

TERRORISM AND POLITICAL INSTABILITY THREATEN MIDDLE EAST ENERGY SECURITY

High oil prices, threats of terrorist attacks, some political instability and the rise in so-called 'oil nationalism' have raised serious concerns about the security of oil supplies.

THE WORLD ECONOMIC FORUM (WEF) defines energy security as the uninterrupted physical availability of energy at an affordable price while respecting environmental concerns.

At first glance, the enormous energy resources of some of the countries in the MENA region would reduce the region's overall energy security risks.

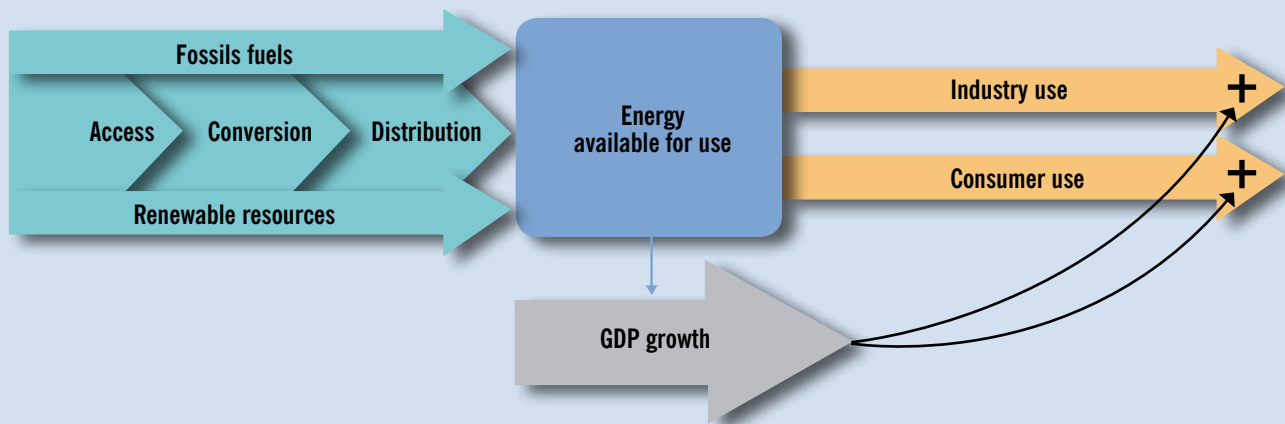
According to WEF's Middle East and North

Africa at Risk 2010 report, the MENA region holds 56 percent and 41 percent respectively of the world's proven oil and gas reserves and will remain a leading player in the world's energy supplies through to 2030 with fossil fuels expected to support more than 80 percent of the world's growth in energy demand.

However, there are significant differences in the energy resources of the individual

MENA countries and the volume of fossil fuel reserves affect energy policies, including infrastructure investments, consumption patterns and energy diversification. Examined in a broader context, energy security goes beyond the mere availability of

Key Input, Output and Influencing Factors in Energy Security



Source: World Economic Forum



energy resources. It has to be viewed in the context of a system that combines access to resources and the ability to convert and distribute energy with specific levels of demand that are driven by growth.

Across the region, countries are facing challenges with one or more of these elements.

With a particularly energy-intensive growth pattern, the region has entered into an escalating feedback cycle of exponentially rising demand that will be increasingly difficult to meet as fossil resources decline and climate change imposes a move to more sustainable low-carbon economies.

The MENA region's total consumption of energy has grown faster over the past decades than any other region in the world. The region, the report says, is approximately 60 percent more energy-intensive than OECD countries (measured by energy consumption per GDP) and the trend is increasing.

The MENA region's primary energy demand is expected to grow at 2.9 percent a year through 2030 and electricity demand alone is expected to double by 2020.

This trend exposes the region to energy security risks in terms of its access, conversion and distribution capacities.

If current trends in energy intensity continue, the region may not be able to continue to deliver affordable and reliable energy to meet the needs of the population and support continued economic growth.

Therefore, countries may have to make a trade-off between generating export revenue and meeting domestic needs. However, these risks play out differently across the Middle East.

