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## On the Horns of an Investment Dilemma: Energy Security and Climate Change

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Relatively low oil prices in the 1980s and 1990s lulled the world into complacency.

Energy security and climate change have become chronic global problems and, in addressing them, the energy industry finds itself on the horns of an investment dilemma. Governments are now confronted by an unprecedented challenge as to how to attract the necessary level of energy sector investment to keep up with global demand growth. However, investors are more than ever reluctant to accept uncertain investment conditions.

Today's energy security problem is a consequence of investment having failed to keep up with global demand growth. The International Energy Agency (IEA) does not rule out a supply-side crunch over the next 7 or 8 years, which may involve an abrupt escalation in oil prices.

Global energy demand nonetheless continues to grow. In the APEC region, primary energy demand is projected to rise by more than 70% between 2002 and 2030.

The climate change problem is also linked to global energy demand growth. As the IEA concedes, *"Rising CO<sub>2</sub> and other greenhouse gas concentrations in the atmosphere, resulting largely from fossil energy consumption, are contributing to higher global temperatures and to changes in climate."* In fact, greenhouse gas emissions from energy consumption are expected to double by 2030.

It is unhelpful to attribute the climate change problem to energy market failure, as was suggested by the UK's Stern Report. The climate change problem is the outcome of nature and civilisation in the broad. As soon as governments get around to establishing efficient carbon markets, there is not much doubt that carbon trading will start to reduce emissions.

### ***The Need for Urgent Action***

High energy prices are not a problem in addressing energy security and climate change – they are the first element of the solution. Despite the short-term hardship that may be caused, pricing consumers out of the energy market is the only efficient way in which demand can be restrained and consumer habits can be changed. High energy prices will also cause investment in the energy sector to "catch up" with economic growth and will incentivise investment in new and more efficient energy technologies.

The second element of the solution is the introduction of efficient carbon markets and the availability of carbon prices to enable investors to better manage their risks.

The third element of the solution is to implement domestic energy sector reforms to remove investment barriers, promote competition and encourage innovation.

Urgent action by governments to introduce carbon markets and take other steps to facilitate energy sector investment is warranted by the centrality of energy to economic growth and sustainable development. Urgent action is also warranted by the energy sector's unique characteristics: that is, its dependence on bulk transactions, its heavy reliance on costly infrastructure and transportation systems, its environmental sensitivity and its need to research, develop and demonstrate new climate-friendly energy technologies.

We should all be asking ourselves: what on earth have governments been doing about global energy security for the last 30 years? Energy importing countries have been focusing on short-term measures, such as emergency stockpiling, without fully appreciating that growth in global energy demand, and shifts in the centers of energy demand, have increased their vulnerability to supply disruptions and price shocks at a greater rate than any short-term measures could ever hope to control.

Energy systems and energy technologies are characterised by inertia and their adaptation to new price realities is either slow or costly. You can say the same thing about political systems.

### ***The Scale of the Challenge***

When I was asked to address APEC Energy Ministers on energy security in 2002, I suggested to them that the promotion and protection of future investment in the global energy sector was potentially the most important single issue of international economic development, other than the management of the world economy itself. It has now certainly become so.

Today's investment challenge is nothing less than immense. Between now and 2030, countries in the APEC region will need to invest between US\$5.95 and 7.55 trillion on energy. Worldwide, the figure is around US\$20 trillion. Most of this investment will be needed in the electricity sector. Can each country afford all of the "environmentally clean" power stations that will be required? The question has special relevance to China, which must install a huge fleet of new power stations if it is to cope with the surge in its economic growth.

When G8 leaders met in St Petersburg in 2006, they agreed that *"ensuring sufficient, reliable and environmentally responsible supplies of energy ... is a challenge for our countries and for mankind as a whole... [and]...that development of transparent, efficient and competitive global*

*energy markets is the best way to achieve our objectives on this score.*". They committed themselves to the St Petersburg Global Energy Security Principles. However, none of them entered into commitments to take domestic action. This is where governments have fallen down.

At their 2007 Summit in Heiligendamm, G8 leaders reaffirmed the St Petersburg Principles, and invited China, Brazil, India, Mexico, South Africa and other major emerging economies to commit to them as well. G8 Leaders reiterated that *"the challenge of energy security will require unprecedented international cooperation."*

Actually, it doesn't, although there is a vital international element to it – what energy security really requires is for governments to take action at the domestic level to align domestic policies with global markets. International meetings to promote more favourable conditions for investment have never been particularly productive because, after the discussants return home, they run into domestic obstacles and issues.

In May 2007, APEC Energy Ministers met in Darwin, Australia to discuss common concerns. They determined that *"addressing the challenges of energy security and sustainable development should be based on well-functioning markets that are progressively characterized by free and open trade, secure and transparent frameworks for investment, market-based price signals, market transparency, good governance and effective competition."*

So far, so good. APEC Energy Ministers, like their G8 counterparts, correctly identified investment facilitation as a key issue. However, the absence of carbon markets continues to be the major current impediment to investment.

