2013 SUMMIT REPORT

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Forging Trans-Pacific Cooperation for a New Energy Era





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Ed Fast (Department of Foreign Affairs and International Trade, Canada) engages with reporters.

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Cover photo (top): Chris Roberge (Deloitte), Satya Yudya (Commission VII, House of Representatives, Indonesia), Wang Zhen (China University of Petroleum), and Peter Hughes (Peter Hughes Energy Advisory Limited)

Cover photos (bottom): Carlos Jericho Petilla (Department of Energy, Philippines), Ken Koyama (Institute of Energy Economics, Japan), Ed Fast (Department of Foreign Affairs and International Trade, Canada), Kathleen Sendall (PES Advisor), and Kazuhiro Nomoto (Japan Bank for International Cooperation)

About the Summit

Mission—The Pacific Energy Summit aims to foster economic and energy security in the Asia-Pacific by developing practical solutions to the dual challenges of rising energy demand and global climate change.

A Regional Gathering—The Pacific Energy Summit is an invitation-only event that convenes high-level policymakers, industry leaders, and experts to articulate regional energy needs and opportunities. The Summit explores market-based policy solutions, coordinates efforts to effectively use available technology and limited resources, and fosters public-private partnerships. The National Bureau of Asian Research (NBR) serves as the Secretariat. The 2013 Summit was co-hosted by the Asia Pacific Foundation of Canada.

Research and Results—To inform plenary sessions and promote thought-provoking discussion, the Summit commissions policy papers from top experts in the field. The working papers, along with a final report summarizing the Summit discussion and findings, are distributed to key stakeholders in the Asia-Pacific region.

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Forging Trans-Pacific Cooperation for a New Energy Era

WORLD ENERGY MARKETS ARE ON THE CUSP OF A NEW ERA. Asia's increasing energy demand, advances in renewable-energy technologies, and swelling production in North American energy resources, including shale gas and tight and heavy oil, are creating opportunities for greater trans-Pacific cooperation.

"This opportunity of the huge abundance of North American resources is a match made in heaven with Asia. Asia is short on oil and gas and other energy sources, and North America is increasingly long on all those resources. It's—in a market sense—a no-brainer," said **Mikkal Herberg**, Research Director of NBR's Energy Security Program and Senior Lecturer in the Graduate School of International Relations and Pacific Studies at the University of California–San Diego.

Herberg was among the 170 participants from industry, government, and research, hailing from 15 countries across the region, at the 2013 Pacific Energy Summit in Vancouver, Canada, which was hosted by the Asia Pacific Foundation of Canada and NBR. Canada was the ideal host country for the theme "Forging Trans-Pacific Cooperation for a New Energy Era." With U.S. oil demand declining and domestic production in natural gas increasing, Canada, which currently exports nearly all of its oil resources to the United States, is seeking to diversify its markets with exports to Asia.

"We know the Asia-Pacific region will have significant energy demands going forward. Canada, of course, offers the resources; we offer a source of energy that you need," said **Ed Fast**, Canada's Minister for International Trade and Minister for the Asia-Pacific Gateway. "We have every reason to work together for the mutual benefit of our economies, our common security, for the well-being of our nations' people."

Over the course of two days of panel discussions and workshops, Summit participants engaged in frank dialogue on meeting Asia's rising energy demand while curbing environmental degradation, mitigating climate change, and facilitating these goals by strengthening trans-Pacific ties. This report provides an overview and analysis of the Summit's main topics of discussion.

How can we forge a stronger consensus on moving forward with what the markets and investment patterns tell us makes sense: meeting Asia's energy needs with cleaner fossil fuels and cleaner energy?

Mikkal Herberg, Research Director, The National Bureau of Asian Research;
Senior Lecturer, University of California–San Diego

Key Findings

Asia's Growing Energy Demand

- The Asian Development Bank (ADB) anticipates that developing Asia's GDP will more than quadruple from 2010 to 2035. Without radical changes to its energy mix, Asia's carbon dioxide emissions will double to 20 billion tonnes in the same period.

- By 2035, Asia will consume 56% of the world's total energy, up from 34% in 2010, and become the world's largest energy consumer. If the region does not change consumption patterns, Asia will double its oil consumption, triple its natural gas use, and need 81% more coal by 2035, according to ADB. Given its limited fossil fuel resources, Asia is increasingly looking to North America for energy supplies.

- Competition to supply the Asian gas market is increasing. Canada and the United States must recognize that Asian markets now have more gas and oil supply options, including Mozambique, Qatar, and Australia. Canada and the United States must act quickly if they are to establish themselves as suppliers of choice.

- Canada and the United States have expertise in energy services and technology, including clean technology, that they can market in Asia. In order to remain competitive, both countries must continue to support and foster innovation in the energy sector.

Open Markets and the Role of Government

- A greater commitment from governments to opening markets and reducing protectionism and resource nationalism would foster more efficient and responsive energy markets. In order to allow markets to determine prices, governments must decrease subsidies for energy and limit other state interventions in the sector. Phasing out subsidies will encourage investment, demand management, the development of new supplies, and energy efficiency.

- State-owned enterprises and sovereign wealth funds are playing an ever-growing role in energy markets but are subject to greater scrutiny in North America than private-sector investment.

The Rising Demand for Natural Gas

- Asian demand for natural gas is expected to triple by 2035, according to ADB. Asian countries are interested in importing liquefied natural gas (LNG) from North America to meet the goals of stable supply and diversification, as well as to gain access to hub pricing in the lower 48 states of the United States. Several Asian countries have demonstrated a willingness to invest billions in North American energy infrastructure toward this end.

- Markets should determine prices for natural gas. Summit participants shared a range of views on the potential both for gas to become a global commodity and for a gradual convergence of regional gas markets in the European Union, North America, and Asia. Most felt that a greater convergence is inevitable, but that this process will take time. Some participants suggested that high project costs for new LNG export facilities and the long-term LNG contracts that are currently in force will ensure that Asian LNG pricing will remain predominantly linked to oil for the foreseeable future.

- In North America, the large-scale export of LNG to Asian markets faces some challenges. In the United States, LNG exports to non–free trade agreement (FTA) partners are subject to a lengthy review process and have encountered opposition from domestic groups that would like to limit gas exports. In Canada, covering the costs of building infrastructure for exports means that Canadian gas requires high prices to be viable. Consequently, Canadian projects may be less competitive on a cost basis in the short term than potential gas exports from the lower 48 states of United States.

- Price signals played a key role in stimulating the innovation that led to the shale gas revolution in the United States and will continue to lead to technological advances around the globe.

Canada has large oil and gas reserves, as well as technical experience. These assets give us the opportunity to drive forward on LNG. But this opportunity won't last forever. Unless something happens relatively swiftly, the market will move on and buyers will find different sources.