Iran has had to ration petrol as it struggles to align supply and demand; Maghreb countries lack basic resources and conversion capacities to keep up with the demands of steep population growth; Kuwait has imported LNG and most GCC countries are struggling with accessing easily convertible resources (such as gas) to fuel their industries as oil fields mature and they seek to optimise oil exports. The region is expected to see one of the largest increases in gas consumption for power generation over the next two decades.

Countries have to reconsider feedstock for power generation plans that were based

on natural gas as existing gas exporters such as Algeria and Egypt will increasingly have to meet domestic power generation demands and reduce exports. The focus on natural gas increases the importance of Iran, Iraq and Libya as sources of natural gas.

These doom laden predictions about the availability of oil supplies and the size of reserves are gaining popular credence at times when oil market conditions are tight. Many international agencies, such as the Energy Information Administration (EIA) and International Energy Agency (IEA), are also predicting a healthy growth in global oil demand in the next 20–25 years, driven primarily by high growth rates of non-OECD Asian economies.

Given that the Middle East is endowed with the bulk of the world's oil reserves and is responsible for a large share of global oil production, security of Middle East oil supplies is central to the oil security debate.

Despite these various potential sources of instability, it has not been all bad news when it comes to the security of Middle East oil supplies. The Middle East and in particular the Gulf states, continues to act as the main supplier of oil to global markets.

energy security has broadened to include the security of other sources of energy such as gas and electricity. In this respect, oil is by far the most tradable fuel and therefore presents fewer problems in terms of security when compared to other less tradable fuels. Energy security has also become intertwined with environmental concerns which place restrictions on the choice of future fuels.

Despite these new aspects of energy security, oil still occupies a central location in the policy debate.

This is expected, since although the importance of oil as a percentage of GDP has declined in most developed countries in the last thirty years, it still constitutes the world's most important source of energy.

Furthermore, the transport and aviation sectors, the lifelines of any modern economy, are still totally reliant on oil where no other fuels have been able to make progress.

Given the dominant position of oil in the world's economy, high and volatile oil prices can have damaging effects on economic growth.

Indeed, high oil prices can induce global imbalances, especially for developing countries.

Thus, unlike other commodities, securing oil supplies and avoiding oil price shocks



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In many instances it has played the role of a swing producer, absorbing supply shocks from within and outside the region.

Oil still dominates energy security

Unlike the 1970s when oil dominated the energy policy debate, the concept of

are essential for an efficient and smoothly-functioning global economy.

The concept of 'oil dependency'

At the root of oil security concerns is the concept of 'oil dependency'. Due to a geological accident, oil is found and extracted in different regions from those in which it is mostly consumed. A small group of countries, predominately in the Middle

East, are endowed with the bulk of the world's oil reserves and are responsible for a large share of global oil production.

On the other hand, global oil consumption is dominated by the US, the European Union, Japan and China.

Although some of these countries are important oil producers, domestic production accounts for about one-quarter of their consumption and consequently these countries have to rely on oil imports to fill the gap.

Oil dependency is likely to increase in the future for North America, Europe and Asia as they possess less than 10 percent of the world's proven reserves.



Dependency, however, is not a sufficient condition to elicit concerns about energy security. Relying on oil imports would not constitute a source of concern if oil continues to flow smoothly from surplus to deficit areas. Thus, in addition to oil dependency, an underlying theme is that the regular flow of oil to importing nations may be subject to disruptions. This conjunction of the concepts of oil dependency and vulnerability to serious disruptions in oil supplies constitutes the basis for energy security concerns.

Terrorist attacks on oil facilities

Oil installations, pipelines and tankers have been subject to numerous terrorist attacks.

One of the most spectacular was the attack in 2002 by an explosives-laden boat on the Very Large Crude Carrier (VLCC) Limburg, carrying a cargo of around 400,000 barrels of crude off the shores of Aden.

The attempt to hit the Abqaiq oil processing terminal in Saudi Arabia in 2006 provided the fuel for counterfactual scenarios in which Al-Qaeda succeeded in destroying Saudi Arabia's oil facilities.

Concerns that terrorist attacks can force the oil industry to its knees are, however, exaggerated. Terrorist attacks usually have temporary effects and damage is rapidly repaired.

Despite the numerous threats, only a few have been translated into attacks, highlighting the difficult logistical challenges involved in hitting oil installations.

Furthermore, the degree of vulnerability is not the same across all parts of the oil supply chain. For example, it may be relatively easy to blow up a pipeline. However, the impact is minimal as attacks on pipelines usually result in limited losses.