Carbon markets cannot create themselves: tradeable allowances need to be standardised and recognised and trading in allowances must be regulated – rules are needed for this purpose. Individual economies must take domestic action to foster carbon markets that are appropriate for their individual circumstances. G8 leaders in Heiligendamm underlined the crucial role of economic incentives, in particular carbon prices, for the necessary large scale investments in climate friendly technologies. It is idle for individual economies to wait for an international carbon trading scheme to be handed down. It is also idle to expect investors to invest in climate-friendly technologies without generous economic incentives.

A supply-side energy crunch cannot be avoided by calls for international cooperation. Without the required investment, the future will be much as the IEA fears.

### ***Cross-Border Investment***

Cross-border investment provides risk-spreading and risk reduction benefits for energy industry players. To manage their costs and risks, and to reduce cross-border transaction costs, energy industry players are looking to vertically integrate their businesses in upstream and downstream directions. This is happening with all of the primary fossil fuels: oil, gas and coal.

In the case of oil, national oil companies are now scrambling to compete against private sector companies for offshore resources. There are many examples: Gazprom, China National Offshore Oil Corporation, Petro-China, to name just a few.

In the case of natural gas, there are almost unlimited resources which cannot enter world markets unless pipelines are developed to transport them across national borders or unless resources are liquefied for shipment as LNG. Much of these resources will remain unavailable to markets until conducive policies can be established, and enabling structural and regulatory frameworks can be installed, to attract the required investment. The APEC Gas Forum has been calling for clear policies on emissions for the last two years.

It is much the same with electricity. Substantial hydropower resources remain undeveloped. Greater cross-border interconnection of power systems will enable neighbouring economies to better manage the mismatch of power supply and demand. For example, if the Greater Mekong Subregion were able to exploit 50% its hydropower potential, this would create additional generating capacity of five times the present total. Interconnection would also reduce the vulnerability of the subregion to most events of force majeure which fall outside its control, such as sabotage and terrorist activity.

### ***What Needs To Be Done?***

Effective responses to the chronic global problems of energy security and climate change require individual economies to introduce carbon markets and to undertake domestic reforms to attract the necessary level of energy sector investment.

Most of the barriers to investment are not encountered at borders – they are domestic or "behind the border" barriers. They include environmental and other regulations, unpredictability and uncertainty of host country investment conditions, corrupt business practices, barriers to competition, the lack of fiscal incentives and a host of other country-specific and project-specific investment risks.

Governments turn on the red light for energy investors if they say "We want you to invest more in energy production but we must somehow discourage greenhouse gas emissions. We are thinking of imposing limits on emissions or taxing emitters". Investors in energy projects don't like this sort of uncertainty.

What is preventing the necessary domestic energy sector reforms? Governments often disagree internally on reforms: finance, energy and environmental ministries have very different responsibilities; they often have conflicting views on what constitutes the national interest; they find it difficult to articulate a whole of government approach to investment issues; and countries with federal systems of government usually find it hard to win domestic political consensus. Sometimes, domestic reforms are restrained by the basic fears of people: for example, fears of being singled out for unfair treatment; fears of being dominated by foreign capital; and fears of national energy depletion if local resources are exported.

Above all, politicians everywhere are afraid of being blamed for rising energy prices. So they drag their feet. Governments need to drop formalities and allow free reign to pragmatism. Each country should be establishing its own high-level task force to review its domestic energy and environmental policies and incentivise investment in climate-friendly energy technologies.

The essential reform elements are, first, allowing energy markets to function freely and transparently (so as to dampen demand in the most efficient and equitable way); secondly, introducing and fostering markets for carbon emissions in order to reduce uncertainty in the

making of investment decisions (this could be either a domestic market or participation in a regional market like the EU); and, thirdly, implementing domestic energy sector reforms to remove investment barriers, promote competition and encourage investment in climate-friendly energy technologies.

The taking of effective responses:

- (i) will facilitate the harvesting of early gains from greater energy efficiency
- (ii) will assist in the formulation and adoption of diversified national risk-management strategies, utilizing all available fuels, much as Japan successfully did after the 1973 oil shock
- (iii) will alleviate the substantial under-investment in production and transportation capacity
- (iv) will facilitate the development of cross-border transportation infrastructure, and facilitate the transport of gas and coal to foreign markets
- (v) will accelerate the development, commercialisation and deployment of more efficient and climate-friendly energy technologies and
- (vi) will enable the greater penetration of renewables into mainstream energy supply.

Over the longer term, high energy prices will be a blessing in disguise. As countries and consumers adjust to the short-term costs, there will be compensating benefits. In the transportation sector, consumers will find alternatives to oil and there will be greater public provision of mass transit systems. In the stationary energy sector, there will be a steady trend towards the greater use of clean coal, natural gas, nuclear energy and renewable energy. There will also be a drive towards the ultimate goal of a hydrogen economy.

Although international energy cooperation should continue to be discussed, individual countries cannot escape the need to find the "best" policy settings for their respective domestic economies in order to facilitate investment and encourage innovation. That is where the main challenge lies.

Will governments respond fast enough to avoid energy supply disruptions and damaging climate events?

Sydney

13 December 2007

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In 2000/2001, Robert chaired the World Energy Council study on "Electricity Market Creation in Asia Pacific". In 2001/2002, he was a consultant to the APEC Energy Working Group on Cross-Border Power and on Micro-Economic Reform of the Electricity Industry. In 2004, he was a consultant to APEC on Cross-Border Natural Gas Trade and on Energy Security.

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