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THE ARAB SPRING AND ITS IMPACT ON SUPPLY AND PRODUCTION IN GLOBAL MARKETS

EUCERS/KAS ENERGY SECURITY FELLOWSHIP 2012-13

SHIRAZ MAHER

In cooperation with

Konrad Adenauer Stiftung

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IMPRESSUM

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EDITORIAL

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Foreword

Dr Gerhard Wahlers, Deputy Secretary General of Konrad-Adenauer-Stiftung in Berlin, Germany and **Professor Dr Friedbert Pflüger**, Director, EUCERS, King's College London

The Konrad Adenauer Stiftung (KAS) and the European Centre for Energy and Resource Security (EUCERS) at the Department of War Studies, King's College London support a young fellow each year with an innovative research proposal on energy security. For this purpose the Fellow has the opportunity to spend two semesters at King's College London, one of England's oldest and most prestigious universities to conduct research on a given topic, jointly decided by EUCERS and KAS.

Shiraz Maher is the first KAS Energy Security Fellow at EUCERS and has spent his research year at King's in 2012/13. During his fellowship, Shiraz has written the study "The Arab Spring and its Impact on Supply and Production in Global Markets".

The Middle East is among the most important regions in the world for the supply and production of energy resources. Indeed, the Arab world holds 49.6% of the world's proven oil reserves and 29.1% of its natural gas. The Arab Spring has distorted an already muddled picture, dramatically recasting the contours of an ordinarily fissiparous region. Significant fluctuations of oil prices on global markets were first felt when the Arab Spring embraced Libya. Production of light sweet crude oil plummeted dramatically from 1.3 million barrels per day to just 60,000. That loss accounts for around 5% of Europe's total supply.

While fossil fuel trade remains of high importance, Shiraz also dedicates a chapter on how the Arab uprisings have emphasized the importance of alternative energy resources and diversification of supply in the region.

The study is a timely and important analysis of the background of the Arab Spring. This includes an overview of the political situation and dependency on energy revenues of the region but also illustrates the economic and energy market impact and considers in the last part geopolitical implications.

We would like to thank the author, Shiraz, who also assisted EUCERS and the KAS in implementing the jointly organised EUCERS/ACATECH/KAS workshop series on resilient energy infrastructure.

EUCERS and KAS are delighted to host this exceptional Fellowship. We would like to take the opportunity to thank Claudia Crawford, former Director London Office, KAS, Hans-Hartwig Blomeier, Director London Office, KAS and Carola Gegenbauer, Operations Coordinator, EUCERS for their support in our joint projects and are looking forward to our cooperation in the years ahead.

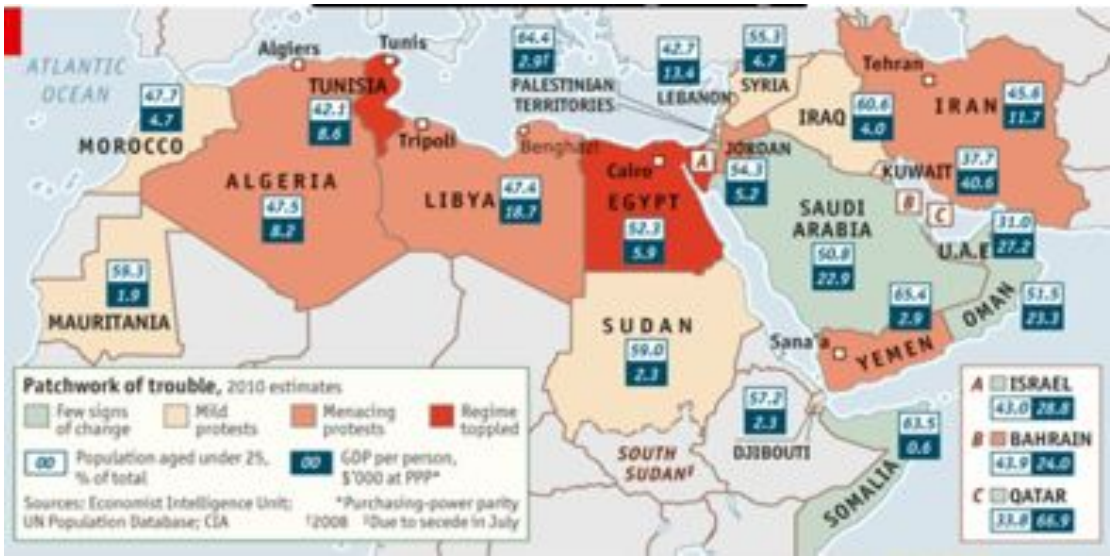
Introduction

When Mohamed Bouazizi, an impoverished street vendor, immolated himself in Tunisia he could barely have imagined the sequence of events it would trigger. A spontaneous revolution borne of economic grievances and corruption spread across the country, unseating the seemingly entrenched government of Zine El Abidine Ben Ali. The touchpaper was lit. More than 100,000 people gathered in Egypt's Tahrir Square on a 'day of rage' designed to express their frustration with the rule of Hosni Mubarak. Eighteen days later, his government would also fall. Unrest spread at an accelerated rate. Libya, Yemen, Bahrain, Iran, and most dramatically of all, Syria, experienced popular uprisings too. For a while it seemed as if entire region would be engulfed by popular unrest, recasting the contours of power in one of the world's most fissiparous regions.

Ever since the Arab uprisings, much has been written about the future of the region. What inspired the unrest? What were protesters campaigning for? And what end goals did they have in mind? The Arab Spring has rightly been characterised as 'leaderless,' that is to say there was no charismatic figurehead who directed and led the protests. Instead, a new generation of young Arab citizens began organising themselves online, venting their anger on social networking platforms like Facebook and Twitter. Behind the anger there was also a lack of any dominant ideology or political alternative to what the protesters were railing against. Islamists, socialists, democrats, and communists all rubbed together in gathering spots like Egypt's Tahrir Square when they campaigned against the rule of Hosni Mubarak.

Herein lies the key point of the political context for the Arab Spring. The principal cause of the unrest was concern over issues like accountability, corruption, and the economy (particularly with regards to unemployment). That much is clear from the ongoing unrest in places like Egypt where the Muslim Brotherhood's administration suffered a counter-revolution just over a year after coming to power. New administrations in Tunisia and Libya are also struggling to assert themselves with meaningful authority. Libya, in particular, continues to suffer from severe unrest with jihadist organisations flourishing in the eastern provinces of the country – some of which were linked to the killing of American Ambassador Christopher Stevens during an attack on the U.S. consulate in Benghazi in 2012.

Map 1
The Arab Uprising, September 2011



Source: The Economist

Despite the 'domino effect' of the Arab uprisings, the Middle East remains a diverse region. What, then, unites these different revolutions? While opposition to authoritarianism and repression provides a partial explanation, it is not sufficient in itself. This does not tell us, for example, why only some Arab countries experienced unrest while others did not – given that almost all are, to varying degrees, autocratic and repressive. Moreover, almost all countries in the region have high rates of youth unemployment – averaging 20 percent across the region as a whole (and 30 percent in Libya) – while also suffering from rising social and income inequality, increased inflation, and corruption.[1]

To understand this it is important to note that Arab governments have traditionally maintained power through a so-called 'authoritarian bargain.' This is the premise on which their rule has been predicated, particularly as repression alone only breeds discontent. According to Desai, Olofsgard, and Yousef:

> ...some form of redistribution to citizens is necessary to secure and maintain their loyalty. Dictatorial regimes are therefore said to rely on an ''authoritarian bargain,'' or an implicit arrangement between ruling elites and citizens whereby citizens relinquish political influence in exchange for public spending.[2]

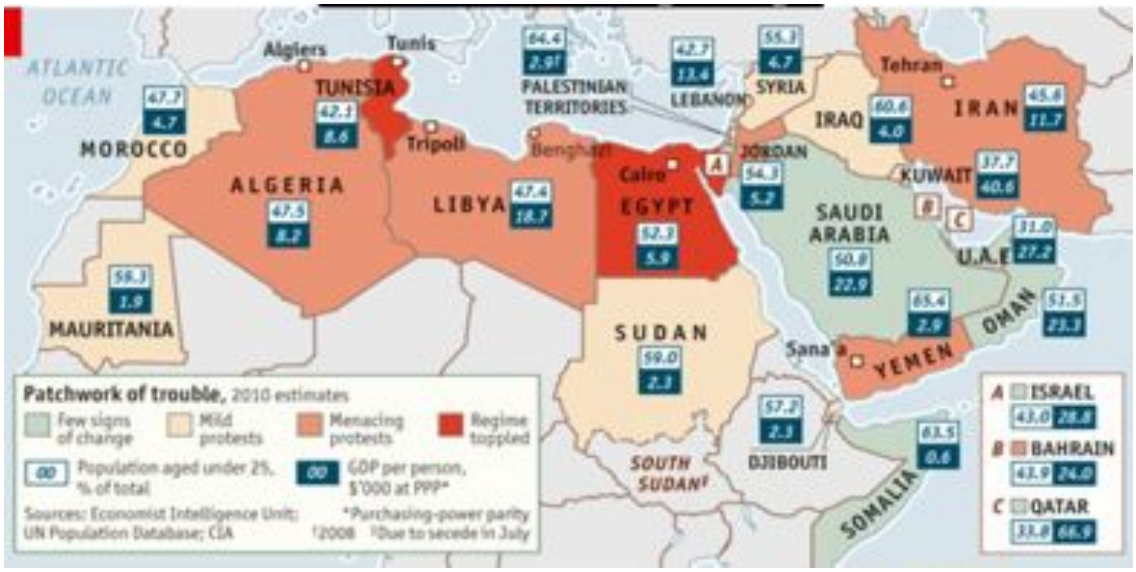
It can be said that unrest primarily hit those countries where the authoritarian bargain unravelled. Typically, these are countries with a low GDP per capita (with reference to purchasing-power

[1] House of Commons, *Foreign Affairs Committee – Second Report British foreign policy and the "Arab Spring"* (Parliament: London, 2012)

[2] Raj Desai, Ander Olofsgard, Tarik Yousef, 'The logic of authoritarian bargains,' *Economics and Politics*, No 1, Vol 21, March 2009, p.93

parity). All the countries which experienced menacing or severe protests have a GDP-PPP per capita under $20,000. The main exceptions to this are Iraq and Lebanon which both have low GDP-PPP but did not experience widespread unrest. In both cases, these countries have experienced significant conflict in the recent past – with the Lebanese Civil War, and Second Gulf War – making their populations weary of social unrest. Nonetheless, both still experienced some degree of mild protest.

Map 2
Arab Spring Countries with population and GDP statistics



Source: The Economist

Meanwhile, the resource-rich Gulf States were left largely untouched by the unrest which affected parts of North Africa and the Levant. These countries all have a GDP-PPP per capita in excess of $20,000 which allowed them to maintain the redistributive elements and social expenditure needed to sustain the authoritarian bargain. These countries responded to the Arab Spring by unveiling ambitious new plans for social welfare provision, boosting public sector wages, and increasing subsidies. They had the resource capacity to do this. The main exception to this is Bahrain where, despite its high GDP-PPP, the country still suffered notable unrest. Yet, an examination of Bahraini society and the uprising there reveals a more intractable problem – sectarianism. The unrest there was primarily fuelled by the majority Shia population who objected to the ruling Sunni family. All of these factors – political, economic, sectarian – and their implications for the region's energy resources, both locally and internationally, are considered in this paper. More importantly, this paper also considers the fallout of all this on global energy markets. After all, despite increasing attempts to diversify energy sources and manage demand, there is still heavy global reliance on hydrocarbon exports from the Middle East and North Africa (MENA).

Introduction

It is a tired truism, of course, to state that the MENA region is among the most important in the world for the production and supply of hydrocarbons. More than 60 percent of the world's proven conventional oil reserves, and 40 percent of the world's proven gas reserves are concentrated there. Moreover, the MENA region has traditionally responded to demand increases. Between 1970 and 2004 the MENA share of total global production periodically ranged anywhere from 25 percent up to 42 percent.[3] From 1984 to 2004, MENA's overall oil production doubled.[4]

The Arab Spring brought the dangers of overreliance on MENA energy reserves into sharp relief. Its corollary is to achieve energy security, that is, minimising price shocks caused by externalities, while diversifying the overall pool of energy types and sources. With regards to the Arab uprisings the disruption of Egyptian gas supplies in addition to the loss of Libyan crude output heightened very real fears of massive hydrocarbon shortages. These fears were accentuated when it seemed like protests might engulf some of the most important global oil exporters such as Saudi Arabia, Kuwait, and the United Arab Emirates. Indeed, the International Energy Agency was forced to respond to disruption from the Libyan uprising by releasing emergency oil stocks onto the market.[5] Saudi Arabia provided further stability by compensating for the loss of output by tapping into its reserve capacity and boosting production.

The exposure to MENA energy markets prompted President Barack Obama to address an audience in Washington D.C. on the topic of energy security. "We meet here at a tumultuous time for the world. In a matter of months, we've seen regimes toppled," Obama said. "Obviously, the situation in the Middle East implicates our energy security." [6] This was a concern, of course, not just for the United States, but for consumers around the world.

[3] Anthony Cordesman and Khalid al-Rodhan, *The changing dynamics of energy in the Middle East, Volume 2* (Center for Strategic and International Studies, 2006) p.20

[4] Ibid.

[5] "How does the IEA respond to major disruptions in the supply of oil?," *International Energy Association* http://www.iea.org/topics/energysecurity/respondingtomajorsupplydisruptions/

[6] "Remarks by the President on America's Energy Security," The White House, Office of the Press Secretary (Georgetown, March 30, 2011) http://www.whitehouse.gov/the-press-office/2011/03/30/remarks-president-americas-energy-security

The Middle East is a diverse region comprising of theocracies, monarchies, and military leaders. Almost all are autocratic, to vary degrees and in different ways. While the region defies easy generalisations, the workings of the authoritarian bargain across the Middle East and North Africa (although the idea is not exclusive to governments there) accounts for one of the principal means by which Arab regimes have traditionally perpetuated their rule.

Countries where this bargain disintegrated were characterised by high unemployment, rising inflation (particularly with regards to the cost of energy and food), and political repression. On the latter point, grievances were acute and focused on the lack of accountability concerning public officials. Indeed, many of the Arab countries which experienced unrest – and, in some cases, continue to experience it – had longstanding 'emergency laws' which effectively suspended habeas corpus for decades and allowed political prisoners to be tried before military or state security courts. The charges against them were often spurious, the evidential standard low, and there was no avenue for recourse to civilian courts. The Egyptian government reintroduced these laws in August 2013 after violence flared between the army and members of the Muslim Brotherhood.

The stifling environment created by this lack of accountability is precisely what inspired Mohammed Bouzizi to immolate himself in Tunisia after the obstructionism of aldermen and harassment from police officials became too much. The antecedents of the popular anger directed against Hosni Mubarak emerged from similar roots. Egyptian anger had been building ever since overzealous policemen killed Khaled Said in June 2010. In many respects, his murder was a metaphor for the entire Arab Spring. Said had visited an internet café near his flat in the coastal city of Alexandria where local policemen happened to be sharing a video among themselves showing them illegally taking seized drugs and money.

The file was accidently transferred to Said's computer over a wireless network and he was detained after forwarding it to friends. Witnesses subsequently reported seeing policemen beat Said to death in public view. An official government report said his death was caused by a drugs overdose. Said's unconvinced relatives later bribed a mortuary worker to take photos of his corpse which revealed all the indelible horrors of state-sanctioned torture: a cracked skull and twisted, tortured features.[7]

Wael Ghonim, Google's Middle East marketing manager, ensured the pictures went viral after creating the page "We are all Khaled Said" on the social networking site Facebook. Egypt's savvy internet generation finally found an emblem to rally their anger, just as the dying images of Neda Soltan had galvanised Iranians

[7] Wael Ghonim, *Revolution 2.0: The Power of the People is Greater Than the People in Power, A Memoir* (Houghton Mifflin Harcourt: New York, 2012) pp.58-81

during the Green movement protests in 2009.

The most interesting of the North African states in this regard is Libya. There was no immediate case of state brutality which spawned the uprising there, but a general case of neglect with regards to social infrastructure in the east. A report in *Time* magazine explained:

> The city of one million has one sewage treatment plant, built more than 40 years ago. Waste is just flushed into the ground or the sea, and when the water table rises in winter, the streets become open cesspools. Benghazi, the second largest city in a country with vast oil wealth and a tiny population, is rotting in its own fifth.[8]

This need not have been the case in Libya. In the years preceding 9/11 Western governments, most notably the United States and Britain, believed that the best way to reform autocratic regimes in the Middle East was through political and economic engagement. That belief led a carousel of leaders courting governments previously considered beyond the pale, including the administration of Muammar Gaddafi. In itself, it was a remarkable development of British state policy that then Prime Minister, Tony Blair, was prepared to cut deals with a man accused of supporting terrorism on British shores. In return, Gaddafi agreed to abandon his pursuit of Weapons of Mass Destruction in return for an easing of his country's international isolation.

Two decades of sanctions quickly disappeared. The United Nations lifted sanctions against Libya in 2003, while both Britain and the United States restored diplomatic relations with Tripoli. There were clear commercial advantages to this. At the end of 2011 Libya was known to hold 48 billion barrels (4 percent) of OPEC's proven crude oil reserves.[9] That, coupled with low production costs and Libya's proximity to Europe made the exploitation of its oil reserves particularly attractive.

The easing of diplomatic tensions with Libya revived the country's stagnating oil sector after a massive decline from its high watermark in the 1970s when production had peaked at 3.320 million barrels per day.[10] By 2003, production was less than half that rate. Moreover, at the time, just 25 percent of the country was covered by exploration licenses. From 2003 to 2011 Libya's hydrocarbon resources therefore experienced a revival as they were traded more freely and competitively on international markets (see graph 1). This political environment, however, would feed into a much more complex energy picture in the region, which would suffer a number of strains following the start of the Arab uprisings.

