Asia's Much-Needed Low Carb Diet

by Paul Steele and Sergio Feld

CLIMATE CHANGE, typically viewed as a threat, also presents a once-in-a-generation opportunity to Asia to lead the next Industrial Revolution as the world shifts to a low-carbon economy. Just as Britain dominated the world in the 18th century after it established its lead in the Industrial Revolution, based on fossil fuels, Asia could dominate the world's politics and economics in the future by leading the next shift away from fossil fuels and toward low-carbon emissions. It is only through this radical move that the impacts of climate change can be reduced. This shift to a low-carbon economy will create demand for new products, new technologies and open new markets. But will Asia seize the opportunity for market leadership?

The success of switches to low-carbon economies in Asia so far is mixed and varies by country. Asia needs to move fast if it wants to be a market leader. Competition for low carbon technologies is picking up in Europe and some parts of the United States as the private sector and some governments start to make the shift. Morover, the emerging global carbon market of London is booming. Asia has the skills, labor, technology base and entrepreneurship to lead the low-carbon revolution. Asia's private sector can seize the opportunity to lead the revolution of decarbonization just as it has led the race for globalization.

But Asia's dynamic private sector needs governments to provide the enabling framework and incentives to make this happen. A key turning point could be the approach Asian governments take when the world meets in Bali, Indonesia in December 2007 for the annual United Nations Framework Convention on Climate Change—the major global agreement on tackling climate change. In the run up to this meeting, the Intergovernmental Panel on Climate Change was honored with this year's Nobel Peace Prize. Their latest reports have shown that climate change is already having a dramatic impact on Asia and will continue to do so.

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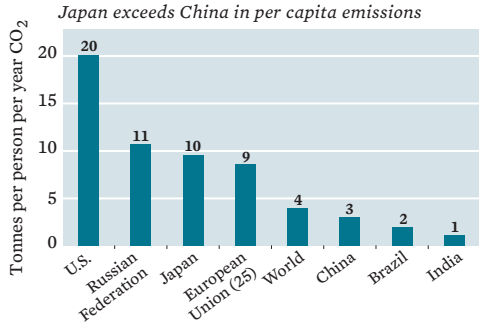
A NUMBERS GAME

Japan exceeds China in per capita emissions



SOURCE: WORLD RESOURCES INSTITUTE, CAIT

Global Emissions Rising

THE BAD NEWS is that far from falling, global emissions are actually rising—and fast. From 1990 to 2005, the signatories of Kyoto Protocol pledged to cut emissions by 5% from 1990 levels and progress on this target is broadly on track due largely to the economic decline in Russia and Central Europe. But the Kyoto Protocol covers only a limited share of emissions and excludes the United States and much of Asia. So globally, emissions are expected to increase 50% by the year 2030 from about 40 gigatonnes of carbon-dioxide equivalent per year in 2000 to a projected range of 50-76 gigatonnes per year by 2030.

Evidence from the IPCC indicates that "business as usual" (i.e., a 50% increase in emissions by the year 2030) would lead to a five-degree-Celsius rise in temperature. The difference between now and the last ice age over 10,000 years ago, is only about five degrees Celsius. With such rises, tipping points could be reached that lead to the melting of large ice sheets in Greenland and ice caps in the Himalayas, the permafrost could thaw and the major rivers on the Indian subcontinent would flood. All these could lead to a runaway rise with catastrophic implications.

While there is debate about what exactly is a dangerous level of greenhouse gas concentrations, European Union member states have defined dangerous as a doubling of preindustrial levels (i.e., 450 parts per million of carbon-dioxide equivalent) which would still lead to a minimum of two degrees Celsius of warming above preindustrial levels. Due to the growing existing stock of greenhouse gases, this level of concentration requires GHGs to be reduced by at least half by 2050, from 1990 levels.

Already Asia emits about one-third of global GHGs —although this is not surprising as it has over half the world's population. China, Indonesia (from deforestation), Japan and India are the major emitters in Asia. In terms of total past emissions, many other industrialized countries have emitted more, and per capita emissions are low (see figure nearby). It is likely that China is about to, or has already surpassed U.S. emissions and has become the world's largest emitter. Indonesia could be the third-largest global emitter after China and the U.S. if deforestation emissions are included. India's emissions are lower, but growing rapidly. It is estimated that by the year 2030, Asia's emissions will have increased from 33% to 50% of global emissions.

