ENERGY 4EVER

Case for Renewable Energy in India

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FUEL BASKET- INDIAN POWER SECTOR (June 2006)

- THERMAL : 83272 MW
- HYDEL : 32726 MW
- NUCLEAR : 3900 MW
- RENEWABLES : 6191 MW

- **TOTAL INSTALLED CAPACITY : 126089 MW**

(Source : Ministry of Power)

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ENERGY SCENARIO - INDIA

- Rapid economic development &
  Increasing population = **High demand for Energy**

  A sustained 8% GDP growth of India requires an annual increase of:

  a) Commercial energy supply from 5.2% to 6.1%
  b) Total primary energy supply from 4.3% to 5.1%

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ENERGY SCENARIO - INDIA *(Contd..)*

- India's current energy basket is coal dominated and is likely to stay this way in the near future.
- Limited domestic coal supply coupled with its poor quality, low level of technological advancements and high instance of environmental perils pose serious challenges for over dependence on coal.
- Limited domestic reserves and uncertain foreign supply of hydrocarbons in wake of their rising international price have seriously impaired country's energy security.

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ENERGY SCENARIO - INDIA (Contd..)

There is a pressing need to explore

Alternate Fuel Options

which are sustainable, locally available and eco-friendly

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CASE FOR RENEWABLE ENERGY

Why **Renewable Energy** (RE) is the preferred option for India

India has the necessary inputs such as:

- Large untapped RE potential (an estimated 100,000 MW)
- Vast land resources for production of Biomass & Bio-fuels
- Abundant sunshine
- Large population and growing consumption will lead to greater pressure on ecology – hence a need for close watch on emissions
- Plentiful sites for harnessing Wind Energy and Small Hydro

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CASE FOR RENEWABLE ENERGY *(Contd..)*

Why **Renewable Energy** is particularly relevant for rural India

- Nearly 55% of India's rural population have no access to On-Grid Systems
- Vision 2012 of India aims for complete household electrification in the country, providing minimum lifeline electricity consumption of one unit per household/day

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CASE FOR RENEWABLE ENERGY *(Contd..)*

Importance of Stand-alone RE Systems:

Stand-alone RE Systems are the best economically viable choice for remote locations where transmission lines cannot reach. Standalone RE systems shall :

- Avoid the high costs involved in transmission capex.
- Avoid distribution losses – Technical & otherwise
- Avoid recurring fuel cost
- Boost the rural economy
- Encourage self help groups & self dependence
- Enable village co-operatives to supply and / or monitor distribution
- Make available much needed energy for basic needs at the doorstep at affordable prices.

RE also bring gains for Indian economy by way of Clean Development Mechanism (CDM) projects.

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RE IN INDIA

- **The Ministry of Non-Conventional Energy Sources (MNES)** is the nodal agency involved in facilitating growth of RE in India
- The Ministry's mandate covers the entire RE sector.
- RE sources covered by MNES are:
  - ⇒ Solar
  - ⇒ Wind
  - ⇒ Small / Mini /Micro Hydel
  - ⇒ Biomass
  - ⇒ Energy from Urban & Industrial Wastes
  - ⇒ Hydrogen Energy & Fuel Cells
  - ⇒ Geothermal
  - ⇒ Tidal Energy sources

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RE IN INDIA *(Contd..)*

- **Indian Renewable Energy Development Agency** (IREDA) is working as a non-banking financial company under the administrative control of MNES to provide term loans for RE projects.
- **MNES** has established three specialized technical institutions viz. **Solar Energy Center** (SEC), **Center for Wind Energy Technology** (C-WET) and **Sardar Swaran Singh Institute of Renewable Energy.**

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RE IN INDIA : FACTSHEET

S.No.	Sources/Technologies	Potential Estimated	Achievement as on 31-3-2006
1	Wind Power (MW)	45,000	5,340.60
2	Small Hydro - upto 25 MW (MW)	15,000	1,826.43
3	Biomass Power (MW) Biomass Gasifiers (MW)	19,000 16,000	912.53 69.87
4	Solar Photovoltaic (MW/Sq. Km.)	20	2.74
5	Solar Water Heating Systems (Million Sq. Mtr. Collector Area)	140	1.0
6	Biogas Plant (Number in Million)	12	3.7
7	Improved Biomass Chulha or Cooking stoves (Number in Million)	120	35.2*
8	Urban & Industrial Waste (MW)	1,700	45.78

Source: MNES;

****As on March 31, 2003***

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TARGET FOR ELEVENTH FIVE YEAR PLAN (2007-12)