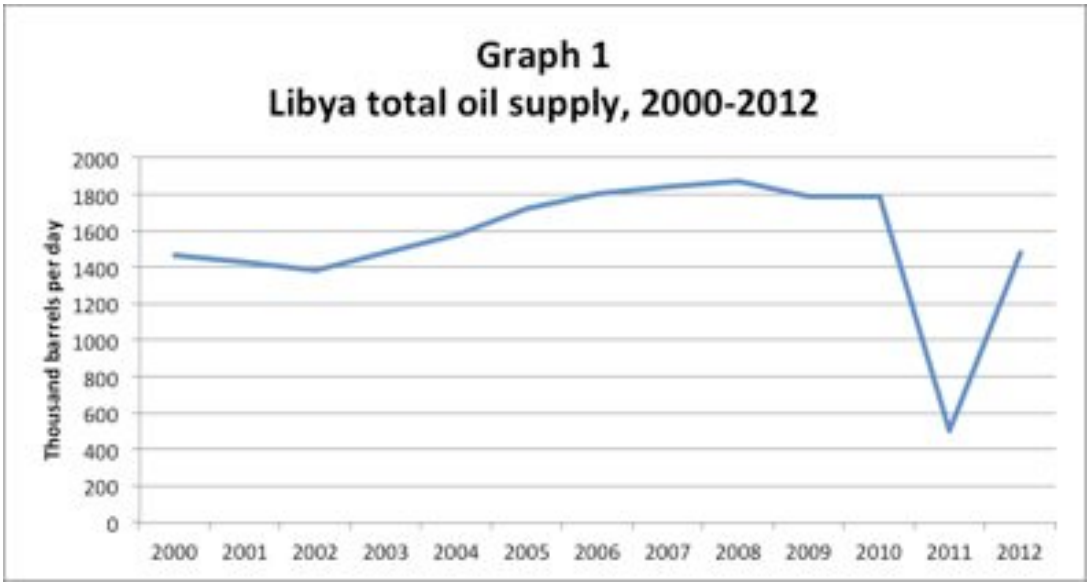
[8] Andrew Lee Butters, 'Dispatch from Libya: why Benghazi rebelled,' *Time*, March 3, 2011.

[9] OPEC Annual Statistic Bulletin 2012, (OPEC, 2012) p.22-23

[10] Gawdat Bahgat, 'The impact of the Arab Spring on the oil and gas industry in North Africa – a preliminary assessment,' *The Journal of North African Studies*, Vol. 17, No. 3, June 2012, p.509

Energy situation in MENA

The effects of Arab unrest were felt differently in different countries. Protests in Libya quickly gave rise to a civil war which dramatically impacted oil production. When Gaddafi launched a military crackdown in response to the unrest, the United Nations responded by issuing a new series of sanctions against the country while also subjecting it to an arms embargo. This created the first major supply disruption of the Arab Spring.



Source: U.S. Energy Information Administration

The losses resulting from Libyan disruption amounted to 1.6 million barrels per day, in addition to another 136,000 barrels per day of refined products (see graph 3).[11] What made the loss of Libyan supply so important, however, is that Libyan crude is predominantly high-quality, low-sulphur, and 'sweet.' This makes it particularly cost-effective for gasoline, diesel, and jet fuel. By contrast, sour grades of oil contain higher levels of sulphur and need greater refinement before use. Not only does this raise production costs, but many refineries in both Europe and Asia also lack the capabilty to refine sour crude. Therefore, although Libyan supply only accounts for a minor part of overall global output, it nonetheless constitutes a significant portion of the overall supply of 'sweet' crude, providing a grade of output that cannot be easily offset even by the swing production of states like Saudi Arabia.

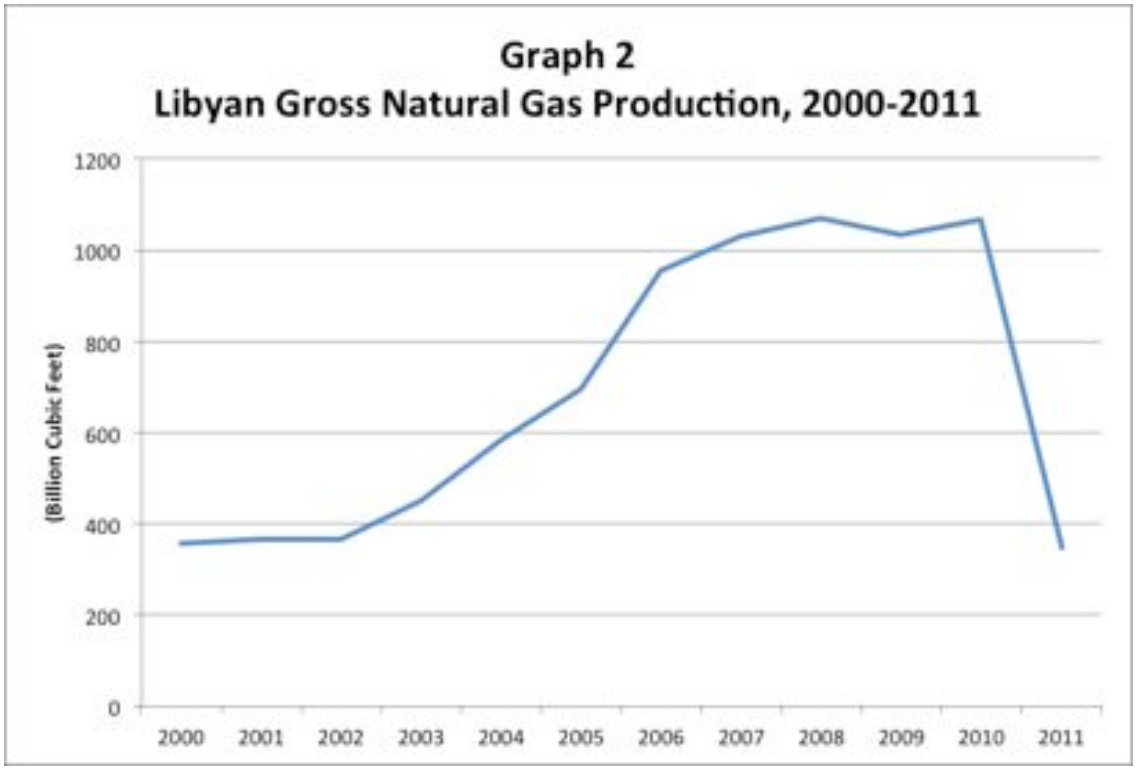
Libyan gas production and exports also declined sharply with the onset of the civil war (see graph 4). [12] The ramifications of this disruption were relatively limited, given that almost all of Libyan gas production is exported to

[11] Hakim Darbouche and Bassam Fattouh, "The implications of the Arab uprisings for oil and gas markets," *Oxford Institute for Energy Studies*, September 2011, p.9; Also see: Energy Information Administration, International Energy Statistics

[12] Energy Information Administration, International Energy Statistics

Italy through the Greenstream pipeline. This did not adversely affect the Italians too dramatically who were already locked into minimum supply contracts with a number of other countries including, most notably, Russia and Algeria. Indeed, the outgrow of all this meant that Italy was oversupplied with gas from 2009 onwards and developed an extensive storage capacity, not least because it continued to take-up a large proportion of its 'take or pay' contracts with other suppliers.[13]

The other significant country to have been affected by political turmoil was Egypt. It is not a significant oil producer and holds just 0.3 percent of the world's proven reserves. Moreover, domestic consumption has increased by more than a third in the last decade (in part, due to ongoing subsidies). As a result, Egypt has become increasingly reliant on oil imports and risks suffering an acute energy crisis as its economy continues to stagnate (see table 3 below for a comparison of Egypt's production and consumption).[14]



Source: U.S. Energy Information Administration

[13] Hakim Darbouche and Bassam Fattouh, "The implications of the Arab uprisings for oil and gas markets," *Oxford Institute for Energy Studies*, September 2011, p.30

[14] Gawdat Bahgat, 'The impact of the Arab Spring on the oil and gas industry in North Africa – a preliminary assessment,' *The Journal of North African Studies*, Vol. 17, No. 3, June 2012, p.505

Table 1
Egypt's oil production and consumption 2000 – 2010 (1000 barrels per day)

Year	Production	Consumption
2000	781	552
2001	758	537
2002	751	524
2003	749	540
2004	721	556
2005	696	616
2006	697	598
2007	710	638
2008	722	680
2009	742	719
2010	736	757

Source: Gawdat Bahgat, 'The impact of the Arab Spring on the oil and gas industry in North Africa – a preliminary assessment,' The Journal of North African Studies, Vol. 17, No. 3, June 2012, p.505

Despite Egypt's negligible oil production, the country is nonetheless the largest crude refiner in Africa with 10 refineries. It therefore imports, processes, and then exports oil. This forms an important cornerstone of Egypt's oil sector with the refining and shipping of crude products. None of this was adversely affected by the turbulence that accompanied the overthrow of Hosni Mubarak. Indeed, the revolution was largely confined to Cairo's Tahrir Square and it was clear from the earliest stages of the uprising that the Army would guarantee the security of energy facilities around the country – not least by boosting sentry points along strategic installations.

By contrast to its fledgling oil industry, Egypt's gas sector has been developing rapidly for both domestic and international consumption. The country holds Africa's third largest proven gas reserves (behind Nigeria and Algeria) and – unlike oil production – saw a consistent rise in production over the last decade. From 2000 to 2010 production trebled although much of this was offset by a more than doubling of domestic consumption too (see table 5).[15]

Table 2
Egypt's natural gas production and consumption 2000 – 2010 in billion cubic metres

Year	Production	Consumption
2000	21.0	20.0
2001	25.2	24.5
2002	27.3	26.5
2003	30.1	29.7
2004	33.0	31.7
2005	42.5	31.6
2006	54.7	36.5

[15] Gawdat Bahgat, 'The impact of the Arab Spring on the oil and gas industry in North Africa – a preliminary assessment,' *The Journal of North African Studies*, Vol. 17, No. 3, June 2012, p.506

2007	55.7	38.4
2008	59.0	40.8
2009	62.7	42.5
2010	61.3	45.1

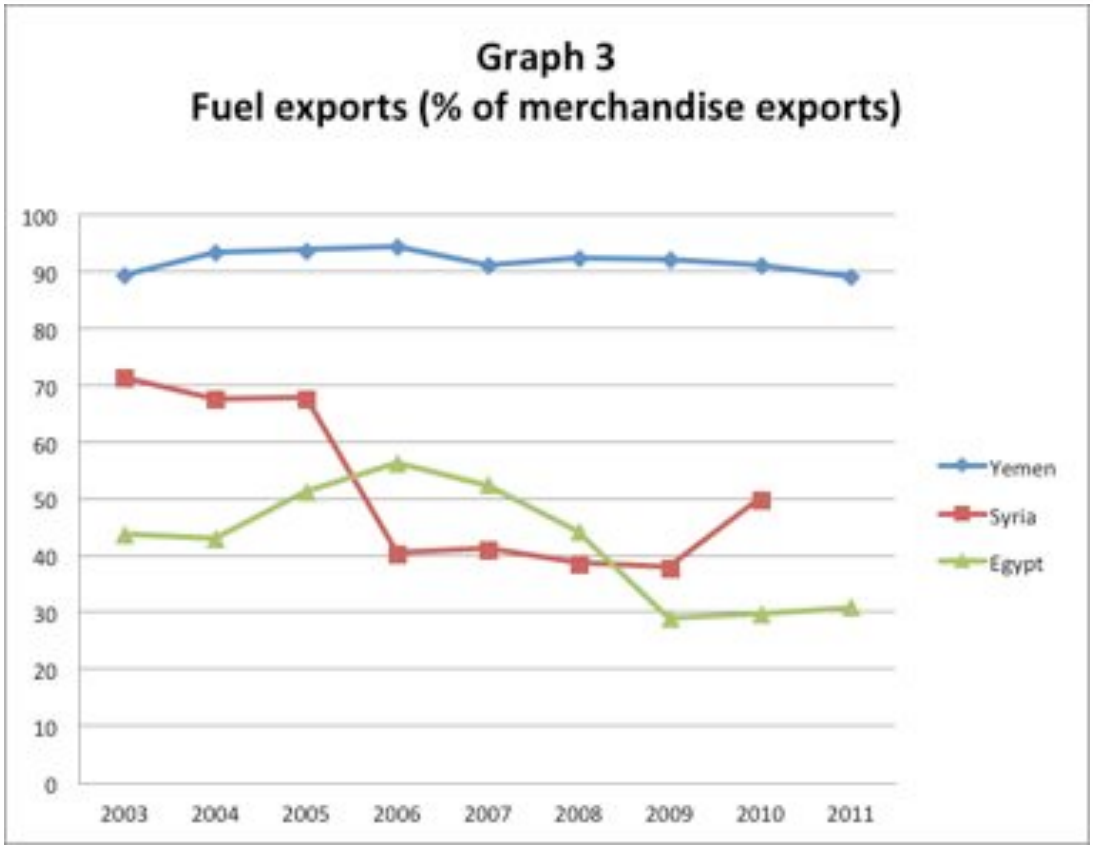
Source: Gawdat Bahgat, 'The impact of the Arab Spring on the oil and gas industry in North Africa – a preliminary assessment,' The Journal of North African Studies, Vol. 17, No. 3, June 2012, p.506

Egypt's gas exports primarily supply countries in the Mediterranean and in the Atlantic basin, with exports to Israel, Jordan, Syria, and Lebanon running through the Arab Gas Pipeline. Market uncertainty contributed to fluctuations in gas prices although, just as was the case with oil, there was no significant disruption to gas production or export from Egypt in the immediate short term (in the long run, however, Egyptian gas supply was subject to disruption and is discussed later in this paper).

Dependency on Energy Revenues

The relationship of some Arab economies with energy resources exposed the dependence of almost all MENA countries on energy revenues. Typically, countries in the region do not have diversified economies and rely heavily on the export of one commodity. This is true even for some resource-poor countries like Syria and Yemen. Energy exports comprise a large part of their export structure, coupled with rents derived from other natural resources. Consider Syria, for example, which does not retain any significant oil reserves. From 2003 - 2005 the country's fuel exports accounted for 71 percent to 67 percent of its total merchandise exports. The issue is much more acute in Yemen which is only a modest oil producer. The World Bank estimates that Yemeni oil reserves will be exhausted by 2018 when hydrocarbon revenues – derived from LNG exports and domestic gas sales – will have fallen to 30 percent of government receipts.[16] This is set to cause serious problems given that in 2006, 74 percent of Yemeni fiscal revenues and 92 percent of merchandise export revenues were derived from oil receipts.[17] The graph below (graph 3) reveals the extent to which Syria, Yemen, and Egypt are reliant on fuel exports.[18] It underscores the importance of fuel exports to even resource poor economies in the Middle East and North Africa region. There is a broader observation to be made from this. While resource-poor countries rely on energy revenues, they generate less revenue than their resource-rich counterparts. Moreover, their counterparts are able to fall back on greater reserves to boost production, raise additional revenues, and distribute funds through social spending commitments.

[16] International Development Association and International Monetary Fund, *Republic of Yemen: Joint World Bank/IMF Debt Sustainability Analysis* (January 2008) p.4
[17] Ibid.
[18] Compiled from data provided by the World Bank, Comtrade database maintained by the United Nations Statistics Division, World Development Indicators.



Source: Compiled from data provided by the World Bank, Comtrade database maintained by the United Nations Statistics Division, World Development Indicators.

Egypt has recognised the need to diversify its economy away from overreliance on rents – that is, wealth derived from geographical and historical fortune – by stimulating economic growth which both creates and sustains jobs.

One longstanding proposal has been to turn the area around the Suez Canal into an international trading and industrial centre, in a project known as the Suez Canal Development Project. To understand the potential implication of this development, consider that goods worth $1.6 trillion pass through the canal annually.[19] That amounts to 10 percent of the world's total shipped goods. Of this, Egypt only capitalises on around $5 billion annually through charging transit fees. The benefits of enhanced commercial activity along the canal would therefore generate substantial and sustained growth by allowing a service sector to develop alongside rent receipts generated by the canal itself.

Documents from the British embassy in Cairo reveal that although Egypt is now committed to pursuing plans for development of the Suez corridor, it lacks the requisite funds to finance the project itself. To do it effectively, the Egyptians have tried to raise an estimated $100 billion from foreign investors, though build–operate–transfer (BOT) or build–

[19] "Egypt sees revenue in Suez Canal corridor project," *Reuters*, October 10, 2012

own–operate–transfer (BOOT) agreements. [20] This would require investors to assume considerable risks in an area of Egypt which, outside of Cairo, has experienced significant levels of violent unrest.

Investors are therefore weary of committing to capital intensive projects with high sunk costs in a country which remains far from stable. Even non-traditional partners in the East such as India and China (traditionally less risk averse than their Western counterparts), have been reluctant to commit capital resources to the country.

That cautiousness will likely continue given the increased level of instability affecting Egypt in the aftermath of Mohammed Mursi's removal from office. Political violence gripped several Egyptian cities, resulting in hundreds of deaths and thousands of activists being injured. Terrorist attacks also intensified, particularly in the Sinai Peninsula and in northern Egyptian towns, where much of the country's industrial output is concentrated.

This background to the Arab uprisings reveals an interconnected relationship between politics and energy resources, on which a number of regional governments are extremely dependent. The proximity of this relationship would mean that both energy and financial markets were exposed to the fallout of unrest across North Africa and the Levant, which is considered next in this paper.