Reducing emissions by half by 2050 instead of allowing them to double would require a massive reduction. The good news is that the technology exists now for such a major reduction in emissions:

- *Electricity*. The production and consumption of electricity will need to provide over 60% of global emissions reductions. These reductions could result from increased efficiency and the greater use of renewables, clean coal, carbon capture and storage, and nuclear power. This challenge is particularly acute in China, India and the U.S., each of which depend on coal for over half of electricity needs.
- *Industry*. Reduced emissions are relatively low cost especially in energy intensive industries such as cement and steel.
- *Transport*. Fuel efficiency is the most cost-effective intervention for vehi-

India and China's policies will greatly influence the world's chances of success in fighting climate change.

cle transport. There is a vigorous debate about biofuels as some of the less advanced methods of production lead to very limited GHG emission reductions and can cause land expropriation and increased food prices. Airlines emissions are a challenge as they remain unregulated by the Kyoto agreement and only limited technologies exist to reduce emissions.

- *Land use*. 18% of GHG emissions come from land-use factors, primarily deforestation. Some have argued that land use, for all its importance, represents a relatively low-cost method for reducing emissions, but this is under debate and would require careful monitoring.
- *Agriculture*. Which makes up an estimated 14% of global emissions is now receiving more attention through changing crop-production methods.

While technologies exist, the challenge is whether efficiency improvements, new technologies or new products can be brought in fast enough to make up for increased demand for goods and services and population growth.

The Government's Role

ASIA-PACIFIC COUNTRIES ARE already starting to make the changes in technology and lifestyles that would be required for the low-carbon revolution. Changes will be driven by active citizens and the private sector. However, governments have a key role to play in encouraging these changes by establishing standards and regulations, setting realistic and standardized carbon pricing, supporting research and development, and ironing out a global agreement to reduce emissions.

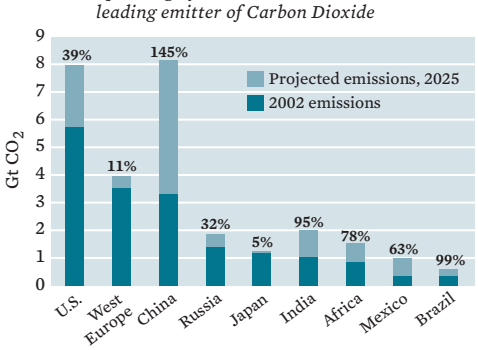
The responses of Asia's governments have been mixed. Japan has a long lead with its history of energy conservation, and an auto industry that is aggressively reducing emissions. Tiger economies like Thailand are also changing fast. Australia remains a laggard with its abundance of cheap coal and energy-intensive development of large cities in arid locations. But the two key economies that matter are China and India.

Both China and India are weighed down (as is the U.S.) by heavy dependence on coal. On the positive side, while there is still debate in the Chinese and Indian governments about the necessity of emissions targets, public opinion may be changing and some private companies see the market opportunities of a low-carbon world. Even the stance of the Chinese and Indian governments seems to be shifting. China has set tough national targets for energy efficiency, renewables and increased tree cover, but implementation challenges remain at provincial levels. Recent disasters and reports that indicate that India is among the worst affected by climate change have affected policy, and India will develop a "Global Warming Road Map" by November 2007. The next 10 years will show whether Asian countries, particularly China and India, can rise to the challenge and take advantage of the opportunities that will come with reducing GHGs and leading the low carbon revolution.

Asian governments can take four major steps to promote this second Industrial Revolution: create sound standards and regulations; price carbon efficiently; support research and development; and form international agreements and targets. While international debate and controversy has focused on reduction targets, the first three issues are crucial to implementing any target.

OLYMPIC EFFORT

China is sprinting by the U.S. to became the world's leading emitter of Carbon Dioxide



SOURCE: WORLD RESOURCES INSTITUTE, CAIT ENERGY INFORMATION ADMINISTRATION REFERENCE SCENARIO, ENERGY EMISSIONS ONLY

Currently Asian governments are promoting many standards and regulations to increase efficiency, promote new technologies and products, and create a legally binding approach to climate change. Some investments are already profitable for people to make but they are not done due to inertia in behavior and industrial systems. Many countries are now planning to phase out old-style light bulbs within ten years. In India, Greenpeace is gathering signatures to petition the government to phase out and eventually ban conventional electric bulbs. Minimum levels of renewable energy are mandated by the EU, many U.S. states and now there are even examples in China and India. Renewable markets are now booming and one of the richest men in China is the owner of the solar power manufacturer SunTech valued at $5 billion.

