Sustainability Outlook

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ENERGY EFFICIENCY – THE LOW HANGING FRUITS OF SUSTAINABILITY

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Energy Efficiency is the 'low hanging fruit of sustainability' as it opens up myriads of opportunities in resource conservation, primarily by plugging in the wastages in energy distribution, storage and use.

Increased volatility of global energy prices has escalated the need for resource efficiency. Moreover, large increase in construction cost of new power plants and shrinking reserve margins besides concerns about reliability of electricity supply systems have all precipitated a gloomy energy scenario. More recently, increasingly stringent environmental regulations about fossil fuel plants and global warming concerns and greenhouse gas (GHG) accountability has put energy production under closer scrutiny.

India's energy scenario is caught in the din of fossil fuel shortages, allegations of gross mismanagement, spiraling debts incurred by electricity distribution companies (utilities), and aging infrastructure among others. The legacy of near total dependence of the power sector on imported fossil fuels (coal & oil) and resultant fiscal deficits of the nation further weakens the system. With multiple, and sometimes conflicting priorities for financing development, reliable systems are necessary to secure funds, justify investments, and ensure recovery of costs of large energy projects. Power shortage in the country threatens to worsen the current economic slump, while any addition to generating capacity is perpetually falling short of expectation. In the recent past the country has witnessed major civil-society oppositions towards new power plant installations from the fear of environmental disasters. Hence the nation is in desperate need of sustainable remedies to lift the country from the present stalemate, and help us identify long term solutions.

Strategy makers world-wide have taken the energy efficiency agenda to a new height recognizing easier prospects in improving resource productivity and enhancing energy access by creating business areas with local jobs. UN secretary-general Ban Ki Moon launched the "Sustainable Energy for All" programme for achieving universal energy access by 2030. The programme primarily relies on efficient energy use and renewable energy sources and aims to double the global rate of improvement in energy efficiency. On the same lines, the Millennium Development Goals initiative has improved its energy efficiency objectives in eradicating poverty and Rio+20 emphasized on efficiency reforms.

The Energy Conservation Act of 2001, recognizing the increased power demand to fuel the economic growth in India prioritized the role of energy-use efficiency and led to the establishment of the Bureau of Energy Efficiency (BEE), under the Ministry of Power. BEE is endowed with regulatory powers for developing and enforcing energy conservation strategies and relies on market-based measures; to create businesses and jobs towards achieving its ambitious energy targets. India's energy efficiency markets are worth 10 billion USD, as per WRI in 2009, with 183.5 billion kilowatt-hours saving potential. These measures span across large energy consuming industries, widely-used appliances (such as lighting, refrigerators, water-heaters, pumps and motors), commercial buildings, SMEs, Agriculture, Municipalities, while new business models like Energy Services Companies (ESCos) are emerging in the country.

The National Action Plan for Climate Change also clearly identifies energy efficiency as an important and critical strategy for combating climate change. To facilitate institutional empowerment in order to meet energy conservation targets, a proper mix of market-based instruments, public policies and regulations becomes a fundamental requisite.

"Each kilowatt of power saved at the end-use is equivalent to 1.8 kilowatt saved at generation. There are several avenues to achieve greater efficiency in India; lighting and refrigerator efficiency alone has the potential to reduce 10% of the projected power generation need in the country. Dangerous carbon emission reductions are also avoided without any additional cost being incurred"

With a view to mitigate the demand for newer thermal plants nearly by one fourth, electricity utility companies can rely on resource planning strategies like Demand Side Management (DSM). Successful implementation of DSM Programmes necessitates wide stakeholder participation. For instance, DSM programmes often include mass replacement of inefficient appliances requiring competitive and transparent bidding processes for encouraging various vendor groups to engage in the process. A unit appliance could be sold at 50% of the market value to the utility, but the sheer quantity of the product purchased (often in 100,000s) ensures revenues to the vendor body. Opportunities for maintenance and service industries are generated for the continued success of DSM programmes. End-use consumer groups are allowed to make informed choices about their energy purchases. The USA has exemplary DSM success stories where various states now source 1-4% of their annual power requirements from energy saved. To this effect, the state of California spent about 1 billion USD for energy saving measures in 2010. Thus, DSM is a stepping stone to more holistic measures like Smart Grids, which requires superior technologies and infrastructure, but has large potentials for energy conservation.

While India has embarked on an ambitious journey of energy for meeting its sustainable growth objectives, it is necessary to gain consensus from various stakeholders to steer this agenda forward. Large corporates have initiated examining their organizational strategy for sustaining their energy access reliably and many are investing in efficient systems and renewable energy sources. Such large corporate infrastructure also presents the potential to generate excess energy which can be fed back into the grid. Using energy efficiency as competitive resource in wholesale power markets and using it to reduce GHG in regional Cap-and-Trade Systems has been increasingly demonstrated in western nations. These strengthen the case for efficiency itself as a key resource tradable in the energy and power exchange market.

Realizing the importance of resource efficiency and conservation is vital in reducing the nation's fiscal deficit. Active participation and sensitization of the relevant government departments, planning and regulating bodies and other institutions such as banks and financial institutions, is crucial to achieve such a success. India's banking systems are yet to actively participate in the energy efficiency markets. Capacity building of various

stakeholder groups is necessary and manufacturer focused programmes should be conducted towards promoting resource efficiency. Water-energy nexus in agricultural sectors are infamous, where inefficient use of pumps leads to water and energy wastage. India's water footprint is one of the largest while compared to fellow developing Asian countries like Philippines and Indonesia whose agriculture-water footprints are about 1/4th of India's. Similarly, renewable energy markets are strengthened by complementary advances in energy efficiency in end-use appliances and technologies. Frontier technologies in alternative energy become viable and sustainable only if the energy delivery infrastructure also keeps pace.

Resource efficiency is therefore the bedrock of sustainability. The goal of meeting the fundamental needs of energy for survival and for development is secured only through the small, diverse stepping stones of energy efficiency projects and process change in each and every end-uses and applications.

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