- ❖Wind Power – 3,500 MW
- ❖Small Hydro Power – 1,400 MW
- ❖Biomass Power/ Co-generation/ Gasification – 1,725 MW
- ❖Solar Power – 25 MW
- ❖Solar Thermal Power – 110 MW
- ❖Energy from Urban/Industrial waste – 140 MW
- ❖Total fund Required – US$ 8.96 Billion
  - Budgetary Support by Government of India – US$ 0.48 Billion
  - Private Sector Investment (Equity + Loan) – US$ 8.48 Billion

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RE – ENABLING LEGISLATIONS

- To mainstream RE into the national energy matrix, it is strongly felt that India needs a comprehensive "Renewable Energy Policy" on lines of similar successful legislations like Germany, UK, Spain, Denmark, etc.
- Legislations including the Electricity Act, 2003 and National Tariff policy have tried to promote RE by mandating state electricity regulatory commissions (SERCs) to ensure inclusion of RE-based electricity in energy mix of state utilities.

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RE – ENABLING LEGISLATIONS *(Contd..)*

- SERCs of Andhra Pradesh, Karnataka, Gujarat, Madhya Pradesh and Orissa have issued final regulations specifying quotas of RE based electricity generation.
- States of Tamil Nadu, Kerala, Rajasthan and Uttar Pradesh have issued consultation papers in this regard.

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RE - FINANCIAL/FISCAL INCENTIVES IN INDIA

- Income Tax Holiday
- Accelerated Depreciation
- Concessional Custom Duty / Duty Free Import
- Capital Subsidy
- Energy buyback, power wheeling and banking facilities
- Sales Tax concession benefits
- Electricity Tax exemption
- Demand cut concession offered to industrial consumers who establish power generating units from renewable energy sources

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RE - OTHER PROCEDURAL COMFORTS

- Industrial clearance is not required for setting up of renewable energy industry
- No clearance is required from Central Electricity Authority for power generation projects up to US$ 21 million.
- Facilities for promotion of export oriented units are available for renewable energy industry also.
- Financial support is available to renewable energy industries for taking up R&D projects with technology institutions
- Assistance for Export Promotion and Market Development
- Blending of Ethanol is allowed up to 5% with Gasoline and similar provisions is being extended to Bio Fuels

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WHY INVEST IN INDIAN RE SECTOR

- ❖ Among the World's Largest Renewable Energy Programmes
- ❖Exclusive Federal Ministry to deal with Renewables (*Perhaps the only country to have it*)
- ❖ Exclusive Financial Institution for funding Renewable Projects
- ❖ Strong Manufacturing Base and Fast Growing Economy
- ❖Availability of Low Cost Skilled Man power
- ❖Vast Untapped Consumer base
- ❖Favorable Government Policy
- ❖Moderate tax rates
- ❖Financial/Fiscal Incentives
- ❖Emerging Clean Development Mechanism (CDM) Market

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SPECIFIC BUSINESS OPPORTUNITIES

Technology import or collaborations for:

- ❖ Manufacturing low cost solar photovoltaic cells / modules
- ❖ Processing and constructing treatment plants for Municipal Solid Waste (MSW) using technologies that can recover resources and energy – high efficiency biomethanation, pelletisation, gasification, incineration and landfill
- ❖ Advanced technologies for treatment of, and energy recovery from industrial effluents and sewage wastewater
- ❖ Fluidized bed biomass gasifiers using a variety of biomass for electrical, mechanical and thermal applications
- ❖ Fuel cells and electric vehicles

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EMERGING OPTIONS

Emerging options that could become good business within a 5 year horizon.

- Solar energy as it is vastly untapped
- Bio fuels produced from non-edible oil seeds
- Geothermal Energy – There are 300 geothermal spring sites spread throughout the country
- Ocean/Tidal Energy
- Fuel Cells for standalone operations
- Small Electric Cars

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EMERGING OPTIONS - HYDROGEN

Emerging options that can be developed to yield results after 5 years

- Hydrogen – widely recognized as clean, reliable and sustainable source enhancing India's energy security.
- MNES has set up a National Hydrogen Energy Board; Five Expert Groups on hydrogen production, its storage, applications in transport & power generation, and hydrogen system integration.

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EMERGING OPTIONS - HYDROGEN (Contd..)

- Based on the reports of these Expert Groups, the National Hydrogen Energy Road Map has been drawn. The Road Map has identified two major initiatives:
  - Green Initiative for Future Transport &
  - Green Initiative for Power Generation
- The Road Map under these specific initiatives has evolved a Hydrogen Vision 2020 where the target is to introduce up to 1 million hydrogen fueled vehicles and 1000 MW of decentralized hydrogen-based power generation, through public-private partnerships.

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THANK YOU

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