Christopher Roberge, Asia Pacific Energy and Resources Tax Leader, Deloitte

Energy, the Environment, and Social License

- Local environmental challenges are a primary driver behind public and government support for measures to mitigate climate change.

- Energy efficiency is the greatest untapped source of energy supply. While continued innovation is essential, government and industry need to support the adoption of higher standards for energy efficiency.

- Methods such as stringent building codes, vehicle emissions standards, better and more accessible information on energy-consumption trends, and energy labeling on consumer goods can make energy policy more transparent and also help encourage the more efficient use of resources.

- The success of an energy project may depend on a company's ability to acquire the "social license to operate"—that is, the community's or greater public's support for the project. Governments and companies wanting to acquire social license must build positive relationships with the public by mitigating the environmental impacts of natural resource development and delivering benefits to local communities. Companies and governments should anticipate that social license issues may alter some energy resource development and export plans.

- Communication with stakeholders is critical to acquiring social license. Companies and governments need to be transparent about their planned business operations and engage early and often with affected communities. Social media and other Internet-based technologies provide additional tools for two-way communication between project proponents and stakeholders.

Energy and U.S.-Canada Relations

- Although the United States and Canada are best seen as energy interdependent, they face new challenges to their integration, such as delays to the permitting of the Keystone XL pipeline and reduced demand for Canadian gas and oil in the U.S. market. Canada and the United States should strengthen cooperation on energy and climate policies to ensure that the model of market-led integration survives in the new energy era.

- Diversification away from sole reliance on the U.S. market for the sale of energy is essential for Canada. Reliance on one market and pipeline bottlenecks, among other factors, have contributed to a substantial discount on Canadian crude, which in turn results in a reduction in royalty payments to the Canadian government. Summit participants agreed that Canada's drive to diversify markets should not be seen as a threat to its energy relationship with the United States but rather reflects Canada's growing potential as a global supplier.

Geopolitical Dynamics

- A more robust trans-Pacific energy trade would support Asian countries' energy-security goal of diversifying supply sources and build confidence in the strong existing trade relations between Asia and North America.

Securing Energy Supplies through Efficiency

Robert D. Hormats (Department of State, United States), S. Chander (Asian Development Bank), and Dennis Blair (NBR) discuss the economic benefits of integrated energy and environmental policy.

GLOBAL ENERGY DEMAND is expected to grow by more than a third by 2035, resulting in overall carbon dioxide emissions of 37 gigatons (Gt), up from 31.2 Gt in 2011, according to the International Energy Agency's 2013 *World Energy Outlook*. At the same time, approximately 990-million people worldwide, most of them in Asia, will still lack access to electricity. While ensuring that countries have access to cleaner-burning fossil fuels and renewable-energy technologies will help balance energy demand with climate goals, Summit participants agreed that achieving increasing energy efficiency is a crucial part of the solution.

"Energy efficiency is a form of energy," said **Yongping Zhai**, Director and Co-Chair of the Energy Committee at ADB. Zhai used the case of India to highlight how energy efficiency can help countries maximize existing supplies and extend access to those currently without power. "India has about 300-million people without access to electricity. Energy losses in the Indian electricity system are as high as 30%; in some cases, even more," he said. "At the same time, people with access to electricity often

Meeting the growing demand for energy resources, while also improving the environment and productivity, is all about a demand on innovation.

Elyse Allan, President and CEO, GE Canada

experience outages. Clearly, energy efficiency can help make best use of existing supplies."

Participants identified a number of mechanisms for improving efficiency among producers, transmitters, and users of energy but focused predominantly on areas of energy efficiency for end users. Some of these mechanisms include smart grids and smart meters; automotive emissions standards and mass transit systems; appliance labeling systems and government regulations on appliance efficiency; and building codes for industrial and residential buildings, including retrofitting preexisting buildings.

Elyse Allan, President and CEO of GE Canada, stressed that both supporting technology innovation and ensuring that new technologies are adopted are essential to enhancing energy efficiency. "Meeting the growing demand for energy resources, while also improving the environment and productivity, is all about a demand on innovation…. How are we driving an innovation system in our countries? How do we support innovation in the development of new technology to achieve energy efficiency and reduce waste? How do we accelerate the adoption of innovative technology once we have developed it?"

For Allan, the key to spurring innovation in energy-efficiency policy and technology is improving domestic and international collaboration. She stated that collaboration is increasingly critical not only for achieving technological breakthroughs but also for ensuring that innovations in technology, infrastructure, and programming make sense to all the parties involved in implementation.

At the same time, panelists on the energy-efficiency roundtable noted how difficult it is to encourage end users to implement existing technology. The general consensus was that subsidies should be used for predetermined periods of time. Allan cautioned that subsidies may be appropriate in some circumstances but that care was needed to ensure that subsidization was, in fact, producing the desired results. She asked, "How do we ensure that we are using subsidization in the most effective way and have the processes in place to make sure that we are actually getting sustained results for what we are subsidizing? And are we subsidizing the latest and greatest technology? Because if we are paying that amount of money and, in fact, not getting the return for that investment, could that dollar have been spent somewhere else?"

Furthermore, **Anthony Jude**, ADB's Senior Advisor for Energy and Chair of the Energy Community of Practice, cited the example of the Philippines as evidence that price signals and incentives are not sufficient to maximize energy efficiency. "Take the Philippines, for example. We have the highest electricity rates, 21 cents per kilowatt hour, but this has not increased energy efficiency in the industrial or commercial sectors. It has only increased the use of compact florescent lamps for lighting in the residential and commercial sectors. There is an urgent need to have an energy label program and consciousness-building so that consumers know how much energy their appliances use. Countries should also put in place their own laboratories for testing energy usage of appliances and should conduct random testing of equipment from showrooms. Failure to do so could cause a country to become a dumping ground for noncompliant merchandise from other jurisdictions." He cited the example of televisions sold across Asia, noting that there is a 40–50 watt difference in efficiency between those sold in Japan and Korea and those sold in the Philippines.

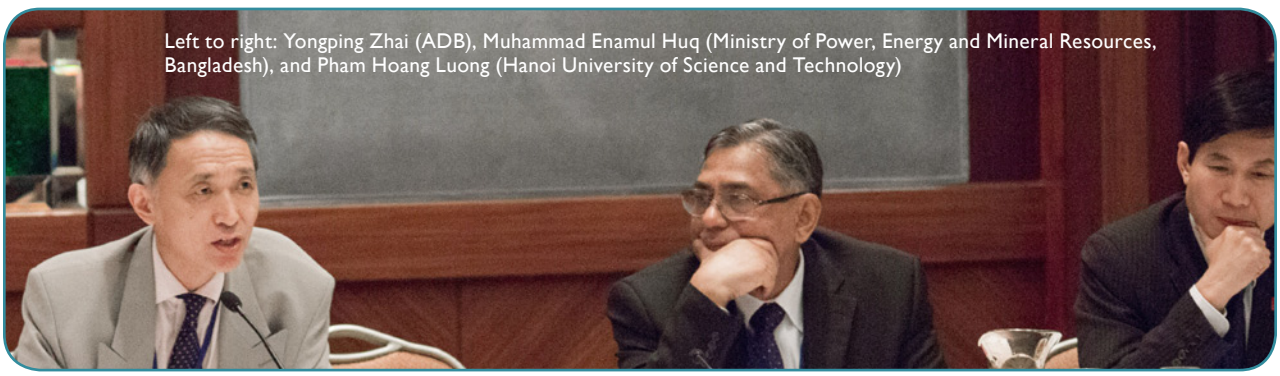
However, some panelists thought that incentives could help. **Pham Hoang Luong**, Vice President and Professor at the Hanoi University of Science and Technology in Vietnam, and **Muhammad Enamul Huq**, State Minister in the Ministry of Power, Energy and Mineral Resources in Bangladesh,

Energy efficiency is a form of energy.

