

COMMENT SECTION

The Complication that Climate Change Poses for Asia-Pacific Energy Security

Robert Pritchard

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Energy security has hit the top of the foreign policy agenda and the G8 Gleneagles and St Petersburg Summits have ensured that it will stay there. But now we have the added complication of climate change and an increasing clamour to reduce greenhouse gas (GHG) emissions. As I questioned in these pages last year, it may already be too late to combat climate change in the time frame envisaged by the Framework Convention on Climate Change.¹ Certainly, the Kyoto Protocol barely begins to address the problem.

When the Economic Leaders of Asia-Pacific Economic Cooperation (APEC) met in Ha Noi in November 2006, they declared that the APEC region faces "the challenges of meeting rapidly growing energy demands while minimising environmental effects". As the International Energy Agency noted in the previous week in releasing the World Energy Outlook 2006, "Reconciling the goals of energy security and environmental protection requires strong and coordinated government action and public support." Exactly what action remains to be seen.

The Global Energy Security Problem

The global energy security problem mainly relates to oil and to products refined from oil. The problem has very little to do with the adequacy of global oil reserves but a great deal to do with their increasing concentration in the Middle East. Assuming global oil consumption continues to rise over the medium to longer term (and this is not an unreasonable assumption), the global distribution of oil production will continue to shift to where the reserves are

concentrated—that is, the share of the Middle East will rise.

In 2003, the Middle East's share of global oil production was 30 per cent. Let us look ahead to 2030. By then, the IEA projects that global energy demand will have risen by another 52 per cent. The Middle East's share of global oil production will by then have risen to a record level of 46 per cent. Increasing market dependency on the Middle East is therefore the single most important energy security risk for all oil importing countries.

A scramble for global energy resources is now under way. Many national oil companies are joining international oil companies in overseas exploration and production. Much of the new exploration activity for oil and gas is in high-cost deep water provinces, pushing up the cost of development. Ignoring any concern about climate change or other environmental effects from the use of fossil fuels, it is clear that this trend is not sustainable.

The Asia-Pacific Energy Security Problem

In the Asia-Pacific region, the dependency of most countries on imported energy is rising as the less developed countries in the region, especially China and India, lift their levels of economic and social development. This is in large measure driven by population growth.

Amongst individual countries in the Asia-Pacific region, the extent of dependency on particular fuel types varies considerably. However, oil represents a high proportion of total energy use, the main exception being China. This is depicted in Table 1.

Are There Sufficient Global Fossil Fuel Resources?

The answer is clearly yes. There are ample global reserves of fossil fuels for many decades even if no new discoveries are made. Figure 1 shows the global comparison of fossil fuel reserves to production ratios. However, coal clearly stands out as the most enduring fossil fuel resource.

In the Asia-Pacific region, there are ample reserves of coal and natural gas but not of oil.

How Widespread are the Coal Reserves in Asia-Pacific?

Unlike in the case of oil, where dependency on the Middle East is projected to increase, reserves of coal are widely spread amongst Asia-Pacific countries. In particular, Australia, China, India and the United States are endowed with gigantic reserves of coal that can potentially sustain them and the entire region for hundreds of years. This is illustrated in Table 2.

The Criticality of Cross-Border Energy Supply

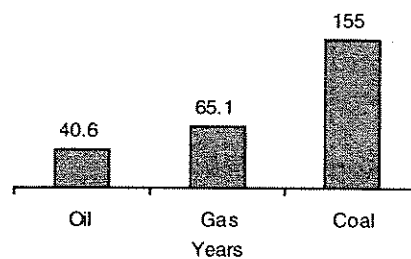
All energy resources (oil, gas, coal, uranium and renewables) will be needed to address the dual energy security and environmental challenge.

¹ Robert Pritchard, "Reflections on Climate Change" [2006] I.E.L.T.R., p.153.

