was also anxiety in the market about stability in major oil exporter and spare capacity holder Saudi Arabia.

Emerging Pattern

Market reactions to the spread of unrest across the Arab world reflected wider uncertainty about the nature of the phenomenon and its potential destabilising effect for the region and the global economy. The feeling among observers of the region was that if this could happen in Tunisia and Egypt – the two countries believed prior to the uprising to be among the least likely to experience such events – it could well happen anywhere. Attention soon turned to countries like Algeria which had higher political risk rankings and where popular expressions of discontent were more common.

However, despite the eruption since the Tunisia uprising of popular protests in almost every Arab country, attesting to the common grievances of young people in the region, there seems to be an emerging pattern in terms of the end-result of these demonstrations in the short term. Countries with nominal republican political systems, as well as long-serving leaders (over 20 years in power) with a propensity to promote nepotism and dynastic succession at the expense of broader participation in the political process, have seen the most radical uprisings and calls for the removal of leaders and their regimes. Tunisia, Egypt, Libya, Yemen and Syria fall within this category. In other countries, the 'contagion effect' has demonstrated itself through the revival and emboldening of longstanding political demands for change, some of which are based on sectarian grievances such as in Bahrain and Saudi Arabia.

In Algeria, where localised protests have been a permanent feature of the political background for the best part of the last decade, events in the region encouraged opposition organisations to press harder for political reforms. But the striking feature of this renewed activism is the shared aversion to political violence and instability among large sections of the Algerian population and political class. Algerians had their botched 'spring' more than 20 years ago and are no longer interested in sudden, radical change.

In the face of this 'awakening', all MENA countries share an undecided future. The final outcome of the recent events is as yet unknown, and the longer-term consequences of the transformation process it has ushered in are as uncertain for countries that have had their leaders ousted as for those that have not/will not.

Impact on Gas Development

Concerns about the short-term disruption effect of political unrest in North Africa on gas supplies from the region gave way to uncertainty over longer-term development issues as soon as it became clear that the risk of short-term market shocks was minimal. Domestic price subsidies, upstream investment terms and export policies are the main issues in question.

Artificially low domestic gas prices have become an untenable feature of MENA gas markets over the years. They have caused enormous distortions in consumption patterns across the region, have indirectly hampered upstream development in some countries, and in many cases have added to the fiscal pressure governments face. In North Africa, Egypt had been grappling with the issue of energy subsidies before the eruption of the unrest in January 2011, and was planning to raise gas prices for industrial users by the end of the year from $1.25 to $2.65–3/

MMBtu. Elsewhere in the MENA region, most governments – with the exception of Iran's – showed little urgency to tackle the issues of low gas prices. Their concerns stemmed from the potential socio-economic effects raising gas prices would have in terms of inflation and attracting investment in the downstream sector – both vital ingredients for social stability.

"Algerians had their botched 'spring' more than 20 years ago and are no longer interested in sudden, radical change"

The recent events are most likely to all but reinforce MENA governments' longstanding hesitation to deal with the issue of subsidies, at least in the short term. Stability, political reform and survival will be the main priorities in the short term for old and new governments in the region, which means gas price reforms will be put on the backburner. This was exemplified by the Algerian government's prompt announcement back in January that it would maintain its $7 billion annual subsidy for the gas-to-power sector.

The same is likely to apply to the issue of upstream investment terms. With many MENA countries facing gas supply shortages, there is an urgent need for governments to improve the fiscal terms for foreign investment in the upstream. However, short-term political priorities are likely to delay meaningful action in this direction. What's more, the likely temptation for governments to maximise the rent from hydrocarbons in order to be able to buy social peace could militate against the improvement of fiscal terms, especially given the current relatively high oil price environment. In Libya, the outlook for the current standoff is highly uncertain, with the country facing the prospect of prolonged civil confrontation and possibly partition. But it may be expected that an eventual rebel-led post-Gaddafi government will promulgate improved hydrocarbon investment legislation by way of reviving the economy and cementing its relations with foreign partners.

Finally, the coming to power of new governments may lead to a revision of gas export policies, which would have an impact on the prospects for MENA gas exports over and above the amount of gas available for export from the region. Again, Egypt is leading the way in this regard, with the government announcing a revision of the price and volume elements of its gas supply contracts with Jordan, Israel and the operator of the Damietta LNG train, SEGAS. However, the second explosion in the Sinai, said to be larger than the first one, may in the meantime result in a longer supply disruption, which in the case of Israel at least could precipitate plans for the development of alternative supply options from offshore fields and/or floating LNG.

Outlook

With issues of supply shortages and strong demand growth pervading most regional gas markets, the outlook for North African gas supply was not particularly promising before the uprisings. The recent events are only likely to exacerbate the region's main gas market issues, particularly in the short term. The longer-term prospects remain highly uncertain, and a lot will depend on the type of politics that will ultimately emerge and its implications for the 'social contract' between state and society in the region, for the efficiency of government institutions and decision-making processes, and for the economic development models countries in the region will pursue. In all of this, politics will continue to be the main determinant of gas development policies in North Africa, especially in the short term.

John Hamilton sees energy as a vital factor in Libya's civil war

At the time of writing in early April, Libya is in the grip of a civil war the outcome of which no one can predict. The situation is so volatile that it is not possible to guess even where the balance of advantage will lie in a few days, let alone in weeks. Analysing what has happened and what might happen to the country's energy sector is therefore a challenging task. Verifiable information – never in large supply in Colonel Muammar Qadhafi's Jamahiriya – is scarce. At question is far more than just waiting to see who will have control of the country's valuable resources; which international companies might benefit or lose out; and whether any part of Libya will be able to export oil in the foreseeable future. Rather gas and oil – or more precisely power and fuel – have taken on vital humanitarian and strategic military importance. Access to them both will be decisive not only in the armed conflict, but also in what its consequences will be for the population. This is also the context in which the United Nations' and other sanctions regimes will be enforced, as the UK, USA and EU look for ways of strangling the regime without doing the same to the population.

Right now the country is divided and neither side appears to have a 'killer blow' it can land on the other. For the Interim National Transitional Council (INTC), the divided and disorganised body which rules rebel 'Free Libya', this would mean instigating a coup or revolt against Qadhafi in Tripoli. For Qadhafi it means taking back the territory he has lost. The No Fly Zone (NFZ) approved by the UN Security Council ought at a minimum to protect the territory between Benghazi and the Egyptian border from falling under Qadhafi's rule again – although even that is not certain. The rebels have briefly taken over towns along the coast up to but not including Qadhafi's tribal stronghold and home town of Sirte.

Significantly all the Sirte Basin oil fields and key oil export terminals are east of Sirte itself. The INTC's strategic objective is to establish firm control over all this territory, with a notional dividing line at Bin Jawad, which lies between Sirte and the oil terminal of As Sidrah (through which oil from the Waha Oil Company is exported). Control over the strategically vital oil terminal towns of Ras Lanuf and Marsa al-Brega further east along the Gulf of Sirte has switched several times. A 'see-saw' scenario in which the centre of Libya becomes a perpetually shifting battle is one most feared by both Libyans and observers of the conflict.