Yongping Zhai, Director and Co-Chair of the Energy Committee,
Asian Development Bank

highlighted the importance of incentives to encourage end users to implement energy-efficiency technology. Pham gave the example that South Korea, Vietnam, and Thailand offer companies grants for energy audits. Huq noted the challenges that developing countries have in implementing energy-efficiency measures: "Despite the huge technological progress made in improving the efficiency of energy consumption and its production, developing countries in the Asia-Pacific can have difficulty implementing efficiency due to lack of resources, limited capital, lack of information...and limited access to technology."

In a related comment, Allan discussed the importance of community education for encouraging the adoption of energy-efficiency practices. "I know in Canada now, we [GE] and others are investing in a significant energy literacy program," said Allan. "We are working with Pollution Probe and NGOs because we feel that if people don't grow up understanding why it is important to shut off the light before they leave for school in the morning, or why they should adopt the new energy-efficient technology, then we have to pay them to conserve energy because they have no other motivating factor."



Left to right: Yongping Zhai (ADB), Muhammad Enamul Huq (Ministry of Power, Energy and Mineral Resources, Bangladesh), and Pham Hoang Luong (Hanoi University of Science and Technology)

The Energy Landscape of the Future

Ken Koyama (IEEJ) shares his views on developing stronger trans-Pacific ties. Also on stage are panelists of Session 1 (left to right): William Colton (ExxonMobil Corporation), Carlos Jericho Petilla (Department of Energy, Philippines), and Mikkal Herberg (NBR).

WHILE EFFICIENCY IS ONE ASPECT of meeting energy demand, the other side of the equation—securing a stable supply of resources—was also widely discussed at the Summit. To meet rising demand in Asia and sustain economic growth, many countries facing a supply shortage are looking to diversify their energy sources and import locations. "Backed by economic and population growth and living standard improvement…energy demand in Asia is rising and is expected to continue to rise," said **Ken Koyama**, Chief Economist and Managing Director of the Institute for Energy, Economics, Japan (IEEJ). "We need to pay attention to the fact that the energy mix in this region is still dominated by fossil fuel."

According to ADB's 2013 *Asian Development Outlook*, if current consumption patterns continue, by 2035 Asia's coal consumption will rise by 81%, its oil consumption will double, and renewable energy will become more cost-competitive but will still not be enough to meet future demand.

The report also found that natural gas consumption in Asia will triple by 2035, a trend that was a focal point of Summit discussions. The International Energy Agency similarly predicts that the region will become the world's second-largest gas market by 2015. With declining reserves from traditional suppliers, Asia will look toward emerging producers in Australia and East African countries, such as Mozambique and Tanzania, as well as toward the United States and Canada.

The United States will obtain 46% of its natural gas supply from shale gas by 2035, according to the Energy Information Administration. This shale gas revolution puts the United States in a position to become a major gas exporter. Canada, which is

> [Natural gas is] abundant, it's clean burning, it's affordable, and it has the ability to underpin economic growth for decades to come.
>
> Paul Siegele, President,
> Chevron Energy Technology Company

traditionally an energy exporter to the United States, also has the potential to expand its market. "It is estimated that over the next ten years, over six hundred major natural resource projects will be undertaken in Canada representing a total investment of some $650 billion. The majority of these investments are in the energy sector, and indeed many companies from throughout the Asia-Pacific region are directly participating in these exciting developments," said Minister Fast.

Many Summit participants viewed natural gas as a cleaner-burning alternative to coal and believed it could help meet energy security while addressing concerns about climate change. "It's abundant, it's clean burning, it's affordable, and it has the ability to underpin economic growth for decades to come," said **Paul Siegele**, President of the Chevron Energy Technology Company.

In terms of demand, Asia has been the dominant importing region for natural gas, accounting last year for approximately 70% of global LNG trade according to FACTS Global Energy. Asia has traditionally imported natural gas from countries such as Russia and Qatar, but a number of factors, such as high prices and instability in the Middle East, are causing Asian countries to diversify their import locations.

One example discussed at the Summit was the Philippines. "Our target is that, by 2030, LNG or natural gas should form about 14%–15% of our energy mix, up from the 8% that we have right now," said **Carlos Jericho Petilla**, Secretary of Energy in the Philippines. "The coal plants are there, and they will continue to exist, but we need to curtail the growth of coal usage. And the only way we can do that is with LNG."

Given increasing gas reserves in places such as East Africa and Australia, where does North America fit into the outlook? "Traditionally Asia has established energy trade with the Middle East. But now it may be time to develop a closer energy relationship between Asia and North America," said Koyama.

Some participants cited the security alliance with North America as strengthening energy ties and natural gas trade. "North America could be a better partner among the four groups I have already mentioned before—the United States, Canada, Australia, and Mozambique, Tanzania, and Russia. It's a paradigm shift for us and for you as well," said **Oh Sung Hwan**, Director of the Global Energy Cooperation Center at the Ministry of Foreign Affairs and Trade in South Korea. "It's very important to correspond political and military alliances with energy security. It's very rare and the first time in Korean history that we have tried to do this."

Left to right: Oh Sung Hwan (Ministry of Foreign Affairs and Trade, South Korea), Ken Hughes (Alberta Energy), James Slutz (Global Energy Strategies), and Charles W. Boustany Jr. (House of Representatives, United States) discuss the changing energy dynamics in North America and Asia.

Integrating Open and Transparent Markets

A conclusion among nearly all Summit participants was that in order for ties between Asia and North America to grow, it is necessary to strengthen free markets and trade and minimize government intervention.

William Colton, Vice President of Corporate Strategic Planning at ExxonMobil, explained that the geographic location of resources does not usually correspond to the area of demand, and free markets allow those transactions to take place. "You really need to have a thriving free market and free trade rules to facilitate the movement of all these energy supplies around the world," he said. "LNG is a thriving market in the Asia-Pacific already, and this is because the region has embraced free trade."

