



Addressing the energy challenges posed by Asia's urbanisation

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Today, I would like to focus on the future of energy in Asia and how the region can develop a more secure and sustainable energy system. South Korea is an appropriate place to focus on this issue. The country is poised to play an important part in that future as a significant player in the global gas industry. Its famous shipyards are building the ships that will transport gas across the oceans to fuel Asia's economic growth.

But let me begin by putting Asia's rising energy needs in perspective. Shell's scenarios team recently published their latest report. It assesses how major social, economic and political forces might unfold over the 21st century and their impact on the energy system. The scenarios reinforce the scale of Asia's resource stresses. For example, energy demand in the region could more than double over the next 50 years. The scenarios also highlight the shift in economic influence from West to East. It's clear that Asia's emerging economies have entered a historic phase of industrialisation and urbanisation.

The pace of change is almost inconceivable. According to McKinsey, the Chinese economy is changing at 10 times the speed of Britain's during the Industrial Revolution and at 100 times the scale. Billions of people in the region are emerging from poverty. This is not only transforming Asia's energy system but also the World's. Between them, China and India will provide the majority of global energy demand growth in the next two decades.

Meeting this demand will be extremely tough. It will require heavy investment in all energy sources, from oil and gas to wind and solar. Asia is also increasingly dependent on energy imports at a time of high and volatile oil prices. This carries significant economic implications. According to one source, by 2020 China could spend as much as US\$500 billion a year on crude oil imports. Then there are Asia's environmental stresses. Governments face public pressure to tackle chronic urban pollution. There's also rising concern about greenhouse gas emissions.

I see three critical steps for the region: intelligent planning in its growing cities; diversifying its energy supply; and the right government policies.

So, first: urban development. The world may need to build the equivalent of one new city of nearly 1.5 million people every week for the next 40 years. Asia is the epicentre of this growth. For example, Karachi's population could grow by half between 2010 and 2025, and Beijing's by even more. This poses challenges. But it's also an opportunity to

make progress towards a more sustainable energy system. The reason is simple. In thirty years' time, cities could account for more than three-quarters of the world's energy consumption. And those with higher population density are more energy efficient than sprawling cities.

They encourage people to use public transport and to make shorter car journeys. According to Shell's scenarios experts, this could lead to the equivalent of a 15 per cent reduction in the average distance travelled by car passengers each year – that's around 2,000 km per person. Intelligent urban planning could even transform the entire global transport system. It would provide the infrastructure for a cleaner car fleet powered mainly by electricity, hydrogen and natural gas, including cars fuelled by compressed natural gas. This would help to cut pollution and ease Asia's need for imported oil. To make this happen, we will need to see a truly integrated approach to urban development. I am talking about deeper collaboration between the private and public sectors, between different cities and across industries.

That's a lesson from Seoul's experience over the past decade. The city has improved its public transport system, and taken steps to tackle road congestion and pollution. A crucial part of the reforms has been the collaboration between the city authorities and a range of parties, including transport companies, the Seoul Development Institute, academics and other cities, including San Francisco and Amsterdam. This reflects the breadth of the challenge and the need to draw on expertise from different sources.

As a second priority, Asia must diversify its energy supply. Renewables are making a growing contribution throughout the region. But fossil fuels are likely to meet the majority of demand for decades. According to Shell's scenarios, fossil fuels could still supply up to 65 per cent of Asia's energy in 2060. That's down from about 85 per cent today. (Globally, fossil fuels are likely to supply around 60 per cent in 2060, down from 80 per cent today). But it's a smaller slice of a much bigger energy system, so fossil fuels demand will remain strong.

So, what is the best way ahead in the power sector? Nuclear power's prospects are uncertain, following the Fukushima tragedy in Japan. Meanwhile, coal-fired power is expanding all over the region. Against this backdrop, I would like to re-assert the importance of natural gas to Asia. The bottom line is that gas is the cleanest burning fossil fuel. It can make the biggest contribution to cutting the world's

CO₂ emissions over the next 25 years. That is because it produces only around half the emissions of coal.

Natural gas can also be the urban fuel of the future. It can help to tackle the pollution crisis in some of Asia's cities. When replacing coal-fired power, it sharply reduces emissions of pollutants like sulphur dioxide and nitrogen oxides. That's why the Chinese government has chosen more than a dozen "model cities" to make the transition to natural gas from coal and oil. Gas power stations are also the most practical option in urban areas. They emit few pollutants. And there's no need for lengthy transmission lines to carry the electricity from distant coal or nuclear plants. But we must acknowledge that gas does face challenges in Asia.