Part 2 – Economic and Energy Market Impact

Risks: Terrorism and sabotage

The risk of subversive terrorist activity directed against critical energy infrastructures in the MENA region has been heightened following the Arab uprisings. While Islamists may not have played a leading role in many of the revolutions themselves, they have subsequently emerged as powerful actors in their respective societies. Old groups like the Muslim Brotherhood have been emboldened while new groups such as Ansar as-Shariah have emerged in Libya, Tunisia, and Yemen. With an extensive oil and gas infrastructure housed in the region, it is important to consider the threats from terrorists to these installations.

[20] "Minutes of meeting with Dr. Waleed Abdel Ghaffar, Head of Technical Committee for Suez Canal Corridor," British Embassy in Cairo (UK Trade and Investment), March 21, 2013. http://www.maritimeindustries.org/write/Uploads/News/2013/2nd%20Quarter/Meeting_with_Dr__Waleed_Abdel_Ghaffar_21-3-13.pdf

Map 3
Selected Oil and Gas Pipelines in the Middle East

Source: U.S. Energy Information Administration
Note: Libya and Tunisia are excluded from this map

Libya

Although Libyan hydrocarbon exports took dropped sharply during the revolution, in many respects the recovery of its energy industry in the aftermath of the civil war has been one of the Arab Spring's success stories. After the transitional government was established in Tripoli in 2011, in less than eighteen months the Libyan oil sector had recovered to its pre-disruption levels. This was crucial for the Libyan economy given that oil exports account for more than 95 percent of Libya's hard currency and almost all of its GDP.[21]

Despite this, Libya remains highly susceptible to turbulence. In September 2012 the American ambassador was killed in Benghazi during a terrorist attack. A powerful Salafi-Jihadist militia known as 'Ansar al-Shariah' (Supporters/Helpers of Shariah) was linked to the attack and enjoys growing influence in the eastern parts of the country. This is accentuated by the fact that Libya has a central government which can barely exert any meaningful authority beyond its capital city.

This climate ensures Libyan oil production will remain imperilled because it is frequently targeted during political unrest. In June 2013 this is precisely what contributed to a sharp decline of 30 percent in production, following serious industrial action by workers striking for better pay, benefits, and better opportunities.[22] In most cases protesters blockaded ports to prevent workers from reaching the plants, and prevented exports from leaving. These protests spread and continued through July and August, costing the Libyan economy an estimated $1.6 billion in lost revenues while crippling the ports of Zeitunia, Brega, Ras Lanouf, and Sedra.[23]

The impact of all this has not been limited to Libya's borders. The Italian company, Eni (the largest foreign operator in Libya) has lost an estimated $2 million per day in lost production. [24] The Austrian and Spanish companies, OMV and Repsol, also had to temporarily halt production in July due to the protests.[25]

This is a replica of earlier demonstration which occurred in March when protesters blockaded the Waha oilfield for three weeks, preventing contractors and equipment from reaching it. [26] Similar episodes of industrial action have also taken place in Morocco, Mauritania, and Niger, with mining sites being targeted in the first two countries and oilfields in the latter.

Libya's Prime Minister, Ali Zeidan, has now threatened a military crackdown to alleviate the pressure caused by

[21] Geoff Porter, *The New Resource Regionalism in North Africa and the Sahara*, SciencesPo, July 2013. http://www.sciencespo.fr/ceri/en/content/new-resource-regionalism-north-africa-and-sahara

[22] Ibid.

[23] 'Libyan PM Ali Zeidan warns oil port protesters', *BBC Online*, 16 August 2013.

[24] 'Libya's worst oil unrest since civil war stores up future trouble,' *Reuters*, August 8, 2013.

[25] Ibid.

[26] "Protesters target field belonging to Libya's Waha Oil," *Al-Arabiya*, March 14, 2013.

protesters.[27] Zeidan is worried that if Libya develops a reputation for unreliability then it will be forced to discount its crude prices for customers. Indeed, a number of European refineries have already found themselves short of Libyan light sweet crude, causing the price of alternatives such as Azeri and Kazakh oil to spike.

Direct action of this kind is a new phenomenon in the MENA region. It follows in large part from the environment created by the Arab uprisings. The fall of autocratic regimes has raised social expectations and made people more inclined towards voicing political dissent and taking collective action. Moreover, the so-called 'fear barrier' of the coercive police states in many of these countries has now been broken. This does not mean that human rights abuses are not still commonplace – they are – but ordinary citizens are now far more prepared to challenge that status quo.

Geoff Porter has argued that the newfound empowerment of locals, and their willingness to protest vociferously in defence of their interests represents a new kind of 'resource regionalism.'[28] This builds on the idea of resource nationalism where newly independent countries in the last century expressed their sovereignty by nationalising their industries. This trend was revived in the early 2000s when commodities prices rose in line with increased demand from the East, particularly India and China. Russia pressured BP and Shell into ceding majority shares in Russian gas to state run Gazprom. Bolivia also nationalised its oil and gas fields. Hugo Chavez gave foreign companies operating in Venezuela a similar ultimatum when he warned that if they failed to turn over majority control to a state owned company, he would nationalise resources in the Orinoco River basin.[29] The Council on Foreign Relations branded this trend as marking 'the return of resource nationalism.'[30] Porter has developed this idea to explain the upsurge in local communities in MENA demanding greater benefits from resources following the Arab uprisings. He explains:

> If resource nationalism was about states insisting on greater benefits from the extraction of the natural resources by foreign firms, then resource regionalism is about local communities demanding greater benefit from those same industries but at the expense of the central state. Resource regionalism is the local equivalent of resource nationalism.[31]

[27] 'Libya threatens army action against oil protesters,' *Reuters*, August 15, 2013.
[28] Geoff Porter, *The New Resource Regionalism in North Africa and the Sahara*, SciencesPo, July 2013. http://www.sciencespo.fr/ceri/en/content/new-resource-regionalism-north-africa-and-sahara
[29] Toni Johnson, 'The Return of Resource Nationalism,' *the Council on Foreign Relations*, August 13, 2007. http://www.cfr.org/venezuela/return-resource-nationalism/p13989
[30] Ibid.
[31] Porter, *The New Resource Regionalism in North Africa and the Sahara*, SciencesPo, July 2013. http://www.sciencespo.fr/ceri/en/content/new-resource-regionalism-north-africa-and-sahara

This resource regionalism is now one of the biggest challenges facing Libyan oil production, with locals demanding a greater share of the spoils from their regional resources. Resolving the tensions between the central state and regional actors will be crucial for Libyan stability in the years ahead, although problems between a bloated and bureaucratised central administration and overlooked regional counterparts has long been a problem in Libyan politics. Forging a national consensus over increased localism is therefore unlikely to be a problem which Zeidan's government is able to resolve quickly.

Algeria

The most significant terrorist incident linked to the Arab Spring was played out in a country that has not experienced any significant unrest itself. Algeria has largely managed to weather the revolutionary violence which engulfed its neighbours, a factor that is in largely due to the Algerian civil war which raged for almost a decade before its conclusion in 2000. Yet, the process by which al-Qaeda affiliated gunmen took nearly 800 workers of the Tigantourine gas facility near In Amenas hostage stems from the unintended consequences of the Arab Spring.[32]

The crisis ostensibly had its roots in Mali, Algeria's neighbour to the southwest. The hostage-takers claim to have acted in response to France's intervention in Mali where its soldiers helped the government repel a jihadist insurrection. But the story actually begins in Libya, where NATO forces decided to support the Libyan rebellion against Moammar Gadhafi in 2011.

Gadhafi had long drawn mercenaries from among the Tuareg, a nomadic ethnic group known as 'the Kurds of Africa' because they are spread across five countries without a state of their own. When the Arab Spring spread from Tunisia and Egypt to Libya Gadhafi enlisted support from thousands of Tuareg fighters to suppress the rebellion, particularly after his own regular forces began to defect.

After Gadhafi was killed in October 2011, his Tuareg forces fled the country because Libyans were particularly hostile towards them for the role they had played in the uprising. Most of them fled to Mali, bringing with them caches of sophisticated arms, including heavy weaponry and antiaircraft missiles.

Jihadist fighters operating in the Sahel benefitted from this arsenal as it flooded the black market after Gadhafi's demise. Groups like al-Qaeda in the Islamic Maghreb (AQIM), Ansar Dine, and the Movement for Unity and Jihad in West Africa bought up the weapons.

By June 2012, the jihadists (along with some nationalist groups like the

[32] 'Shiraz Maher: The Jihadist Eruption in Africa,' *Wall Street Journal*, January 18, 2013

Movement for the Liberation of Azawad) had effectively removed all traces of government control in northern Mali, creating an Islamic State. Thus, when French troops launched Operation Serval to halt the flow of jihadist influence, jihadists responded by striking against the Tigantourine gas facility. Their aim was to strike against the site in order to hit western interests directly (both Britain's BP and Norway's Statoil hold stakes in Tigantourine), while also causing price rises in global markets.

The costs, financial and non-pecuniary, of the incident have been far reaching. By the end of March 2013 the incident was estimated to have cost $645 million, with an ongoing average daily loss of $7 million.[33] Moreover, as a result of the attack, Algeria has experienced a production decline every month this year. BP has also delayed two major Algerian gas projects in the aftermath of the hostage crisis while it – along with other international oil companies (IOC) such as Total and Statoil – complain of the sharp rise in operating costs following the incident. Security bills have also trebled at a time when IOC's were already complaining about the tough regulatory framework of doing business in the country.

Egypt

The greatest disruption in Egypt came from sabotage to the Arish-Ashkelon pipeline which supplies Israel with gas. The pipeline provided around 40 percent of Israel's gas and was the only meaningful manifestation of the peace treaty between the two countries.[34] The gas supply agreement was signed in 2005 by the Egyptian General Petroleum Corporation (EGPC)/Egyptian Natural Gas Holding Company (EGAS), the East Mediterranean Gas Company (EMG; which owns and operates the Arish-Ashkelon pipeline), and the Israel Electric Company (IEC). Under the deal, Egypt would supply Israel with 25 billion cubic metres of gas over 15 years at an annual rate of 1.7 billion cubic metres.

The deal was wildly unpopular not just because many Egyptians objected in political terms to normalisation with Israel, but also because Israel was being sold gas at half the price countries like Turkey and Greece were paying on the open market. Under the agreement, Egypt would sell gas to EMG (which is jointly Egyptian-Israeli run) who then sold it to the IEC for around $3 per mbtu (million British thermal units). IEC would then resell the gas for around $4.5 mbtu, allowing it to achieve 50 percent margins on imported Egyptian gas.[35] Once the revolution began an inevitable pattern of sabotage followed.

Mubarak had not even fallen when the first significant attack against the pipeline occurred. On February 5, 2011,

[33] Attack on Ain Amenas in Algeria: Implications and Recommendations, *Butchko Security Solutions*, March 2013

[34] Shmuel Even, "Egypt's Revocation of the Natural Gas Agreement with Israel: Strategic Implications," *Institute for National Security Studies*, Insight No. 332, May 6, 2012.

[35] Joseph Hammond, "Egypt's Gas Trade: Exit Pharaoh, Enter Leviathan?," *Think Africa Press*, March 29, 2012

saboteurs caused an explosion on the pipeline leading Egypt to temporarily halt gas exports to Israel and Jordan. While Israel receives around 40 percent of its gas from Egypt, the situation was even more acute in Jordan which relies on Egypt for 80 percent of its supply.[36] In the twelve months that followed Mubarak's overthrow the pipeline was attacked twelve times resulting in frequent supply disruptions. These countries were then forced to seek alternative supplies in the short term at significantly increased costs.

Ultimately, Egypt terminated its gas contract with Israel in April 2012.[37] EGAS claimed it had not been paid on previous deliveries although the Israelis disputed this and accused their Egyptian counterparts of a breach of contract. The cancellation of the contract was a deeply political move, despite statements by both Mohammed Mursi and Benjamin Netanyahu to the contrary.

Beyond the political unpopularity of the supply agreement, it did not make sense for Egypt to continue exporting gas the way it had been in the past. Domestic consumption is rising at a staggering rate, with Egyptian authorities struggling to meet demand. To appreciate this in context, consider that Egypt is now asking Russia to help it fulfil contractual obligations for gas supply because so much of its production is being diverted to satisfy domestic demand.[38]

At a more pragmatic level, the economic cost of maintaining a supply contract with Israel became increasingly expensive for Egyptian authorities. They have only ever exerted nominal control over the Sinai – a region which has been the launchpad for terrorist attacks against Israel ever since the overthrow of Mubarak. The Arish plant was therefore increasingly difficult to secure and would have been almost economically impossible to protect against further sabotage in the future.

The Suez Canal itself was untouched by the political unrest which removed Hosni Mubarak from power. Yet, the canal has periodically suffered from the rise of piracy off the Horn of Africa and Gulf of Aden. In 2008 there were more than 60 piracy-related attacks on tankers passing through the area, more than double the number in 2007.[39] That number grew again in 2009, and although the threat has been in partial decline recently it nonetheless remains an important consideration. Insurance premiums for carriers wanting to transition through the area have increased significantly, prompting an increasing number of ships to sail around the Cape of Good Hope rather than navigate the Bab el-Mandeb

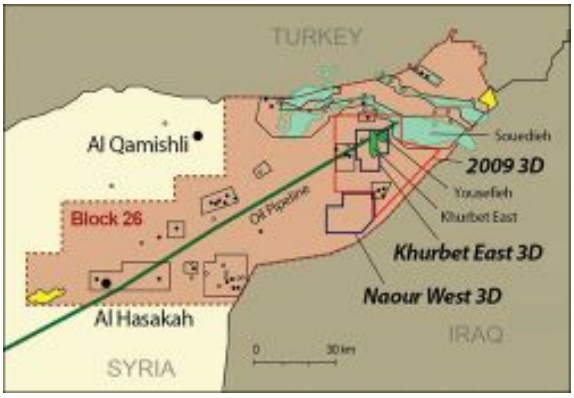
[36] "Egyptian Gas to Israel, Jordan May Halt for Two Weeks," *Bloomberg*, February 6, 2011
[37] "Egypt scraps Israel gas supply deal," *BBC Online*, April 23, 2012
[38] "Russia says Egypt asks for help with gas supplies to Europe," *Reuters*, April 20, 2013
[39] William Komiss and Lavar Huntzinger, *The Economic Implications of Disruptions to Maritime Oil Chokepoints* (Center for Naval Analysis, March 2011) p.10; Also see: *The Economic Cost of Somali Piracy 2011* (One Earth Future Foundation, 2012)

Strait, which leads into the Red Sea and up to the Suez.

The fallout from Syria: Kurdish separatism and renewed terrorism

Among the many unintended consequences of the Arab uprisings is the relative empowerment of the Kurds. A stateless ethnic group spread across Iran, Iraq, Syria, and Turkey, the Syrian conflict has strengthened the aspirations of separatist groups operating in the country. While Syria does not have significant reserves of oil, it had begun development and exploration of sites in the north-east of the country (the site is known as Block 26). Since the Syrian civil war this area has fallen from government control into the hands of the Democratic Union Party (PYD), a Syrian Kurdish party.[40]

Map 4
Oil fields in Kurdish populated north-eastern Syria



Source: Gulfsands Petroleum; Block 26, Syria

Kurdish separatists from the Kurdistan Workers Party (PKK) were also blamed for an explosion which disrupted the Iraq-Turkey oil pipeline, which runs from Kirkuk to Ceyhan.[41] The Turkish government fears that as Kurdish autonomy grows in Syria, this will inspire separatist movements operating in Iraq and Turkey such as the PKK to sabotage pipelines and other vital infrastructure as they agitate for independence.

Aside from Kurdish aspirations, the upsurge of jihadist militancy in Syria has reinvigorated al-Qaeda affiliates in Iraq. This imperils energy infrastructure in the region because these groups often want to inflict financial harm on the governments they oppose. Indeed, al-Qaeda in the Arabian Peninsula (AQAP) announced this as a major strategy in 2010, where it hoped to inflict pecuniary losses on already fragile governments. In August 2013 the Iraq-Turkey oil pipeline was bombed again, this time by suspected jihadist groups who are said to have attacked the pipeline around 30 times since the start of the year.[42]

Energy Markets, Bottlenecks and Chokepoints

Alongside the risk of terrorism and sabotage, the geography of the MENA region also conspires against it. A series of chokepoints converge in the region, accentuating the threat from political instability and rogue actors. The concept of a 'chokepoint' originally stems from military terminology, referring to a

[40] 'Kurdish-Islamist fighting spreads to Syrian oil fields,' *Reuters*, July 18, 2013

[41] 'Blast shuts down Iraq-Turkey oil pipeline,' *Al-Jazeera*, July 21, 2012

[42] 'Iraq pipeline bomb halts Kirkuk flows,' *Upstream*, August 16, 2013.

narrow passageway of terrain that cannot be easily circumvented.[43] With regards to energy trade, chokepoints consist of narrow transit points in the logistical supply chain for oil and gas delivery where flow could be easily disrupted. Precise definitions, however, vary. Almost all considerations of chokepoints take the vulnerability of some maritime transit routes into account such as the Strait of Hormuz, which the Energy Information Administration describes as "by far the world's most important chokepoint."[44] Yet, others also classify the vulnerability of infrastructure such as pipelines and oil/gas refineries and repositories as chokepoints. Chatham House, for example, identifies the Abqaiq and Ras Tanura loading facilities, both in Saudi Arabia, as potential chokepoints if adversely affected by political upheaval or terrorism.[45] For the purposes of this paper, given that the threat from terrorism and sabotage has already been considered, this section only considers maritime chokepoints.