In some countries, however, national constitutions prevent the liberalization of markets. In Indonesia, for example, there is a provision blocking the liberalization of the domestic market price for gas, which would allow the market to determine the price. Despite such hurdles, the government could act creatively with market incentives. "We could satisfy both sides between the demand from the people to have low-priced gas and the investor who would like to have a fairly high price because of the complexity of the field. The government could at least incentivize the investor through a profit split," said **Satya Yudha,** a member of the Indonesian House of Representatives.

Other obstacles blocking greater LNG trade are political pressure and trade restrictions in the United States and Canada. In Canada, the provinces, the federal government, First Nations, and communities may have different interests in energy development. Many Summit participants agreed that Canada needs to cultivate an approach to energy development that benefits the entire country in order to encourage greater energy trade and streamline investments in energy resources. "People are engaged, people are paying attention, people are recognizing that this is a Canadian challenge that we have to work together on and that we can achieve something together on. It's called nation-building, and that's really what we are about," said **Ken Hughes**, Alberta's Energy Minister. "It's actually about engaging around granular, subregional, and regional issues and bilateral or multilateral interprovincial benefits."

Views are also divided in the United States

on the benefits of LNG exports to Asia. Some U.S. policymakers are concerned over the environmental impact of shale gas production, while others are focused on restricting consumption of U.S. gas to the domestic market. Summit participants noted that this would limit the benefits of U.S. energy production. "I would say that the United States has a bit of an energy-policy identity crisis," said **James Slutz**, President of Global Energy Strategies. "For 40 years, we've operated under fear, scarcity, shortage, and insecurity, and so that's been our frame of reference.... But now we have this abundance, and I think it does take time to get your arms around that."

Charles W. Boustany Jr., a member of the U.S. House of Representatives, noted that in the U.S. Congress, this perception of scarcity may translate into legislation that would prevent open markets and lead to resource nationalism. "There has been legislation put forth to allow LNG exports only to NATO countries and Japan, which I don't think is the right thing to do, being someone who really wants to promote open and integrated energy markets," he said.

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>
> Carlos Jericho Petilla,
> Secretary of Energy, Philippines

Current U.S. policy expedites LNG exports to countries that have an FTA with the United States. By contrast, non-FTA countries must undergo an extensive review process by the Department of Energy to ensure that exports do not damage the U.S. national interest. This limits the potential for exports to two of Asia's largest consumers, China and Japan. Currently, there are nineteen applications pending with the Department of Energy for exports to non-FTA countries.

"If the United States abides by the WTO rule stringently, I think that we have the right to the uptake of some imported shale gas in a more transparent manner," said **Tadashi Maeda**, Managing Executive Officer and Global Head of the Infrastructure Finance Group at the Japan Bank for International Cooperation (JBIC).

Greater expansion of LNG exports to non-FTA countries could lead to a more integrated market with Asia. "The open trade and integration of energy markets that we've seen between the United States and Canada, with the new possibilities for LNG exports and potential export of refined product and maybe even oil, could really form the basis for an integrated market with Asia," said Congressman Boustany. "I see this as a tremendous plus. I think LNG exports really represent the beginning and will facilitate this market development if we can get this off the ground."

Left to right: Shahriar Fesharaki (FACTS Global Energy), Tilak Doshi (National University of Singapore), and Tadashi Maeda (JBIC)

Japan's LNG Outlook

Since the Fukushima Daiichi disaster in March 2011, Japan has scaled back its production of nuclear energy, with only 2 of its 54 reactors fully operating as of April 2013. The slowdown of the nuclear industry is putting greater pressure on energy prices, and Japan is looking to diversify its energy sources and to reduce costs. Japanese LNG imports account for 30% of the global LNG trade, and 60% of those imports are consumed by Japanese electricity companies. Japan will be looking toward greater LNG imports to satisfy demand, but this comes at a price.

"The change in utility companies' behavior has a lot of implications for the LNG market," said **Shinichi Kihara**, Director of the International Affairs Division in the Agency for Natural Resources and Energy at Japan's Ministry of Economy, Trade and Industry (METI). "In Japan right now the utility companies are submitting applications to raise the electricity tariff because of the Fukushima event." With METI's policy to stringently assess fuel cost, utility companies are seriously looking into procuring low-cost LNG.

The United States and Canada seem to be two attractive options for Japan to diversify and secure a stable supply as well as lower costs. Kihara noted that costs to import LNG have grown from $40 billion to $65 billion. "This is making our national trade balance red for the first time in 31 years. So this is a critical issue in Japan. It's hitting the economy very hard," he said. "In the new administration, which started at the end of last year with Prime Minister Abe, LNG low-price procurement is high on the agenda."

Following the Fukushima tragedy, Japan is trying to decide on the role that nuclear energy will play within the country and to determine the effects that this decision will have on substitute and alternative sources. Because Japan is the second-largest economy in Asia, the outcome will reverberate throughout the energy world.

Dennis Blair, Board of Directors, NBR

LNG Markets and the Asian Premium

LNG markets—domestic, regional, and possibly global—were one of the most widely discussed issues at the Summit. "We talk about global markets, but gas is definitely not a global market yet. The question is what a massive LNG flow can do to create more of that sort of market," said **Kevin Lynch**, Vice Chairman of BMO Financial Group, member of the Asia Pacific Foundation of Canada Board of Directors, and Co-Chair of the 2013 Pacific Energy Summit.

In April 2013, gas prices in the United States were around $4 per MMBtu (million British thermal units); whereas prices were around $15 per MMBtu in Asia. Some Asian buyers are looking toward the United States and Canada to develop hub-style pricing in place of the current oil-indexed pricing in Asia, which would allow gas to become a "normal" commodity in terms of prices that reflect current demand and supply.

While no overall consensus was reached, there were many assessments of the future of LNG pricing in Asia. One of those is that oil-indexation is declining, and it is only a matter of time gas is treated as a global commodity. "Different gas supplies are coming online from various locations around the world. If you have more sources from which to purchase gas, gas is going to become more of a global commodity," said **Christopher Roberge**, Asia Pacific Energy and Resources Tax Leader at Deloitte.

Participants largely agreed that it would take time to transition to a global gas commodity market. **Tilak Doshi**, Chief Economist and Principal Fellow at the Energy Studies Institute in Singapore, explained that timing may depend on spot markets. "If markets are tight, the current dominant pricing regime, JCC-based [Japanese customs clearing price], will remain around for longer. But we expect markets to become more liquid and the spot market to be a bit looser with a tremendous amount of quantity of liquefaction coming in 2014, 2015," he said. "A few years after that we expect the spot market to be more flexible, and that would be the time when pricing formulas start changing."

