

# Interview

World Institute of Sustainable Energy

## WISE *ways of mitigating* Climate Change



General G M Pillai, IAS, Founder Director - WISE

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# World Institute of Sustainable Energy

## WISE ways of mitigating climate change

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The World Institute of Sustainable Energy (WISE) is a not-for-profit organisation and Trust established in Pune, to promote the cause of sustainable energy, energy conservation and sustainable development with special emphasis on renewable energy. The activities of WISE thus aim to provide a major impetus to the development of the renewable energy sector in all Indian states. Founder Director General G M Pillai-*IAS*, explains to 'Electrical India', why renewable energy is critical for containing depleting fossil fuel resources and climate change and for building a sustainable energy future.

### QUESTIONNAIRE

*In the not-too-distant future, power plants will shift from large, remote centralised stations to rooftops, basements, backyards, or nearby hill ranges. Experts predict that half the world's energy supply by 2050 will be from renewables. But there are several obstacles to the integration and effective market penetration of renewables. How will these obstacles be overcome?*

The main obstacles are 'fossilised' mindsets. Despite strong scientific evidence about the impending peaking of production and eventual burnout of fossil fuels in the next three decades, the belief in business-as-usual continues. Many commercially viable clean energy technologies are already available. Several others are moving fast towards commercial viability. What we need are proactive policy frameworks enabling full-cycle blooming of these technologies from R&D to market expansion. There are any number of proven global best practices in policy that we can adapt to our circumstances. It would be difficult for me to elaborate all of them here. All I would say is that the way to overcoming the obstacles lies in the three Ps: Policy, Policy, and Policy

*To maintain its economic growth rate of 8-10%, India needs all the energy it can get. But the momentum of economic growth overrides crucial environmental concerns. How can India sustain a high economic growth rate and leapfrog into a sustainable energy regime without irreparably harming the environment?*

Considering a certain percentage of growth as the ultimate objective is conventional wisdom. In an age of fast depleting natural resources which form the basic building blocks of economic activity, it is futile to expect continuous, unlimited economic expansion based on old models of growth. Such growth is achieved through environmentally, economically, and socially unsustainable means. What is required for real gross national happiness is sustainable economic activity. The current mode of growth will

ultimately kill itself through its accumulated negative externalities. A vision for the future should invariably focus on clean technologies not only in energy, but in every sector.

***The world is hotting up. Climate systems are changing. The 1990s were the hottest decade ever, sea levels rose by 10-20 cm during the 20th century, and atmospheric carbon dioxide levels are 31% higher than in 1750. There's overwhelming scientific evidence to prove that climate change is human-induced and closely connected to energy use and the burning of fossil fuels. How can this be remedied?***

The real remedy lies in a transition to a clean and sustainable energy system in the next three decades. Based on latest technology developments in the sustainable energy sector, I would predict that India can produce at least 6,00,000 MW of grid connected power from renewable sources only (including hydropower) in the next three decades if we do the requisite planning today. Then there are numerous possibilities of large-scale off-grid applications (like buildings with their own independent power systems) and demand side management by deploying renewable energy sources like solar power. The irony is that all our perspective plans upto 2030 are heavily predicated on fossil fuels which are fast depleting and whose prices are galloping. Even if you discount the projected catastrophic impacts of climate change, we will be forced to transition to renewable energy in the not-too-distant future for the above reasons.

***Hydropower is riding the wave of climate change: it is touted to cut down the use of fossil fuels and sequester carbon in its reservoirs. The pace of implementation is being stepped up in India, but claims of the climate benefits of hydropower seem to be running far ahead of the science of the matter. But, is it possible that even if hydropower does cut down on fossil fuel, it does so at the expense of other impacts on the ecosystem and communities?***

I think we would need to continue our hydropower development because it is the most suitable base-load technology. The question we need to address is to make hydropower human-scale i.e. without large-scale displacement, and eco-friendly. Hydropower is renewable only if it is managed sustainably. And I think it is possible to do that. We should forget our fixation on mega-projects. Why I emphasize the need for hydropower is because many renewables are intermittent and produce power only when the resource is available. Having said that, I appreciate the enormous research happening in energy storage technology which may ultimately solve the problem of intermittency of renewables. In fact, fast-growing grid-connected renewable technologies like Concentrating Solar Power (CSP) are soon going to use storage media like compressed air, molten salt, heated oil, etc., for storage of electricity. This way CSP can produce power for more than 20 hours a day.

