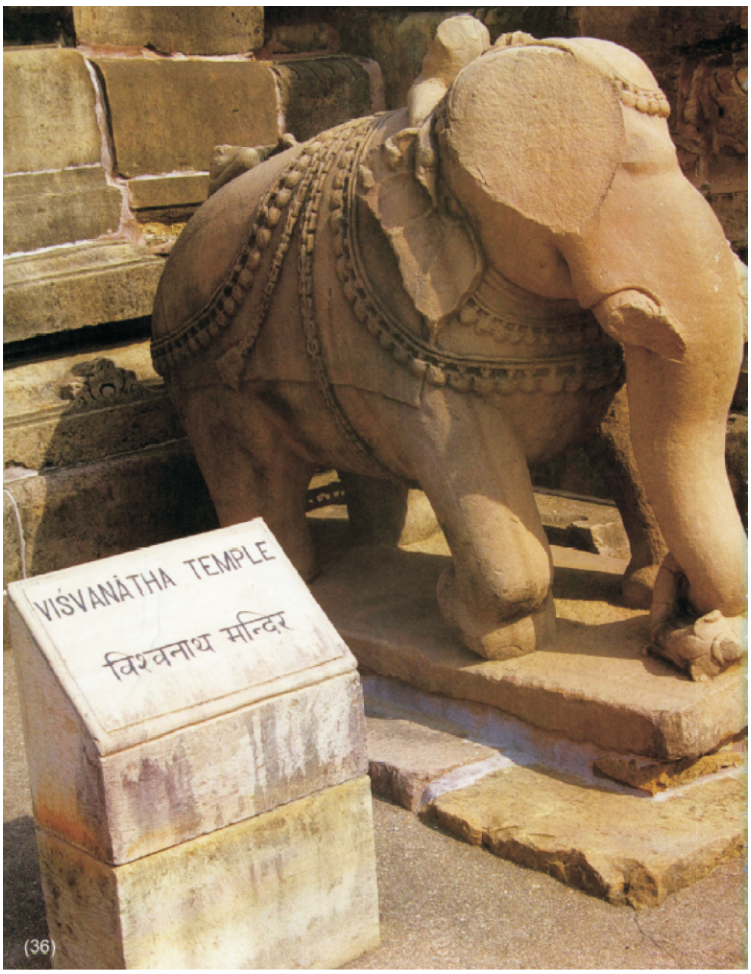
Future of Energy



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The per capita gross domestic product and more importantly, the per capita quality of life (QOL) index have a strong positive correlation on the per capita energy production and availability for any country. So, as vast swaths of humanity attempts to pull itself out of poverty in the new century and different countries across the world, including countries with huge populations such as China and India, continue to become more industrialized, it is inevitable that the demand for energy across the world will grow exponentially in the coming decades.

As can be expected with most real-life factors, beyond a certainly point, there are diminishing returns in the incremental increase in QOL with incremental increase in per capita energy consumption. Moreover, in situations where the energy production and its by-products and transmission mechanism are not properly managed, they may even lead to deterioration in the QOL due to factors such as environmental pollution. Thus, it becomes critical that the means of energy production and transmission are chosen appropriately in addressing the huge energy demands of the future. Technology and human ingenuity will ensure that future energy demands be met fairly, cleanly and peacefully therefore present civilization need to focus on energy conservation, development of technologies to use renewable and biomass energy resources, unconventional fossil fuels such as heavy oil, coal bed methane, gas hydrates, new oil production techniques, discovery of more oil fields, development of coal technology, CO_2 sequestration, nuclear energy (Fission and Fusion), Solar Thermal and PV etc.

In this session, we looked at a wide gamut of energy production mechanisms involving direct tapping from sunlight, fission and fusion

of atoms and renewable sources (such as biodiesel). Also covered are potentially efficient and novel sources based on fossil fuels (gas hydrates) and fuel cells. Subjects of electricity production and gas turbines are also discussed. We summed up our discussion in this session by taking a look at the effects of policy decisions on the future energy markets in India. The topics and speakers for the symposium were:

1. Current Status of Fast Reactor and Associated Fuel Cycle Technology in India in the context of Energy Security and International Developments (Baldev Raj, Director IGCAR, Kalpakkam)
2. Biofuels: Growing them in backyard to run the Vehicles (Avinash Agarwal, ME)
3. Fuel cells (Anil Kumar, CHE)
4. Organic solar cells (Sundar K Iyer , EE)
5. Gas turbine combustion and power generation (Abhijit Kushari, AE)
6. Gas hydrates (K. Muralidhar, ME)
7. The Future of Energy Markets in India: Structure and its Regulation (Anoop Singh, IME)
8. Tomographic imaging of the Aditya Tokamak (Nitin Jain, NET; student)
9. Carbon nanotube based solar cells (Arun Tej Mallajosyula, EE; student)
10. Laser fired low emission futuristic internal combustion engines (Dhananjay Srivastava, ME; student)

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