The only oil fields and terminals definitely in INTC hands are easternmost Sarir and Mesla fields from which oil is piped to the Tobruk terminal. These are capable of producing about 100,000 b/d. Benghazi-based Arabian Gulf Oil Company (Agoco) allegedly sold one shipment to an Italian buyer for approximately $80m in hard cash in early March, but since then the terminal has not exported, although it is ready to do so. In late March, Qatar offered to act as an intermediary, marketing oil exported by Agoco, which has seceded from National Oil Corporation (NOC) control and declared itself to be under INTC authority. The INTC says that Qatar will place revenues in an escrow account to comply with sanctions, which have been imposed on NOC, and also by the USA on Agoco itself.

Qadhafi-controlled Libya is itself divided. A bitter struggle is still underway in the town of Misrata – strategically important as the gateway to Tripoli and home to a major support from which most Gulf of Sirte offshore oil exploration has been serviced. Government troops have also assaulted a number of towns in the Jebel Nafusa – a mountainous area south of Tripoli. The hydrocarbons in western Libya are located in offshore fields north of Tripoli and onshore fields in the Ghadames area on the border with Algeria and the Murzuq area in the far south-west. The pipelines to the coast pass through the Jebel Nafusa, making it a strategic location. Colonel Qadhafi is said to have ordered the evacuation of offshore rigs in mid-March – which some understood as a threat that he could destroy them creating a Mediterranean environmental catastrophe. The onshore fields are also shut. Speaking on the telephone from Tripoli on 29 March NOC chairman Shukri Ghanem confirmed that all exports had stopped – not only because of sanctions but also because 'most of the fields are closed'. He said that 'the workers abandoned them because of the looting'.

"A 'see-saw' scenario in which the centre of Libya becomes a perpetually shifting battle is one most feared by both Libyans and observers of the conflict"

In the same conversation, Ghanem also made claims about the refining industry under regime control. He claimed that the Az-Zawia refinery west of Tripoli – which has capacity to process 120,000 b/d of oil was operating at 80 percent of capacity. He did not specify which fields the crude was coming from. The regime retook the town of Az-Zawia in a brutal crackdown which may have killed a large number of civilians – the facts have yet to be established. As well as guarding Tripoli's route to the Tunisian border, the town is home to the only refinery now under total regime control. Since sanctions, it is the only source of fuel for both transportation and power generation for the two main Tripoli power stations, and several others including at least one of the two Al-Khums power stations which provides power to the Great Man-Made River – a scheme for piping vast quantities of water from deep aquifers in the far south of Libya to the coast.

In Tripoli by end March there was already a severe shortage of diesel and petroleum for civilian use. The extent to which this was hampering military efforts was not clear. One of the key unknowns is the amount of storage capacity that exists for both crude and for refined products. Ghanem admitted the shortage of fuel for vehicles saying 'Zawia is not producing enough to reach Tripoli,' adding that 'everybody wants his tank full'. But a Libyan oil sector professional now outside the country passed on rumours that the authorities in Tripoli were 'going mad about establishing some sort of contact with [Algerian state company] Sonatrach to transport some fuel for domestic use by tanker via Ghadames'.

There are few other domestic sources of fuel. The 220,000 b/d refinery at Ras Lanuf has not been operational for weeks as the town has been the focus of military skirmishes and most of the workers have fled. Kerosene tanks at the refinery were also destroyed in an attack by regime aircraft early in the conflict. Libya's other refineries are a small plant at Sarir and the 20,000 b/d Tobruk refinery which is supplying eastern Libya. The INTC's troops are short of fuel – and sources have suggested they may now be getting extra imported supplies. Qatar's intervention in late March, promising not only to help with exports but also to supply fuel, is therefore an important lifeline. It has already sent a pair of tankers with a total of 3800t of liquefied petroleum gas to Benghazi to alleviate a shortage of cooking gas, and will presumably send more of what is needed.

So far, gas supplies have continued uninterrupted by the conflict. Libya's gas network is not yet unified – the project to build a coastal pipeline has been delayed by at least two years and the contractor Punj Lloyd has struggled to complete a final section of the pipeline between Az-Zawia and Tripoli. The western network supplies gas to the power stations at Al-Ruweis (Western Mountain), Abu Kamash and Az-Zawia. It also feeds the Zuwara and Az-Zawia desalination plants. The gas comes from Eni's Western Libya Gas Project. When sanctions were first applied on the Qadhafi regime, Eni shut down exports through Greenstream but

obtained an exemption from the UN to continue supplying gas domestically for humanitarian reasons.

Gas in the east of Libya is supplied from associated gas fields in the Sirte Basin, most of which are under the control of NOC subsidiary Sirte Oil Company. It also operates an LNG plant at Marsa al-Brega, which even before the crisis was operating at a fraction of its design capacity. Sources both outside Libya and in Benghazi say that supplies have remained on stream and that there is no shortage of power. The majority of eastern power comes from gas and some from oil. The regime has used its control over the power network as a weapon to some extent – the town of Misrata has been cut off from both power and the main water supply for nearly a month. Its 500,000 population is dependent on its gas-fired seawater desalination plant. But there are physical limits to this and Tripoli cannot cut off Benghazi from the grid. According to a senior General Electricity Company of Libya source in Benghazi, the grid is divided into three with the National Control Centre in Tripoli, and a grid operated out of Sirte and one out of Benghazi. But it would collapse if major eastern infrastructure went down. Cutting power to the east would also affect Egypt, given the interconnections in place.

"Maintaining sanctions on the regime that are both effective and humanitarian will probably be impossible"

The situation as it stands could last for weeks or months. UK military strategists are known to doubt whether the combination of the INTC's disorganised volunteer forces and the NFZ are capable of changing the situation on the ground or putting sufficient pressure on Qadhafi to 'crack' Tripoli. Diplomatic sources appear more confident about the dismantling of the regime following the defection of the foreign minister and former External Security Organisation chief Musa Kusa on 31 March. He was for four decades one of the most feared men in Libya after only the Colonel himself. But a coup remains impossible to predict.

