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Climate Change - in for surprises?

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Climate change has become a household word these days and everybody seems to be concerned about its effects on the fate of the world we live in. However, only to a point - or so it seems. When politicians discuss about measures how to deal with the problem, better yet, how to possibly avoid accelerating increases of temperatures, floods and other such climate "catastrophes", the well-known "not in my backyard" mentality seems to prevail. In other words, measures to reduce emissions of so-called greenhouse gases, which are mostly blamed for much of what climate change is all about, are looked upon as unpleasant obstacles to continued economic growth and prosperity.

Yet, evidence is mounting that greenhouse gas (GHG) emissions are indeed a major cause of the changes in climate parameters we have witnessed in recent decades. The Intergovernmental Panel on Climate Change (IPCC), a widely acknowledged authority on this matter in its 2007 report states that "Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations." Limiting - or better yet- reducing emissions of greenhouse gases, which lies at the heart of the UN Framework Convention on Climate Change and its associated Kyoto Protocol seems a logical consequence, if one wants to seriously avert sustained global warming.

The observed trends in climatic parameters appear to be broadly consistent with our theoretical understanding and climate model projections, of how the climate system is expected to respond. However, scientists also know that climate change does neither necessarily follow such projections nor does it have to stick to a smooth and continuous path.

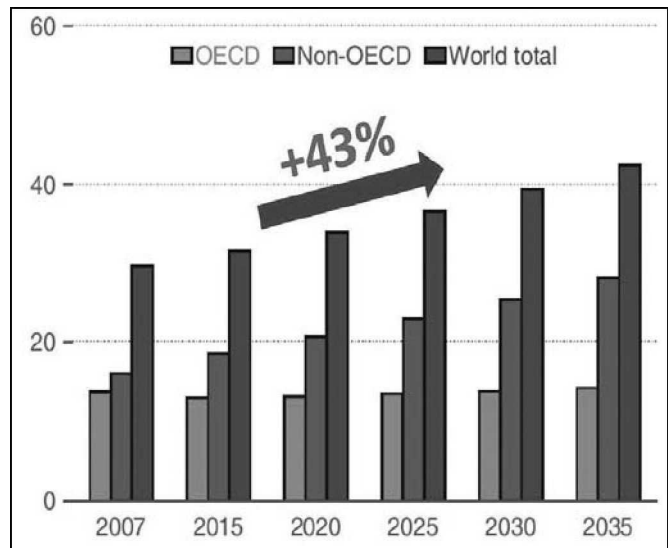
As for our abilities to predict climate change, let us look at the Arctic sea ice cover. While earlier models predicted a gradual decrease in summer ice extent, observations over the last decade have shown that sea ice is receding much faster than any of the projections had made us believe. While this -among other consequences- will lead to the widely popularized threat to the survival of polar bears, the effects of these dramatic changes reach far beyond the Arctic. And this brings us to the second issue.

It is well known from the study of past climate changes that on a larger, global scale the climate system sometimes responds to changes in one or more of its constituents in a much more erratic and strongly accelerated manner than expected. While there is still need for more research on these so-called threshold events, the record of the past tells us that they are a real possibility for today's world. The accelerated decline in the Arctic sea ice cover may very well constitute such a step-change that may trigger the crossing of such a threshold. So, we might indeed be in for surprises, most likely unwanted and possibly unpleasant ones, if climate change proceeds as we see it today. The already mentioned observed increase in the frequency of extreme weather events, such as tropical storms or severe draughts may just be a foretaste of the kind of surprises we may have to expect in the foreseeable future.

When looking at the projections of future greenhouse gas emissions, prospects of reversing the current trends in climate change are rather bleak. According to the U.S. Energy Information Administration's "International Energy Outlook 2010", global energy-related carbon dioxide emissions alone are expected to increase from 29.7 billion metric tons in 2007 to 42.4 billion metric tons in 2035, thus amounting to an increase 43% relative to their 2007 value during that period. It is also expected that this increase is almost exclusively due to emissions from non-OECD countries, while OECD countries are projected to actually decrease their emissions slightly. Given the uncertainty -if not the improbability- of the latter assumption, this outlook may prove to be overly optimistic.

In light of these expectations, we may indeed be in for unpleasant surprises that nature holds in store for us. Is there anything we can do to avert such prospects? Not too much, one has to say, as far as climate development is concerned. We have set in motion changes in the global system that are almost impossible to revert on the short run. What we should now concentrate on is to devise effective and well focused adaptation measures. If they are well conceived and swiftly implemented, they may indeed help us to attenuate the unavoidable consequences of climate change and thereby allow us to safeguard the integrity and existence of human and non-human life on this planet as we know it today.

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World energy-related carbon dioxide emissions, 2007-2035 (billion metric tons); modified after World Energy Outlook 2010, U.S. Energy Information Administration, www.eia.gov/loia/flieol/index.html