If LNG is traded via spot pricing in Asia, the location of the trading hub will depend on factors such as pipeline natural gas connections and future demand size. Shanghai may be a good candidate, though other options exist. "Korea is in a better position than any other Asian country to import LNG from the United States, having an FTA with the United States," said **Nam-Yll Kim**, Managing Director of the International Cooperation Group at the Korea Energy Economics Institute. "Creating a gas hub is a longer-term institutional approach. Despite Asian energy imports accounting for nearly three-quarters of the global energy trade,

we have no spot-market operation within this region. It makes it difficult to improve this region's pricing scheme."

Wang Zhen, Executive Dean and Professor at the China University of Petroleum in Beijing, explored Shanghai as a potential trading hub but said that issues remain over transparency and the central government's role in regulating the price. He added, however, that "with more and more energy imports from the international market, there is a greater potential [for a Shanghai trading hub]."

Doshi explained that Singapore and other Southeast Asian countries are relatively small LNG players compared with Korea and Japan. "Until Korea and Japan either separately or together bring about the capability of discovering spot prices and creating some kind of price indicator for Northeast Asia, Asia will remain without a real-time LNG price index," he said. "Singapore by itself as a physical hub does make sense because of the number of smaller countries in the Southeast Asian region that have emerged, or will emerge in the near future, as LNG importers."

Another potential factor that may affect Asia's LNG prices is a drop in the price of oil. Increased oil production—especially in Canada and the United States, where there are higher levels of tight oil extracted from shale rocks and oil sands production—and lower oil demand may over time reduce the price of oil-indexed gas over time.

"Although we think that oil indexation will continue to weaken, it is not going away yet. You still have a lot of long-term contracts," said **Anthony Yuen**, Global Energy Strategist at Citigroup. "But we think oil prices will be coming down as well on strong supply growth and weaker demand growth globally."

Furthering the argument that spot pricing will not replace oil-indexed pricing, some Summit participants noted that oil indexation covers the cost of infrastructure development, and when these development costs are added to hub pricing, the differential between Asian and North American gas prices is minimal. **Shahriar Fesharaki**, Vice Chairman of FACTS Global Energy, wrote in a Summit working paper that future LNG prices will also hinge on infrastructure costs. "High project costs for new plants, coupled with long-term LNG contracts that are currently in force, ensure that Asian LNG pricing will remain predominantly linked to oil for the foreseeable future, even when accounting for North American exports."

We talk about global markets, but gas is definitely not a global market yet. The question is what a massive LNG flow can do to create more of that sort of market.

Kevin Lynch, Vice Chairman,
BMO Financial Group

Canada-U.S. Relations

While the Pacific Energy Summit focused on building energy ties between North America and Asia, many panelists also addressed the importance of Canada-U.S. energy relations. One Canadian official explained that the "Canada-U.S. energy relationship is unparalleled globally. It's enduring.... We supply about 15% of the oil refined in the United States and 13% of the natural gas consumed.... About 8% of our electricity output also flows to the United States, most of it hydro." He also noted that predictions of future U.S. energy self-sufficiency will not preclude energy imports from Canada.

A consistent theme of the Summit discussions was the importance of an open, integrated energy market between Canada and the United States. Participants said that the energy industry in North America is truly continent-wide and that markets must be allowed to function to maximize economic outcomes. In the case of the North American refinery industry, for example, U.S. refineries have been built to maximize the value of the types of heavy crude produced in Canada rather than of domestically produced lighter crudes.

Despite this highly positive energy relationship, there have been increasing barriers to integration, which some participants attributed to growing protectionism in the United States. The most frequently cited example was the delay in the permitting process for the Keystone XL pipeline. Backlogs in pipeline infrastructure have contributed to a substantial discount on Canadian crude. In February 2013, Alberta announced that it anticipated collecting $6 billion less in royalties from nonrenewable energy during the 2013–14 fiscal year than originally anticipated.

In keeping with the general view of the value of open markets, most panelists were in favor of the Keystone XL pipeline. "The Keystone pipeline is important because of the jobs. It's important because of providing a heavy crude oil feedstock to our refinery complex that has been built to maximize the value of heavy oil. It makes a lot of sense," said James Slutz. "But there's another potential challenge, or real downside, to not approving [the pipeline]. That is it communicates well beyond that project that we're not open for business in the United States. And that, to me, is a bigger concern from a policy perspective."

Regardless of the outcome of the Keystone XL decision, panelists noted that Canada will need to diversify its energy markets to maximize the value of its natural resources. At the same time, **David Jacobson**, U.S. Ambassador to Canada, noted that this diversification is not a threat to the United States. He stated in an interview with the *Vancouver Sun* during the Summit, "We expect that Canada will sell its goods and services and natural resources where the markets need them, and that if Canada prospers as a result of that, then the United States will be one of the beneficiaries."

Building the Energy Framework of the Future

In order to build the necessary infrastructure to export LNG from North America to Asia, Summit participants agreed that foreign investment is the key.

In Canada, the lack of existing infrastructure in terms of pipelines and LNG terminals makes it more expensive to expand production for export, creating less certainty regarding returns on investment. Canada could need up to $50 billion in infrastructure investment if it plans to reach Qatar's LNG export levels. South Korean, Japanese, Malaysian, and other Asian companies are interested in investing, but it will be far more expensive to export gas from Canada than the United States. Still, in terms of regulation, Canada might be an easier market to navigate from a foreign investor's perspective. "Canada has good advanced technology and financing markets," said Sung Hwan Oh. "It has very friendly policies."

"Canada may permit exports more easily than the United States," said JBIC's Maeda. "The disadvantage of Canada is a lack of infrastructure, including a pipeline over the Rocky Mountains. LNG costs in Canada will be more expensive."

Meanwhile, in the United States many of the terminals that were destined for LNG imports can be converted to export terminals more cost-effectively than building new terminals. Some participants noted that the United States has more regulations than Canada, and companies need to consider the additional taxes when deciding on financing a project.

"From our perspective, a single project can be $20 billion. What are the taxes? What are the regulations, and are contracts going to be honored? These are really critical elements to attract the investments that are required," said Colton. "I think the Asia-Pacific has a great track record here, including the sanctity of contracts. One of the reasons that LNG has grown so well in the Asia-Pacific is because, by and large, you can rely on contracts being honored."

To accommodate the increase in imports and to meet demand, many participants expressed the need for greater infrastructure investments in Asia. Kim explained that while South Korea has a nationwide pipeline network, it is cut off from supplies because of political and security tensions with North Korea. Kim hopes that Russia might be able to act as a facilitator in a pipeline project through North Korea. In contrast with South Korea, Japan lacks the infrastructure for greater natural gas delivery. "Therefore, there is some possibility that we are going to make investments in making a domestic gas pipeline network in Japan," said Maeda.

I think the Asia-Pacific has a great track record here, including the sanctity of contracts. One of the reasons that LNG has grown so well in the Asia-Pacific is because, by and large, you can rely on contracts being honored.