The longer the conflict persists, the greater the chance of a breakdown in the nation's energy infrastructure as a result either of collateral damage, sabotage, or degradation. This could quickly escalate into a humanitarian catastrophe, should for instance the power supply to the Great Man-Made River fail, oil in storage at refineries or power stations run out, or if gas supplies from either east or west be interrupted. In terms of how the industry could eventually be revived, little can be said while the conflict is at this stage. So long as the Qadhafi regime is in control of Tripoli, there can be little hope of any foreign participation on the ground. Maintaining sanctions on the regime that are both effective and humanitarian will probably be impossible. If that is needed, some sort of Iraq-style oil-for-food programme will have to be introduced, with all the potential for abuse that Saddam Hussein notoriously took advantage of. Sanctions could be lifted on the east of Libya allowing Agoco to restart its sector. But international oil companies may be hesitant about turning their backs on Tripoli where their current interests mostly reside. The international community may be wary of sanctioning activity that appears too much like the partitioning of the country. The legal and constitutional implications of such a division would be immense. It is therefore unlikely that the Sirte Basin – the heart of Libya's oil sector – will start producing again in significant quantities until the conflict has been resolved one way or the other. However, some activity is not only possible but also essential to sustain both resistance – and life.

Emma Murphy asks whether democracy will follow freedom in Tunisia

Until December 2010, Tunisia was considered to be one of, if not the most stable of the authoritarian regimes in the Arab region. Its president, Zine el-Abidine Ben Ali, had ruled since taking power in a constitutional coup in 1987. Early promises then of democratisation soon gave way to a carefully stage-managed pluralisation of the political system, which ensured that the president's own party (the Rassemblement Constitutionnel Démocratique, or RCD) consistently won in rigged national elections, and that he was himself repeatedly re-elected. Opposition was tightly controlled; a limited number of small, personalised and ideologically vacuous parties were legalised, while genuine opposition such as the Islamist el-Nahda Party, were brutally crushed and their leaders forced into exile. Ben Ali built up a massive internal security apparatus that protected his rule as he and his extended family set about plundering the Tunisian economy through privileges, monopolies and corruption. Even as Ben Ali's economic liberalisation policies brought him international plaudits and, to be fair, a decent rate of national economic growth, wealth became increasingly concentrated in the hands of Ben Ali's siblings and his wife's Trebelsi clan. They accumulated massive holding companies which dominated the tourism, transport, real estate, car sales and even banking sectors. As they became more conspicuously affluent, the economic reform programme began to stall in the face of a demographic youth bulge, which brought hundreds of thousands more new entrants onto the job market each year than could be absorbed with gainful employment. Investors became nervous, competition with foreign goods more intense, and real unemployment rose steadily to an unofficial rate of around 22 percent. With a captive local media, fraudulent electoral processes, and a

regime obsession with security, the pressure was mounting. Three years ago, a series of strikes and demonstrations in an impoverished southern mining town was quickly suppressed through a combination of police crackdowns and targeted financial assistance.

However, the trigger for a popular uprising came when 26 year-old Mohamed Bouazizi, an unemployed graduate living in the central town of Sidi Bouzid, set fire to himself in front of municipal offices in a desperate act of protest on 17 December 2010. His act struck a chord with the local population, who initiated protests and demonstrations that rapidly spread across the country. Initially, the regime utilised the familiar strategy of sending in the armed police, branding the protesters 'terrorists' and 'thugs', whilst simultaneously sending Minister for Development, Mohamed Al-Nouri Al-Juwayni, to Sidi Bouzid promising jobs and assistance to the town.

"what had begun as expressions of economic grievances, became calls for political freedom and an end to the President's rule"

But by now, Tunisia was stirring. Even as Ben Ali himself visited the fatally-injured Bouazizi in hospital, the internet-savvy Tunisian population were sharing pictures, commentary and video footage of the protests via YouTube and Facebook. With an estimated quarter of Tunisian youth connected through social media sites, the population were able to share their outrage over the police brutality, to mobilise and orchestrate new demonstrations, and – via satellite television channels like *al-Jazeera*, to draw international attention to their struggles, exposing the true nature of Ben Ali's regime. It was not long before what had begun as expressions of economic grievances, became calls for political freedom and an end to the President's rule.

By December 27, the protests had spread to Tunis itself. Under mounting pressure, Ben Ali made a televised national broadcast, declaring the demonstrations to be unacceptable and threatening protesters with the full force of the law, but also seeking to appease them with the sacking of a number of regional governors and less influential cabinet ministers. The broadcast only fuelled the flames: national associations and civil society organisations joined the protesters, calling for a general strike and taking to the streets themselves. On 12 January a curfew was imposed on Tunis itself, but when this failed to intimidate the protesters, Ben Ali made a second televised appearance offering unprecedented concessions, promising investigations into the allegations of corruption and the killing thus far of nearly seventy protesters. He offered greater media freedoms and declared that he would not himself be standing again for presidential re-election. In response the streets filled for another night with disbelieving and change-hungry youths. The following day, a state of emergency was declared, the entire government was sacked and Ben Ali promised fresh elections within six months. But the President's carrot and stick strategy fell apart when the Army Chief of Staff, Rachid Ammar, resigned, refusing to turn the Army's guns upon the protesters. Although Ben Ali himself had begun life as a military officer, and despite his having originally seized power with the tacit endorsement of the army, he had not retained a significant personal power base within the army and it had never developed its own economic empire as had military establishments elsewhere in the region. Rather, Tunisia's military services have been substantially professionalised, and have developed good collaborative relations with American and European military forces which had provided them with a broader strategic vision for the country's future than backing a dictator and his cronies whose own corruption was becoming a major liability for national stability.

Abandoned by the Army, Ben Ali was convinced by senior ministers that the time had come to leave. That evening, Prime Minister Mohammed Ghannouchi, appeared on television to announce that the President had left the country and that, under Chapter 56 of the constitution, he had himself assumed the role of Interim President. As Ben Ali and some of his family fled, seeking refuge first in France but finally in Saudi Arabia, events moved quickly. The army took control of strategic sites such as the airport, while the constitutional court ruled that Chapter 57 of the constitution was more appropriate and that the speaker of the parliament, Fouad Mebazaa, should in fact take office as Interim President, pending the calling of new elections. The move signified the determination of the political establishment that Ben Ali's departure should signify a resignation and not a temporary respite.

"over fifty aspiring political parties have sprung up across the country, ten of which were legalised in March"

The immediate popular euphoria which followed Ben Ali's departure was soon followed by a deep concern that this should not be the end of the process of political change. Protesters remained on the streets, demanding not just the inclusion of opposition figures in the Interim Government, but the removal of all figures from the previous regime, the dissolution of the RCD party itself, the immediate release of all political prisoners, the legalisation of previously banned as well as new political parties, and full constitutional reform. In defiance of the requests of the Prime Minister that strikes and demonstrations should come to an end, so-called 'liberation caravans' brought protesters from around the country to Tunis to add their voices to the demands for change. After a fitful start, during which ministers joined and left the cabinet of the Interim Government, in response to such popular demands, the Interim Government stabilised

somewhat with the resignation of Ghannouchi himself, the last survivor of Ben Ali's cabinet.