In the Saudi context, an attack on a pipeline would have no impact as there is plenty of spare capacity in the transport infrastructure which makes it straightforward to bypass the damaged pipeline.

To cause large disruptions, terrorists therefore need to cause damage to key installations such as oil processing complexes, or to set oilfields ablaze.

Hitting such key targets is very difficult and should not be compared to attacks on a pipeline. Given the importance of the oil industry to the Saudi economy, bottlenecks are heavily guarded.

In the Kingdom, one commentator notes that over the past few years, the Saudi government has heavily invested to enhance security at all of its oil facilities.

There are up to 30,000 guards protecting the Kingdom's oil infrastructure, while high technology surveillance and aircraft patrols are common at the most important facilities. In addition, anti-aircraft installations defend key locations.

Regardless, terrorist attacks on oil targets remain a menace to the oil market. Although their impacts are limited, terrorist acts affect the psychology of market players and tend to place a premium on oil prices.

Sanctions: the oil weapon

The dependence of oil-exporting countries on oil revenues implies that consuming nations also possess an oil weapon. Unlike the oil weapon in the hands of oil producers, consuming countries can use sanctions to target specific countries.

Furthermore, when implementing sanctions, they can choose the timing.

The US has been the most active in using sanctions as a tool of foreign policy to induce change behaviour in regimes. The effect of sanctions depends on their type and oil market conditions. Multilateral sanctions under the UN umbrella can be very harmful as they have the effect of curtailing oil exports from the targeted country. Multilateral sanctions adversely affect the country's productive capacity by limiting foreign investment and technology transfer in the oil sector. Unilateral sanctions, on the other hand, do not necessarily affect the flow of oil from the country under sanctions.

This would cause some temporary inconvenience as the oil exporter establishes new trade partners and seeks new customers. In the short term, therefore, the impact of

unilateral sanctions is rather limited.

However, if unilateral sanctions are kept for a long time, they would ultimately affect the productive capacity of exporters, like in the case of the Iran–Libya Sanction Act (ILSA) imposed by the US against Iran and Libya.

The sanction, which doesn't apply anymore to Libya, prohibited international oil companies from investing in the oil sectors of these countries, curtailing their long-term production capacity.

Inadequate infrastructure

The energy infrastructure in the region is not meeting demand. For example, the World Bank estimates that the installed generation capacity of the electricity sector is 20 percent below the current MENA region aggregate demand for electricity. Without significant investments, many countries will be unable to meet future demands.

Poorly performing and insufficient energy infrastructure has significant impact on the economic growth of the region, overall entrepreneurship and time and costs involved in starting new business. For example, World Bank Enterprise Surveys show that firms consider electricity one of the biggest constraints to their business.

The constraints stem from inadequacies of electricity service – access to electricity, electricity distribution and the reliability of supply – as well as from connection costs.

In addition, most countries in the region experience significant transmission and distribution losses in power systems. A study of 11 MENA countries found that the equivalent of 17.9 GW or 13.3 percent of total installed capacity was lost in transmission. Reducing these losses to 10 percent would provide a savings of US\$ 5.5 billion equivalent in new infrastructure investments.

Resolving these shortcomings will require infrastructure investments representing approximately 5 percent of the MENA region's GDP or an annual investment of US\$ 100 billion. One-third of the investment will be required to simply maintain existing generation and transmission assets. Currently, about half of this amount is mobilised.

HOW CAN CYBER ATTACKS THREATEN OIL & GAS SECURITY?

Mohamed Rizvi, Manager, Information Security and Advisory Services at eHosting DataFort explains.



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What are the main threats to oil and gas security across the MENA region?

Cyber threats mainly focus on organisation data or classified information. Typically, such attacks affect critical infrastructure and this is common for all sectors. Stealing of data or corrupt data, denial of services such as bringing down the functionality of services are the common type of security threats faced even by this sector.

Specifically in this sector, there are control systems used to maintain physical infrastructure such as distribution control systems that are used for surveillance systems

and in the entire supply chain systems as part of the daily operations and these include connectivity between offshore refineries and the main offices via Internet to transmit data to local networks.

Cyber-attacks today also target these control systems which can affect the sector to a large extent. The entire supply chain may get affected as these are the main nerve systems for the industrial producers.