William Colton, Vice President of Corporate Strategic Planning, ExxonMobil

Rapid developments in unconventional gas, greater attention to alternative energy, the emergence of large new energy exporters, new oil and gas finds of considerable magnitude, and the meteoric rise in energy demand from emerging economies in Asia have sharply altered where energy comes from, where energy goes, and what kind of energy is produced and used.

Robert D. Hormats, Department of State, United States

Asia's Energy Challenge

Asia's energy demand has grown dramatically over the past three decades and is expected to swell to keep pace with rising GDP, especially in developing countries. With an average of 6% annual growth, developing countries in the region could produce 44% of global GDP by 2035, according to ADB. Given that rise in GDP, energy consumption in the region will account for more than half the global demand by 2035. How Asia meets that demand and manages the environmental impacts of increased energy consumption will be a critical determinant of its future economic trajectory.

S. Chander, Director General of Regional and Sustainable Development and Chief Compliance Officer at ADB, suggested a few possible options to contain burgeoning demand, one of which is to reduce energy subsidies. "Many are unproductive, and the time has come to take a second look at many of them," he said. Subsidies tend to impose a burden on budgets, accounting for 2% of GDP in India, Indonesia, and Vietnam and 4% in Bangladesh and Pakistan. "Countries that need energy the most can't afford it with these subsidies," said Chander.

Removing subsidies and allowing open, transparent markets sets the right path toward a solid economic framework, according to **Robert F. Cekuta**, Principal Deputy Assistant Secretary of State in the Bureau of Energy Resources at the U.S. Department of State. "If you allow the markets to work, you will see investments made in developing power sectors."

Political challenges will have to be overcome so that energy markets can be better integrated to encourage lower demand while making gains in supply. Chander noted that regional electricity systems can efficiently cover supply failures with integrated backup capacity, and this could be achieved especially in the greater Mekong subregion. **Susannah Pierce**, Vice President of Value Chain Integration at Shell Canada, agreed with this assessment. "Efficiency gains can be made through smarter and more integrated infrastructure," she said.

Regional cooperation can easily be achieved through institutions such as ASEAN, according to one Summit participant, but Chander noted that standardized regulations, pricing, and contracts across borders will only work if participants are open to sharing information.

If countries can overcome these obstacles, creating more integrated markets and allowing the market to determine the price for electricity, they could expand electricity to rural areas in developing Asia, according to Cekuta.

Advances in technology can also contribute to rural electrification. In Indonesia, independent hydropower is used to supply energy to villages, and this model can be replicated throughout ASEAN countries. Improvements in technology could also unlock more of the natural gas potential in Asia. The region only has about 14% of the world's unconventional gas reserves and 15% of technically recoverable oil and natural gas liquids. Chander explained that U.S. investments in shale gas projects throughout Asia may help many counties meet demand and also curb carbon emissions.

Innovating the New Energy Era

Infrastructure expansion and higher production capacity in natural gas also depend on innovation. "We have just scratched the surface of how much we can get from these shale formations," said Yuen. Technology is still improving, and that may lead to a greater extraction of gas from shale rock formations at a cheaper price that will bring in a greater supply.

Technological innovation may have sparked the shale gas revolution in the United States; however, innovative open markets enabled it to succeed. Slutz provided context to Summit participants. "It really was because we allowed the market to work and gas prices were, in the mid-2000s, higher than what we had been expecting. They were $8–$9 per billion cubic feet in the United States, and it was really the response to that price signal that launched shale gas. So we should not forget that these price signals are very valuable in fostering innovation," he said.

Part of allowing markets to foster innovation involves the elimination of subsidies. **Robert D. Hormats**, U.S. Under Secretary of State for Economic Growth, Energy, and the Environment, noted that while subsidies or "green mercantilism" policies may be attractive in the short term, they ultimately hinder innovation. "Over the long term, green mercantilism will discourage investments of time, money, and talent for the development of new technologies. These policies will reduce the pace of innovation, which is critical to revolutionize our energy sector and enable new technologies to be competitive, without requiring subsidies or other forms of protection," he said.

GE's Allan also stressed that innovation could be applied to policy: "When we look to the regulatory process and public policy that we need to develop to encourage efficiency in the energy world, how are we encouraging innovative public policy? What does that look like in terms of when we structure new types of free trade agreements and when we think about our regulatory and environmental approval processes?"

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>
> James Slutz, President, Global Energy Strategies

Session 5 panelists (left to right): Mary Alice Haddad (Wesleyan University), David Porter (BC First Nations Energy and Mining Council), Anthony Jude (ADB), Peter Eggleston (Chevron), and Kevin Lynch (BMO Financial Group)

Acquiring the "Social License to Operate"

Large infrastructure projects in North America and Asia are subject to public and government scrutiny of their economic, social, and environmental impacts. As a result, the success of a project increasingly relies on a company's or a government's ability to acquire the "social license to operate"—that is, the agreement of a community or the wider public to economic activity in a region.

"We have talked about having the commercial license to act, the policy license to act, and the legal license to act. How do you have the social license to act?" asked Lynch. "How do we make sure that the conversation is not about energy projects *or* the environment, energy *or* the indigenous people, energy *or* the community, but rather is about 'and'?"

One takeaway from the social license panel is that the steps necessary to achieve social license vary case by case. Nevertheless, panelists from a number of backgrounds (industry, banking, indigenous communities, and academia) offered some general principles on how to achieve a community's or government's support for an energy project. These include high environmental standards for the project, transparency around environmental and community impacts, and attention to value creation for both governments and communities. With respect to the third principle, **Peter Eggleston**, General Manager of Policy and Government and Public Affairs at Chevron Asia Pacific Exploration and Production, stated that companies can create social value through investment in community health, education, and economic development; job training and employment opportunities; and tax payments. Anthony Jude of ADB noted that projects involving the displacement of communities must have resettlement plans that include compensation for lost livelihoods and accommodation of traditional practices.

A number of panelists noted that indigenous communities often have unique rights in international agreements and under a country's laws. As a result, companies may need to adopt different approaches for working with indigenous communities. For example, ADB has performance standards specific to projects that will affect indigenous peoples. In the case of Canada, **David Porter**, CEO of the First Nations Energy and Mining Council, mentioned that many First Nations in British Columbia have aboriginal title to the land. He stated that First Nations "are not going to be

looking at projects that enhance the well-being and wealth of others, but continue to see us mired in abject poverty. That is no longer tolerable." As a result, indigenous communities in Canada are increasingly seeking profit-sharing with companies, royalty-sharing with governments, and an equity stake in natural resource projects, among other concessions.

Panelists identified other resources that are essential for implementing a social license strategy. These included adopting a dedicated and appropriately allocated budget for meeting social license goals; assessing government capacities to implement social license activities and provide funding and training as necessary, which is especially relevant for international finance organizations like ADB; and ensuring that community members play a leadership role in evaluating their own needs and how these needs are met.

