



Presents

CAMPAIGN ON ENERGY TECHNOLOGIES

Inaugural Talk—"Indian energy sector: Overview, challenges, approaches"

Introduction & background

Today we are thrown in the face of a big challenge of solving ever increasing demand for energy. This challenge becomes a massive task when it comes to developing countries like India, China and Brazil. Due to inherent advantages like ease of transportation to the point of use and certainty in the availability of source, fossil fuels still dominates the energy sector. But the unavoidable burden with fossil fuels like coal, natural gas and oil is the carbon emission in the environment and limited source that can sustain for few centuries only. Hence is the need of renewable and clean sources of energies like Solar, Wind, Hydro, Biomass, Tidal, Geothermal, Photocatalysis/Hydrogen energy to name a few of the sources among the various options of natural resources available with us. But we cannot think renewable as complete replacement of fossil fuels due to the inefficient generation, storage and utilization of renewable sources of energy. So the need of the hour is to drive our initiatives towards production, storage and efficient usage of both conventional and renewable sources of energy.

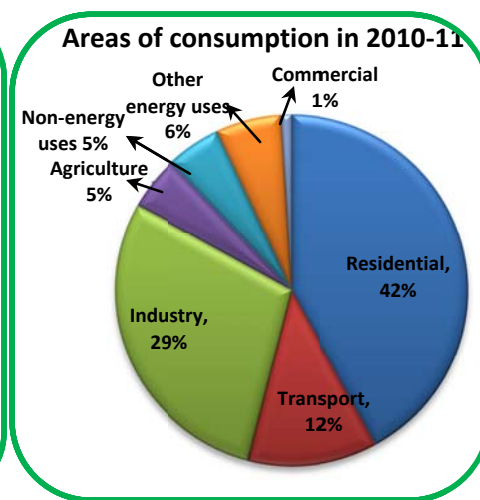
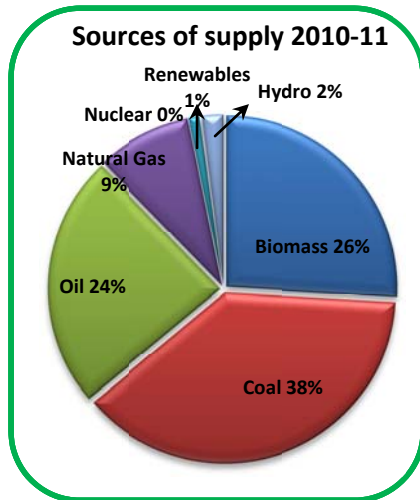
In order to drive this initiative towards a focused direction for solutions, Venture Center has planned a campaign on energy technologies. Under this initiative we intend to create "Pune Interest Group on Energy Technologies" in order to nucleate and nurture innovation and entrepreneurship in the energy sector. Several talks and discussion meetings have been planned around themes like Energy landscape and trends; emerging challenges and opportunities, new energy related technologies – generation, storage, delivery etc and other related topics affecting energy generation, storage and delivery — for example government policy, resource availability etc

The inaugural talk of this series "Indian energy sector: Overview, challenges, approaches" was delivered on 13th July 2015 by Dr. Ashok Sreenivas, Senior Research Fellow at Prayas Energy Group, in the Lecture Theatre at 900 NCL Innovation Park. The event brought together a diverse audience of entrepreneurs, academicians, and research students of various institutes in and around Pune, consultants and various organizations working on sectors related to Energy. This report is an effort to capture the highlights of the talk delivered by our eminent speaker Dr. Sreenivas.



In his detailed analysis about the Indian Energy sector, Dr. Sreenivas discussed about “overview of the Indian energy sector, major challenges, proposed way forward and opportunities”. Each of the section is briefly discussed below.

The schematics presented in the section **“Overview of the Indian energy sector”** reveal that solid fossil fuel Coal leads the energy sector being the 38% of sources of energy supply. Due to use of solid biomass by rural sectors “Biomass” is the 26% of sources of energy supply. A look at the schematic on consumption shows that transport, residential and industry are the major power consumers.



“Coal is the largest element of the supply basket and about 80% of coal is used for power generation. Transport, residential and industry are the major consumers of energy”Ashok Sreenivas

Three major challenges were stressed upon in the next section of the talk **“Major Challenges”**. The challenges were categorized as,

Energy poverty
Lack of access to modern energy for major consumers like household and enterprises in developing countries and dependence on inefficient energy sources like solid fuels

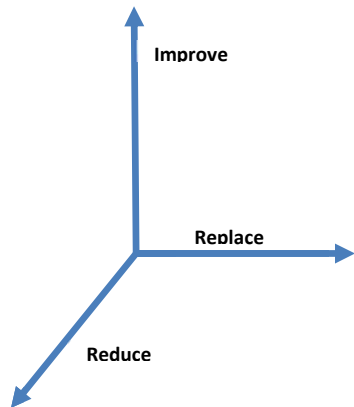
Rising imports and viability

- Not well endowed with conventional energy
- Land, water, location constraints
- Rising Imports
- Energy pricing

Socio-environmental regime

- Socio-environmental impacts in terms of pollution,
- Conflicts around land / resources
- consequence of rising green house gas emissions due to use of fossil fuels

According to Dr. Sreenivas a 3-directional model framework of “Replace-Improve-Reduce” should be the **“Proposed Way Forward”**



Replace the conventional sources of energy with “Renewable sources of Energy” to prevent environmental degradation and preserve the limited resources of fossil fuels. In spite of issues with renewables like heavy dependence on weather for continuous availability of resource,-managing grids, affordability, lack of policies for land acquisition, and competing use

of water, there has been a rapid growth and ide acceptance of renewable over the last 7 years.

Improve access and quality of supply especially in rural areas, planning capacity addition and transmission, efficiency of generation, storage & consumption in major sectors like transport, household and industries. Speaker also recommends improvement in governance & management, environmental standards and genuine competition

Reduce inequity in terms of consumption of energy between rural and urban societies, modern energy to the traditional forms of energy, across cities. Increase in sales and in turn the consumption of AC, cars, air transport.

“Ambitious plans of 175 GW of renewables by 2022 (100 GW solar, 60 GW wind) & 60% of incremental capacity up to 2022 will be renewable!”

As Albert Einstein said “In the middle of difficulty lies opportunity” the shortcomings with renewables also present bundles of opportunities. Dr. Sreenivas pointed to these **“Opportunities”** in his concluding section of the talk

- Large adoption of renewables
 - 100 GW of solar by 2022 – 40 GW rooftop
 - Possibility of separate Renewable Energy Act?
- Related changes
- Doubling of coal production and power generation targeted by 2019
- Environmental management in terms of new policies and rules like the one for emissions from power plants.
- Ambitious LED program announced
- Other appliances also likely to have tighter standards
- Industry-specific opportunities
- Transport sector for e.g. railways trying to chart a new course
- Urban sector like households and residential societies are far more aware than before in terms of waste management and rainwater harvesting etc. Concept of Smart cities and AMRUT is also emerging steadily.

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