He was replaced by Beji Caid-Essebsi, an old Bourguibist minister, who will see the country through to elections in July for a new Constitutional Council, which will then oversee the reform of the constitution in anticipation of full national assembly and presidential elections. The Council will have authority to reappoint the Interim Government for the intervening period, or indeed replace it. In the meantime, over fifty aspiring political parties have sprung up across the country, ten of which were legalised in March. El-Nahda has also finally been legalised and its leader, Rachid Ghannouchi, has returned to Tunis (although declaring that he himself does not intend to stand for office). The opposition parties which had been legal during Ben Ali's tenure are fighting now to restore their credibility in the face of charges of collusion with the old regime, and – since the RCD has also been dissolved – it is unclear which party, if any, will be able to mount a viable national campaign when the elections actually take place.

In the midst of all this uncertainty, some Tunisian institutions are holding strong. The courts have already laid criminal charges against Ben Ali and are seeking ways to extradite him back from Saudi Arabia and to retrieve assets frozen by overseas governments. Other members of his and his wife's family have been arrested and are already standing trial on a range of charges, most frequently relating to corruption. Their vast holding company empires were quickly assigned temporary directing administrations and are mostly back trading on the Tunis Bourse. Investigations have also been launched into dodgy privatisations and corrupt practices within ministries such as the Transport Ministry. The Foreign Ministry suffered an early set-back when the first post-Ben Ali Foreign Minister, Ahmed Ounais, was forced to resign, but it has since stabilised into rapid recovery mode, hastening to reassure international partners that Tunisia remains open for business. Likewise the Minister of Tourism has launched a massive campaign to woo back international travellers and to promote internal tourism in the meantime. It is this embedded institutional capacity which provides the real hope that Tunisia can pass successfully through the traumas and fragilities of democratic transition, combined with an educated and newly-vocal population, determined to maintain their path towards a better future.

WTI and Brent Benchmarks

Edward L. Morse sees no Rx for WTI any time soon

There is little mystery about why West Texas Intermediate (WTI) crude oil started to see its price de-couple from time to time from sister crude benchmark Brent starting in 2007. There's even less mystery about the near complete disconnect in the market values of these two crude streams, which came to the fore in 2010 and will linger in the market for at least another 18–24 months, perhaps even longer: crude oil supply has become congested in the US mid-continent and it is highly unlikely that there will be a short-term fix. The separation between WTI and global markets looks likely to worsen before it improves.

WTI, the light sweet crude oil traded on the New York Mercantile Exchange (NYMEX, now owned by the CME, the Chicago Mercantile Exchange) is physically settled at a major terminal hub at Cushing, Oklahoma. Cushing is a gathering point for distribution to refineries through the US mid-continent, in what is called PADD II, an area that includes the old US mid-west manufacturing belt. That area has been partially landlocked from the perspective of oil logistics, requiring crude oil to be imported from outside. But starting in 2007, as we shall see below, imports from Canada, which is also, ironically, partially a landlocked area, and local oil production from within the US mid-continent, have grown so rapidly and unexpectedly that the entire mid-continent area has become rapidly oversupplied.

There are only three solutions: backing out oil brought in from outside the mid-continent; building new pipelines and rail lines to the US Gulf Coast, or reversing one or more pipelines that currently bring crude oil into the region from the US Gulf Coast; and slowing down the pace of production, with the possibility – indeed now the likelihood – that production will have to be closed in as new supplies grow at the pace they have recently set. But that's getting a bit ahead of the story. In order to understand how the mid-continent of the United States became a glutted market in a world of $115–120 per barrel oil, and how WTI became first a limping and now a broken benchmark, we need to step back and look at the history of WTI.

The WTI paper barrel contract has been remarkably successful. It not only worked extremely well for its first quarter century of operation, but it became the most liquid of all paper contracts for commodities. For most of the time since the WTI paper barrel contract started to trade on the NYMEX almost exactly 28 years ago, this mid-continent area of the USA required crude oil 'imports' from other regions in order to balance seasonal refinery demand. The refinery system

of the region has been 'crude short,' with supplies brought in from Canada, from other parts of the United States (some of the West, or PADD IV area, some from Texas and Louisiana, the heart of the PADD III region), and imports brought via pipeline or barge from US Gulf of Mexico ports.

For nearly 25 years following the first quarter of a century, largely because Cushing was partially landlocked (oil could be imported to Cushing but not exported to international markets from there), WTI was priced higher than the nearly look alike crude from the North Sea, Brent. It was also priced higher than a US produced crude on the US Gulf Coast, LLS (Louisiana Light Sweet crude), which has similar specifications to WTI. The WTI premium enabled the market to pull LLS up the pipeline system as required, just as the WTI premium over Brent crude oil was able to attract cargoes of Brent across the Atlantic. It helped that North Sea crudes were in surplus to local demand and that WTI crude was in deficit relative to local demand.

"crude oil supply has become congested in the US mid-continent and it is highly unlikely that there will be a short-term fix"

Thus for much of the time that there were spot markets for both WTI and Brent, WTI sold at a premium, averaging about $1.75 per barrel. When the premium was high, the arbitrage to bring Brent crude across the Atlantic worked; when it was relatively low the arbitrage was unnecessary and unprofitable.

The traditional premium of WTI over Brent was first challenged in 2007, a time when some paper barrel traders thought it had to do with market manipulation by other traders, but when the underlying cause was in the physical markets. What changed were two secular changes, one on each side of the Atlantic Ocean, with what happened in North America somewhat more important than what was happening in Northwest Europe.

On the supply side the bigger change was the relentless growth of crude oil from Canada, largely because of the steady development of production of oil from Canada's rich deposits of oil sands and bitumen. A smaller but tangible change occurred in Europe, with the decline in North Sea output from over 6 million b/d at its peak in 2003, to 4.88 mb/d by 2006 and eventually to 3.39 mb/d last year. But just as the Brent market was tightening due to depleting capacities, US imports from Canada started to grow rapidly. In 2000, when North Sea crude was frequently in excess of 6 million b/d, Canadian production averaged slightly more than 2 mb/d. By 2006, Canadian output exceeded 2.5 mb/d, with almost the entire increment flowing into the US mid-continent, displacing crude oil brought in from PADD III on the US Gulf Coast. Canadian crude oil output is now averaging 3.1 mb/d and should reach 3.3 mb/d by this time next year.

As Canadian output continued to rise, refiners in the Chicago area, with significant upgrading capacity, opted to consume Canadian oil, which was selling at a discounted price to waterborne crude flowing up the 1.1 mb/d Capline pipeline from St. James, Louisiana. In effect what was happening was a backing-up of Canadian crude because the pipeline system didn't allow oil to flow past Chicago – that was the situation when for a couple of brief periods Brent crude sold at a premium to WTI as the seasonal refinery demand for crude resulted in significant volatility in crude oil prices in the US mid-continent and in Canada. Relief came initially when Canadian pipeline company, Enbridge, bought the 190 kb/d Spearhead pipeline, which had been bringing oil from Cushing to Chicago, Enbridge reversed the line and crude oil started flowing from Chicago and on to Cushing where ample and expanding storage capacity created a safety valve for bottlenecked crude oil and allowed the normal premium of WTI to Brent to return.

