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## Fight against global warming: N-energy wont help

By M V Ramana & G Ananthapadmanabhan

***Improving energy efficiency is not merely desirable but also a necessity in mitigating global warming.***

It has become common to assert that nuclear power can play a major role in mitigating global warming. There are even those, including some who call themselves environmentalists, who aver that nuclear power is the most important, if not the only, solution to the climate crisis. The report by the Intergovernmental Panel on Climate Change (IPCC) working group (WG) on mitigation presented on May 4 shows just how far this is from the truth.



In this report, the IPCC-WG evaluated the emission reduction potential of various options for two time frames: short and medium term (till 2030), and long term (after 2030). Of these, the former is more important for two reasons. First, as the IPCC-WG argues, "Mitigation efforts over the next two to three decades will determine to a large extent the long-term global mean temperature increase and the corresponding climate change impacts that can be avoided." Second, one cannot be confident about

technological and economic forecasting beyond a couple of decades; uncertainties dominate any longer term projections. Let us therefore focus on the IPCC-WG's results for this period.

In the short to medium term, the report divided mitigation measures into seven categories: energy supply, transport, buildings, industry, agriculture, forestry, and waste, and estimated that together they have a potential to reduce emissions by about 16.2-30.3 Giga tonnes of carbon dioxide equivalents/year (GtCO<sub>2</sub>/y). Of this sum, energy supply constitutes a mere 2.4-4.7 GtCO<sub>2</sub>/y. Within this energy supply category, there are several possibilities that are currently on the market: improved supply and distribution efficiency, co-generation of heat and power, fuel switching from coal to gas, nuclear power, renewable heat and power (hydropower, solar, wind, geothermal and bio energy), and early applications of carbon capture and storage (e.g. natural gas processing). The message is clear: an expansion of nuclear power can at best play a minor role in mitigating climate change.

But there are good arguments against expanding nuclear power to help with emission mitigation to even this limited extent. First, among all electrical generating technologies, nuclear energy alone is prone to catastrophic accidents with potentially global impact. Chernobyl is the best known instance of such a disaster. Though nuclear safety has received much attention since that accident, the underlying features of the technology haven't changed. It is a complex technology, where events can spin out of control in a very short time, and uses large quantities of radioactive materials. Second, another unique aspect is the close connection between nuclear energy and nuclear weapons. Despite the development of elaborate safeguarding schemes, the possibility of using the infrastructure and knowledge developed for producing nuclear energy in the acquisition of nuclear weapons remains. Thus, further expansion of nuclear power will increase threats to security and peace.

Finally, different stages of the nuclear fuel chain release large quantities of radioactive and other toxic materials into the biosphere. Some of these will continue to pose risks to human health for thousands of years. There is as yet no satisfactory solution to the radioactive waste problem and they have to be isolated from human contact and possibly monitored if they are not to cause radiation doses. This need for stewardship is unprecedented in human history. This is also clearly iniquitous to future generations since they would bear the consequences while we use the electricity generated by these reactors. Thus, expanding nuclear power in response to climate change concerns merely trades radioactive externalities for carbon emissions at best.

Leaving aside nuclear power - for good reasons - there are other important lessons offered by the IPCC-WG report. The most significant of these is the importance of other sectors of the economy that offer enormous potential for emission reductions, in particular buildings (5.7-6 GtCO<sub>2</sub>/y), industries (2.5-5.5 GtCO<sub>2</sub>/y), and agriculture (2.3-6.4 GtCO<sub>2</sub>/y).

The report also points out that it "is often cheaper to invest in end-use energy efficiency improvement than in increasing energy supply to satisfy energy demand. Efficiency improvement has a positive effect on energy security and employment". Studies such as the Energy (R) evolution


done by DLR, the German Aerospace centre, for Greenpeace and the European Renewable Energy Council, suggest that aggressive investment in efficiency using proven technologies can reduce energy demand by nearly 50 per cent.

Policy makers around the world should start treating investment in energy efficiency measures on par with and as an alternative to augmenting energy supply. Until now efforts at improving energy efficiency have by and large remained voluntary; rarely have they been mandatory. The threat of climate change implies that improvement of efficiency is no more a "desirable, nice to have" but is an absolute "must have". This is particularly true in developing countries because tapping the potential of efficiency enhancements is the only way to sustain economic growth within the heating up greenhouse that is our Earth.

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