

# Alerts on Emerging Policy Challenges

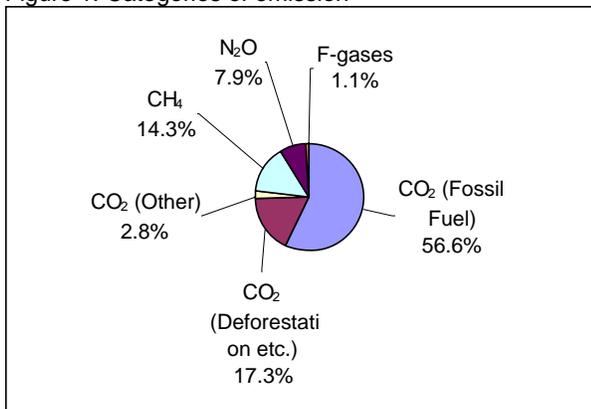
## CLIMATE CHANGE AND TRADE POLICY: A PRELIMINARY DISCUSSION

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### Introduction

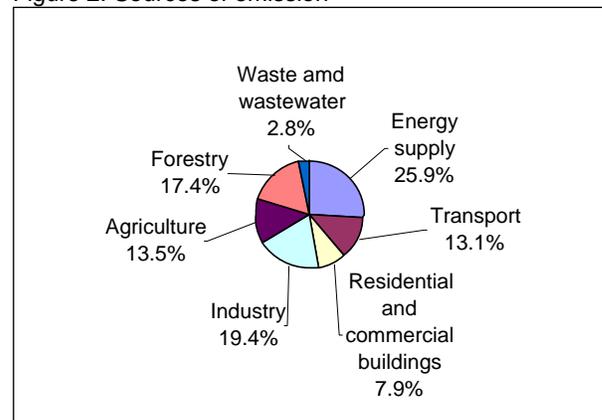
Scientific studies make it clear that climate change is already happening, with greenhouse gas emissions induced by human activities as a significant driver of this change. Prior to industrialisation, the CO<sub>2</sub> concentration in the atmosphere was about 280 parts per million (ppm). But by 2007, it has increased to about 382 ppm mainly due to combustion of fossil fuels and significant deforestation in different parts of the world. Methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) are the two other major greenhouse gases. The major sources of emission are energy supply and industry. The sectors that are responsible for significant emission are forestry (deforestation leads to decreased capacity of the earth to absorb CO<sub>2</sub> and increases emissions), agriculture and transport. The limiting of global average temperature at 2°C from the pre-industrial level would require that the CO<sub>2</sub> concentration is stabilised between 445-490ppm. The temperature will continue to rise for a few centuries even after emissions and CO<sub>2</sub> concentration are stabilised (IPCC 2007). Such stabilisation would require drastic cuts in emissions.

Figure 1. Categories of emission



Source: IPCC (2007), Fourth Assessment Report, Summary for Policymakers.

Figure 2. Sources of emission



Source: IPCC (2007), Fourth Assessment Report, Summary for Policymakers.

### Engagement at the global level

Keeping this in view, the members of the United Nations Framework Convention on Climate Change (UNFCCC) met at Bali in December 2007 where they agreed to have a shared vision for long term cooperative action. Countries also agreed to adopt measures on mitigation, adaptation, finance and technology transfer. Though no figure was quoted in the Bali Action Plan, there has been a suggestion from several quarters to contain the temperature within 2°C of the pre-industrial level and accordingly a per capita emission of 2 tons of greenhouse gases per annum by 2050 and 1.5 tons by 2100. Whether the emission reduction is front loaded (deeper cuts in early years) or back loaded will make a huge difference. What kinds of commitments developed and developing countries will accept to make is also a contentious issue. A principle that has been accepted at the UNFCCC is 'common but differentiated responsibility', but different countries are interpreting this concept differently. While developing countries are not willing to accept any binding commitment on mitigation in

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developed world might adopt trade measures on the basis of energy efficiency or emission levels that will adversely affect their exports. Countries with larger populations tend to emit more greenhouse gas emissions and hence receive greater attention, but it is not fair to simply measure total emission when that number is largely based on population size. Moreover, for climate change implications it is important to look at the stock of greenhouse gases in the atmosphere. If countries are allotted an entitlement of emissions as a stock concept and on the basis of population size, most developed countries have already exhausted their quota. Developed countries cannot now take back their contribution to the stock of greenhouse gases, and it then becomes incumbent upon them to take the responsibility for mitigation and adaptation, even in developing countries. The Kyoto Protocol under the UNFCCC framework specified targets and actions only up to the year 2012. The current process of determining an action plan for the post-2012 period will culminate in the Copenhagen Summit on Climate Change to be held in December 2009. It is likely that countries can agree on a long term target for restraining a temperature rise and some framework and measures covering the areas of mitigation, adaptation, technology transfer and finance, if not in 2009, then in the course of 2010. However, going by past experience, ensuring that the countries fulfill their commitments will remain a challenge, as it is not certain how strong the compliance mechanism will be.