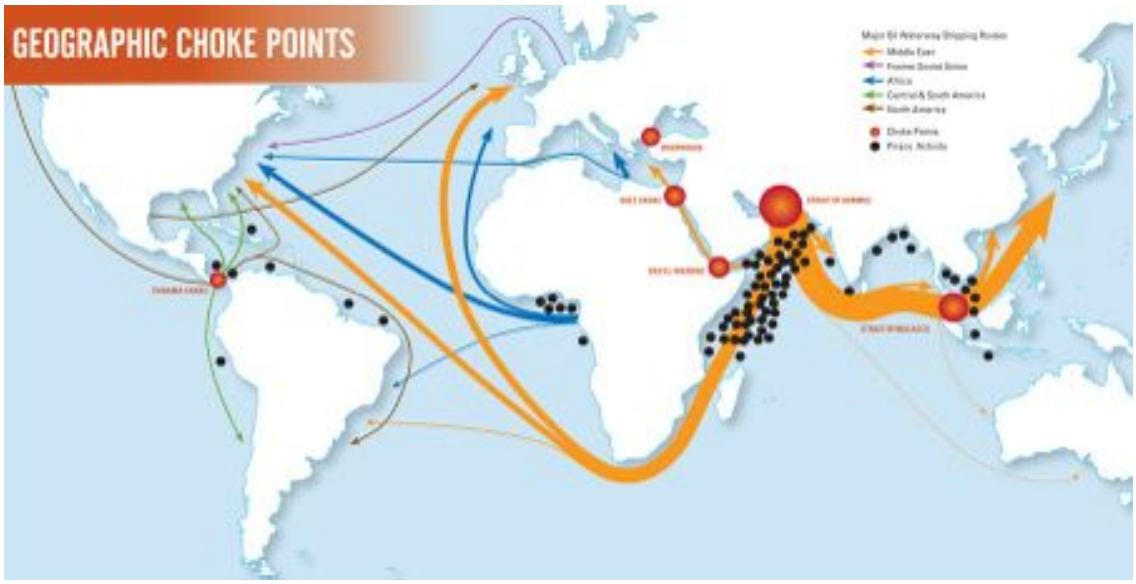
International markets depend on reliable transit routes. Disruption to these supply chains, even for short periods of time, can have a notable impact on international markets by increasing transit costs and raising energy prices for consumers. Moreover, maritime chokepoints can make ships more vulnerable to piracy, terrorism, and accidents.

It is worth noting that chokepoints causing vulnerability to – and turbulence in – the integrity of oil supply chains have greater international ramifications than disruptions to gas flows. Disruption to gas supply chains tend to have regional impacts, with limited contagion, particularly as gas prices are set based on regional variables. The Russian-Ukrainian gas disputes of 2007-2008 and 2009 demonstrate that while disruptions can be severe, their impact is regionally contained.[46] By contrast, global oil trade means prices will spike and vary internationally based on disruptions almost anywhere in the supply chain.

With regards to the Arab Spring, there are a number of maritime chokepoints to consider – indeed, four of the world's seven are located in the region – consisting of the Straits of Hormuz, Bab el-Mandab, Suez Canal/Sumed pipeline, and the Turkish Straits.

[43] Charles Emmerson and Paul Stevens, *Maritime Choke Points and the Global Energy System: Charting a Way Forward*, Chatham House, January 2012.
[44] U.S. Energy Information Administration, *World Oil Transit Chokepoints*, August 2012.
[45] Charles Emmerson and Paul Stevens, *Maritime Choke Points and the Global Energy System: Charting a Way Forward*, Chatham House, January 2012.
[46] Ibid.

Map 5
International maritime chokepoints



Source: American Security Project, Geographic Choke Points
**Note: the Danish Straits are not identified in the map above.*

Maintaining the integrity of maritime chokepoints is enshrined in international law, most notably in the United Nations Convention on the Law of the Sea (UNCLOS) which came into force on 16 November 1994. This established the principle of 'transit passage' which applies to all commercial and military vessels, and states:

> ...all ships and aircraft enjoy the right of transit passage, which shall not be impeded ... for the purpose of continuous and expeditious transit of the strait between one part of the high seas or an exclusive economic zone and another part of the high seas or an exclusive economic zone.[47]

The Convention is therefore designed to prevent hostile states from closing strategic Straits, or introducing vexatious regulations, which would practically impede their use.

Strait of Hormuz

The Straits of Hormuz is the world's most important chokepoint, with a total oil flow of almost 17 million barrels passing through it in 2011.[48] That accounts for about 35 percent of all seaborne trade, or almost 20 percent of all globally traded oil.[49] Of that, around 85 percent was destined for markets in the East, most notably India, China, South Korea, and Japan. Furthermore, around 20 percent of global liquefied natural gas (LNG) passes through the Strait, coming from Qatar which exported 2 trillion cubic feet of

[47] United Nations Convention on the Law of the Sea, Part III, Article 38

[48] U.S. Energy Information Administration, *World Oil Transit Chokepoints*, August 2012
[49] Ibid.

LNG in 2011.[50] Just 21 nautical miles wide at its narrowest point, the Strait is particularly vulnerable to the threat of blockade.

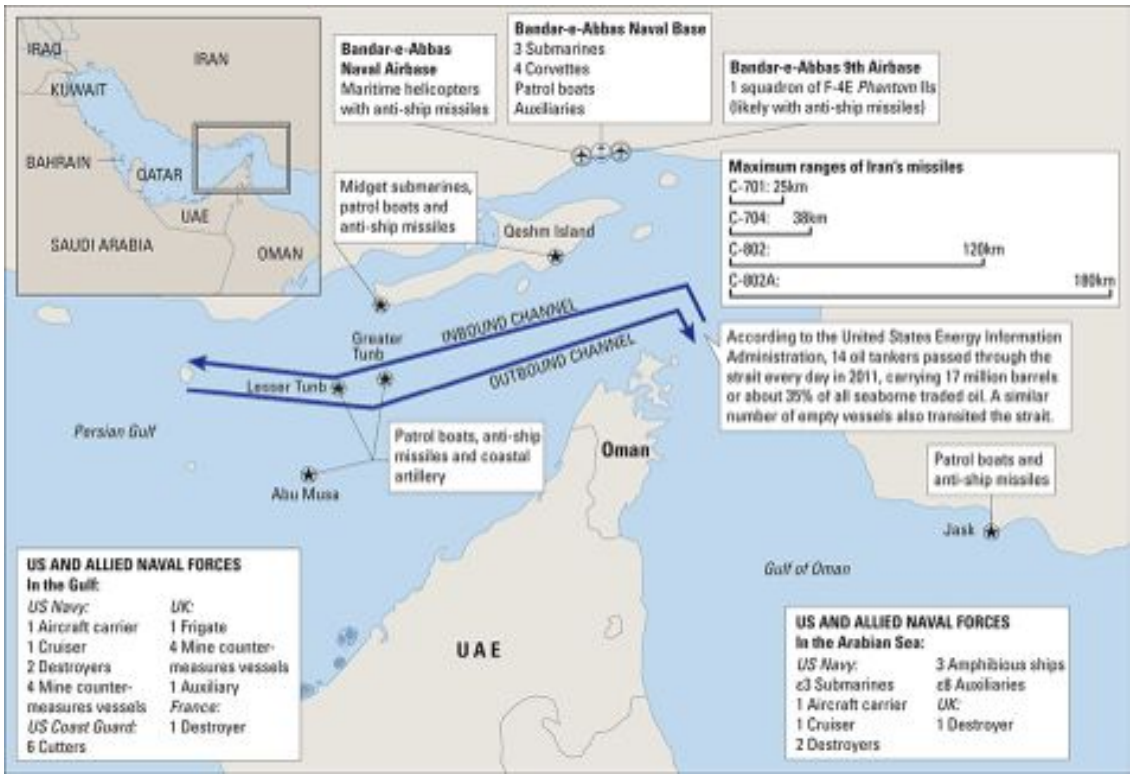
In this regard, Iran has repeatedly threatened to undermine the integrity of the Strait of Hormuz in response to political pressure over its nuclear programme. Over the years Western and Israeli leaders have periodically threatened military action against Iranian nuclear facilities if Tehran refuses to abandon its weapons programme. In response, Iran has said it will impose a naval blockade across the Straits of Hormuz if attacked. Any blockade of this kind would seriously disrupt supply for some of the world's most important oil producers including Saudi Arabia, Kuwait, and the UAE; as well as for gas producers such as Qatar.

Iranian leaders have, on occasion, demonstrated their willingness to underwrite these threats. "We don't consider crude oil as a political tool. However, if necessary, we'll use it any way we need," the Iranian oil minister, Rostam Qasemi told al-Jazeera in 2011.[51] A few weeks later Iranian warships conducted a 10-day naval drill known as "Velayat-e 90" in the Strait.[52] Similar drills were repeated the following year when Iranian forces staged a six day exercise using warships, submarines, jet fighters, and hovercraft.[53] All this builds on Iranian actions during the Iran-Iraq war in the 1980s when the Iranian navy mined the Strait.

The Strait is so strategic to the energy security of the United States that successive administrations have committed themselves to defending its integrity ever since 1976. Indeed, Roger Stern has calculated than from 1976-2007 the United States has spent around $8 trillion protecting oil cargos in the Persian Gulf.[54]

[50] Ibid.
[51] 'Iran: Willing to use oil as a political tool,' *al-Jazeera*, November 23, 2011
[52] 'Iran navy starts 10-day wargame in Strait of Hormuz,' *Reuters*, December 24, 2011
[53] 'Iran starts war games in Strait of Hormuz,' *Reuters*, December 28, 2012
[54] R.J. Stern, 'United States cost of military force projection in the Persian Gulf, 1976–2007,' *Energy Policy*, (2010), doi:10.1016/j.enpol.2010.01.013

Map 6
Strait of Hormuz, with shipping channels and Iranian military capabilities



Source: International Institute for Strategic Studies, Strait of Hormuz, Iran's Options

There is some limited infrastructure which allows regional oil producers to circumvent the Strait in the event of a blockade. Last year the UAE opened the Abu Dhabi Crude oil pipeline with a capacity of 1.5 million barrels per day (more than half of the UAE's net oil exports) which bypasses the Strait altogether. Instead, it gives Emirati producers from Fujairah direct access to the Indian Ocean. Saudi Arabia also has the Petroline (otherwise known as the East-West pipeline) which carries oil from the Abqaiq complex to the Red Sea for exports to Europe and the United States.[55] Iraq also has the Kirkuk-Ceyhan pipeline which would carry exports to Mediterranean. This pipeline, however, is subject to repeated terrorist attacks and sabotage, regularly impeding flow. Moreover, it is not running at full capacity because of the need for maintenance due to aging infrastructure.

None of this can overcome the more perilous reality that all the Gulf's most significant oilfields lie in the east, well within striking distance of Iranian missiles should it decide to attack the production capabilities of its neighbours.

[55] 'Factbox: MidEast energy export risks, alternative routes,' *Reuters*, December 2008

Suez Canal

Passage through the Suez was unhindered during the 2011 revolution, leaving an important source of rents free of disruption. Indeed, the canal has remained largely unimpeded by unrest in the region as a whole and, last year, continued to produce returns of $5.2 billion for the government. [56] This matched the return from 2011. Moreover, in 2012, about 2.97 million barrels per day (bbl/d) of oil passed through the Suez, the highest amount to have ever transited through it; representing an increase of 7 percent on the previous year.[57] This follows a dip of northbound oil flows through the Suez in 2009 as a result of the global economic downturn. While the Suez also accounted for 13 percent of globally traded LNG in 2012, this represented a fall of 0.56 trillion cubic feet from 2011, partly due to increased domestic production in the United States and decreased demand in some parts of Europe.[58]

The Suez has, of course, been closed in the past by Gamal Abdel Nasser in 1956. While its integrity has not been affected by subsequent political turmoil in Egypt this could change as the country falls into an increasing spiral of violence following the ouster of Mohammed Mursi. Following a draconian crackdown against both members and supporters of the Muslim Brotherhood, and the arrest of its leadership, there are increased calls for violence by Islamist elements within the country. Terrorist activity has already targeted the Arish-Ashkelon pipeline, and it remains possible that such actors – who are particularly empowered in the Sinai – might sponsor attacks against the SUMED pipeline and ships passing through the Suez. Furthermore, the ability of the Egyptian army to resist such attacks could be diminished if the United States cuts aid to Egypt's Armed Forces, which totalled $1.6 billion in 2012. Disruption to the Suez would have a significant impact on transit times and cost with, for example, the transit distance from Saudi Arabia to the United States being increased by approximately 2,700 miles.

[56] "Egypt Suez Canal official sees stable revenue in 2012," *Reuters*, September 13, 2012
[57] U.S. Energy Information Administration, *World Oil Transit Chokepoints*, August 2012
[58] Ibid.

Map 7
Egypt, map of the Suez, SUMED pipeline, and Arab Gas Pipeline

Source: Energy Information Administration

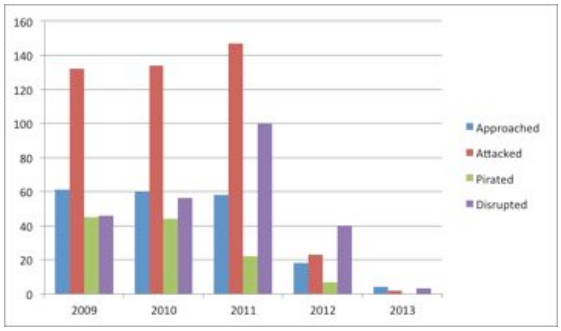
Bab el-Mandab Strait

The Bab el-Mandab Strait is a narrow waterway connecting the Gulf of Aden with the Red Sea. At its narrowest point it is just 18 miles wide and disruption here would prevent tankers from reaching both the Suez Canal and the SUMED pipeline. While Yemen has suffered from political upheaval as a result of the Arab Spring, the Strait has not been affected by this.

Map 8
Bab el-Mandab Strait

Years before political unrest gripped MENA ships passing through the Strait were subject to the risk of piracy. Indeed, much of the waters along the Gulf of Oman and the Gulf of Aden were subjected to repeated attacks by pirates. A number of ships found it difficult to insure themselves against pirates and were therefore required to sail around the Cape of Good Hope. However, increased policing in the Horn of Africa and armed naval patrols have largely pushed this problem into retreat in recent years as the graph below reveals.

Graph 4
Total Pirate Activity off the Horn of Africa coast



Source: NATO Shipping Centre, piracy attacks

The Turkish Straits

The Turkish Straits consist of two narrow passages. The Bosporus Strait connects the Black Sea to the Sea of Marmara, while the Dardanelles Strait connects the Sea of Marmara to the Aegean Sea. At its narrowest point it is just half a mile wide.

There is no direct pressure on the Turkish Straits as a result of the Arab Spring. There is potential, although it remains speculative at the moment, that if tensions between Russia and Turkey intensify over the Syrian conflict then passage through the Straits could be effected. Turkey can also benefit from Syrian instability by receiving Iraqi oil through the Kirkuk-Ceyhan pipeline. While Syria is not a significant oil producer it nonetheless retains strategic relevance as an important oil transit state. During the Iran-Iraq war, for example, Damascus demonstrated its support for Tehran by closing the Kirkuk-Baniyas pipeline which carries oil from Iraq to the Mediterranean. When the pipeline was bombed by the United States following the invasion of Iraq in 2003 it was once again taken offline and has been out of service ever since. Plans by several countries, including Russia and Iran to restore the pipeline have stalled and, while the country remains gripped by civil war, will not be revived in the foreseeable future. This will boost Turkey's importance as a transit point for exports moving through the Mediterranean basin.

Map 9
The Turkish Straits

Source: EO Earth, The Turkish Straits

The geography of MENA's maritime routes therefore exposes energy markets – both local and international – to turbulence in the region. Yet, when considering the vulnerability of MENA countries to political unrest and, consequently, the likelihood of disruption to energy markets, it is important to first consider the differences between the region's energy importers and exporters.

MENA Importing and Exporting Countries

Energy revenues in MENA provide a vital source of economic growth, industrial development, social protection, and political stability (not least with

managing macroeconomic factors and inflation). As has already been discussed, the countries which suffered serious political unrest in the Arab Spring compared to those which did not can broadly be divided into those who are resource-rich and those who are resource-poor.

As a result, the Gulf States were able to insulate themselves against unrest much better than their neighbours. In Qatar and Saudi Arabia several thousand citizens joined online groups calling for mass demonstrations against the government, but these failed to materialise. Dissent in Oman and the United Arab Emirates was also largely confined to online expressions of anger. In Kuwait protesters stormed the parliament, prompting the resignation of the Prime Minister. Bahrain was the only Gulf country where protests crystallised into a cohesive movement although, even there, the rebellion was quickly suppressed.

Rich in resources, they were able to boost social welfare spending programmes to stave off unrest. According to a report by Merrill Lynch Bank of America the first six months of unrest in 2011 cost the six constituent countries of the Gulf Cooperation Council (GCC) around $150 billion.[59] Much of this went to new social welfare programmes boosting public sector wages, increasing energy subsidies, and increased spending for health and education.[60]

The House of Saud responded to political unrest in the region by announcing a range of social welfare measures totalling $126 billion in early 2011.[61] Yet, Saudi Arabia's security considerations extend beyond its borders. It also fears broader regional unrest, particularly among the Gulf monarchies because it believes that the fall of one Arab monarchy could inspire similar sentiments elsewhere. Therefore, by the middle of 2011 Saudi Arabia had already given Jordan $1 billion to stabilise its economy and help with its budget deficit, while also offering Jordan preferential prices on oil.[62] To understand how the Arab Spring has influenced annual budget expenditure in Saudi Arabia see graph 8 below.[63]

In 2012 the Gulf Cooperation Council (GCC) also initiated a Gulf Development Fund worth $5 billion to support the economies of Jordan and Morocco – the only two Arab monarchies not included in the GCC.[64] Kuwait, Bahrain, and Oman also announced massive rises in domestic social expenditure, with the

[59] Gulf Oilfield News, Vol 6, Issue 4, p.11

[60] Human Rights Watch, *Country Summary: Saudi Arabia* (Human Rights Watch: New York, January 2012)

[61] Hakim Darbouche and Bassam Fattouh, "The implications of the Arab uprisings for oil and gas markets," *Oxford Institute for Energy Studies*, September 2011, p.18

[62] "Saudi Arabia Grants Jordan $1 Billion for Budget, Al Arab Says", *Bloomberg*, July 26, 2011.