In 2008, when Brent was briefly selling at a premium to WTI, as oil prices crashed in the last half of the year, investment in new Canadian oil sands output was postponed for a while and incremental supply from Canada slowed down. But with the return of higher prices in 2009, Canadian oil sands projects were back on track, increasing output on average 150 to 175 kb/d per year. Indeed in 2010 oil output increased at a rapid rate toward the end of the year, rising from around 2.9 mb/d from the second quarter by 200 kb/d by year end. 2011 output is expected to rise by another 150 kb/d.

"What is required to reconnect WTI to global markets is ways to reduce inflows of oil from the Gulf Coast to the mid-continent and also ways to move oil from the Mid-Continent to the Gulf Coast"

Meanwhile, the shale gas revolution in the lower-48 US states started to move toward tight sands oil structures and the focus of the new output was the US mid-continent. In many ways, the surprising acceleration in the decoupling of West Texas Intermediate crude oil prices from global markets this past winter stems from an even more surprising accelerated trend: the growth of crude oil production in the US mid-continent. In the middle of the last decade crude oil production in the mid-continent of the United States had fallen to around 415 kb/d, a level reached in early 2004. But the growth in output in PADD II has been stunning and accelerating. This past January, PADD II crude oil output reached 1.12 mb/d, almost 700 kb/d higher than it had been five years earlier, and the rate of growth was accelerating. As between Canadian production and local PADD II production, output trapped in PADD II has risen by more than 1.5 mb/d, in an area of the USA with stagnant

demand. Over the past half year, output in PADD II has been rising at a rate of over 20 kb/d per month, with strong growth in the Bakken play in North Dakota and Montana and equally strong growth in the Permian Basin, centred in Texas, but much of the oil growth there is gathered into PADD II's Cushing hub.

All in all, as between the Bakken and Permian Basins and oil flows from Canada, oil production heading for the US mid-continent looks likely to rise by 400 to 450 kb/d by April 2011. What's more, production in Bakken and the Permian Basin look likely to rise to close to 1 million b/d each by the end of this decade and they are two of five onshore basins in the lower-48 states that have tight sands characteristics that could sustain high levels of production for years, without facing significant declines.

"the chances are great that between now and 2013–2014 a significant amount of potential oil production in the US will have to be shut in, stranded there by environmental politics"

Thus the dynamics of the US mid-continent market have changed dramatically in the past three years, leaving infrastructure capable of moving crude oil out of the US mid-continent lagging significantly behind production, which is trapped in PADD II. What is required to re-connect WTI to global markets is ways to reduce inflows of oil from the Gulf Coast to the mid-continent and also ways to move oil from the Mid-Continent to the Gulf Coast.

The NYMEX has defended the viability of the WTI contract as a benchmark by pointing to the continued flow of oil from the Gulf of Mexico into PADD II, showing that the inland US market remains tied to global markets. And they are right in pointing to flows of crude up both the 1.1 mb/d Capline and the 350 mb/d Seaway pipeline that brings crude oil from Texas City to Cushing. But there are reasons why neither pipeline will be reversed any time soon. The Capline brings a significant amount of term contract crude including from the Middle East to refiners as far north as Chicago. These lube rich Middle East crudes have become fundamentals to refiners' economics and in today's uncertain environment refiners don't want to relinquish long-term supplies. Seaway pipeline is owned by Conoco, which has indicated that it wants to continue to bring its own equity crude oil to refineries it owns in Oklahoma and Texas and won't reverse the line.

TransCanada Pipeline's Keystone line has a planned expansion from Cushing to the US Gulf Coast, which has been delayed by environmental groups. At present both the US State Department and the Environmental Protection Agency have new environmental impact statements for the pipeline under review. A decision is anticipated sometime between now and the middle of the third quarter, after which it will take another 18–24 months to lay the line, which would make early 2013 the earliest likely time for completion. Enbridge pipelines has a similar plan which aims at a new line by 2014.

Meanwhile, oil bottlenecked in PADD II can be brought to the Gulf Coast via truck and rail, but logistical obstacles indicated that production is increasing faster than new rail links can be developed. A temporary fix for bringing crude from Canada and PADD II to the US Gulf Coast involves the reversal of the Longhorn petroleum products pipeline from Houston to El Paso and its conversion to a crude oil pipeline, but that too would take time and would alleviate the bottlenecking of crude from the Texas Permian Basin.

The only other solution would be the building of a pipeline from Alberta, Canada to the West Coast of Canada across the Rocky Mountains, where a combination of 'First Nation' indigenous tribes who own the right-of-ways and environmental objections to creating a new export terminal near Vancouver create major obstacles to that solution.

The likelihood is that some new rail links from North Dakota to the US Gulf Coast, along with a 25 percent expansion of storage at Cushing, can provide short-term alleviation of the problem. But until pipelines are built to bring crude oil from the US mid-continent to the Gulf Coast, WTI will remain a broken benchmark. And the chances are great that between now and 2013–2014 a significant amount of potential oil production in the US will have to be shut in, stranded there by environmental politics.

Bob Levin considers the relative value of crude oil between North America and Europe

An average spread between the nearest common month to delivery contracts for Brent futures prices and West Texas Intermediate (WTI) futures of $10.77 per barrel during Q1 2010 has impacted how some analyse the market. It has also impacted how some characterise the market, including various *ex cathedra* pronouncements about *benchmarks*. During Q1 2010, however, the *market* asserted its indifference to pronouncements, as it has previously done. We can learn from this indifference or, at least try.

Changing Relative Values

Since 2005 (and even starting before that), there have been significant changes that have impacted the relative value of crude oil between North America and Europe. North Sea oil production has declined significantly while production has increased in

the USA and Canada. From 2005 to 2010, US and Canadian net imports decreased by 3.35 million barrels per day while European (non-Eurasia) imports increased by 300,000 barrels per day. All other things equal, the relative value between oil priced in the USA decreased versus oil priced in the North Sea; and the price of WTI and Brent futures have reflected these relative changes.

"North Sea oil production has declined significantly while production has increased in the USA and Canada"

But when prices started to reflect these changes, not everyone embraced the change as natural; some came up with other explanations that, when examined further, were shown groundless. For instance, in spring 2007, the US oil market suffered an exogenous shock from unplanned refinery outages; storage of oil at Cushing, Oklahoma reached a record level. WTI temporarily priced below Brent. Some commentators responded to this by claiming that storage tanks in the Midcontinent were full and this was causing a price disconnection between Brent and WTI. This was wrong on three important counts. First, storage tanks were not full (including in Cushing); second, the Midcontinent market was (and is) much bigger than Cushing – more than 3.2 million barrels per day refined during this period. And third, during this period, crude oil flows from the US Gulf to the US Midwest were above 1.6 million barrels per day, a tangible indication of the connectedness of the US Midcontinent and waterborne markets.