Table 1: Primary Energy Dependency by Fuel in Selected Asia-Pacific Economies Excluding Wind and Solar, 2005 (Tonnes of Oil Equivalent)

	Oil	Natural Gas	Coal	Nuclear	Hydro	Total	Oil as per cent of Total
Australia	39.7	23.1	52.2	-	3.7	118.7	33.4
Canada	100.1	82.3	32.5	20.8	81.7	317.5	31.5
Chile	11.9	6.8	2.4	-	5.9	27.0	44.0
China	327.3	42.3	1081.9	11.8	90.8	1554.0	21.1
Hong Kong	13.8	1.9	7.2	-	-	22.9	60.3
India	115.7	33.0	212.9	4.0	21.7	387.3	29.9
Indonesia	55.3	35.5	23.5	-	2.1	116.4	47.5
Japan	244.2	73.0	121.3	66.3	19.8	524.6	46.5
Korea	105.5	30.0	54.8	33.2	1.2	224.6	47.0
Malaysia	22.0	31.4	6.3	-	1.5	61.2	36.0
Mexico	87.8	44.6	6.0	2.4	6.3	147.2	60.0
New Zealand	7.0	3.2	2.1	-	5.5	17.8	39.3
Peru	6.4	1.4	0.6	-	4.3	12.8	50.0
Philippines	14.7	2.7	5.9	-	1.9	25.2	58.3
Singapore	42.2	5.9	-	-	-	48.1	87.7
Taiwan	41.6	9.6	38.2	9.0	1.8	100.3	41.5
Thailand	45.6	26.9	11.8	-	1.3	85.6	53.3
United States	944.6	570.1	575.4	185.9	60.6	2336.6	40.4

Source: BP Statistical Review of World Energy, June 2006

Figure 1: Comparison of Global Fossil Fuel Reserves to Production Ratios at End 2005 (Years)

Source: BP Statistical Review of World Energy, June 2006.

Because energy resources are spread very unevenly amongst individual economies, there must be an increasing reliance on cross-border energy supply. There is however no simple "energy highway" solution that can be devised to speed up the traffic; rather, there is an aggregation of multiple, competitive, unregulated cross-border energy markets where supply and demand determines the volume and value of trade. Similarly, there is an aggregation of possible solutions.

A study for APEC on barriers to cross-border natural gas trade highlighted a range of trade and investment barriers and recommended a range of strategies to overcome them.² One recommendation

taken up was the establishment of the APEC Gas Forum. Many "behind the border" barriers remain. Deriving the full gains from removing trade and investment barriers will take time but significant benefits should be derived as the barriers are progressively overcome.

The Complication of Climate Change

Not only the public but the scientific community and energy industry participants are expressing increasing concern that the continuing use of fossil fuels, particularly the burning of coal for power generation, is no longer a sustainable strategy. This poses a special challenge for the energy industry as energy production and consumption is the main source of GHG emissions.

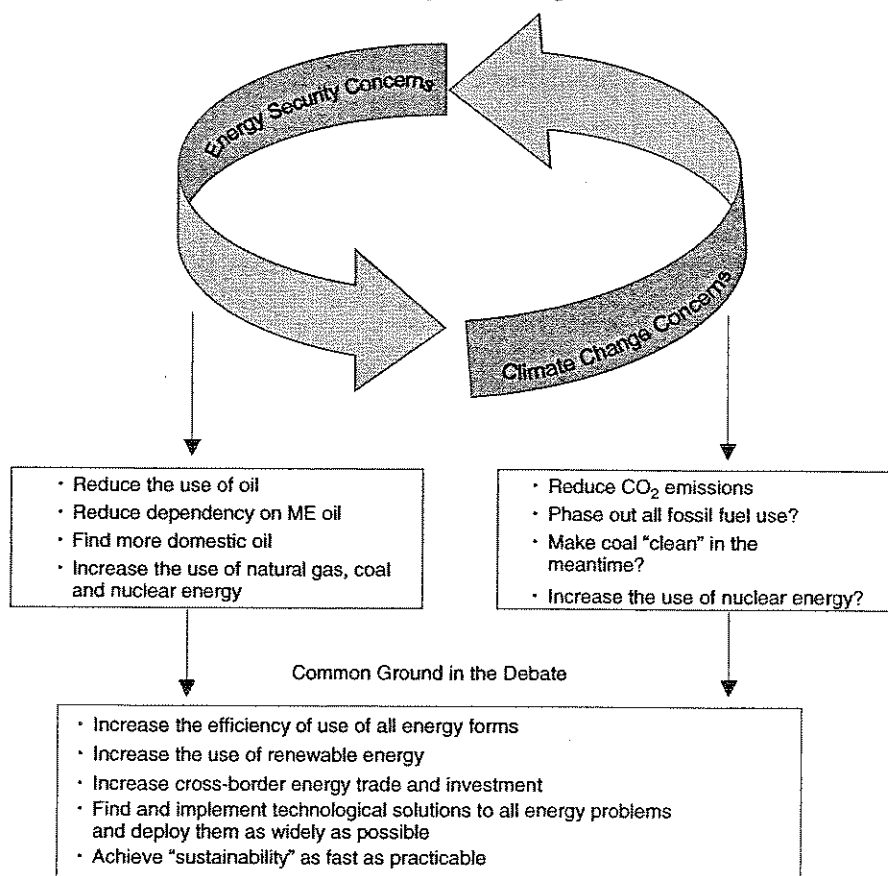
² Resources Law International, "Great Expectations: Cross-Border Natural Gas Trade in APEC Economies", APEC Secretariat, Singapore, 2004.

