

# NTS ISSUES BRIEF

**Risk and resilience: Securing energy in  
insecure spaces**



**Abstract:** This issues brief outlines key points brought up at an Energy Security Seminar on 'Risk and Resilience: Securing Energy in Insecure Spaces' held on 29–30 October 2012 in Singapore. Energy vulnerabilities faced by the Asia-Pacific were discussed, and the need for a new regional architecture based on cooperation emphasised. This seminar was jointly organised by the RSIS Centre for Non-Traditional Security (NTS) Studies and the Singapore Ministry of Defence for government representatives from defence and security agencies in the Asia-Pacific region.

## Introduction

The latter half of the 20th century brought a global post-war industrial boom and a corresponding rise in demand for energy. As supply of oil and gas from traditional sources such as the Middle East peaked and prices rose, states began to seek conventional oil and gas in insecure locations. States also started turning to oil and gas in unconventional forms such as shale and oil sands; the emergence of new technologies and high oil prices had made the extraction of these unconventional sources more economically viable.

Sourcing for energy in insecure or new areas heightens countries' exposure to risk. On the other hand, diversification also enables countries – particularly those that are net importers of oil and gas – to enhance their resilience to external shocks. There is thus a need to pay more attention to assessing the trade-off between risk and resilience. The optimum balance may differ over time, depending on a country's energy policies and developments in the energy market. Hence, policymakers and industry leaders will need to have a good understanding of the new sources of supply and they must keep abreast of developments in order to make the right decisions.

These issues form the backdrop to the Energy Security Seminar on 'Risk and Resilience: Securing Energy in Insecure Spaces' held on 29–30 October 2012 in Singapore. This seminar was jointly organised by the RSIS Centre for Non-Traditional Security (NTS) Studies and the Singapore Ministry of Defence for government representatives from defence and security agencies in the Asia-Pacific region.

The one-and-a-half-day closed-door seminar sought to bring together experts to examine relevant energy security issues. The seminar also aimed to increase awareness of the new spaces in which energy security is pursued, as well as to kick-start discussions on the implications of emerging developments. This report summarises the main themes discussed during the seminar.

- ***Existing work on energy security tends to over-emphasise the prospect of geo-political competition and conflict over resources while under-emphasising the promise of cooperation. A new regional architecture for energy cooperation can help minimise risks and help meet growing demand both in Southeast Asia and the wider Asia-Pacific region, thus enhancing energy security.***

Asia's rapid economic growth is driving an enormous rise in the consumption of hydrocarbons. The region accounts for 66 per cent of the growth in global oil demand over the past two decades. This is projected to increase to 85 per cent over the next 20 years. Much of the region's energy has to be imported. China, India and Southeast Asia import more than half of their oil needs. Japan and South Korea are completely dependent on imports for their oil supply, most of which comes from the Middle East.

As a result of this dependence on energy imports, countries in Asia are highly vulnerable to shocks such as price fluctuations. Although the world's energy system is more resilient than before, current projections suggest that there will be rapid growth in energy demand. Indeed, the world has reached a historical inflection point requiring a radical shift in the way energy is sourced, transformed and consumed. In short, a new regional energy architecture is needed. An effective energy architecture underpins economic growth, and could act as a significant platform for human development and social welfare. While the pressures and possibilities for change in energy architecture are at a historical high, what is less clear is what shape the transition will take.

The observation was made that any emerging regional energy architecture would need to focus on issues such as nuclear power and safety, and disaster preparedness; optimisation of energy; trade in energy products; incentives for 'green' energy products (through for example tariff measures); cross-border energy interconnectivity and oil stockpile sharing.

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The above concerns are addressed, to varying degrees, by a number of cooperative frameworks whose goals are geared towards enhancing energy security and minimising exposure to risk in an emergency situation. They include the ASEAN Petroleum Security Agreement (APSA), the Trans-ASEAN Gas Pipeline (TAGP), the ASEAN Power Grid (APG), the Malacca Straits sea-lane security cooperation, the ASEAN+3 Energy Partnership, the Asia-Pacific Economic Co-operation (APEC) Energy Security Initiative, the Asian Ministerial Energy Roundtable and the Cebu Declaration on East Asian Energy Security of 2007.

Such frameworks could potentially facilitate energy market integration by connecting fragmented energy markets physically and financially via power grids, gas pipelines or liquefied natural gas (LNG) terminals. They help improve energy security by increasing the sources of energy that are available to countries. Cross-border power trade in an integrated ASEAN power market could also help reduce the costs of meeting growing demand in the region.

However, challenges remain due to variations in the levels of economic growth and differences in energy infrastructure needs across the Asia-Pacific. It is therefore imperative that governments identify the infrastructure gaps in the region and address them accordingly. Also, states in the region should harmonise their legal and regulatory frameworks. In particular, ASEAN's legal and policy frameworks on cross-border power trading needs to be strengthened through the establishment of common standards and principles. Although it is envisioned that an enhanced energy infrastructure and stronger regional cooperation would bring huge gains to the region, the speed at which this may be realised remains unknown.