***Flailing nuclear establishments worldwide are using global warming as an opportunity to resurrect an industry that has collapsed because of its inability to provide clean, safe, or cheap electricity. How far is this true considering that there are dissenting views in respect to nuclear energy not being environment-friendly, safe or economical?***

No comments.

***Waste incineration poses serious risks to human health and the environment. But the trend is to experiment with burn-technologies and waste-to-energy programmes, ignoring cheaper and safer alternatives. Can you clarify which alternative is more ecofriendly?***

Waste-to-energy is going to be an insignificant contributor to electricity generation. If you do want a suggestion of suitable technology, I would think of the fermentation-to-gas route. Contrary to the conventional wisdom of a future world with megacities, I visualize an urban disaggregation in the future. We will be forced to downscale all mega-developments and go for a decentralized mode of development, coupled with distributed and decentralized energy generation. In-situ disposal of biodegradable waste through composting would be ideal for a post-oil decentralized future.

***Researchers in India envision millions of hectares of wastelands greened with oil-bearing jatropha. All the sugarcane-growing states are excited about bio-ethanol. And Mercedes Benzes vehicles have been run on bio-diesel blends. But is the hype around biofuels really conceivable?***

The current Jatropha type biofuel hype is totally unscientific and far removed from holistic realities. It is a specialist's pipedream. If you analyze the Wastelands Atlas of India, you would see that we have just about 20 million hectares of 'cultivable' wasteland. There are competing claims on them for afforestation, urbanization, industrialization, etc. Productivity of these wastelands are very low and cultivating fuel species on them may not be commercially viable. In fact, today, most biofuel crops are being grown on agricultural lands and not on wastelands. So, in a situation of increasing population and saturation of agricultural food grain production leading to import of wheat and rice, food security is a major concern for India. With the United States (which produces 80% of exportable food surplus in the world) diverting large areas of land for fuel production, we may not have enough surplus in the global food system to import for our needs. We cannot afford to divert large tracts of land for producing fuel.

But latest technology developments which portend the possibility of producing ethanol/biodiesel by converting cellulosic biomass using microbes offer hope. If this becomes commercially viable in the

next 3 years (as is predicted), we may be able to produce enough biomass through inter-cropping or other such agronomic practices without disturbing food production. Again, the question whether biofuels are really green remains because they emit noxious gases like nitrous oxide. We will have to invent ways of making cellulosic biofuels really environment-friendly. However, the hope of centralized production of liquid fuels to completely replace petroleum is unrealistic. A post-oil transportation strategy will have to be planned on a mix of technologies using clean biofuels, electricity and hydrogen / fuel cells.

***Natural gas is an efficient fuel, emits 60% less carbon dioxide than coal and 42% less than oil, and is available in abundance. But there are perceived challenges in India's transition to a gas-fuelled economy. So what are the ways and means for such transition to take place?***

India has only 0.5% of the world's natural gas reserves. Domestic gas is insufficient to plan a future strategy. We have been unsuccessful in obtaining piped gas not only from Iran, but even from our neighbours like Burma and Bangladesh. Then LNG becomes the other option. But the delivered prices of LNG are increasing day-by-day and will thus make it an unviable option for large-scale power generation. Government and private promoters have already backed out from LNG-based power generation projects. Increasing global competition for available LNG is also a worry. So, at best, natural gas can be seen as a medium-term transitional fuel of marginal significance till the sustainable energy future arrives. While trying to securitize external supplies of such transitional fuels, we should right away take co-coordinated and proactive measures for accelerating the emergence of the real solution: a renewable energy future.

***Researchers link global warming to record US hurricane seasons, accelerated melting of Arctic sea ice and Siberian permafrost, and apparent disruption of the global ocean current that warms Europe. The Kyoto signatories have agreed to emissions targets for the second compliance period beyond 2012. How successful has the drive in curbing emissions been to date, and will there be other means to do so?***

There is no tangible evidence of any major reduction in emissions of greenhouse gases. Carbon trading through the Clean Development Mechanism under the Kyoto Protocol will only help developing countries to earn an additional stream of revenue for their clean technology investments. At the same times, it allows the developed countries to continue to pollute. The real solution will come when the global community resolves to transition to a sustainable energy system as fast as possible.