Some people question whether supplies can really keep pace with such strong demand. After all, gas demand across Asia is projected to more than double over the next 25 years. Meanwhile, LNG supplies are under pressure, partly because Japan's needs have risen following the Fukushima tragedy in 2011. But we must keep hold of the underlying reality: global gas resources are expanding rapidly and they will continue to do so. It's easy to forget that North America's energy supply revolution is still in its early

stages. The continent could now have more than 100 years of gas supplies at current consumption rates. For importers like South Korea, tight and shale gas is only one chapter in a bigger story – the expansion in the world's LNG supplies.

Asia's demand for LNG has tilted the global trade eastwards. Singapore and Malaysia began importing LNG this year. Before long, they could be joined by countries including Vietnam and the Philippines. Meanwhile, others are expanding their import capacity, including South Korea, Thailand, China and India. They will all have access to vast new gas resources around the world. At Shell, we see worldwide LNG supplies doubling this decade and Australia is front and centre. It is building around half a dozen major new LNG project. By the end of the decade, Australia could rival Qatar as the world's biggest LNG exporter. By 2020, North America may also emerge as a significant LNG supplier. This year, the US government has granted several new permits for projects to export LNG worldwide. And in Canada, Shell, KOGAS and other partners have announced plans to develop an export facility on the Pacific Coast. That is not all. Russia is considering plans to expand its export capacity and East Africa might emerge as a supplier to Asia over the longer term.

So, LNG supplies could grow quickly. And Asia will benefit from an increasingly diverse and flexible group of suppliers. But we must also acknowledge certain realities. None of these LNG projects are cheap or easy to build. They are major infrastructure projects. And there is competition for the human and physical resources needed to build them. So, the energy industry must continue to strengthen the competitiveness of natural gas. One critical step will be innovation. An example is Shell's pioneering Prelude Floating LNG project.

Work is well under way in Korea's shipyards on this project to process, store and transfer liquefied natural gas at sea. It will be the largest offshore floating facility in the world. It will be used to tap the Prelude gas field more than 200 km off Australia's northwest coast, a field that is too small and remote to be economically developed in the traditional way. Another advantage is that can eliminate the need to devote land and pipelines to process LNG onshore. This not only reduces costs, but also the environmental impact.

The industry must also address cost pressures

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across the entire supply chain. South Korea's shipyards can be pivotal. They are now a vital link in the global supply chain, amid strong demand for LNG carriers and Floating LNG facilities. With our partners, Shell is working on projects in Indonesia and Australia, which we anticipate will also use Floating LNG. The high quality of Korea's yards is attracting heavy investment. So they must be encouraged to maintain the outstanding quality of their work. That means continuing to invest in their people. It also means holding their suppliers and contractors to the same rigorous standards and efficiency. That brings me to the final point I would like to cover.

The right government policies will be critical to meeting Asia's energy challenge. The first priority must be to tackle the region's urban pollution crisis. The Chinese government recently released its air pollution action plan. It sets out plans for limiting coal use and addressing vehicle emissions. The introduction of air quality standards throughout the region would be an important step in the right direction.

A second policy goal must be to encourage investment in new energy sources, especially natural gas. That means exploring for and developing resources in frontier areas such as deep water fields. Such projects can be technically

challenging, with some costing tens of billions of dollars. So the message for governments is that these projects need stable fiscal and regulatory frameworks to be viable.

That leads directly onto my final priority: fossil fuel subsidies. In 2011, these totaled US\$520 billion around the world, according to the IEA. This is a complex issue, not least because subsidies protect consumers from higher energy costs. But they also discourage investment in new energy supplies. They're a burden on government finances. And they can be wasteful, by encouraging energy to be used inefficiently. So tackling subsidies could bring major benefits to Asian countries, despite the potential political sensitivities in implementing these reforms.

In summary, Asia's story is increasingly that of the entire global energy system. How the region meets its growing needs will have profound consequences for the world. But it's also true that Asian countries can take immediate action that will reap benefits for decades. Effective urban planning can promote energy efficiency and transform the global transport infrastructure. Another critical step is to diversify the energy mix. Natural gas can be the urban fuel of the future. But none of this will happen without firm policies from governments across the region. □

Beijing by night: the population of the Chinese capital is expected to grow by more than half by 2025