In addition, standardized carbon prices are needed as there has been no cost for carbon emissions set by the market until recently—with the market mechanisms of the Kyoto protocol. Carbon prices can be set through either a tax or a trading system. Oil price increases have already acted like an indirect carbon tax to make emissions costly. While China sells carbon at about $10 per-tonne carbon-dioxide equivalent through the clean development mechanism of the Kyoto Protocol, Norway has gone the furthest by setting a carbon tax of $50 per-tonne carbon-dioxide equivalent. But in general, currently traded carbon prices are too low due to shortcomings in the current systems and an excess of carbon credits.

A global carbon price of $20-$50 per-tonne carbon-dioxide equivalent would make most key carbon reducing technologies viable. Furthermore there are signs that carbon prices are likely to rise. This would not have to be politically unacceptable as a $20 carbon price would only increase U.S. gas prices by 6%, while U.S. electricity prices would rise by an estimated 14%. However, this assumes that all countries adopt these carbon prices and hence again demonstrates the cost savings that would be achieved globally if Asia were also a part of the global-emission pricing scheme. Simply put, Europe benefits from buying carbon credits from Asia, and Asia benefits from the funds the trade brings in. In 2006, EU purchases of Chinese Clean Development Mechanism carbon credits reached $2.5 billion, which is equivalent to over 20% of the EU's foreign direct investment in China.

If carbon credit prices are important now, research and development will be vital for the future. R&D is a public good that benefits many players both nationally and globally. In addition there are many risky investments, such as carbon capture, which may have low returns now. There is growing venture capital going into some of these low carbon technologies, but these investors may still focus on the areas with the fastest return. Often a medium and long-term perspective is needed—as shown by the huge fall in renewable energy prices over the last 30 years—often only possible with major government support.

Perhaps the most dramatic fall is in wind energy which is now available at about $0.07 per kilowatt hour compared to prices in the 1970s of $2. However, con-

trary to what might be expected, actual spending on energy R&D, by both government and the private sector has been falling. This is starting to change now and in 2006 it was estimated that spending on renewable energy had reached $100 billion. R&D for a low-carbon economy can be supported by public-private partnership, tax breaks and subsidies.

Step Up Asia

FINALLY, INTERNATIONAL AGREEMENTS and targets for GHG reductions covering as many countries as possible are of key importance to solving the problem. The more countries involved, the easier and cheaper reductions are. Targets are also an important signal to consumers and producers. The main international agreement on climate change is the United Nations Framework Convention on Climate Change, which was agreed on in 1992 at the Rio Summit and has now been ratified by 191 countries including the U.S. Five years after the Convention, a protocol was agreed in Kyoto, which has now been ratified by 173 countries, but still not by the U.S. or Australia. Under the Kyoto Protocol the so-called Annex I (richer) countries have to reduce their emissions by 5% by the year 2012 from their 1990 level. The search is now on to agree upon a future protocol to cover the year 2012 and onwards when the Kyoto targets expire. It has been agreed that such an agreement should be in place by 2009 so that the next meetings of the Convention signatories, known as the conference of the parties, meeting in Indonesia in December 2007 will wrestle with this issue. The views of China and India will be key to an international commitment to reduce GHG emissions. The EU is committed to reduce GHG emissions by 20% by 2020 (from 1990 levels), and by 30% if other countries such as the U.S., China and India also commit to targets. Japan and Canada, in the run up to the Group of Eight leading nations meetings in Germany in June 2007, have also agreed to a target of halving global emissions by 2050. There is about a ten-year window to put in place available technology to reach this target before GHG concentration levels are on the path to dangerous levels. Asia is important as the more countries that are included in the global GHG reduction targets, the easier it will be to reach. If China, Indonesia and India are not included, then it may be very hard for the richer Organization for Economic Cooperation and Development countries to reduce their emissions fast enough in the required time frame and so temperatures will continue to rise.

The Asia-Pacific region is already the region that suffers most from extreme weather events and these will likely increase with climate change. Recent examples include floods across South Asia that affected 20 million people, cyclones in Karachi and across Pakistan that displaced a million people and the heat waves and floods in India that affected several million more. The threat of sea-level rise on many small island countries in the Pacific is well known, but in the archipelagos of Indonesia and the Philippines, many islands could disappear completely, forcing people to migrate. Crop yields are predicted to fall in many places as rainfall patterns change, rivers dry up and heat waves increase. The retreat of the Himalayan glaciers, which serve as water towers for the great rivers of Asia—the Ganges, Indus, Mekong and Yangtze will affect millions of people, increasing hunger across the region.

The policies put forward by the Asian governments, especially India and China, this December and in the coming years will go a long way in determining the world's ability to effectively deal with global climate change.