- ***The South China Sea has been identified as a potential flashpoint for conflict in the region. Achieving progress on resolving tensions in the area requires countries to strengthen efforts to promote joint development of hydrocarbon resources and to adopt a binding code of conduct for all parties to the territorial dispute.***

The South China Sea is strategically located between Southeast Asia and the Strait of Taiwan (which lies between China and Taiwan). There are two main island chains in the area – the Paracels and the Spratlys. A majority of the more than 200 islands, rocks and reefs in the South China Sea are part of these two chains. Many of these land areas are very small. The Spratlys for example cover less than 5 sq km. In addition, many of them are partially submerged and uninhabitable.

Much of the attention given to the South China Sea stems from its strategic location and the perceived abundance of hydrocarbons and fisheries in the

area. A US geological survey in 1994 suggests that the South China Sea could yield an estimated 28 billion barrels of oil, while studies conducted by China estimate that the area between the Spratlys and the Paracels could yield 105 billion barrels of oil. However, these figures are unproven and are likely to change as oil exploration continues.

The South China Sea is also rich in natural gas, which likely exists in greater amounts than oil. In 2006, the Canadian company Husky Energy and its partner, the China National Offshore Oil Corporation (CNOOC), announced a find of 4–6 trillion cubic feet (tcf) of natural gas.

Besides hydrocarbons, the South China Sea is of crucial importance to the fishing industries of surrounding countries. The area accounts for 10 per cent of the world's annual catch. It has been observed that ownership of the islands of the South China Sea would bolster claims to the surrounding sea and its resources.

Some have argued, however, that existing estimates of hydrocarbon reserves may be overstated as exploration is still on-going, and there is not yet enough data for accurate projections. Moreover, it may not be commercially viable to extract hydrocarbons from the area. With the seabed located atop some of the earth's most unstable tectonic plates, extraction efforts would be fraught with difficulties. For example, the Philippine Sea Plate continues to collide with the Australian Plate, hence destabilising the ocean bed and posing challenges to oil and gas exploration.

Nevertheless, despite these factors, control over the natural resources in the area remain important to various countries. This, in combination with its strategic location, makes the South China Sea a hotly contested region. China and Taiwan have the most expansive claims over the waters. Their claims, which are represented by the nine-dashed line,<sup>1</sup> overlap with exclusive economic zones, islands and territorial waters claimed by five other states. Vietnam claims sovereignty over all of the Paracel and Spratly islands. The Philippines claims a large area of the Spratly islands and the Scarborough Reef. Malaysia and Brunei claim a smaller area of the southern Spratlys. Indonesia claims none of the disputed islands but its exclusive economic zone overlaps with the nine-dashed line.

Disputes over the islands of the South China Sea and its surrounding waters have come to be characterised by increasingly hostile rhetoric, maritime paramilitary deployments and perceptions of China's growing assertiveness, all of which have contributed to growing nationalism in the Philippines and Vietnam. The maritime disputes have also attracted the involvement of the US, which claims to maintain an impartial view

of the disputes while facilitating the modernisation of the Philippine navy and reaffirming the US defence treaty with the Philippines.

All states involved have stressed the need for peaceful resolution, and emphasised the importance of refraining from large-scale military conflict. However, prospects for a negotiated settlement may be complicated not only by considerations of the potential offshore oil and gas resources in the area, but also by claimant states having different preferences when it comes to resolution mechanisms. Beijing has thus far insisted on resolving the disputes bilaterally, while Vietnam and the Philippines have sought to conduct multilateral discussions.

To achieve progress on the issues under contention, states must strengthen collaborative efforts through measures such as joint development of hydrocarbon resources and fisheries, and the adoption of a binding code of conduct for parties to the dispute.

- ***Shale gas and biofuels are thought to be promising alternatives to traditional fossil fuels. However, the exploration of such alternative energy sources should take into account the impact on society and the environment. The risks posed by potentially disruptive weather events and other phenomena related to climate change must also be factored into energy planning.***

Shale gas, a natural gas formed and trapped in sedimentary rocks, has attracted increased attention in recent years. According to estimates, the amount of shale gas that is technically recoverable globally is 7,062 tcf. For comparison, the corresponding figure for conventional gas is 15,009 tcf. The US leads the world in shale gas exploration with production increasing by 48 per cent between 2006 and 2010, and shale gas is expected to account for 47 per cent of US gas production in 2035. The US has an estimated 459 tcf of shale gas that is technically recoverable. Although significant shale gas reserves exist in Europe – the region's technically recoverable shale gas resources are estimated at 636 tcf – its exploitation of shale gas has been limited to date with no capacity for commercial production.

Biofuels have also emerged as a potential substitute for liquid fossil fuels, with their use seen as a cost-effective way to promote reduction of carbon dioxide emissions in the transport sector. Biofuel advocates have argued that this energy source could increase energy security by reducing dependency on oil imports and lowering exposure to volatile oil prices; and that production of biofuel crops could promote economic development by creating new sources of income for those living in rural areas.