Some panelists also noted the important role that NGOs and social media can play in helping companies implement their social license goals. **Mary Alice Haddad**, Associate Professor of Government at Wesleyan University, said that NGOs can partner with companies in their social license activities by offering a legitimate avenue for corporate transparency. She cited the Institute of Public and Environmental Affairs, a Chinese NGO, which offers a platform facilitating corporate transparency by displaying data about environmental compliance and green supply-chain management efforts.

With respect to social media, Eggleston pointed out that the success of a social media strategy, and all social license activities, depends on building authentic relationships with the public. "It [social media engagement] depends on your ability to have genuine relationships at the local level," he told the audience, "because it is what others put on social media that is important." Companies need a track record of good practices to build trust with the government and the public. He felt that Chevron's proven ability to maintain a quarantine area on Burrow Island in Australia for over 45 years helped the company gain both government permits and a social license to operate an LNG plant on the island.

While panelists agreed that building public consensus is increasingly important to energy projects, their remarks highlighted a number of obstacles to achieving social license. These include disagreement between the proponent and community about their respective roles, unclear regulatory structures, timeline issues that arise when the acquisition of social license is slower than the needs of business, and disagreement among the stakeholders about the "moral value" of a project. This last concern is most clearly seen in North American debates regarding oil pipelines and fracking.

The consequences of not overcoming these challenges can be serious. The impact of the failure to gain local support will vary by jurisdiction but can include damage to a company's reputation, delays in the project due to protests and court challenges, and government rejection of necessary permits. In fact, a recurring theme at the Summit was the very close relationship between social license and government decision-making. If public concerns about a project become too intense, government leaders may intervene for political reasons, such as concerns over re-election. In situations where it is not possible to reconcile the priorities of communities or special interest groups with those of an energy project, the responsibility will often fall to government authorities to determine how to balance these interests.

Conclusion


Dennis Blair (NBR)


Rabinder Malik (TERI-Japan) and Pham Hoang Luong (Hanoi University of Science and Technology)


Kevin Lynch (BMO Financial Group)

THE 2013 PACIFIC ENERGY SUMMIT provided participants a rare opportunity to hear the perspectives of delegates from Canada, the United States, and many Asian countries on how to forge deeper trans-Pacific energy ties for a new energy future.

In their closing comments, co-chairs **Dennis Blair**, NBR Board of Directors, and Kevin Lynch, the Asia Pacific Foundation of Canada Board of Directors, highlighted key themes of the Summit, including an emphasis on open markets, the need to balance energy demand for economic development with climate change mitigation, and the importance of innovation to enhance energy supplies and solve environmental challenges. Both Blair and Lynch noted an overarching theme: all of the above priorities depend heavily on government decision-making. As a result, innovative public policy will be central to achieving energy and environmental goals in the Asia-Pacific. Blair asked the audience, "How do we

> We need to identify innovative ways forward in the energy sector…whether these are new technologies…or new government policies.
>
> Dennis Blair, Board of Directors, NBR

help our political leaders make smart, informed energy policy decisions that reach our overall goal of adequate energy supplies at affordable prices with acceptable environmental impact? We have to help them fashion policies that will gain the widespread acceptance of their people and also satisfy the requirements of important constituent groups within their countries, which they have to deal with and whose support they will need for success in the long run."

The Asia–North America energy relationship is evolving rapidly and The National Bureau of Asian Research and The Asia Pacific Foundation of Canada are indebted to the Summit's sponsors, advisers, working paper authors, and participants for their generous contributions. We will continue our work to bring their research, networks, and expertise to bear in deepening understanding of the opportunities presented by the rapid changes underway in world energy markets and in the energy relationships between the United States, Canada, and Asian countries. Whether working in government, industry, or research, all Summit participants can contribute to the future of the trans-Pacific energy relationship and its potential contributions to meeting energy demand and safeguarding the environment.

Left to right: Satya Yudha (House of Representatives, Indonesia) and Peter Hughes (Peter Hughes Energy Advisory Limited)

Agenda Overview

Forging Trans-Pacific Cooperation for a New Energy Era

VANCOUVER, CANADA • APRIL 2–4, 2013

World energy markets have undergone a seismic shift driven by Asia's rapidly rising energy demand; the increasing commercial viability of energy supplies such as shale gas, tight and heavy oil in North America, solar, and wind; and gains from energy efficiency. Yet, despite new energy supplies and more efficient technologies, policymakers face significant challenges in continuing the trajectory of economic growth and poverty reduction while safeguarding the environment in the face of escalating impacts from climate change. Summit participants will explore these trends and what role stronger Asia–North America energy and environmental cooperation could play in meeting these challenges.

DISCUSSION

ADB's View on "Asia's Energy Challenge: Ensuring Energy Security in Asia and the Pacific"

Moderator:	Dennis C. BLAIR *Board of Directors, The National Bureau of Asian Research*
Remarks:	S. CHANDER *Asian Development Bank*
Respondents:	Robert F. CEKUTA *Department of State, United States*
	Dino Patti DJALAL *Embassy of The Republic of Indonesia in the United States*
	Susannah PIERCE *Shell Canada*

Left to right: Dino Patti Djalal (Embassy of Indonesia, United States) and Robert Cekuta (Department of State, United States)

SESSION ONE

Welcome: Dennis C. BLAIR
Board of Directors, The National Bureau of Asian Research

Kevin LYNCH
BMO Financial Group

Remarks: Ed FAST
Foreign Affairs and International Trade, Canada

Forging Trans-Pacific Cooperation for a New Energy Era

Moderator: Mikkal HERBERG
The National Bureau of Asian Research

Panelists: William M. COLTON
ExxonMobil Corporation

Serge DUPONT
Natural Resources, Canada

Ken KOYAMA
The Institute of Energy Economics, Japan

Carlos Jericho PETILLA
Department of Energy, Philippines

SESSION TWO

The Golden Age of Gas: How Far Can It Take Us?