[63] Table compiled from Jadwa Investment annual budget reports on Saudi Arabia. See: *Saudi Arabia's 2013 Budget* (Jadwa Investment), and all annual reports through to 2007.

[64] "GCC creates $5 bln support fund for Jordan and Morocco", *The Daily Star (Lebanon)*, December 21, 2011.

latter raising the minimum wage for national workers by over 40 percent.[65]

The region's energy exporters also maintained social commitments through expensive subsidy programmes which, as Fattouh and El-Katiri argue are used for a mix of six different rationalising factors including: expanding access to energy, protecting the poor, fostering industrial development, consumption smoothing (or management), avoiding inflationary pressures, and political considerations.[66] The last of these factors is particularly relevant for authoritarian regimes keen to mollify their populations.

Resource abundance has allowed these countries to embrace the 'rentier state' model of governance. This theory, first coined by the economist Hossein Mahdavy, argues that resource rich countries are able to avoid taxation by deriving either all, or most, of their national revenue through rents achieved from the cultivation of their natural resources.[67] Theorists later argued that civil society, democracy, and liberalisation are all hampered in rentier economies which arc towards authoritarianism because rents allow them to avoid a traditional social contract with their people.[68] Rentier states instead maintain low tax bases (if it all) and maintain high subsidies in return for ongoing social stability.[69] As a result, Arab governments have used subsidies to exercise strong price control mechanisms over the region's most commonly used energy types: crude oil, oil products, natural gas, and electricity.

It is worth defining what is meant by the term 'subsidy' in this context. The word itself can be a slippery, expansive, and vague concept shorn of meaningful economic relevance. De Moor and Calamai provide a useful definition of subsidy, describing it as:

> ...any measure that keeps prices for consumers below the market level or keeps prices for producers above the market level or that reduces costs for consumers and producers by giving direct or indirect support.[70]

As Fattouh and El-Katiri point out, this "remains the most commonly used method for calculating subsidies due to its simplicity" and underpins the price-gap

[65] Hakim Darbouche and Bassam Fattouh, "The implications of the Arab uprisings for oil and gas markets," *Oxford Institute for Energy Studies*, September 2011, p.18

[66] Bassam Fattouh and Laura El-Katiri, Arab Human Development Report: Energy subsidies in the Arab World (United Nations Development Programme, Regional Bureau for Arab States, Research Paper Series, 2012) pp.13-16

[67] Hossein Mahdavy, "The Pattern and Problems of Economic Development in Rentier States: The Case of Iran", in Studies in the Economic History of the Middle East, ed. M.A. Cook (Oxford University Press, 1970). Also see: Mohamed Althani, The Arab Spring and the Gulf States: Time to embrace change (Profile Books, 2012)

[68] Mohamed Althani, The Arab Spring and the Gulf States: Time to embrace change (Profile Books, 2012)

[69] Rolf Schwarz 'State Formation Processes in Rentier States: The Middle Eastern Case', Paper presented at the Fifth Pan-European Conference on International Relations, "International Relations Meet Area Studies" (The Hague, September 9-11, 2004)

[70] De Moor and Calamai quoted in Bassam Fattouh and Laura El-Katiri, Arab Human Development Report: Energy subsidies in the Arab World (United Nations Development Programme, Regional Bureau for Arab States, Research Paper Series, 2012) p.11

approach used by the IEA when calculating energy subsidies.[71]

Almost all of the MENA countries from the powerhouse hydrocarbon exporters of Saudi Arabia and Qatar to the net energy importers of Jordan, Lebanon, and Morocco, have tried to manipulate energy prices. As popular uprisings took root, governments across the region renewed their belief that strong subsidies would bring stability.

Almost all have increased subsidies in the hope of alleviating pressure on consumers while 'buying' stability. Jordan and Bahrain responded to popular pressure by increasing subsidies by $425 million and $40 million respectively in 2011 to offset the prospect of political unrest.[72] Even then, sectarian concerns continue to undermine the legitimacy of the Bahraini royal family while the extra spending failed to halt inflationary forces in Jordan. Prices for electricity, petrol, and gas continued to rise through 2012.[73]

In Egypt, a subsidy reform programme intended to achieve full cost recovery by 2014 was abandoned in 2009 after social pressure intensified against Hosni Mubarak.[74] Following his re-election in 2008 workers from the predominantly industrial city of El-Muhalla El-Kubra launched an unprecedented series of public protests to denounce the prevailing economic conditions, most notably: high inflation and low wages.

The antecedents of the Egyptian revolution are rooted here, as the resulting turmoil gave rise to the 'April 6 Youth Movement', an Egyptian campaign group which urged national solidarity with the workers of El-Muhalla El-Kubra.[75] Indeed, the *Washington Post* described the unrest and solidarity movement which emerged it as a "fledgling rebellion."[76] In the climate that followed, petroleum subsidies increased from $7.2 billion in 2005/2006 to $11.9 in 2009/2010.[77]

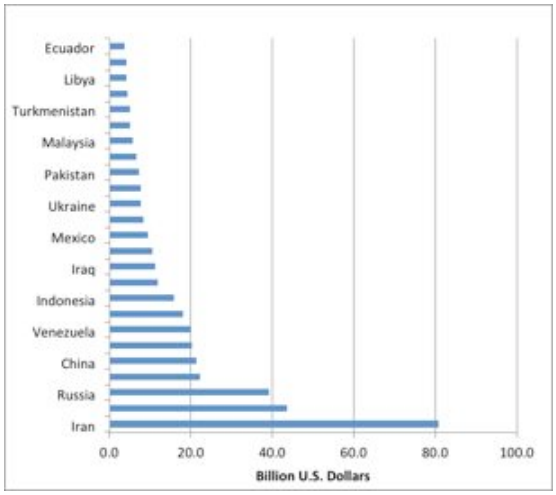
The United Arab Emirates had also considered phasing out fuel subsidies but then froze plans once unrest gripped North African governments. In 2012 when Emiratis complained about gasoline prices the Federal National Council unanimously elected to increase subsidies.[78] Unlike Jordan or Egypt, the Emirati government can rely on greater financial resources to fund the programme.

The disparity between the region's energy importers and exporters is brought into sharp relief when considering their respective approaches to subsidies. Of the top 25 countries offering subsidies, nine

[71] Ibid, pp.11-12
[72] Mohsin S. Khan and Svetlana Milbert, 2Middle East Protests: Can Money Buy Peace?' Pearson Institute for International Economics (March 9, 2011) http://www.piie.com/blogs/realtime/?p=2068
[73] 'Gas price rises spark anger and protests in Jordan,' *BBC Online*, December 27, 2012
[74] Vincent Caste, Reforming Energy Subsidies in Egypt (African Development Bank, March 2012)
[75] The group maintains an official page on Facebook in lieu of a website: https://www.facebook.com/april6mov
[76] 'Fledgling Rebellion on Facebook Is Struck Down by Force in Egypt,' *Washington Post*, May 18, 2008.
[77] Vincent Caste, Reforming Energy Subsidies in Egypt (African Development Bank, March 2012)
[78] 'Reforming Energy Subsidies Easier Said Than Done?' *Wall Street Journal*, March 27, 2013

are from the MENA region (see graph 5) and only one, Egypt, is a resource-poor country.[79]

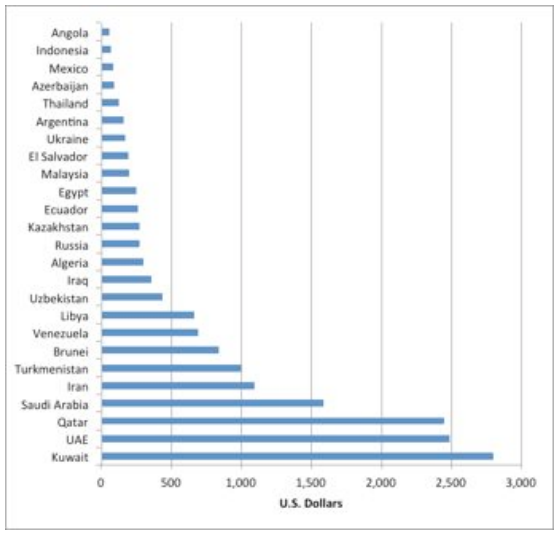
Graph 5
Fossil Fuel Consumption Subsidies in Top 25 Countries, 2010



Source: Compiled by Earth Policy Institute from International Energy Agency (IEA), World Energy Outlook 2011 (Paris: 2011), p. 515, and from IEA, Fossil Fuel Subsidy Database, at www.iea.org/subsidy/index.html

The disparity between the region's energy importers and exporters becomes even more dramatic when considering the subsidy per capita (see graph 6).[80] Put in this way, the top 5 global subsidisers are all resource-rich MENA countries – Kuwait, the United Arab Emirates, Qatar, Saudi Arabia and Iran.[81]

Graph 6
Fossil Fuel Consumption Subsidies Per Person in Top 25 Countries, 2010



Source: Compiled by Earth Policy Institute from International Energy Agency (IEA), World Energy Outlook 2011 (Paris: 2011), p. 515, and from IEA, Fossil Fuel Subsidy Database, at www.iea.org/subsidy/index.html

Much as with oil, gas prices are highly subsidised in the Middle East. The region consequently has the lowest wholesale price for gas in the world (see graph 7).[82] As a result, gas consumption in the MENA region has almost doubled over the preceding decade, rising from 240 Bcm/yr to just under 450 Bcm/yr.[83] Indeed, Hakim Darbouche points out that the political-economic considerations

[79] Compiled by Earth Policy Institute from International Energy Agency (IEA), World Energy Outlook 2011 (Paris: 2011), p. 515, and from IEA, Fossil Fuel Subsidy Database, at www.iea.org/subsidy/index.html

[80] Compiled by Earth Policy Institute from International Energy Agency, Fossil Fuel Subsidy Database, at www.iea.org/subsidy/index.html, updated 2011.

[81] Svetlana Milbert, 'Reform of Energy Subsidies in the Arab Countries', *MENA Source* (Atlantic Council, April 2013) http://www.acus.org/viewpoint/reform-energy-subsidies-arab-countries

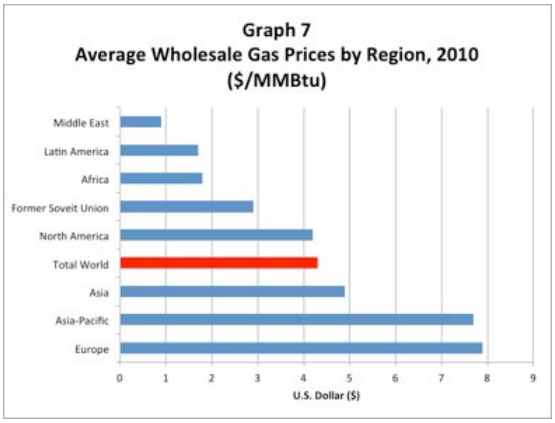
[82] International Gas Union, *Wholesale Gas Price Formation 2012 - A global review of drivers and regional trends* (August 2012) p.15

[83] Hakim Darbouche, 'Issues in the pricing of domestic and internationally-traded gas in MENA and sub-Saharan Africa,' *Oxford Institute for Energy Studies*, 2012, p.11

of Arab governments have been influenced by the fact:

> ...gas is (at least initially) produced in association with oil and NGLs and thus regarded as a free by-product of the more-valued liquid hydrocarbons. It is also perceived as a way of rent distribution by the state for the poorer segments of the population.[84]

In many respects, Arab governments originally considered gas as a nuisance or by-product and underestimated its true economic value. Prices were set low and much of it is still flared – around 70 Bcm/yr in MENA.[85]



Source: International Gas Union, Wholesale Gas Price Formation 2012 - A global review of drivers and regional trends (August 2012) p.15

It is worth noting that gas subsidies form only a small share of the overall energy subsidy in most MENA countries, with the exception of Qatar, Iran, and the UAE where they accounted for 34, 31.6, and 54.9 percent of the total energy subsidy in 2010.[86]

Subsidies are, of course, just one part of the overall energy picture in MENA. Moreover, while the implication of delays to issues such as subsidy reform are localised (with a degree of broader impact), disruptions to energy supply and production in the region will have global consequences. It is necessary, therefore, to consider the pressures on oil pricing as a result of the uprisings, the extent to which some of the world's largest economies are dependent on MENA reserves, and what alternatives are currently being explored to reduce that dependency.

[84] Ibid, p.6
[85] Ibid, p.11
[86] Ibid, 14

Oil pricing: speculation and export pricing

The Arab uprisings caused turbulence in energy markets although no significant or persistent threat to supply occurred. Despite this, prices jumped and have remained in flux as the region continues to experience instability. To consider the manner in which the price of energy exports – and oil in particular – jumped following the unrest in MENA it is necessary to appreciate the way in which it is traded.

Oil prices were traditionally set by an OPEC administered system which proved unsustainable after an increasing number of non-OPEC oil producers entered the market coupled with decreased international demand following a global economic recession in the mid-1980s. By 1986 the model was discarded in favour of a market mechanism eventually leading to the increased financialization of energy markets, particularly with regards to the trading of 'paper' and 'wet' barrels of oil.[87]

In its simplest construction, the trading of paper barrels refers to the virtual trading of oil. In this case, rather than taking delivery of a physical barrel of oil, an investor purchases the option to take delivery of oil at a specified future date. Much of this trading is now formalised in futures markets including the New York Mercantile Exchange (NYMEX) trading West Texas Intermediate, and the Intercontinental Exchange (ICE) in London trading Brent Bland. The paper market consists of both commercial and financial investors.

Trading in paper barrels is particularly important for commercial investors in sectors like the aviation industry where commercial imperatives require companies to hedge against potential fuel price volatility. Competitive pressures, for example, mean that fuel price hikes cannot always be passed on to consumers. Mike Corley, president of EnRisk Partners LLC, explains:

> Hedging allows market participants (companies that consume large quantities of diesel fuel and other energy commodities) to lock in prices and margins in advance, while reducing the potential impact of volatile fuel prices…The fluctuating price of fuel can present large financial risks that have a significant impact on the bottom line. That is the primary reason why many large, fuel-consuming companies hedge their fuel costs. Another reason is to improve or maintain competitiveness.[88]

Speculators also invest in the market for paper barrels. Typically, these are investors who have no interest in taking delivery of oil and make money by trading the option. They usually enter the

[87] Bassam Fattouh, An anatomy of the crude oil pricing system, Oxford Institute for Energy Studies (January 2011)

[88] Mike Corley, 'Fuel efficiency: know when to hold 'em,' *Rock Products*, November 2008, p.29

market for shorter periods and have an interest in market movement. The extent to which speculators move the market, increase volatility, and drive the spot price of oil is hotly contested.

Last year, Joseph P. Kennedy II, who previously served in the House of Representatives and is president of the Citizens Energy Corporation, wrote a provocative article in the New York Times regarding oil speculation. He argued:

> ...there are factors contributing to the high price of oil that we can do something about. Chief among them is the effect of "pure" speculators — investors who buy and sell oil futures but never take physical possession of actual barrels of oil. These middlemen add little value and lots of cost as they bid up the price of oil in pursuit of financial gain. They should be banned from the world's commodity exchanges, which could drive down the price of oil by as much as 40 percent and the price of gasoline by as much as $1 a gallon.[89]

The role of 'speculators' has become widely viewed in negative terms, particularly since the onset of the global financial crisis. Yet, there is little evidence to substantiate Kennedy's view. A major study into the role of speculation in oil markets by Fattouh, Kilian, and Mahadeva, concluded:

> We find that the existing evidence is not supportive of an important role of speculation in driving the spot price of oil after 2003. Instead, there is strong evidence that the co-movement between spot and futures prices reflects common economic fundamentals rather than the financialization of oil futures markets.[90]

On the other side of the paper barrel market is the trade in wet barrels. This concerns the physical product, the actual barrel of oil itself. The interaction between paper and wet markets is complex, but is best explained by Paul Stevens as follows:

> The paper market provides the signals that create the context in which prices in the wet barrel market are negotiated. It does not set the price per se but indicates a starting point for discussion of the numbers in the contract. Perceptions in the paper market about surpluses or shortages in the wet barrel market inform behaviour that determines the paper barrel price: perceptions of shortage, current or impending, will push the price up, and vice versa, as the money managers move cash into and out of the

[89] Joseph P. Kennedy II, 'The high cost of gambling on oil,' *New York Times*, April 10, 2012

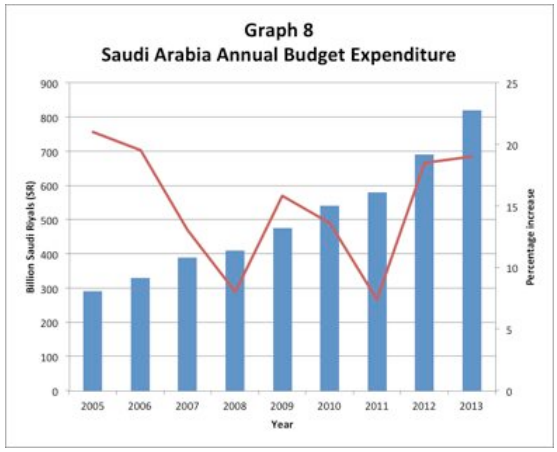
[90] Bassam Fattouh, Lutz Kilian, Lavan Mahadeva, 'The role of speculation in oil markets: what have we learned so far?' (no publisher details) July 2012.

paper markets in anticipation of price changes.[91]

One of the drivers behind paper barrel volatility, as Stevens points out, is perception. Some speculators who watched unrest sweep across North Africa, and further into the Gulf and Levant reacted with concern. This drove fears over the potential of serious hydrocarbon shortages. In this regard, it did not matter that countries like Saudi Arabia, for example, had not experienced any widespread or serious unrest. Indeed, these fears were not assuaged by political figures such as the former Saudi oil minister, Sheikh Zaki Yamani, who predicted that Saudi Arabia would be gripped by unrest and that oil prices would subsequently rise to somewhere between $200 and $300 a barrel.[92] Of course, the only significant wet barrel disruption came from the Libyan civil war which effectively halted all production and supply from the country.

