'Energy Internet' For Rural Areas

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The capacity addition for electricity generation during the 10th Five Year Plan fell short by more than 50%. We could add only 21,280 MW. The rural electrification programme has not been a great success either. Even in those electrified rural areas, real power availability is only for a few hours a day. Despite repeated bottlenecks, failures and setbacks, we refuse to think 'out-of-the-box'. Business-as-usual continues. Such is the entrenched faith in the capacity of conventional technologies, that we continue to think that solutions to all problems are available through them! So the Central Government proposes to add 78,577 MW in the 11th Plan period; and most of that addition would come from new coal-based stations. With the hard-hitting Fourth Assessment Report of the IPCC, there is a consensus that climate change is a reality. The effects of continuing to burn large quantities of fossil fuels like coal are going to be suicidal. The impacts of the planet's warming, which now seems irreversible, will spare nobody – neither the developed nor the developing.

In fact, India has the great advantage of learning from the mistakes of the developed countries and charting a sustainable, eco-friendly path of economic development. Our insistence on conventional solutions will boomerang in the not too distant future. Recoverable quantities of a commodity like coal is not abundant in India, as some geologists would have us believe. Our production of coal is expected to peak around 2015 and then decline. The favourite belief of economists that in the absence of domestic supply we will resort to imports is also going to be shortlived. A recent report by the Energy Watch Group from Europe (summarised on Pg.10) says that global coal production will also peak around 2025 and then decline. Can we build a long-term power system based on such fast depleting resources? The economic consequences of a development paradigm increasingly based on imported oil and coal are unfathomable. It is high time we think 'out-of-the-box' and evolve our own sustainable alternatives. If we build a complex national grid based on increasingly scarce resources like coal, when its production dwindles and eventually depletes, the national grid will collapse with unimaginable consequences. Unscientific optimism is a recipe for future disasters. **History shows that a state of denial precedes every catastrophe**.

George Monbiot, in his hard-hitting new book 'Heat' (reviewed in the Jan-Feb 2007 issue of *Green Energy*) speaks of an alternative – 'The Energy Internet'. This is an entirely different way of responding to the question of how our energy might be generated and used. The complex, loss-making, hugely expensive national grid has been of little use to the rural areas. For the villages, we could go in for 'micro-generation' as an alternative. The energy internet links up hundreds of micro-generators in a local distribution web, which would be more or less self-sufficient, but linked to other local webs to enhance its security. We can gradually transform our electricity system into an energy internet, using already proven, viable renewable technologies like wind, cogeneration, solar, small hydro and biomass-based power, and emerging technologies like wave energy, tidal energy, and fuel cells. In such a new system, buildings will no more be passive consumers of energy, but become power stations which are constituent parts of local energy networks. Every household is linked to its neighbours to form a miniature version of the national grid: a generating 'island'. This island can in turn be connected to the surrounding micro-grids to offer more security.

Micro-grids would also have technical issues to be resolved, including the need for synchronisation between 'islands'. For example, in a micro-grid, frequency stability becomes critical and control of power quality will be a big issue. Surely, we need to start studying the possibilities and solutions for managing micro-grids in the future, at least for our rural areas. Along with a cybernet linking our villages, we can have an energy internet also in the not too distant future! The energy internet would necessitate decentralised economic production and local marketing, and help build a healthy, sustainable and equitable society. Such a society cannot be built with the current model of growth. Linear unlimited growth of 10% a year is a short-term fallacy. Growth for the sake of growth is the ideology of the cancer cell. The decentralised and localised development vision of *Gandhiji* which we have consigned to the archives, will become increasingly relevant as the fossil fuel economy fades into oblivion!