These systems may not be as exposed to attackers as compared to information systems available online. However, these systems face different types of challenges posed by the intruders. Today, different mechanisms are utilised to get into these systems. The recent malware called 'Stuxnet', also called 'the attack of the decade' targets industrial systems.

Oil and gas industry is also not exposed to the Internet to a large extent other than email and web services.

What kind of measures should oil & gas companies adopt to mitigate risks?

Physical security measures are generally implemented in the form of access control systems, security guards with 24x7 surveillance/monitoring and dual control measures.

Safety measures play a major role in this environment so as to ensure that people who work in this environment are safe. Hence, it is imperative to have such controls implemented.

Technologies like firewalls, network/host intrusion prevention systems and data security solutions are security components available in most organisations. Qualified people have to be appointed to manage the security environment. Though there are systems in place, the human element is also significant to the oil and gas sector.

Supervisory Control and Data Acquisition (SCADA systems) / control systems are used in this sector to control their operations and provide feedback to the control system placed in the main office.

Electronic intrusions and attacks may come from inside or outside the company. From within, intrusions may be innocent mistakes made by an operator, or deliberate attacks by disgruntled employees. Externally,

intrusions come from former employees, computer viruses, and from hostile external attackers. There may be Internet connections to the control system to enable management, engineering, and others to monitor processes and progress which may create an exposure to intruders.

Therefore, supervisors of these systems are tightening the physical and cyber access to the SCADA/Control systems to limited operating and contract personnel.

What are the dos and don'ts of an effective energy security policy and strategy?

- An organisation must have a proactive approach for solving security incidents
- Adopt appropriate management systems for implementing controls to mitigate threats. This could begin with having information security, logical and physical security policies supported by processes and procedures implemented across the organisation.
- Critical policy violation could lead to major disasters resulting in personnel injuries, financial losses and environmental damages. Hence, monitoring of violations/compliance to such policies and processes needs to be audited regularly to avoid mishaps proactively.
- Increasing awareness of policies, processes and procedures creates secure environment and brings effectiveness in the security controls implemented on the ground.
- Globally recognised security standards like ISO 27001 are also followed in the oil and gas sector to implement security best practices. On the other hand, there are different standards addressing environmental controls and health and safety issues which impact this industry to a large extent. If these best practices are not followed, there could be short - and long-term consequences for the people and environment resulting in the future generation suffering from illness, loss of billions of money and this may even create an impact on the economy.
- An energy security policy and a security strategy need to be decided in an

organisation based on different security threat scenarios affecting the sector e.g. oil leakage, damaged marine cables, terrorist and cyber-attacks, natural events and accidents are factors to be taken into consideration while planning a security policy.

- Security around SCADA systems needs to be reviewed regularly to ensure confidentiality, integrity and availability to maintain the intellectual property of the organisation.

To what extent does the terrorism threat pose a real danger to energy production?

Threats from terrorists and different interest groups are executed these days via cables and Internet as opposed to physical attacks. 'Stuxnet', the latest malware which targeted the industrial machineries revealed the involvement of various interest groups and combination of cyber attacks with technological components.

The sector could be subject to cyber attacks targeting critical infrastructure with the intention to sabotage its progress and that of the country.

How does the UAE compare against other GCC countries in terms of energy security?

Maturity levels in terms of technology are more or less the same for all regional organisations but there are gaps in terms of holistic approach to manage security and safety levels.

Effectiveness of controls is different from organisation to organisation. Representation in GCC energy forums brings a common platform to discuss deficiencies and approach towards adopting best practices to comply with international regulations.

Organisations have to remain focused on business continuity management and disaster recovery services to ensure they remain in business in the event of a disaster (terrorist attack, major cyber attack and natural disasters). UAE companies are adopting these practices to an extent.

THE TOP TEN RISKS FOR OIL AND GAS

1. Uncertain energy policy

Steps companies can take to respond to this risk:

- Adopting an organised approach to educate and lobby political leaders and the general public about the need for a coherent and consistent energy policy. This is a long-term goal to which companies should commit sufficient resources.
- Understanding and anticipating the national energy policy of the country in which operations take place. This may include making use of policy advisors on the ground, even for smaller companies.
- Creating broad-based initiatives for compliance, including new reporting structures to implement compliance and other proactive measures to meet anticipated regulatory changes. The relocation of sourcing or manufacturing operations to countries or regions that offer lower compliance costs is an option to consider.