During Q1 2009, storage levels at Cushing reached new highs (capacity had increased), the WTI-Brent spread widened and WTI's first and second nearby contracts reflected an especially large contango. Once again, there were allegations of WTI 'disconnecting'. The release of 'final' stock levels for the remainder of the Organisation for Economic Co-operation and Development (OECD) countries three months later revealed that European petroleum stock levels during Q1 2009, relative to consumption, may have been the highest ever. During this period, prompt (*Dated*) Brent versus *Forward* (as published by *Platts*) was backwardated about one-third of the time, an unintuitive response to record-breaking stocks; to disconnect from that was a sign of health. (Meanwhile, crude oil flows from the US Gulf to the US Midwest were slightly less than 1.2 million barrels per day.)[1]

With the expanded spread during Q1 2011, allegations have returned; but what has happened in the oil market?

- Crude oil production in the US Midwest increased by more than 150,000 barrels per day in January from a year earlier.
- During January, 1 million barrels of crude oil per day flowed from the US Gulf to the Midwest.
- Midwest refinery utilisation was down and stocks have steadily grown since mid-February (more so than Cushing). Gulf Coast stocks increased but notably less than the previous two years. Refinery utilisation has been increasing since mid-February.[2]
- Rest of OECD: come back mid-May for preliminary; mid-July for final.[3]

What has happened with the use of 'benchmarks?'

- Average open-interest in NYMEX WTI futures increased by 171,529 from December 2010 to March 2011. (Open-interest is the measure of positions committed to a particular contract)
- Average open-interest in NYMEX WTI options increased by 766,975 from December 2010 to March 2011.
- Comparable open-interest for Brent futures decreased from December 2010 to March 2011; options increased by over 180,000.[4]

"Even in the midst of the tumultuous Q1 2011 world oil market, the relationship between WTI and Brent futures prices holds surprises regarding its strength"

Inferences About Oil Market and Benchmarks

1. Be careful in making inferences.
2. *Some* important evidence supports that increased oil production from onshore US and Canada has displaced US Gulf oil in the Midcontinent but there are some additional questions. There was a documented reduction of 600,000 barrels per day of crude oil between Q2 2007 and January 2011; but 1 million remained. It seems more could be displaced. Can onshore producers be expected to knowingly continue to commit production to an average discount versus the US Gulf of $10.77 per barrel?
3. Market participants are sophisticated at adapting to volatile differentials in crude oil prices. Throughout March 2011, more than 10 billion barrels of oil denominated in 'benchmarks' were subject to hedging or diversification on organised exchanges every day. For some market participants, the risks being managed are linear and relatively straightforward. But, for many of the thousands of

1 All of the production, consumption, refining, stocks and crude oil flow data in this section are from the U.S. Energy Information Administration (EIA).
2 All of these US data are from the EIA.
3 In fairness to IEA, their preliminary national production data significantly trail US national data but are released at about the same time as US regional data. They do not seem to release anything comparable to the data for crude oil flows between regions. Their inventory and refinery data are not available on a weekly basis and trail the release of U.S. data by months.
4 NYMEX open-interest from www.cmegroup.com; Brent open-interest from www.theice.com.

professionals who manage these commitments, the profiles of their risks and opportunities are heavily non-linear and asymmetric. It is no surprise that the events of Q1 2011 resulted in an increased commitment overall of over 900 million barrels in NYMEX WTI alone.

4. Even in the midst of the tumultuous Q1 2011 world oil market, the relationship between WTI and Brent futures prices holds surprises regarding its strength. Many are accustomed to the historical correlation between daily price-changes for these instruments that is above 90 percent. During Q1 2011 it fell to 72.44 percent. But that is still higher than the relationship between Brent futures and Dated Brent, which was under 71 percent, only a little lower than historically. For those of the mindset to label, should this render Dated Brent 'disconnected'?
5. The US government provides significant fundamental market information within three business days (and extensive other market information two months after the fact) at both the national and regional level, including the Midwest and US Gulf Coast regions. Armed with this level of detailed information, traders of US oil are the best informed in the world and US oil prices embody the most robust reflection of fundamental market content of any in the world.

Conclusion

The US oil market continues to undergo significant investment and development both for increased production and improved and enhanced infrastructure. As changes in supply unfold, changes in distribution and the distribution system follow. These are an integral part of the fundamentals that seasoned market participants take for granted. Related to the topic at hand, this means two likely things. One, the change in relative values between US prices and North Sea prices will continue its long-term trend as the USA displaces more imports. And two, additional outlets for Midcontinent oil will emerge and relieve pressure on the spread between the US Gulf and Midwest.

As for the relationship with the Brents, Futures and Dated, that is and will continue to be influenced by the structural differences in the 'benchmarks'. WTI is firmly rooted in physical delivery and physical fundamentals and it benefits from the reliable stream of fundamental data, weekly and otherwise, issued publicly by the US government. The Brents are structured such that, in practice, they need not be strongly tethered to physical supply and demand – and typically are not tethered. And there is no public dissemination of any fundamental data corresponding to either. Accordingly, even after Midcontinent oil begins to displace US foreign imports by directly flowing to the US Gulf, these 'benchmarks' may continue to disagree.

Twenty Years of Producer–Consumer Dialogue

Bassam Fattouh and Coby van der Linde

Introduction

On 22 February 2011, at the extraordinary ministerial meeting in Riyadh, the International Energy Forum (IEF) turned a new page with the adoption of the Charter in which further institutionalisation of energy cooperation among producing, consuming and transit countries was agreed.

In its relatively short history, the consumer–producer dialogue can already look back on many important achievements. Many of these have come about in the past ten years. Yet without the confidence building of the early years, none of the achievements would have happened. The dialogue has been nurtured by various countries and has survived because no one party has or has been allowed to claim it as its own or become a vehicle for special interests. In the future, new countries will need to come along to extend the dialogue further. Now entering its third decade, the emphasis on the traditional producing and consuming countries is changing to include new consumers and producers, bringing new dimensions and challenges to the dialogue. The existing international organisations such as OPEC and IEA, whose roots can be traced to developments and events in the 1960s and '70s, have not been able to accommodate the increasing importance of the energy interests of these newcomers.

Achievements

Twenty years after the first meeting in Paris in July 1991, the IEF has evolved into one of the most inclusive platforms for dialogue in which consumers and producers meet on a regular basis to discuss issues of common interest pertaining to the global energy scene. At present, the IEF member countries account for more than 90 percent of global oil and gas consumption and production. Such a broad and diverse base of constituents, however, does not in itself guarantee a successful and constructive dialogue. After all, these member countries have very diverse interests, which are often difficult to reconcile. A necessary condition for a successful dialogue is that despite their diverse interests, there is recognition among member countries of shared aims and an awareness of the common challenges facing producers and consumers.