With regards to the Arab Spring, the greatest and most enduring source of upward pressure on oil prices will come not from the market nor from speculation, but from the dependence of Gulf States on higher export prices. The difference in approach to handling the region's uprisings between resource-rich and resource-poor countries has already been noted above. The Gulf states were able to counter potential unrest by investing massively in subsidies and social welfare projects.

This has made Arab exporters increasingly reliant on high export prices. Consider Saudi Arabia where energy exports still account for the lion's share of GDP. The House of Saud responded to political unrest in the region by announcing new spending commitments totalling $126 billion.[93]



Source: Table compiled by author from Jadwa Investment annual budget reports on Saudi Arabia. See: Saudi Arabia's 2013 Budget (Jadwa Investment), and all annual previous reports through to 2007.

With the exception of 2009, the rate of growth in the annual budget expenditure of Saudi Arabia dropped until the onset of political unrest in the Middle East. The following budget then produced a significant hike in growth of just under 19 percent, a growth rate that was

[91] Paul Stevens, 'The Arab Uprisings and the International Oil Markets,' *Chatham House Briefing Paper*, February 2012, p.2

[92] "Update 2 – oil could hit $200-$300 on Saudi unrest – Yamani," *Reuters*, April 5, 2011.

[93] Table compiled from Jadwa Investment annual budget reports on Saudi Arabia. See: *Saudi Arabia's 2013 Budget* (Jadwa Investment), and all annual reports through to 2007. A variation of this appears in Hakim Darbouche and Bassam Fattouh, "The implications of the Arab uprisings for oil and gas markets," *Oxford Institute for Energy Studies*, September 2011

reproduced in the 2013 budget. Thus, two years after the Arab Spring, the Saudi budget has grown by around 40 percent. The *Financial Times* argues that:

> Saudi Arabia could need the oil price to average more than $100 a barrel by 2015 to sustain the big public spending rises it plans in an effort to forestall the political unrest sweeping the Middle East.[94]

That price would represent a trebling of the oil price needed to balance the Saudi budget in 2005.[95] According to the IMF's regional economic outlook, the current breakeven price for Saudi oil is $80 a barrel, and in the United Arab Emirates is just above that mark.[96]

The new commitment to social expenditure by Gulf regimes means reservation oil prices are likely to remain high and inelastic too. Not only will this inflate real prices, but it also removes the more pragmatic element of Saudi policy which allowed it to assuage erratic behaviour by other producers by utilising its swing production capacity.

Libya and Venezuela already put Saudi Arabia under pressure last year to cut oil production in order to prevent prices from slipping. Both want to establish the price of $100 as a price floor.[97] While the Saudis remain moderate when it comes to oil prices, there is the potential for the country to start acting like OPEC's price hawks if Riyadh feels it must defend a minimum oil price in order to balance its budget.

Dependencies on MENA

Fluctuations in oil prices are most acutely felt in markets in the East, which have grown in both significance and relevance for MENA exporters over the last three decades – and are where the greatest exposure from overdependence on MENA oil reserves currently lies. The rise of Eastern economies is something which caught the attention of President Obama who, when talking about the fallout from the Arab Spring, told an audience at Georgetown University:

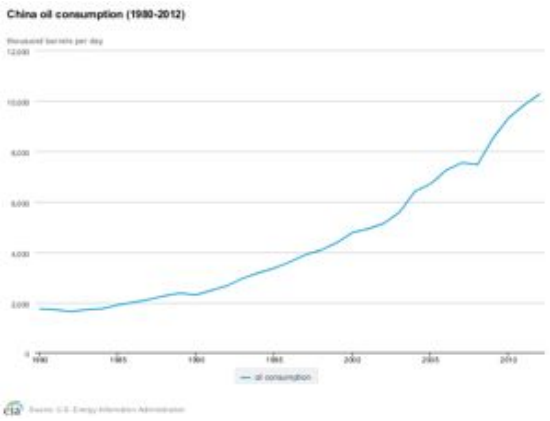
> When you look at the long-term trends, there are going to be more ups in gas[oline] prices than downs in gas[oline] prices. And that's because you've got countries like India and China that are growing at a rapid clip, and as 2 billion more people start consuming more goods...it is absolutely certain that demand will go up a lot faster than supply. It's just a fact.[98]

[94] "Saudi budget could require high oil price", Financial Times, March 31, 2011.
[95] Hakim Darbouche and Bassam Fattouh, "The implications of the Arab uprisings for oil and gas markets," *Oxford Institute for Energy Studies*, September 2011, p.19
[96] International Monetary Fund. Middle East and Central Asia Dept, *Regional Economic Outlook, October 2011: Middle East and Central Asia* (October, 2011)
[97] 'Saudi under OPEC pressure to prevent oil price collapse,' *Reuters*, June 13, 2012
[98] "Remarks by the President on America's Energy Security," The White House, Office of the Press Secretary (Georgetown, March 30, 2011) http://www.whitehouse.gov/the-press-office/2011/03/30/remarks-president-americas-energy-security

Not only are India and China growing, but they also weathered the global economic downturn better than most Western economies, which led to a reduction in demand in the West. By contrast, in just under two decades – from 1990 to 2008 – the collective proportion of global energy consumption by India and China has doubled from 10 percent to 21 percent.[99]

Since 1980, Chinese consumption has grown by more than five times with more than half of its imports coming from the MENA region (see graph 9). Of these, the third largest supplier of crude oil to China is Iran, which supplied 555 thousand barrels per day in 2011.[100] Whilst Iranian oil is subject to highly restrictive sanctions in both the United States and the European Union – effectively removing it as a supply source – China is not bound by such strictures. This has allowed it to access a ready market and build strategic ties with an important rival to those Sunni Gulf states who are traditionally more politically inclined towards the United States.

Graph 9
China oil consumption (1980-2012)



Source: U.S. Energy Information Administration

The growth of Chinese demand and consumption has led the Energy Information Administration to predict that:

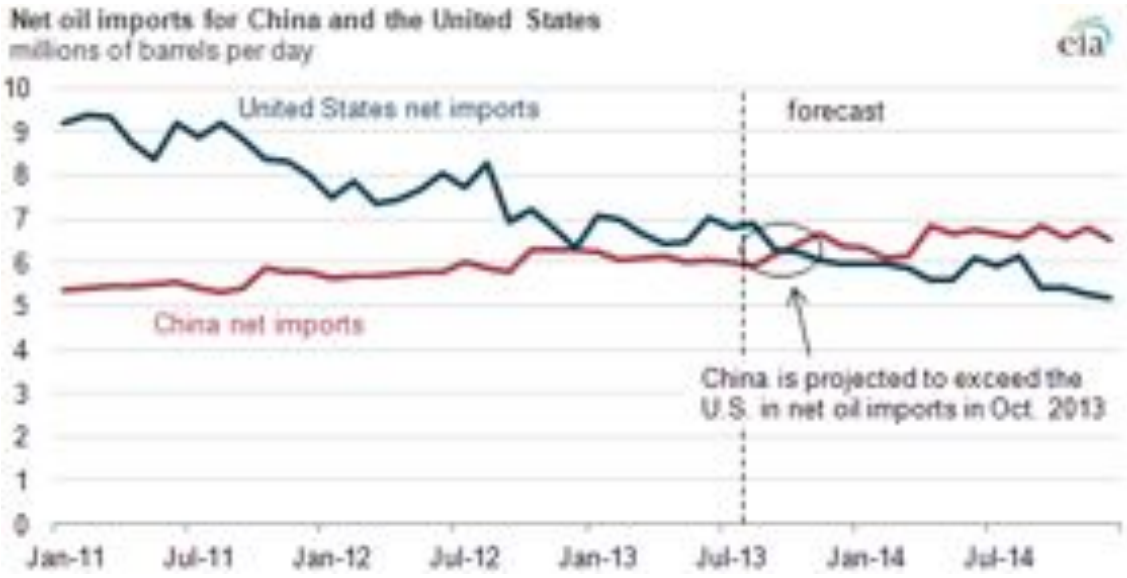
> China's net oil imports will exceed those of the United States by October 2013 on a monthly basis and by 2014 on an annual basis, making China the largest importer of oil in the world.[101]

The growth of Chinese demand is one reason for this, coupled with increased domestic production in the United States and a flat-lining of demand there (see graph 10).

[99] Energy Information Administration, *International Energy Outlook 2011*, (Washington D.C., US Government Printing Office)
[100] Energy Information Administration, *China: Background*, September 2012

[101] Energy Information Administration, 'China poised to become the world's largest net oil importer later this year,' *Today in Energy*, August 9, 2013

Graph 10
Net oil imports for China and the United States



Source: *U.S. Energy Information Administration Short-Term Energy Outlook, August 2013*
Note: *Net oil imports are defined as total liquid fuels consumption less domestic production*

This growing dependence on energy imports is shaping Chinese regional policy, both in the Indian subcontinent and the Persian Gulf. Beijing's reliance on Iranian oil has already been mentioned, but the country also relies heavily on imports from Saudi Arabia (the greatest source of Chinese oil imports), Oman and Iraq. Yet, much of China is landlocked with its industry in central and western parts of the country located a significant distance away from ports in the east. For development in these parts of the country – including regions such as Xinjiang – the Chinese are also reaching into countries like Pakistan to establish new energy corridors.

Earlier this year it was announced that China would take over operational control of the Gwadar port through the China Overseas Port Holding Company, after the Port of Singapore Authority pulled out. Gwadar is located in the Balochistan region of Pakistan and has been developing a sophisticated deep sea port which can accommodate ULCC oil tankers. The inward investment into Gwadar could give it significant regional importance.

Gwadar would provide Caspian, Central Asian, and West Chinese exporters with an increased route to market, overtaking ports in the Gulf. It could similarly provide an alternative transit route to East and West Asian consumers if the Strait of Malacca chokepoint ever became constricted. Indeed, the so-called 'Malacca dilemma' has concerned

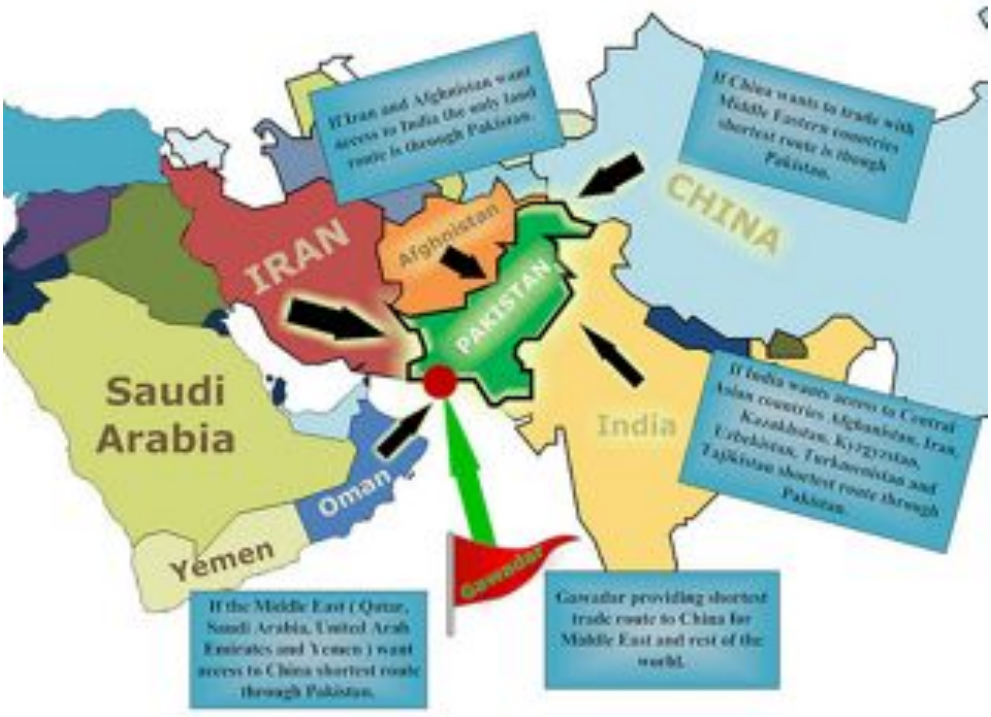
Chinese policy makers for some time prompting Robert Kaplan to argue:

> [China] is too dependent on the narrow and congested Strait of Malacca between Indonesia and Malaysia for its oil and natural gas shipments from the Middle East to Chinese ports. Thus, China has been engaged in port-building projects in Pakistan and Burma, which, someday, may be linked by roads and energy pipelines directly to China.[102]

In terms of great power posturing, too, this gives China added leverage against reliance on Sunni Gulf states.

The political implications of Chinese reach into Pakistan are particularly significant for India, whose growth both countries are keen constrain (China because of economic competition, and Pakistan because of political rivalry). This is all part of a broader commercial/military approach by Beijing known as the 'string of pearls' strategy which seeks to create sea lines of communications which encircle India and establish Chinese dominance across the Arabian Sea, Indian Ocean, and Bay of Bengal.

Map 10
Strategic importance of Gwadar port



Source: Gwadar Strategic Importance, GwadarCity.info

[102] Robert Kaplan, 'China's Port in Pakistan,' *Foreign Policy*, May 27, 2011

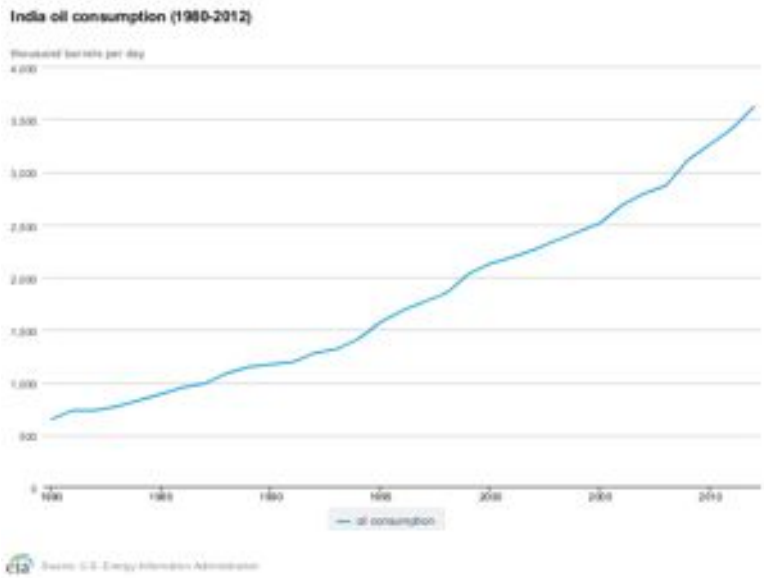
Map 11
Chinese 'String of Pearls' ports

Source: Business Monitor International

With regards to Indian oil consumption, it has also grown at a similar rate to that of China's, rising by a factor of 6 over the last thirty years (although it does not consume as much).

Indeed, India was the world's fourth largest oil and petroleum consumer in 2011, behind the United States, China, and Russia.

Graph 11
Indian oil consumption, 1980-2012



Source: U.S. Energy Information Administration

The Indian source of crude oil imports, however, is not as diverse as China's. Of China's top five import sources only three are MENA countries. By contrast, all of India's top five are located in MENA. Moreover, the top five sources of Chinese oil imports only account for 37 percent of its total imports while they account for 57 percent in India.

Table 3
China v India crude oil imports by source

China	India
Origin country (percentage supplied)	**Origin country (percentage supplied)**
Saudi Arabia (20%)	Saudi Arabia (19%)
Angola (12%)	Iraq (13%)
Iran (11%)	Kuwait (10%)
Russia (8%)	UAE (9%)
Oman (7%)	Iran (6%)

Source: Compiled by author from data provided by U.S. Energy Information Administration

Only two of the countries China relies on are from the Gulf (Saudi Arabia and Oman), whereas almost all of India's – with the exception of Iran – are Sunni Gulf states. Thus India is greatly exposed to any political disruption emerging from the region and is also highly susceptible to any blockading of the Strait of Hormuz.

This picture of dependence on MENA reserves is only a partial picture because it relies primarily on conventional oil and gas supplies. Yet, the advent of shale plays in recent years has tilted the playing field away from traditional OPEC powerhouses, although the exact extent to which unconventional reserves such as shale will change the energy landscape remains highly contested.

'Alternative' supplies

The Arab uprisings underscored the need for energy importers to diversify their sources. Countries like Israel and Jordan, for example, were caught by disruption to Egyptian gas exports, prompting them to hasten existing diversification plans. Libyan oil disruption also refocused attention on shale oil production which has, indirectly, benefited from political unrest in MENA. One of the unintended consequences of renewed spending commitments in the region is that if governments in the region become dependent on higher oil prices to balance their budgets, the relatively high costs associated with shale (from the energy intensive fracking extraction process) become more competitive. This section will therefore consider these various 'alternative' supplies to MENA oil in turn.