2. Access to reserves: political constraints and competition for proven reserves

Steps companies can take to respond to this risk:

- Investing time and resources in fully understanding the risk environment in which operations are conducted; no two operational environments are the same. To completely grasp the political climate on the ground, a company may consider a local partner to take advantage of existing opportunities.
- Improving access to reserves by increasing joint ventures globally and re-evaluating the viability of current operations. Companies can also strengthen alliances and partnerships with national oil companies (NOCs) to help mitigate the risk of losing access to key reserves in the event of increased prices or political disturbances.
- Knowing the alternatives. Although oil will remain strategically important for some time, companies should already be looking

to the future. Gas is likely to become a more significant commodity, as it is a cheaper alternative than renewables. The current major problem with gas — its location and complex transportation — is likely to be resolved as technology improves and new infrastructure is built.

3. Cost containment

Steps companies can take to respond to this risk:

- Tightening operational costs can help to manage this risk. This may involve streamlining processes, making more effective use of shared services, including IT services, improving business processes and trying to reduce costs all the way through the supply chain.
- Ensuring that the management of cost-reduction programmes has accountability and bottom-up reporting. A company must be able to communicate the strategy and the execution plan. Companies are advised to align all cost reduction initiatives with an execution strategy and adhere to it. Those companies that have already implemented cost reduction initiatives should be continually reviewing the success of these initiatives.
- Increasing the focus on rigorous working capital management to raise liquidity levels, introducing new technology to enhance operational efficiencies and outsourcing non-revenue-generating services, such as accounting and payroll management, are cost control measures that should be evaluated.

4. Worsening fiscal terms

Steps companies can take to respond to this risk:

- Having a thorough understanding of the local fiscal regimes, including tax laws in the country where operations take place. In emerging markets, the way things are done in practice can differ greatly from the published tax laws. Working with a local advisor can help in overcoming this challenge.

- Striking the right balance between managing worsening fiscal terms and investing in new development opportunities, including scenario planning for fiscal risks against varying economic conditions.
- Strengthening the tax supply chain management through a global approach that can include transfer pricing, business restructuring, partnering to gain foreign tax credits and other initiatives.
- Having a good working relationship with local regulators and governments can be very helpful when terms begin to change. Also, having international arbitration clauses in agreements can be useful.

5. Climate and environmental concerns

Steps companies can take to respond to this risk:

- Integrating climate and environmental concerns with the core business model rather than treating it as a separate issue. Climate and environmental concerns have become a core business risk and must be managed in a routine manner.
- Performing enterprise risk assessments to assess exposure across segments and ensure mitigation and incident response plans are in place.
- Anticipating stricter regulations around carbon and making the appropriate amendments and investments now. An opportunity exists for those who want to be leaders in low-carbon energy.
- Partnering with the NOCs in the country where operations take place to better understand the local environmental regulations.
- Improving non-financial reporting, including carbon emissions data, and the environmental impact of operations. Companies can seek third-party verification of their climate change disclosures, including statements of performance and claims about the positive impacts of products or services.

6. Price volatility

Steps companies can take to respond to this risk:

- Carefully re-evaluating all investment strategies, including the balance between oil and natural gas investments. This involves conducting scenario planning for investments and divestments against low to moderate prices even if current prices are high. It also involves having plenty of liquidity before investing in a project as protection against any potential volatility.
- Engaging in econometric modelling to better understand oil and gas market developments. This is an often overlooked practice outside of international oil companies (IOCs) — but potentially a very useful one that companies can use to anticipate price volatility.
- Applying prudent management techniques, including cutting costs, evaluating the supply chain process and re-evaluating the capital plan and expectation of returns.
- Companies can also consider hedging strategies for margins and costs, and tax management strategies to improve cash flow.

7. Human capital deficit

Steps companies can take to respond to this risk:

- To reduce duplication and inefficiency, companies must manage, define and coordinate HR processes on a centralised level to help HR professionals focus on workforce challenges.
- Creating an inviting business culture to attract young people — for example, highlighting the technological advances in the industry in order to create awareness that the industry is constantly developing, modernising and evolving technologically.
- Leveraging older workers' knowledge. Be creative with retirement arrangements to retain intellectual capital.
- Consider slower, phased-in retirement arrangements and/or re-enlist retirees as part-time consultants.