Perhaps the main achievement of the dialogue of the past twenty years is its success in increasing the awareness of the high degree of energy interdependence, which most likely will increase in the foreseeable future. Rather than treating it as a source of tension and conflict, the IEF has been calling upon both consumers and producers over the years to embrace interdependence 'for its potential as a cohesive force underpinning healthy growth of the world

economy, fair energy trade, and international cooperation'. Such statements are a far cry from the tense relations between oil producers and consumers that prevailed in the 1970s and 1980s and reflect how much has changed for the better in the relationship. To some extent, the dialogue has also succeeded in bringing closer the two main consumer and producer organisations: OPEC and the IEA. The Charter now calls for further cooperation.

Another visible and concrete example of success in the consumer–producer dialogue is the establishment of the Joint Oil Data Initiative (JODI). The IEF Secretariat has consistently promoted JODI as representing 'the single most important collaborative effort to address the issue of market data transparency'. The promotion of greater transparency in energy markets has been a recurring key message in most international gatherings and is considered crucial to achieving security of both supply and demand. There are still critical problems that have challenged the achievement of JODI's objectives of providing timely and reliable data on all IEF member states. Yet JODI remains the single most comprehensive attempt to collect data of such magnitude. Another important achievement is that it has raised awareness of the technical difficulties involved in improving the quality and reliability of energy data and its timeliness. This has induced the Secretariat and its partners to play a more active role in improving data collection methods in different countries through providing advice, organising workshops and conducting training sessions.

The IEF has also achieved a certain degree of institutionalisation, which has helped to give the dialogue more structure. This institutionalisation, however, has not induced any shift towards creating a global energy organisation with binding global energy governance, nor has it affected the informality of the dialogue. The twenty-year history of the IEF shows very clearly that the parties concerned are strongly attached to the idea of the informality of the dialogue. This is expected, as energy issues involve quite complex political, economic and social dimensions, which are difficult to reconcile and changing the IEF into a forum with powers to make binding decisions would limit the scope for an open and frank dialogue.

Managing Volatility

In the past twenty years, the intensity and breadth of the dialogue have been driven largely by key market events. Of these events, oil price instability has been the main impetus behind the intensification of dialogue in recent years. It is interesting to note, though, that while the parties' main concerns are about the level and volatility of the oil price, neither consumers nor producers have an interest in managing the price level. There is an implicit agreement that the determination of the oil price should be left to market forces. This does not imply that prices are not discussed in Ministerial meetings. But the closing statements are very general. They often call to 'reduce price volatility in the interests of producers and consumers' because volatility 'complicates the interpretation of market signals and may adversely affect investment'. Other statements call on 'both producer and consumer countries...to take action to reach sustainable price levels' without describing what these actions might be.

Historically, producers and consumers have had very divergent interests: producers tend to favour higher prices while consumers favour lower prices, depending on the stage in the oil price cycle at which importers and exporters find themselves. Any policy to counter oil price shocks would not be credible if managed by parties with very divergent interests. In a rising market, producers lose interest in policing the upper boundary and, when prices fall, consumers lose interest in policing the lower boundary. The producer–consumer dialogue has not matured enough to deal with such complex issues or to suggest potential ways to manage oil price instability. There is also a clear power asymmetry in the short term. While producers have options in both falling and rising markets, consumers are much more constrained in their policies in the short term. In the long term, however, the balance of power tends to shift in favour of consumers who can pursue oil substitution policies, implement efficiency measures, raise taxes on petroleum products, and encourage the development of alternative energy sources which have the effect of reducing long-term oil demand and the share of oil in the energy mix. Thus, an important role for the consumer–producer dialogue is to bridge the gap between the long-term and short-term interests of consumers and producers in order to create a more predictable and stable oil market. Recently, there has been a realisation that too low or too high oil prices serve none of the groups and that 'oil prices should be at levels that are acceptable to producers and consumers to ensure global economic growth, particularly in developing countries' without any indication of what these levels should be.

Does the failure to bargain about price levels or to manage the price level within bounds mean that the consumer–producer dialogue has failed? The answer is no. Since both sides agree that the oil price should be set by market forces, the dialogue has aimed at improving the functioning of the market by promoting better understanding of the links between the financial and physical layers of the oil market and whether regulation is needed to improve market transparency. The IEF has also been showing a willingness to engage with the issue of stabilising short- and long-term expectations through better mutual understanding of oil market conditions and communicating to the market. In the Cancun Ministerial Declaration in Mexico in March 2010, producers and consumers noted for the first time the importance of stabilising expectations, recommending that the IEF should 'disseminate key information related to marginal cost, investment levels, and alternative energy sources that could help stabilize short and long-term expectations' and 'act as the forum through which a better mutual understanding of views is communicated to the market'.

The supply disruption caused by the first Gulf War in 1990–1991 proved to be decisive for the consumer–producer dialogue, as it increased the awareness of common interests among parties and revealed the usefulness of coordinating actions in key areas such as the use of stocks and spare capacity. Disruptions however did not feature prominently in the dialogue during most of the 1990s. The availability of large

spare capacity and the willingness of OPEC to fill the gap in the case of physical disruptions meant that concerns about disruptions received little priority in the policy agendas of consuming countries. The rapid rise in demand in the mid-2000s and the various supply shocks in producing countries such as Iraq, Venezuela, Nigeria and recently Libya brought back to the fore the issue of spare capacity and its role in dampening price volatility. Despite its rise in importance on the policy agenda, producers and consumers shied away from the issue for a long time. It was not until the Jeddah meeting in 2008 that specific calls were made for the expansion of spare capacity:

> [T]he existence of spare capacity throughout the oil supply chain is important for the stability of the global oil market. Hence an appropriate increase in investment, both upstream and downstream, is necessary to ensure that the markets are supplied in a timely and adequate manner. Predictable energy and investment policies, as well as better access to technology, are necessary to this end.

The above statement highlights an important dimension, as it acknowledges that maintaining spare capacity is the responsibility of both producers and consumers; it should be extended to the entire supply chain and not to upstream players only. However, such statements are general and do not address the complexity of the issues surrounding spare capacity: Does spare capacity constitute a public good? If it does, should all parties share the cost of maintaining spare capacity? If spare capacity is to be held in producing countries, can consuming countries find acceptable mechanisms to compensate producing countries? In such a system, who makes the decision to release the supply from existing capacity? These and other questions have not yet been the subject of frank discussion and debate. Currently, policies concerning whether to maintain spare capacity and at what levels are solely set individually by governments with no coordination even between producing countries.