## Role of technology

While some might argue that great reductions can be made in greenhouse gas emissions using current technologies (particularly by increasing efficiency), this is still debated. This argument assumes, among other things, that companies replace their current capital stock with the most efficient available today—something that is not likely to occur in the near future even in developed countries due to its considerable investment/replacement costs (Saunders and Turekian 2007). Moreover, energy efficient durable goods may not be able to achieve the desired emission reduction objectives. Increased energy efficiency can increase the use of these products. For example, if cars and air conditioners become more energy efficient, people may simply use them more.

It is also doubtful if technology can be the only solution to climate change. Developed countries have good access to technologies and financial resources, yet the emission levels in these countries are five to ten times higher than acceptable levels. It is also noteworthy that North America and Western Europe have similar standards of living as well as similar access to technologies, yet the emission level in North America is almost double that in Western Europe. Economic and environment policies as well as attitudes of people in individual countries play an important role in this regard.

It is, however, encouraging to note that it is technically possible to replace much of the fossil fuel use which is the major source of greenhouse gases. Indeed, the technical potential of renewable energy is about 18 times the global primary energy use in 2001. However much of it may not be competitive with alternative fossil fuels. It is

also not possible to always replace fossil fuels in sectors like air transport with existing technologies.

Table 1. Technical Potential of Renewable Energy (exajoule<sup>1</sup> per year)

Energy Type	Use in 2001	Technical potential
Hydropower	9	50
Biomass	50	>276
Solar	0.1	>1,575
Wind	0.12	640
Geothermal	0.6	5,000
Ocean	Not estimated	Not estimated
Total Renewable	60	>7,600
Total Primary	402	Not estimated

Source: World Energy Assessment 2001, Chapter 5: Energy Resources (<http://www.undp.org/energy/activities/wea/drafts-frame.html>)

## Climate change will disproportionately affect developing countries

Most developing countries already operate at a very low level of energy use and hence their mitigation efforts are not likely to contribute much to the possible global emission reduction. In addition, it is now commonly believed that some degree of climate change is inevitable no matter what we do now (IPCC 2007). As a result, developing countries will need to make elaborate preparations for adaptation to climate change. Indeed, vulnerability to climate change is considered to be higher in developing countries due to social, economic and environmental conditions. Climate change will further reduce access to drinking water, negatively affect the health of poor people, and will pose a real threat to food security in many countries in Africa, Asia, and Latin America (AfDB et al 2003).

Climate change is also likely to increase the frequency and magnitude of extreme weather events such as droughts, floods, and storms. Poor countries and poorer people usually suffer more due to such natural calamities. In many developing countries, a huge majority of the people depend on climate-sensitive sectors like agriculture and fisheries for their livelihoods. For many countries, these sectors are also a main source of exports (IPCC, 2007).

Developing countries have very limited institutional and financial capacity to anticipate and respond to the effects of climate change. Given this scenario, for low income developing countries, it makes sense to concentrate entirely on adaptation rather than on mitigation efforts. Such measures should include significant investment on disaster preparedness as well as technological interventions in agriculture and health.

<sup>1</sup> One exajoule (10<sup>18</sup>joule)/year is equivalent to 470,000 barrels of oil/day

## Developing countries risk being priced out of fossil fuels

Many developing countries are likely to achieve the goal of 1.5 tons per capita emission of greenhouse gases by 2100 by default. At the current rate of production, oil is estimated to last only for about 40 years. But while consumption of oil is growing fast, the major oil companies have been downgrading their own reserve estimates. About 100 odd countries have oil reserves. Of these, about 60 countries including the United States, Russia, the United Kingdom and Norway are well past their peak. By 2030, all countries taken individually will be past their peak, while the global production will reach its peak around 2020. Hence, the current (2009) low price of energy due to the global recession is likely to be only temporary. Starting 2020, the price of oil is likely to see a sharp rise. The reserve-production ratio for natural gas is estimated to be about 60 years. Again, it is unlikely that new gas finds will be large enough to offset the rate of increase in production and consumption (Nanda 2008). It is believed that reserves of coal are much larger and may last for 180 years, but extracting coal would be much more difficult due to socio-economic (e.g. displacement of people) as well as environmental reason (Kleiner, 2009). Thus in a business-as-usual scenario, there is unlikely to be enough fossil fuels to maintain per capita emission at higher than 1.5 tons in 2100. But by then, too much damage would already have been done to the climate system.