Shale oil

The debate surrounding the extent and significance of the so-called 'shale revolution' is hotly contested and multidimensional, revolving around issues such as its true potential, long-term sustainability, environmental impact, and economic feasibility. With regards to the

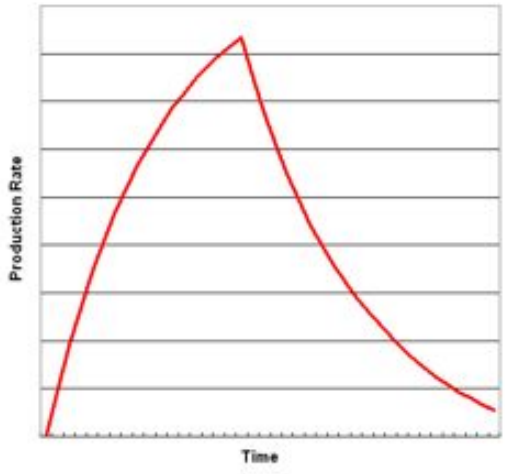
Arab Spring, shale takes on immediate significance under the rubric of diversifying oil supply. Moreover, because the most significant oil disruption of the uprisings came from Libya which produces light, sweet crude the relevance of shale – which produces a similar grade of crude – demonstrated its potential as an alternative source.

Shale is conventional oil extracted from unconventional formations of low porosity and permeability. The extraction takes place through a process of hydraulic fracturing (commonly referred to as 'fracking') which relies on horizontal drilling into rock formations, into which slickwater and proppents are then pumped at high pressure. This causes tiny fractures within the rock formations from which oil and gas can be recovered.

The current debate about shale is characterised by claim and counter-claim. On the one hand, a bald assessment of its potential resource pool in the United States suggests America could become the world's largest oil producer in just a few years. Indeed, the United States is now producing more oil domestically than it has for most of the last three decades, with around 7.56 million barrels a day at present.[103] This would represent a significant shift in the geopolitical balance of energy security, if sustainable reserves could be developed in politically stable Western countries.

Yet, this raw assessment of shale's potential must be tempered by consideration for price vulnerability, drilling intensity, and recoverable supply. The most important of these factors is the economic viability of shale which has benefited from the Arab uprisings. Developers of conventional oil fields invest significant sunk costs into exploratory drilling, making commercial assessments, and then building the infrastructure to bring a new field online. Once the field is finally operational, it then takes a few years before reaching peak production (see graph 12 below). The entire process takes several years (usually a decade), requiring an extended commitment from investors who base their decision on projections about the medium to long-term price of oil.

Graph 12
Conventional oil field production and decline curve

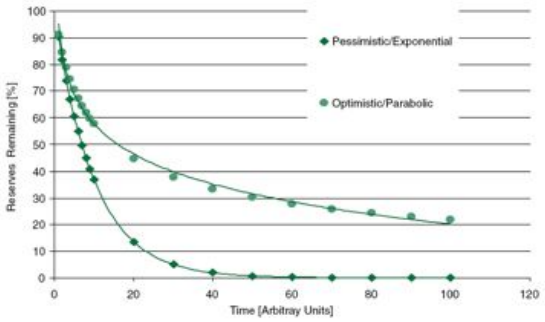


The timeframe involved with the extraction of shale oil is radically different. A shale play can be brought online within months and reaches peak production almost immediately. Thereafter the production decline is steep. Shale play developers

[103] 'U.S. Shale Oil: Saudi Prince's Fear Delights North Dakotan,' *ABC News*, July 31, 2013

consequently operate on a much shorter time horizon, looking at short term and immediate market conditions (graph 13). This is where shale developers will benefit from the turbulence of the Arab Spring. The rise in prices, particularly from the increased dependency on a higher reserve price from Gulf producers makes the relatively higher costs associated with shale oil extraction and supply much more economical.

Graph 13
Optimistic and Pessimistic Shale Gas Depletion Rates



Source: Prospects for Shale Gas, Energy and Climate Change Committee, UK Parliament

Companies operating in this area must therefore be prepared to exploit short-term market conditions, moving quickly to bring new sites online. This requires a mind-set of greater aggression and bullishness than is needed by other oil companies which move more slowly and in response to longer event horizons.

The profitability of such sites is also tight and contingent of a number of factors. While the Middle East remains unsettled and the spot price for oil remains high, shale plays can prove profitable. Leonardo Maugeri estimates that:

> The full development of shale oil in the United States requires an oil price higher than $80 per barrel in the short term, and higher than $65 per barrel in the longer term (five years).[104]

But the on going sustainability of shale projects will be dependent on more than just turbulence in the Middle East. Economic recovery in both the United States and Europe remains uneven and may stifle growth coupled with decreases in energy demand.

OPEC will also pushback against perceived threats to its interests. Producers are already increasingly concerned over the extent to which shale could threaten their oil exports. Mohammed Bin Saleh Al-Sada, Qatar's Minister of Energy and Industry, told OPEC last year:

> If we look at the growing technological advances in producing tight oil from low permeability reservoirs, oil production from the US Bakken play is expected to jump from 500,000 b/d currently to over three million b/d by 2020. Such results could be reproduced in many mature basins worldwide.[105]

Indeed, it is expected that more than 90 percent of American shale production will come from just three formations by 2020: Bakken-Three Forks (North

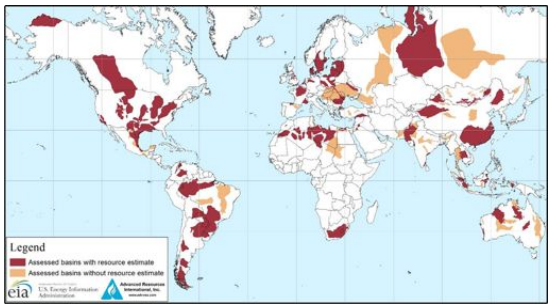
[104] Leonardo Maugeri, *The shale oil boom: A U.S. phenomenon*, Belfer Center, Harvard, June 2013.
[105] OPEC Bulletin, 6-7/12, p.60

Dakota), Eagle Ford (Texas) and Permian Basin (Texas).[106]

Prince Alwaleed bin Talal of Saudi Arabia warned that the kingdom faced an "inevitable threat" from shale production. He also noted Saudi's overwhelming reliance on oil exports for receipts, regarding the challenge from shale as a "source of concern."[107] Alwaleed hedged his concerns as part of a wider economic assessment of the challenges facing Saudi Arabia, arguing that it would need to boost output from 12.5 million to 15 million barrels per day to meet increased budget commitments.

Moreover, if the global abundance of shale basins were developed and brought online, it would represent a significant shift in the geopolitics of energy away from OPEC countries – which consist primarily of countries in the Middle East and Africa (along with two South American countries). By contrast, the most significant shale oil plays are currently concentrated in the United States, Russia, China, Argentina, and Libya. None of these countries is an OPEC member.

Map 12
Basins with assessed shale oil and shale gas formations



Source: U.S. basins from U.S. Energy Information Administration and U.S. Geological Survey; other basins: Advanced Resources International (ARI) based on data from various published studies.

Table 4
Top 10 countries with technically recoverable shale oil resources

Rank	Country	Shale oil (bn barrels)
1	Russia	75
2	United States	58
3	China	32
4	Argentina	27
5	Libya	26
6	Australia	18
7	Venezuela	13
8	Mexico	13
9	Pakistan	9
10	Canada	9
	World Total	**345**

Source: U.S. Energy Information Administration

The global abundance of shale reserves has not yet, however, been fully realised.

[106] Ibid.
[107] 'U.S. Shale Oil: Saudi Prince's Fear Delights North Dakotan,' *ABC News*, July 31, 2013

The United States currently leads the world in the extraction of shale reserves primarily because of the technological challenges involved with extraction. This relates to a range of technical factors, including the challenges posed by different rock formations, and the need to constantly bring a large number of new wells online. Indeed, the equipment needed for horizontal drilling – a necessary component in fracking – is overwhelmingly concentrated in the United States. Leonardo Maugeri explains:

> In December 2012 it was necessary to bring ninety new wells on stream each month to maintain the production rate at Bakken-Three Forks...But as production grows [there], the number of wells also must grow exponentially.[108]

It is unlikely any country can match the drilling intensity exhibited by the United States. Even in countries with relative technical sophistication and financial clout such as China, its third largest national oil company, the China National Offshore Oil Corporation (CNOOC), has been investing heavily in Chesapeake Energy to benefit from its fracking expertise.[109]

Moreover, while estimates have been cast about the size of recoverable reserves around the world, it is only in the United States where the geology of the various formations has been most authoritatively explored and assessed. This gives producers better insight into the costs associated with developing shale plays in the United States, whereas a number of factors remain unknown for similar formations elsewhere. Given the tight margins which relate to shale plays, heightened extraction costs at different formations may render them uneconomical.

Uncertainties also persist in other areas over the science of shale oil. Estimates over the technically recoverable resource (TRR) are constantly being revised in line with technological innovations and greater production experience. This makes precise forecasting difficult, given that estimates frequently shift over the TRR.

The development of shale plays in the United States (and in the Western world more generally) also faces alternative challenges beyond technical limitations. Environmentalists are deeply opposed to fracking which they believe damages the environment and distracts energy companies away from developing renewable sources. There are numerous considerations in this regard, not least the massive quantities of water needed for fracking (anywhere from 1-8 million gallons) which diverts it away from stream flow, or concerns arising from contamination of the injected water which is pumped underground and then works its way back to the surface. There are also fears over seismic activity caused

[108] Leonardo Maugeri, 'Shale Revolution Not So Simple,' *The National Interest*, August 8, 2013
[109] Naomi Rovnick, 'How Shale Energy Is Bringing America and China Together,' National Journal, May 30, 2013

by the fracking process which disturbs rock settlements underground. Although it is generally thought the process does not disturb these formations enough to produce any meaningful seismic event, there have been reports of activity being severe enough to have registered on the Richter scale in both the United States and United Kingdom.

There is a broader point here. The development of shale, as with the development of energy more generally, is a deeply political issue. The Arab Spring may have made the economics of shale development more attractive but it also underscored the necessity of a robust and diversified energy sourcing policy for Western governments. This makes shale even more attractive for American politicians keen to further reduce their dependency on energy imports.

The quest for gas independence in Israel

Israel has traditionally been a net importer of energy. For a country facing difficult relations with its neighbours this leaves it woefully exposed to regional turbulence. Towards the end of 2010 Israel's fortunes changed dramatically. Exploratory drilling about 80 miles off the Haifa coastline discovered new gas pockets of between 17-20 trillion cubic feet (tcf) – the largest gas discovery of the last decade, in what is known as the Leviathan gas field. This was preceded by a discovery the previous year of the Tamar gas field which is estimated to hold just under 10 tcf. In March 2013, gas started flowing from Tamar. "We are taking an important step towards energy independence," declared Israeli Prime Minister Benjamin Netanyahu.[110] Israel has additionally cultivated a series of smaller gas fields in the Levant basin (see table 5, and map 1) which should make the country a net gas exporter by the end of the decade.[111]

Map 13
Israeli gas fields in the Levant basin

Source: Offshore Energy Today

110 "Israel starts gas production," *Tethra Energy*, April 3, 2013

111 Table adapted from: Hakim Darbouche, Laura El-Katiri, and Bassam Fattouh, 'East Mediterranean Gas: what kind of a game-changer?' *Oxford Institute for Energy Studies,* (December, 2012) p.5. Image tagen from: Offshore Energy Today. http://www.offshoreenergytoday.com/gas-production-starts-from-tamar-field-off-israel/

Table 5
Israeli gas discoveries in the Levant basin

Field	Discove-ry date	Estimat-ed reserves (tcf)	First gas planned
Leviathan	2010	17-20	2016
Tamar	2009	9.7	2013
Tanin	2012	1.2	-
Mari-B	2000	1.1	2004
Noa	1999	0.04	2012
Dalit	2009	0.35-0.5	2013
Dolphin	2011	0.08	-

Source: adapted from: Hakim Darbouche, Laura El-Katiri, and Bassam Fattouh, 'East Mediterranean Gas: what kind of a game-changer?'

Israel therefore already had options to diversify away from reliance on Egyptian gas imports, and from being an energy importer more generally. The discovery and cultivation of rich gas pockets in the Levant basin has made this possible, allowing Israel to readjust without too much disruption following the cancellation of its agreement with Egypt. The problems associated with overreliance on that arrangement were felt in the immediate aftermath of the cancellation. In summer 2012 Israeli energy demand peaked at 12,370 megawatts (MW) while its grid had a total power production capacity of 12,800 MW. This left the country with just a 2-3 percent reserve margin, causing sporadic brownouts across the country.[112] This crisis reaffirmed Israeli political resolve to pursue strategies of achieving greater energy independence and security.

Prospects for Jordan

Unlike its Arab neighbours, Jordan lacks natural resources and is therefore a net energy importer. At present, 96 percent of Jordan's electricity generation is fuelled by imports, of which 80 percent comes from Egypt.[113]

Disruptions of Egyptian gas supplies, which amounted to 82 days' worth of loss in the first half of 2011 alone have prompted it to seek alternative sources. This is particularly important for Jordan as its economy continues to stagnate, coupled with high unemployment and inflation. Energy price hikes of 9 percent in 2012 were deeply unpopular. This situation is complicated further by the massive influx of Syrian refugees fleeing the civil war who represent a not insubstantial drain on already depleted Jordanian resources. Jordan's almost complete exposure to external shocks like these were summed up by the IMF as follows:

> As one of the world's most energy-import-dependent countries, adverse developments

[112] "Israel's Natural Gas Sector: Opportunities, Challenges and Strategic Outlook," *ACPO Forum*, 2012, p.3
[113] *White Paper on Nuclear Energy in Jordan* (Jordan Atomic Energy Commission, September 2011) p.13

> concerning either the diminished availability of energy imports (through further curtailment of critical gas supplies from Egypt) or higher energy-import prices (due to adverse shocks to global energy supplies) would have serious repercussions for the Jordanian economy.[114]

There may be some solace for Jordan in all this. The Gulf States are particularly worried by the prospect of instability in Jordan, not least because it would represent the first Arab monarchy to become embroiled in the fallout of the Arab uprisings. They have managed, so far, to avoid the turbulence rocking the region. The Gulf monarchs fear the psychological effect of one monarch being deposed would fuel unrest within their kingdoms, prompting Qatar to enter into negotiations with Jordan over its gas supply – a relationship it was unlikely to have considered in alternative circumstances. In part this is due to the 2005 moratorium Qatar placed on gas development projects in its North Field, the principal site of the country's natural gas reserves.[115] Nonetheless, keen to help Jordan stabilise its economy the Qataris will now supply it with some gas through the Red Sea Aqaba terminal.

Yet, as the Qataris will not be lifting their North Field moratorium (indeed, indications suggest they will extend it) this will not satisfy all of Jordan's long-term gas import needs. It is therefore pursuing a policy of supplier diversification. In June 2012 the Jordanians finally convinced the Iraqi government to approve plans for the construction of a pipeline carrying heavy oil and natural gas to the Aqaba terminal. Jordan is also exploring options of importing gas from both Israel and Iran, although Gulf regimes remain traditionally hostile to both countries and may therefore seek to counteract any potential for adverse influence in such cases.

None of this comes cheap. Jordan was able to secure gas from Egypt at a favourable rate which it can no longer enjoy. According to the IMF, Jordan's energy import bill rose by 50 percent in 2011 – accounting for 16 percent of its GDP.[116] This has prompted Jordan not just to seek diversification of suppliers, but also of source. In 2007 it discovered 65,000 tonnes of uranium in the Jordanian desert, the eleventh largest deposit in the world. Two years later the Jordanians signed an agreement with the Korean Atomic Energy Research Institute to build a 5 MW research reactor. This is a precursor to its plans to have a fully operational reactor by 2019. If achieved, this would go a long way to satisfying a number of Jordan's energy concerns while also easing domestic pressures. Most notably, it would help the Jordanian government achieve a degree of autonomy and stability over domestic

[114] *Jordan: 2012 Article IV consultation* (IMF, May 2012) p.20

[115] Energy Information Administration, Qatar: Overview (January 2013); Also see: *The Report: Jordan 2012* (Oxford Business Group, 2012)

[116] *Jordan: 2012 Article IV consultation* (IMF, May 2012) p.20

pricing given that nuclear energy production costs are relatively stable compared with fossil fuels. This will not be easy avenue for Jordan to pursue. Although it is a signatory of the Nuclear Nonproliferation Treaty – which allows for uranium enrichment for energy production – international opinion is still suspicious of any nuclear development in the Middle East. This is not helped, of course, by the Iranian nuclear programme which has long been suspected of having military ends.

Jordan's dilemma in this regard reflects the wider context to all this – the political considerations and sensitivities of great powers, all with vested, competing, and frequently diverging interests in the region. Indeed, it is not only external powers that have fractured aspirations for MENA. There is also a war within; the fratricide of sectarian groups all vying for dominance, captured most dramatically by heightened Sunni-Shia rivalries. This is the perilous geopolitical dynamic that both IOCs and NOCs must navigate. The following section considers these factors and their implications for the energy picture in the region.

The Sunni-Shia schism

The Arab Spring unravelled long standing, albeit subterranean sectarian tensions within the region which influence some of the grand power gesturing. The main fault line is that between the two main denominations of Islam, known as Sunni and Shia. The former constitute the largest body of normative Islamic practice, with around 80-90% of all Muslims falling into that sect. The Shia make-up the rest and are predominantly concentrated around the Persian Gulf, in Iran, Bahrain, and southern Iraq. They also constitute a significant minority in Lebanon. The schism between these two sects originated from a dispute over who should succeed the Prophet Mohammed in leading the Muslim community as Caliph. This disagreement, as religious difference often does, gave rise to theological fissures and battle.

Tensions between the two sects have flared periodically throughout the history of Islam and, in contemporary times, have intensified in the post-9/11 environment. Al-Qaeda has repeatedly attacked Shia communities in its primary areas of operation: Pakistan and Iraq. During the Iraq War, sectarian tensions dominated much of the fighting and these rivalries were again revived by the Arab Spring.

Shia communities are usually subject to some level of harassment and oppression in countries where they do not form the majority. Saudi Arabia is an excellent example in this regard, and its challenges perfectly demonstrate the political dynamics which dominate the background of the Arab Spring.