Investments

Rather than focusing on geopolitically-induced disruptions, the dialogue has shifted towards potential disruptions caused by the lack of investment in the oil supply chain. The investment issue has been a recurring theme in most Ministerial meetings. One of the important achievements of the dialogue in this area has been the increasing awareness that investment is a shared responsibility between producers and consumers, as bringing available resources to the market requires adequate investment and timely investment in the entire oil and gas chain. Nevertheless, the fact remains that the decision to develop reserves in producing countries is mainly in the hands of their governments and the NOCs, and none of the producers wish to relinquish this sovereign decision either through discussion or agreements between producing countries or between producing and consuming countries. As a result of the wave of mergers in the 1990s, many investments in upstream and in refining are now in the hands of privately-owned oil companies in various consuming countries where governments' influence is mainly in the area of regulation. Recognising this asymmetry, the consumer–producer dialogue has never attempted to coordinate investment plans. Instead, it has explored ways to remove impediments to investment in the oil sector. The basic message of the dialogue has been the importance of adequate investment, aided by 'favorable energy, fiscal, investment and environmental relations' which 'are needed for freer and expanded trade in oil and gas and for sustainable world economic growth'. The IEF agenda has broadened to discuss specific measures that can induce investment in the energy sector, such as reducing long-term uncertainty through increasing transparency and improving information flows on investment plans, energy security and climate change policies and their potential impact on demand, enhancing the corporation between NOCs, IOCs and Service Companies, and broadening cooperation and exchanges in the fields of human capital and technology advancement and many other measures.

Conclusion

The development of the dialogue shows that in the last decade both parties have avoided confrontational topics such as green taxes and the financing of spare capacity and have focused more on themes that can bring them closer together. Furthermore, they also reveal that many key players are not yet ready to deal with more contentious issues. This approach has been effective in building confidence and promoting trust among the parties. However, there is a risk that in the long run the key issues that lie at the heart of consumers' and producers' concerns will become marginalised, leading to a loss of interest in the dialogue. Furthermore, while the dialogue in the 2000s has resulted in greater understanding of the nature of the investment problem and appreciation of the individual sides' point of view, concrete initiatives and proposals to alleviate the investment problem have remained limited. This reflects the fact that while consumers and producers have become more aware of challenges facing the oil market and more conscious of other party's concerns, there is still wide divergence of interests and even unwillingness by some parties to take the dialogue to the next stage where more concrete initiatives could be implemented.

The dialogue has already reached many milestones. Consumers and producers have overcome some of their past myths, fears and suspicions and have become more aware of a number of common challenges related to energy markets. The institutional structure supporting the dialogue continues to strengthen; the structure and quality of the dialogue have also improved over the years. With all this in mind, the evident conclusion must be that the past twenty years have been positive for the consumer–producer dialogue. Nevertheless, many challenges remain and many others are likely to emerge in the future. The way in which producers and consumers express their interests, to what extent they are willing to engage in issues that lie at the heart of their energy concerns, and whether they succeed in relating these energy issues to the wider context of political, economic and social security and the climate change challenge will define the future path of the dialogue.

Asinus Muses

How I learned to stop worrying and love ~~the bomb~~ nuclear power

Nuclear crises are not a favourite topic of satire (the classic *Dr Strangelove* being the clear exception). The disaster in Fukushima became even less humorous when it was upgraded in severity to the same level as Chernobyl. Fortunately for Japan and the world, this appears to have been an over-reaction, with the power plant having released only 10 percent of the amount of radiation as the Soviet disaster. Fortunately for Asinus, the follies of humanity remain diverting even as the reality of our predicament becomes gloomier: to wit, observe the ongoing conflict between George Monbiot, the green who converted to nuclear a couple of years ago, and his former comrades in arms, including the eponymous president of the Helen Caldicott Foundation for a Nuclear-Free Planet. Monbiot has accused the anti camp of making claims 'ungrounded in science, unsupportable when challenged, and wildly wrong,' and of using the same tactics as climate change deniers: 'Failing to provide sources, refuting data with anecdote, cherry-picking studies, scorning the scientific consensus, invoking a cover-up to explain it.'

Caldicott archly responded that 'Mr Monbiot... is a journalist not a scientist,' and that 'Monbiot and others at best misinform, and at worst misrepresent or distort, the scientific evidence of the harmful effects of radiation exposure.' Her ace card is that 'the US National Academy of Sciences BEIR VII report has concluded [that] no dose of radiation is safe.' Asinus, also not a scientist, but blessed with an internet connection, decided to take a look at this document. It finds that 'in a lifetime, approximately 42 of 100 people will be diagnosed with cancer. Calculations in this report suggest that approximately one [additional] cancer per 100 people could result from a single exposure to 0.1 Sv of low-LET radiation above background.' Residents have been evacuated within 20 km of the Fukushima power plant; for those between 20 km and 30 km away, it would take about a year of standing outside, or 11 years of staying indoors, to receive 0.1Sv of radiation.

Asinus would not choose to relocate to the region, but observes that the report's figures imply that this dose increases your (relative) risk of cancer by 2.4 percent; for comparison, being obese increases a woman's risk of breast cancer by 30 percent, and anyone's risk of bowel cancer by 11–14 percent, while one study found that women who had lost 20 pounds or more had 11 percent lower risk of cancer than women who had not. The World Cancer Research Fund finds that about a third of cancers in the UK could be prevented by healthier lifestyles (where leading a healthier lifestyle is not intended to include avoiding nuclear power plants). At the risk of poor taste, Asinus notes that if 0.1Sv of radiation were to reduce the appetite for a couple of months, as a treatment it would substantially reduce the risk of cancer.

Asinus further notes that Caldicott's interpretation that 'no dose of radiation is safe' lines up oddly with the report's statement that 'Lower doses would produce proportionally lower risks', where one-tenth of the above dose would lead to one-tenth the extra risk of cancer, i.e. one extra person getting cancer per 1000 people, as opposed to one per 100 people. Caldicott's claim is not exactly false, but it is exactly equivalent to the proposition that 'no amount of getting out of bed is safe.'

Every (mushroom) cloud has a silver lining

On the other hand, Caldicott points out that consuming radioactive elements is rather more risky than external exposure, and Asinus is inclined to avoid eating Japanese imports for a while (no more chewing on my digital radio). But since economists have long worried that Japan's current account surplus is dangerously large, this could even be a silver lining for the global economy.

Perhaps more surprisingly, economists have noted that it might help even the Japanese economy, whose problem for the last 20 years has been a lack of demand. Nothing stimulates investment quite like the destruction of a region's infrastructure.

(Not) Storing up problems

While Asinus's amateur research into the risks of nuclear power has mostly been reassuring, he remains nervous at the fact that not a single country in the whole world has yet constructed a permanent resting place for radioactive waste from nuclear power plants. Tens of thousands of tonnes are being stored in temporary facilities. (One wonders if planners are awaiting an earthquake to take the problem off their hands.) Sweden may be about to become the first to do so, if plans for such a facility are given the go-ahead. The blogosphere has been recalling past efforts to design a sign that will warn people thousands of years from now that they shouldn't open the big metal doors. The winner of a US competition was Brandon Alms with a picture of two little rabbits looking up at a glowing circular symbol, bathing in its light. The message was not in the symbol itself. It was in the fact that the rabbits' shadows each had three ears.

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