Table 2: Coal Reserves of Selected Asia-Pacific Economies at End 2005

	Million tonnes	per cent of world total	R / P ratio (years)
Australia	78,500	8.6	213
Canada	6,578	0.7	101
China	114,500	12.6	52
India	92,445	10.2	217
Indonesia	4,968	0.5	37
Mexico	1,211	0.1	121
Thailand	1,354	0.1	64
United States	246,643	27.1	240

Source: BP Statistical Review of World Energy, June 2006

Figure 2: The Energy Security and Climate Change Challenge—Will It Be a Vicious or Virtuous Cycle?



However, the feasibility of phasing out fossil fuel use in the near to medium term remains very dubious.

Action to successfully combat climate change could possibly require far greater political and economic sacrifices than any nation may be prepared to countenance. At present, the Asia-Pacific region's two largest developing countries, China and India, emphatically reject any suggestion that their economic development should be curtailed by measures to prevent global climate change. For them, understandably, development is the overriding concern, which is why they have joined with Australia, Japan, South Korea and the United States in the Asia-Pacific Partnership on Clean Development and Climate (AP6).

In the stationary energy sector, in the near term, natural gas is seen as a key bridging fuel. Nuclear power will also play an increasing role. In the transportation energy sector, however, there is no presently obvious substitute for oil.

The Special Challenge for Coal

Can the increased use of our abundance of coal resources quickly be made environmentally acceptable? This is the trillion dollar question. If the answer is yes, it will provide one of the main answers to the dual challenge of energy security and climate

change. The answer will depend on a technological breakthrough.

With the advent of AP6, the scope of the task is beginning to be mapped out. However, the enormity of the task is not yet fully appreciated. The task is mainly for the private sector: the selection of technologies is for commercial firms to decide, not for governments to ordain, but governments will need to provide appropriate incentives and they will need to decide on the appropriate degree of environmental regulation of the use of coal.

The Special Challenge for Governments

The special challenge for governments is whether they can accommodate both energy security and climate change concerns in a virtuous cycle. There are some fundamental difficulties in achieving this. To commence with, climate change is a global issue. Energy security, on the other hand, is both a global and domestic issue.

In deciding on its policies and its regulatory regime, each country has to take into account its

domestic resource endowment, its national economic development priorities, its local environmental factors and the costs and benefits of the various energy options.

The challenge is depicted in a rudimentary way in Figure 2.

Concluding Comment

Future energy security and environmental policies will need to complement each other in a manner that will, at the very least, not retard the pursuit of sustainable economic development. With the realisation that the Kyoto Protocol barely begins to fix the climate change problem, most governments and most energy industry participants have been caught napping. All players are now scrambling for solutions to the climate change problem but the weight of expectation is on coal suppliers and users to come up with the practical answers.