When uprisings unseated governments across North Africa, the Shia community in Saudi Arabia launched a series of protests on March 10, 2011, to agitate for reform. The protests were easily contained and dismissed. The reason they did not feed into a broader movement as in other countries is precisely because Saudi Sunnis fail to identify with their Shia counterparts as full citizens. The lack of social solidarity therefore meant the call for unrest was easily portrayed as an attempt at sectarian sabotage.

Localised unrest of this kind would not ordinarily cause too much concern, but there is a significant undercurrent to the Shia protests which must be considered here. The Shia community is concentrated along Saudi's Eastern coast which is where its richest oilfields are also based (see map 14). [117] The most important of these are located in areas of dense Shia population, including the Ghawar oilfield – the largest oil production site in the world.

[117] U.S. Energy Information Administration, Saudi Arabia: Overview (February, 2013). Table data adapted by author for relevance.

Map 14
Shia communities and oilfields in the Arabian Peninsula

Source: Saudi-Iranian Tensions and Shia Islam in Saudi Arabia, Geocurrents.info

Table 6
Major onshore oil fields in Saudi Arabia

Name	Production/capacity
Ghawar	5 million bbl/d of Arab Light crude
Khurais	1.2 million bbl/d of Arab Light crude
Shaybah*	0.75 million bbl/d of Arab Extra Light
Qatif	Capacity 500,000 bbl/d of Arab Light crude
Khursaniyah	500,000 bbl/d Arab Light Crude
Abqaiq	400,000 bbl/d Arab Extra Light crude

Source: U.S. Energy Information Administration, Saudi Arabia: Overview (February, 2013). Table data adapted by author for relevance.

Note: Shaybah is not located in an area of Shia concentration, but is instead in the south-east of the country in an area known as Rub' al-Khali *(the empty quarter).*

The government of Saudi Arabia assured international markets of sustained oil supply and production during early 2011, but a significant Shia insurrection could have directly affected exports. Fears this could happen were heightened by the former Saudi oil minister, Sheikh Zaki Yamani, who predicted serious unrest would erupt inside the kingdom and cause oil prices to hit somewhere between $200 and $300 a barrel.[118]

Saudi Arabia's foreign policy then led to them to offer direct military support for the tiny Gulf statelet of Bahrain which suffered a significant uprising following the overthrow of Hosni Mubarak in Egypt. While the ruling royal family in Bahrain is Sunni, the Shias comprise its single largest religious bloc. When they began agitating for reform, there was serious pushback. Although Bahrain is only a modest producer of oil and gas, it retains importance for a number of political reasons. Firstly, Bahrain has refinery capacity which helps Saudi Arabia, such as their shared production of oil from the Abu Safah offshore field in Saudi Arabia.[119] Regional governments were also unwilling to allow a Shia administration to take root in Bahrain because this would extend the Iranian sphere of influence into the Persian Gulf. This has real – albeit distant and theoretical – implications for global energy markets.

Any government friendly to Tehran in the Persian Gulf would further extend Iranian reach into the narrow waterways around the Strait of Hormuz. As has already been explored, this is one of the world's most important energy bottlenecks, and one which has been repeatedly threatened with blockade by the Iranians. It was not just the Saudis who therefore had an interest in the

[118] "Update 2 – oil could hit $200-$300 on Saudi unrest – Yamani," *Reuters*, April 5, 2011.
[119] U.S. Energy Information Administration, Bahrain: Overview, February 2013

ongoing stability of the Bahraini royal family. The West also had a vested interest in Bahraini stability. For the United States their interest was particularly acute. A hostile regime in Bahrain would likely expel its Fifth Fleet which is garrisoned there. This would not only diminish American naval power in the region, but also undermine the primary launchpad from which the United States would attempt to reverse an Iranian blockade of the Strait of Hormuz, should that occur in the future. These interests – that of super powers beyond the region – must consequently be considered in detail.

American influence v Chinese/Russian influence

Regional sectarian rivalries have been at their most intense in Syria where an initially peaceful uprising has now given way to a brutal civil war. Sunni Muslims comprise around 75 percent of the Syrian population, although power is concentrated in the hands of the Alawite clan – an offshoot of the Shia. The Syrian administration is therefore extremely close to Iran and has relied on Tehran's patronage (along with that of Russia and China) to sustain itself throughout the civil war. This support has come in many forms beyond the supply of weapons including, perhaps most importantly from Damascus's point of view, political support in the United Nations Security Council.

Of all the Arab Spring countries, none has exposed the divide between the great powers as acutely as the Syrian conflict. At the regional level, Sunni states like Saudi Arabia, Qatar, and Kuwait all swung dramatically behind the Syrian opposition (which is predominantly Sunni). Turkey and Jordan also swung behind the opposition but less for sectarian reasons. In their case, both countries have absorbed a large number of refugees and are experiencing increased economic strain as a result. Indeed, in Jordan, the Zaatari refugee camp is now the fourth largest 'city' in the country. This comes at a time of acute economic crisis for Jordan (some of which has been elucidated upon above). By contrast, Shia powers in Iran and Iraq are aiding Bashar al-Assad's beleaguered administration. They want to perpetuate a so-called 'Shia crescent' of power which spreads – however informally – from Iran, through Iraq and the Persian Gulf, into Syria and Lebanon. This gives Iran a powerful sectarian bloc across the middle of the Muslim world with Sunni Arab states to the West and Sunni Asian countries (such as Pakistan and Indonesia) to the East.

European governments and the United States have consistently called for the removal of Assad from office. Russia has thwarted their efforts because of longstanding interests in Syria, both economic and ideological. On the latter of these points, Russia is particularly keen to prevent the United States from shaping the region. It already worries about the projection of American power, particularly after relations deteriorated following the South Ossetia War against

Georgia, in August 2008. Georgia was already pursing strong relations with the West at the time and hosts part of the Baku–Tbilisi–Ceyhan (BTC) pipeline which carries oil from the Azeri–Chirag–Guneshli oil field in the Caspian to the Mediterranean. Notably, it bypasses both Russia and Iran. The United States therefore responded to Russia's invasion of Georgia by announcing the establishment of a new missile defence system in Poland, a move the Kremlin regarded as being deeply hostile. Russia responded by establishing a naval base in Tartus, Syria, which is capable of hosting its nuclear armed warships.

Map 15
Baku–Tbilisi–Ceyhan pipeline

Source: U.S. Energy Information Administration

Beyond Russia's political considerations, it also has economic concerns. Syria is one of Russia's biggest defence clients, with contracts worth somewhere between $4 and $6 billion.[120] Russian firms also have a significant stake in the Syrian energy sector. Tatneft, Russia's sixth largest oil and gas company, has been exploiting Syrian oil with the Syrian National Oil Company since 2010 including projects for exploratory drilling near the Iraqi border. Another company, Stroytransgaz, also has significant investments in the country and has been operating there since 2000.[121] From 2005-2009 it worked on constructing a 320 kilometre stretch of the Arab Gas Pipeline in Syria. It has also been working on the South Middle Area Gas Exploitation Project, involving the construction of gas processing plants and development of existing gas fields.

China's position is more nuanced than Russia's. The country was traditionally Syria's main source of imports, accounting for around $2.2 billion in 2010 although Beijing's considerations extend beyond this.[122] As has already been explored earlier, while China is reliant on oil imports, it has diversified its sources. Saudi Arabia provides 20 percent of Chinese oil while Iran accounts for 11 percent. Beijing is therefore hedged neatly between the two principal powerhouses of the Sunni-Shia divide. Moreover, the Chinese approach to the Arab Spring has largely been one of unobtrusive passiveness. They

[120] Margarete Klein, 'Russia's Policy on Syria: On the Way to Isolation?,' German Institute for International and Security Affairs (SWP)
[121] 'Additional Agreement on the Stroytransgaz' Project Concluded in Syria,' Stroytransgaz Press Center, November 9, 2011
[122] EU Bilataral trade and trade with the world: Syria, EU Commission, July 5, 2013

abstained on the Security Council vote over military action against Libya and are happy to let Russia take the lead in defending Syria abroad. Chinese foreign policy in recent years has been focused around developing its 'string of pearls' approach across the Arabian Sea, Indian Ocean, and Bay of Bengal, coupled with aggressive investments into sub-Saharan and central Africa. In this context, of course, it is worth noting that the second largest source of Chinese oil imports is Angola.

Meanwhile the position of the United States and Europe has long been established in the Middle East. They are close to Saudi Arabia politically, and are sceptical of Iran. Its regime is regarded as diplomatically dangerous and the country's energy exports have consequently been subject to sanctions for decades. Relations with the so-called 'Shia crescent' have traditionally been strained and have come under renewed pressure over events concerning the Arab Spring. Iran has, for example, consistently accused the West of hypocrisy for its failure to support Shia protesters in Bahrain while focusing on the Syrian regime. The Arab uprisings have therefore exacerbated existing strains with regard to regional tensions, rivalries, alliances, and interests. These positions are now more entrenched and polarised than before, making diplomatic de-escalation increasingly difficult.

Considerations for IOCs and NOCs

The international business environment has not been particularly welcoming to IOCs in recent years. They control approximately 5 percent of known conventional crude deposits, while the rest is controlled by NOCs.[123] The rise of NOCs stems predominantly from the wave of nationalisation in the 1970s by newly empowered governments around the world who leveraged popular sentiment with resource nationalism. The idea was simple enough: that foreign companies would not be allowed to 'exploit' national resources without paying their fair share. There are now a number of way in which IOCs can try to benefit from the Arab uprisings, despite several global factors weighting overall conditions in favour of NOCs.

As demand for oil grows (particularly in the East), and more countries pursue policies of energy source diversification, new resources will be harder to access. Production methods will require more innovation and optimization, particularly when it comes to accessing unconventional oil sources through processes like deep offshore, and horizontal drilling. This is where IOCs were traditionally thought to have an advantage over NOCs, with sophisticated research and development programmes, experience across all sectors of the supply chain; and proficiency in different environments. Even here, companies like Saudi Aramco and Sonatrach have recently attracted attention by pioneering

[123] *Fueling the world of tomorrow: IOCs and NOCs at a turning point,* Deloitte Consulting: Energy & Resources

new petroleum engineering solutions such as the digital oilfield programme.[124]

High oil prices have also weakened the bargaining position of IOCs wanting to pursue equity based participation in new projects. For example, the first licensing round in Iraq used service contracts, which resulted in BP and CNPC accepting a fee of just $2 a barrel, making them some of the lowest margin barrels in the world.[125] Coupled with this, IOCs are also facing stiff competition from NOCs, particularly Asian ones, who are also prepared to operate on tighter margins and with less profit because of state backing. China's state-owned CNPC now has exploration and production activities in 27 countries.[126] Most recently it has entered into Ecuador's Pacific Refinery Project with two other NOCs: PetroEcuador and Petroleos de Venezuela. It is also pursuing similar projects across Central Asia and Central Africa, such as the offshore gas project in Mozambique's Rovuma gas field.

Yet the ties between NOCs and the state can also be a source of hindrance over issues like strategic direction. NOCs may, for example, be under pressure to create jobs, divert extra resources to training and development programmes, and react to political steering. This is something IOCs have traditionally been laboured with, with host countries requiring them to employ and train locals and engage in knowledge transfer initiatives. Herein lie opportunities for synergy between IOCs and NOCs.

The Arab Spring swept away autocratic regimes that were mired in corruption and otherwise opaque business practices. Newly installed governments must react to that environment by relieving pressure from stagnating economies, unemployment, and a lack of inward investment. The Libyan government has the most to gain from creating the conditions where NOCs can work effectively with IOCs in this regard.

Conditions under Gaddafi were extremely repressive for IOCs. Much of Libya's oil resources remain both undiscovered and undeveloped. On the first point, exploration licences were issued with often prohibitive terms. For example, the agreement regulating IOC exploration in Libya is known as the Exploration and Production Sharing Agreement (EPSA) IV. Under its terms, the Libyan NOC would take around 80-90 percent of the revenue from oil and gas production while the IOC would bear all the costs of exploration and appraisal.[127] Whereas previous EPSAs also insulated IOCs from market fluctuations by guaranteeing a fixed price per barrel of oil, EPSA IV changed this to link the system of payments to market forces.

[124] Arthur Melet, 'The growing role of national oil companies in the innovation process in the Middle East and Africa,' *IDC Insights*, August 2013
[125] 'NOCs and IOCs: resolving tensions,' Norton Rose Fulbright, March 12, 2010
[126] CNPC website, Exploration & Production. http://www.cnpc.com.cn/en/aboutcnpc/ourbusinesses/explorationproduction/?COLLCC=1837098042&
[127] George Booth and Admir Kordvani, Understanding the Libyan Oil & Gas Production Sharing Agreement Framework (article 2 of 3), Clyde and Co,

This, of course, gives IOCs little protection from market forces.

The restrictive commercial environment has meant that IOCs are only willing to develop large discoveries, due to the compressed margins EPSA IV compelled them to work on. Thus, while a number of wells have been discovered in Libya, they remain undeveloped because IOCs did not regard them as commercially viable. It is in the Libyan government's interests to develop these sites not just for the additional revenue they will generate but also because of the immediate benefits IOCs can offer. These will include cash readiness, job creation, and skills transfers. To achieve this, Jay Park, a partner with Norton Rose, argues that Libya's challenges include replacing EPSA IV with more favourable terms which reconfigure the relationship between the state and IOCs.[128] It will also need to introduce a Development Production Sharing Agreement to incentivise production for IOCs, along with developing a solid regulatory legal framework underwritten by constitutional safeguards.

This is one of the greatest challenges for countries transitioning through the turbulences of the Arab Spring. The economic benefits of encouraging NOC-IOC cooperation have already been stated, but achieving the political consensus where a suitably enticing and robust regulatory framework can be created will not be easy. Newly installed governments across MENA are struggling to exert meaningful authority. This is particularly apparent in Libya where the government has very little actual control beyond the capital. The challenges facing these new administrations are therefore numerous, and safeguarding the energy sector is just one of many issues.

Conclusion

The contours of power are still far from settled in the Middle East. Almost three years since events in the rural Tunisian town of Sidi Bouzid ignited revolutionary passions across the entire Middle East an unsettled and uneven picture has emerged. Governments in the Gulf have largely weathered the storm of revolutionary passions, while administrations across North Africa tumbled. In Syria – the Arab Spring's open sore – repression gave rise to a civil war in which forces aligned to al-Qaeda have come to dominate the opposition.

All of this has had, and continues to have, multidimensional implications for energy markets, affecting everyone from producers to suppliers and consumers. This paper has demonstrated how the political and energy situation in MENA helped some governments – particularly, those with a GDP-PPP per capita in excess of $20,000 – thwart revolutionary movements in their incipient phases. Purchasing power parity allowed those governments - mostly in the Gulf – to boost social commitments through an authoritarian bargain which trades freedoms for welfare.

[128] Jay Park, Petroleum development opportunities in Libya after the Arab Spring, Open Oil, November 21, 2012

This has not been an easy balance easy to maintain. Increased social expenditure commitments have made governments in the Gulf more dependent on higher reserve prices for oil in order to balance their budgets. This not only makes them more susceptible to pressure from traditional OPEC price hawks like Iran and Venezuela, but also delays long overdue domestic structural reforms in many Gulf economies. Subsidy reform has consequently been sacrificed to achieve political stability.

Economic problems will not be the only outgrow of regional turmoil. Militant groups across North Africa are also reinvigorated. Sabotage in Egypt has already produced serious consequences for both Israel and Jordan, while Islamists in Libya, Tunisia, and Algeria pose additional threats. The last of those countries has already suffered a significant terrorist attack on the Tigantourine gas facility near In Amenas, while sabotage against energy companies remains a pattern of civil unrest in Libya in order to attract government attention.

This paper has considered these threats and explained them in context of both intra-regional tensions, including sectarian issues such as Sunni-Shia rivalries; coupled with the competing goals of superpowers such as the United States, China, and Russia, who are all invested in the region. The local and international picture was then used to explain how IOCs wanting to exploit regional reserves consider the operating environment to be relatively hostile and unpredictable.

Opportunities have emerged from some of the region's convulsions. Terrorism and political pressures have accentuated an energy crisis in Jordan and Israel, spurring on both to pursue existing energy diversification strategies. The increased price of oil exports has also meant that fracking technologies are currently more cost effective to pursue, while prices remain high. Moreover, these technologies are perfectly placed to capitalise on the present turmoil because shale plays are usually exploited over much quicker timeframes than conventional oilfields.

Producers will also be drawn to shale because of the concentration - not just of shale basins, but also of the extraction technologies – in stable, advanced economies such as the United States and Canada. This is particularly attractive when considering that al-Qaeda aligned terrorists are flourishing across North Africa and the Levant. Al-Qaeda is now not just controlling large parts of northern Syria but is also resurgent in Iraq where a recent surge in sectarian violence demonstrates the potentially serious implications for its energy exports, given the previous pattern of terrorist sabotage and deliberate targeting of energy infrastructure in the country.

For Western governments, 'opportunity,' is the takeaway lesson of the Arab Spring. Most developed economies have long considered means of diversify both their energy suppliers and energy mix. For

resource poor countries in the region, the urgencies of this lesson have been acute. They have had to adapt quickly. Yet, it is the world's larger economies which now have an opportunity to cultivate and develop shale reserves.

The fallout of the Arab uprisings has ensured that both the political and economic conditions needed to spur its advance have aligned, and are likely to remain favourable for the immediate short to medium-term. If shale plays and technologies – among other energy sources – are developed this would not only help Western governments get closer to their goal of realising a broader, more advanced, and stable energy mix – but it would also weaken autocratic rulers across MENA by reducing their GDP because of a decline in demand. If that happens, the Arab protesters may yet get what they have been searching for.

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