However, alternative energy sources such as shale gas and biofuels are not without their problems. The switch by food-producing agricultural sectors to biofuel production is a major contributor to food price increases which in turn exacerbates food insecurity in many countries. In Indonesia, where palm oil is the most important source of biofuel, the production of palm oil has triggered or contributed to land grabbing, rising food prices and deforestation; and resulted in increased greenhouse gas emissions. In order to minimise the negative consequences of palm oil production, governments could adopt a set of indicators for sustainable palm oil production, strengthen the rule of law and expand engagement with civil society.

The extraction of shale gas could also pollute the environment if chemicals and waste from such activities find their way into the water supply. As many shale deposits are buried under aquifers (an underground layer of water-bearing permeable rock or sediment), the process of drilling and fracking could release harmful chemicals into the surroundings and potentially contaminate land and water. In addition, when shale gas is used to generate heat, it has a significantly larger greenhouse gas footprint than conventional natural gas, oil or coal.

While countries in Southeast Asia continue to rely primarily on fossil fuels, many have begun to tap alternative energy sources. Although the region does not have abundant fossil fuel reserves, it does have significant potential to harness renewable energy resources such as hydropower, solar, wind, biomass and geothermal energy. Hydropower has the most direct and imminent potential of being utilised. For example, active cooperative efforts are on-going to develop hydropower in the Greater Mekong Subregion. Shale gas exploration in the region, however, is at a nascent stage of development compared to such regions as North America. Because of the high cost and advanced technology required, there is limited impetus for countries in Southeast Asia to pursue the development of shale gas. Biofuel, on the other hand, has developed rapidly in recent years although the scale of its production and distribution still pales in comparison to conventional fossil fuels. Nuclear energy had previously been an attractive source of alternative energy for many governments. However, the safety concerns raised by the 2011 Fukushima incident forced governments to reconsider plans to develop nuclear energy.

Risks related to climate change and extreme-weather related disasters need to be factored in when designing policies related to alternative energy. Natural disasters such as typhoons and drought could potentially cripple power plants and devastate biofuel crop farms, causing power and fuel shortages, which could lead to, for example, an increase in the

local prices of motor vehicle fuel and the shutdown of hydroelectric facilities. These may in turn result in reduced investment in the development of alternative energy sources.

The vulnerability of renewable energy infrastructure to climate variations raises serious energy policy questions, particularly for countries that are prone to frequent occurrences of natural hazards such as the Philippines. National energy planning must therefore take into account climatic risks and impacts. It was suggested that scientific modelling such as inoperability input-output modelling (IIM) may be useful in this regard. IIM provides estimates of the cascading inoperability and economic losses that result from interdependencies within large-scale economic and infrastructure systems; and can be used to compute the potential downstream impacts of disruptive climatic events on renewable energy systems. Such scientific models could be used to inform the development of energy policies that aim to increase resilience to climate risks.

## Conclusion

With demand for energy increasing, achieving energy security will remain a challenge that has to be managed collectively. There is thus a need for a new regional energy architecture that is able to balance energy security, economic development and environmental sustainability.

The region would also have to pay attention to the South China Sea issue. In 2002, ASEAN had concluded a code of conduct with China. The Declaration on the Conduct of Parties in the South China Sea aimed to resolve 'territorial and jurisdictional disputes by peaceful means, without resorting to the threat or use of force, through friendly consultations and negotiations'. It also encouraged claimants to exercise self-restraint and build mutual trust. However, the Declaration has failed to contain tensions in the South China Sea as it is a non-binding instrument and places no obligations on claimant states to abide by its principles. In response, there have been renewed attempts to institute a new legally binding code of conduct, and efforts along such lines need to continue.

In the discussion, the importance of alternative sources was acknowledged; but it was also highlighted that the potential impacts on food security and the environment should not be ignored.

## Note

<sup>1</sup> The nine-dashed line refers to the demarcation line used by the governments of the People's Republic of China and the Republic of China (Taiwan) for their claim in the South China Sea.

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## About the RSIS Centre for Non-Traditional Security (NTS) Studies

The RSIS Centre for NTS Studies, NTU, was inaugurated by the ASEAN Secretary-General, Dr Surin Pitsuwan, in May 2008. The Centre maintains research in the fields of Food Security, Climate Change, Energy Security, Health Security as well as Internal and Cross-Border Conflict. It produces policy-relevant analyses aimed at furthering awareness and building capacity to address NTS issues and challenges in the Asia-Pacific region and beyond. The Centre also provides a platform for scholars and policymakers within and outside Asia to discuss and analyse NTS issues in the region.

In 2009, the Centre was chosen by the MacArthur Foundation as a lead institution for the MacArthur Asia Security Initiative, to develop policy research capacity and recommend policies on the critical security challenges facing the Asia-Pacific.

The Centre is also a founding member of and the Secretariat for the Consortium of Non-Traditional Security (NTS) Studies in Asia (NTS-Asia). More information on the Centre can be found at [www.rsis.edu.sg/nts](http://www.rsis.edu.sg/nts).