- Developing local and regional talent. This must be accompanied by investment in culture and language training to avoid issues with language barriers and miscommunications as expatriate managers try to bridge the cultural gap with their local workforce.

8. Supply shocks

Steps companies can take to respond to this risk:

- Investing in more stable markets, even if this means a lower return, and making use of longer-term hedging tools such as re-allocating capital to projects with longer-term stability.
- Adopting a flexible, shorter lead-time capital structure would allow the generation of peak supply to help endure the downturns.
- Focusing on assets that allow production to be maximised between supply shocks. Restructuring agreements to ensure supply. Companies should carefully analyse the current strength and capabilities of their supply chain and identify bottlenecks or weaknesses.

9. Overlapping service offerings for IOCs and oilfield service companies

Steps companies can take to respond to this risk:

- For IOCs, taking advantage of the fact that they have a strategic advantage over OFS companies in the area of programme management, due to extensive experience.
- For OFS companies, developing long-term strategies that recognise that price fluctuations will affect them more severely than NOCs and IOCs.

10. New operational challenges, including unfamiliar environments

Steps companies can take to respond to this risk:

- Continued heavy investments in new technologies, including those for unconventional oil and gas. IOCs have been at the forefront in developing new technologies for E&P and transportation. However, independent oil and gas companies further developed technological advances that unlocked the potential of unconventional natural gas resources. To remain competitive and gain access to new opportunities, this investment by oil and gas companies must continue.
- Closely managed joint ventures (JVs) that can increase business opportunities and mitigate risks among IOCs, subcontractors, NOCs and local governments. Companies should evaluate current and potential JVs for counterparty and political risks in order to effectively establish safeguards and manage exposures.
- Strategic acquisitions in diverse geographies or challenging environments. These acquisitions can help companies expand their operations and give them access to trained personnel and required R&D.
- A dedicated focus on capital project management. Coordinating capital and project management activities in connection with capital design and construction programmes.

Source: Ernst & Young
Business Risk Report 2010



Energy security and investment in Middle Eastern oil sectors

In addition to politically-induced disruptions, the dynamics of the oil market may cause serious market dislocations. The worst possible scenario is one in which the oil supply would fall short of demand. This can occur in two ways: either as a result of peak oil or due to lack of investment preventing the oil industry from maintaining and expanding its productive capacity to meet oil demand.

The issue of underinvestment in the oil sector has become central to the energy policy debate. The main fear is that the necessary investment in the oil sector would not be forthcoming and supply would then fall short of demand. Given that the bulk of oil reserves are in the Middle East, the issue of investment in the oil sectors of the region receives special attention.

Investment is also complicated by the relationship between the governments and/or national oil companies and the international oil companies. International organisations such as the IEA consider that restriction of access to reserves is an important barrier to investment.

What matters most is the nature of the relationship between the two parties. In countries where access to reserves is allowed, there may be important obstacles that could delay or prevent investment by international oil companies.

Oil prices have often been volatile, blurring the distinction between transitory and permanent price movements.

There is a case for delaying the investment until new information about market conditions arrive, especially information about expected global demand and oil supplies from other countries. For the oil industry, the option to wait is very valuable. After all, the decision to defer rather than invest immediately, or



increase production, is more profitable than to invest and increase production in the face of falling global demand. In other words, it is more profitable for all oil investors (national and private companies) to err on the side of under-investing.

The underinvestment problem in the oil sector has many facets and cannot be

attributed to a single factor. Given the various dimensions of the underinvestment problem, energy policy has not been successful in tackling the issue of underinvestment in the oil sector. There have been some recent efforts to promote the so-called 'producer-consumer' dialogue to help remove obstacles to investment.

This dialogue was formalised in 2003 and a new institution, the International Energy Forum, was set up to promote the dialogue between consumers and producers.

Although this represents a positive development, the effects, if any, are likely to appear only in the long term. In fact, there are doubts as to whether this dialogue would result in any measures that could have a real impact on encouraging investment in the oil sector.

Although their impacts are limited, terrorist acts affect the psychology of market players and tend to place a premium on oil prices.