However, before fossil fuels are depleted, energy prices will be so high that a large number of poorer people and poorer countries will be priced out of the market. Considering such a scenario, developing countries must have an active and vigorous programme to promote alternative energies. Apart from promoting energy efficiency, measures can be adopted to promote renewable energy. Alongside fiscal incentives, there can be appropriate regulatory measures to enable small producers of renewable energy, including at household level, to have interface with grid supply. Moreover, while fossil fuels are going to see higher prices on a long-term basis, the prices of renewable energy are likely to decline due to further development in technology and growth in market size.

## Climate change and trade

Whether trade can or should be restricted on the basis of climate friendliness of production processes is still contested territory. It has been suggested that if developed countries adopt emission cuts, they must in exchange have some border tax adjustment mechanism for imports coming from countries that do not make emission cut commitments. However, it is not clear whether such unilateral measures will be compatible with the WTO rule of treating like products equally. The general approach under WTO rules (GATT Article XX) has been to acknowledge that some degree of trade restriction may be necessary to achieve certain policy objectives as long as a number of carefully crafted conditions are respected. The WTO Appellate Body, in the Shrimp-Turtle case, has opened the door to the

possibility of trade measures on environmental grounds (WTO 1998). Interestingly, neither the UNFCCC nor the Kyoto Protocol provides for specific trade measures. In fact, UNFCCC stipulates that the measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade (UNFCCC Article 3.5).

However, such measures would be difficult to implement in a fair manner. Pollution levels would be different for different producers in the same industry as they may not all be using the same technology. Thus, a single adjustment rate for all producers is likely to be discriminatory. Moreover, such a single rate would be a serious disincentive for producers adopting energy efficiency measures on their own. The case for border adjustments may not be very good as a study has shown that the overall impacts of domestic policies like carbon tax and energy efficiency standards on competitiveness have not been very strong. While they have been negative in some sectors, in others, the impacts have actually been positive due to subsidies and exemptions (World Bank 2007).

In the case of border tax adjustments, the issue is of government policies and measures that can restrict trade. Individual purchasers are, however, free to make their buying decisions that may include sustainability criteria. In fact there is, albeit extremely limited, evidence that such measures are being adopted by individual buyers in the developed world. Exports from developing countries to developed countries could be considerably affected by the eco-labelling in the European Union and the United States. Eco-labelling tries to ensure that the exports from a country are harmless for the consumers and environment of the importing country, looking at the entire life cycle of the product and analyzing the production and process related criteria. Thus, emission norms will enter the eco-label criteria in the future with greater measure (CUTS 2005). As a result, developing countries will be forced to share the burden of emission reductions in developed countries through the trade route, even if they do not have any emission reduction target as such or developed countries do not adopt a border tax adjustment mechanism.

Meanwhile, the issue of climate change has already entered the WTO through its trade and environment agenda. The WTO members have already been discussing the liberalisation of tariff and non-tariff barriers in trade in environmental goods and services. There has now been a call to have special focus on climate-friendly goods, though no definition or even an agreed set of criteria for determining an environmental or climate-friendly good have been agreed. Nevertheless, some WTO members have proposed some lists which contain, as argued by many others, goods of multiple uses. Technology being dynamic in character, a static list may not be of much value as revising the list on a regular basis would be cumbersome. Surprisingly, the issue of transfer of technology did not receive much attention in the WTO discussion on trade and environment though it is an important component of the UNFCCC agenda. Nevertheless, the issue of the role of intellectual property rights (IPR) in access to environment-friendly

technologies has been raised by some countries in the WTO Committee of Trade and Environment. Moreover, much of the discussion on technology transfer has been concerned with the issue of climate change mitigation. However, for developing countries, technology would probably be more important for adaptation particularly in the areas of agriculture and health.

## Conclusion

Most developing countries are currently dealing with the challenges of engaging at the global level where the current focus is on mitigation. The real challenge for them, however, is to understand the potential impacts of climate change and to take appropriate adaptation measures. They need to develop technical, institutional and human capabilities to face these adaptation challenges. They should, however, ensure that their mitigation efforts bring sufficient co-benefits as their resources and capabilities are typically limited.

Trade measures like border tax adjustments are likely to be discriminatory as they will treat both energy-efficient and inefficient producers equally and are thus best avoided. Developing countries will also likely be forced to take some mitigation measures to maintain their trade performance through non-governmental initiatives like voluntary labelling etc. Many developing countries that depend heavily on climate-sensitive sectors like agriculture and fisheries may find it difficult to maintain their export performance and might require significant adaptation on this front. Since development and diffusion of technology will have an important bearing on climate change mitigation and adaptation and since they are significantly affected through the global intellectual property rights rules under the WTO, the global community should also ensure that such rules do not create unnecessary barriers to the diffusion and development of technologies.

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