Moderator: Peter HUGHES
Peter Hughes Energy Advisory Limited

Panelists: Christopher ROBERGE
Deloitte

Paul SIEGELE
Chevron Energy Technology Company

WANG Zhen
China University of Petroleum at Beijing

S.W. YUDHA
Commission VII (Energy, Mineral Resources, Environment, Research and Technology), House of Representatives, Indonesia

LUNCH

Welcome: Yuen Pau WOO
Asia Pacific Foundation of Canada

Remarks: David JACOBSON
Embassy of the United States, Canada

Integrating Energy and Environmental Policy to Achieve Economic Growth in the Asia-Pacific

Moderator: Dennis C. BLAIR
Board of Directors, The National Bureau of Asian Research

Panelists: S. CHANDER
Asian Development Bank

Robert D. HORMATS
Department of State, United States

ROUNDTABLES

Roundtable 1

Waste Not, Want Not: Securing Energy Supplies through Efficiency

Moderator: Yongping ZHAI
Asian Development Bank

Panelists: Elyse ALLAN
GE Canada

Muhammad Enamul HUQ
Ministry of Power, Energy and Mineral Resources, Bangladesh

PHAM Hoang Luong
Hanoi University of Science and Technology

Roundtable 2

Finding the Right Price: LNG Markets and the Asian Premium

Moderator: Shahriar FESHARAKI
FACTS Global Energy

Panelists: Tilak DOSHI
Energy Studies Institute, National University of Singapore

Shinichi KIHARA
Ministry of Economy, Trade, and Industry, Japan

Tadashi MAEDA
Japan Bank for International Cooperation

Anthony YUEN
Citi Research

SESSION THREE

The North American Policy Environment and the Impact on Asia

Introducer: Charles W. BOUSTANY, Jr.
House of Representatives, United States

Moderator: Yuen Pau WOO
Asia Pacific Foundation of Canada

Panelists: Ken HUGHES
Alberta Energy

OH Sung Hwan
Ministry of Foreign Affairs and Trade, South Korea

James SLUTZ
Global Energy Strategies

DINNER AND DISCUSSION

Welcome: Richard ELLINGS
The National Bureau of Asian Research

A New World Order? The Geopolitical Impact of Asia's Rising Energy Demand and North America's Energy Renaissance

Introducer: Yuji TAKAGI
Sasakawa Peace Foundation

Panelists: Dennis C. BLAIR
Board of Directors, The National Bureau of Asian Research

Kevin LYNCH
BMO Financial Group

SESSION FOUR

Infrastructure: Building the Energy Framework of the Future

Moderator: Mark THURBER
Stanford University

Panelists: Douglas P. BLOOM
Spectra Energy

Aaron ENGEN
BMO Capital Markets

Nam-Yll KIM
Korea Energy Economics Institute

Tadashi MAEDA
Japan Bank for International Cooperation

SESSION FIVE

Finding Common Ground to Meet Energy and Environmental Goals

Moderator: Kevin LYNCH
BMO Financial Group

Panelists: Peter EGGLESTON
Chevron Asia Pacific Exploration and Production

Mary Alice HADDAD
Wesleyan University

Anthony JUDE
Asian Development Bank

Dave PORTER
First Nations Energy and Mining Council

CLOSING REMARKS

Fast Forward to the Future

Remarks: Dennis C. BLAIR
Board of Directors, The National Bureau of Asian Research

Kevin LYNCH
BMO Financial Group

Working Papers

To inform plenary sessions and promote thought-provoking discussion, the organizers of the 2013 Pacific Energy Summit on "Forging Trans-Pacific Cooperation for a New Energy Era" commissioned five policy papers from top experts in the field.

Energy-Efficiency Policies in the Asia-Pacific: Can We Do Better?

Tilak K. Doshi
Energy Studies Institute, National University of Singapore

Nahim Bin Zahur
Energy Studies Institute, National University of Singapore

Implications of North American LNG Exports for Asia's Pricing Regime

Shahriar Fesharaki
FACTS Global Energy

Forging a New Trans-Pacific Energy Trade: Opportunities and Challenges

Mikkal E. Herberg
The National Bureau of Asian Research
University of California, San Diego

The U.S.-Canada Energy Relationship and the Growing Role for Asia

James Slutz
Global Energy Strategies LLC

Social License to Operate: How to Get It, and How to Keep It

Brian F. Yates
SNC Lavalin Environment

Celesa L. Horvath
Ventus Development Services Inc.

The papers are available at www.nbr.org.

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The National Bureau of Asian Research (NBR) launched the Pacific Energy Summit in 2009 with the vision to find innovative solutions to energy and environmental challenges in the Asia-Pacific, and is fortunate to be joined this year by the Asia Pacific Foundation of Canada (APF Canada). As Summit co-hosts, APF Canada and NBR would like to express their gratitude for the insights, contributions, and support of our core Summit leadership—our Summit advisors, partner, and sponsors, as well as the Summit staff. We are also deeply appreciative of our moderators, panelists, and paper authors, who have played an integral role in developing and strengthening this year's program.

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Cenovus Energy Inc. is a Canadian integrated oil company. It is committed to applying fresh, progressive thinking to safely and responsibly unlock energy resources the world needs. Operations include oil sands projects in northern Alberta, which use specialized methods to drill and pump the oil to the surface, and established natural gas and oil production in Alberta and Saskatchewan. The company also has 50% ownership in two U.S. refineries. Cenovus shares trade under the symbol CVE, and are listed.

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Husky Energy (TSX: HSE) is one of Canada's largest integrated energy companies with upstream and downstream segments operating in Western Canada, offshore Atlantic Canada, in the United States, and offshore China and Indonesia. Husky has a market capitalization of approximately $26 billion, with more than 5,000 employees. The company's balanced growth strategy focuses on consistent execution, disciplined financial management, and safe and reliable operations.

Nexen is an upstream oil and gas company responsibly developing energy resources in some of the world's most significant basins including the UK North Sea, offshore West Africa, the United States, and Western Canada. A wholly-owned subsidiary of CNOOC Limited, Nexen has three principal businesses: conventional oil and gas, oil sands, and shale gas. Nexen manages a diverse suite of assets, has a strong team that can deliver value from these assets, and is working to maintain and enhance its operations around the globe. Nexen's team of approximately 3,000 employees operates under a clear set of value-based principles of excellence, personal accountability, integrity, and social and environmental responsibility. It's about getting the job done, the right way.

Shell has operated in Canada since 1911 and is one of Canada's largest integrated oil and gas companies. Headquartered in Calgary, Shell Canada employs more than 8,200 people and holds approximately 30% of Royal Dutch Shell's global resource base. For the eleventh consecutive year, Shell was named one of Canada's top 100 employers. Shell works with neighbouring communities, employees, First Nations, governments, and other stakeholders to reduce impacts and maximize benefits from its operations. A leading manufacturer, distributor and marketer of refined petroleum products, Shell produces natural gas, natural gas liquids, and bitumen, and is Canada's largest producer of sulphur.

Spectra Energy Corp (NYSE: SE), a FORTUNE 500 company, is one of North America's premier pipeline and midstream companies. The company's operations in Canada and the United States include more than 35,000 kilometres of natural gas and liquids pipelines, approximately 305 billion cubic feet (Bcf) of natural gas storage, as well as natural gas gathering and processing, and local distribution operations. Building upon its centurydeep foundation of serving North America's growing need for natural gas, Spectra Energy's Canadian LNG business is focused on delivering a multitude of liquefied natural gas (LNG) opportunities in western Canada, including the joint venture between Spectra Energy and BG Group. The proposed new natural gas system to serve a new LNG facility of Canada's west coast represents a key element of Spectra Energy's next wave of investment opportunity in British Columbia and provides an opportunity to create value by leveraging the region's surplus natural gas supplies and facilitating its export to high-demand global markets.

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