

Energy for Development

Opening remarks

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Millenium Development Goals

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV/AIDS, malaria, and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development

Energy is crucial to the attainment of each of these goals

To illustrate.....

- **Mitigation of poverty and hunger**
 - **Irrigation for increased food production**
 - **Light for permitting income generation/education beyond daylight**
 - **Power for machinery to increase productivity**
- **Health care**
 - **Better medical facilities**
 - **Refrigeration & sterilization**
 - **Development, manufacture and distribution of drugs**
- **Protection of environment**
 - **Improving agricultural productivity**
 - **Arresting deforestation**
 - **Reducing greenhouse emissions**

Energy Poverty

■ No access to electricity

- South America 46 million
- Africa 549 million
- South Asia 798 million
- China 221 million

Total

1.6 billion

■ Per capita electricity consumption per annum

- Some African countries ~ 50 KWh
- India ~ 650 KWh
- OECD countries ~ 8600 KWh

Energy security

- Energy independence vs networking
- Assured fuel supply
 - Fossil and nuclear
- Providing assistance to countries in crisis
- Setting up of a global energy organization
- Avoidance of stresses in supply-demand balance

Balanced utilization of resources

- Fossil fuel – *CO2 generation*
- Nuclear energy – *waste generation*
 - Closed fuel cycle coupled with Partitioning and Transmutation of Minor Actinides reduce waste volume and long term radiotoxicity
 - Thorium utilization extends fissile material availability for several centuries
- Solar energy – *for decentralized use*
- Hydrogen generation from water splitting using primary energy sources (solar or nuclear) – *for transport sector*
- Renewable energy

Role of renewable energy in development

- **Biogas for decentralized use - cooking and electricity**
- **Small hydropower for local electricity**
- **Small windpower for water pumping and local electricity**
- **Solar photovoltaics for local electricity**
- **Ethanol and biodiesel for agriculture and transportation**
- **Large hydropower for grid electricity**
- **Geothermal energy for heat and grid electricity**
- **Large windpower for grid electricity**

Agenda

- **Analyzing and diagnosing the problem**
 - Whether all countries develop to the median, mean or maximum energy use
 - Sustainability in terms of resources
 - Environmental impacts
- **Technology solutions**
 - Distributed and concentrated forms of energy
 - Solar, wind
 - Nuclear
 - Rural and urban use
 - Energy conversion, storage and distribution
 - Energy conservation
 - Innovations
- **Solutions through international cooperation**

“Assuring universal access to affordable energy services and eliminating energy insecurity are international responsibilities unfulfilled. All of us – governments, the energy industry and international organizations – must reassess our record, rethink our programmes and re-dedicate ourselves to success”

- Dr. Mohamed ElBaradei