

Indian Power Sector

An Overview of Renewable Energy Sector



In this Presentation

- Indian Renewable Energy Scenario
- Regulatory Framework
- Policy Initiatives by Govt
- Services by IL&FS
- IL&FS Competitive Advantage
- IL&FS Experience in Renewable Energy
- Case study – Timarpur-Okhla WtE Project



Indian Power Scenario

Total Installed Capacity – 135 GW (As on 31.08.2007)

- Hydro 34,130 MW (25%)
 - Thermal 86,976 MW (64%)
 - Nuclear 4,120 MW (3%)
 - Renewable 10,175 MW (7.5%)
- 17th EPS Projections for Requirement of Power

Year	Electrical Energy Requirement at Power Station Bus Bars (GWh)	Annual Peak Electric Load at Power Station Bus Bars (MW)
2011-12	968659	152746
2016-17	1392066	218209
2021-22	1914508	298253



Renewable Energy - Sources

- Renewable Energy derived from natural processes that are replenished constantly
- Sources of Renewable Energy
 - Hydro (Up to 25 MW)
 - Wind Energy
 - Bagasse / Biomass / Agri Residue
 - Solar
 - Municipal & Industrial Waste
 - Geothermal
 - Tidal Energy



Renewable Energy Scenario

Estimated Medium Term Potential (2032) & Achievements as on 30.06.2007

Sources / Systems	Estimated Potential (MW)	Cumulative Achievements (MW)
Grid Interactive Solar Power	50,000	2.12
Bio Power (Agro residues & Plantation)	16,881	543
Wind Power	45,195	7,231
Small Hydro Power (up to 25 MW)	15,000	2,013
Cogeneration – Bagasse	5,000	635
Waste to Energy	2,700	43
Total	134,776	10,467

Source: MNRE



Regulatory Framework

- **Electricity Act 2003**
 - Section 3 - **National Electricity Policy and Plan** for development of power system based on **optimal utilization of resources including renewable sources of energy**,
 - Section 4 - GoI to prepare a National Policy **permitting stand alone systems** (including those based on **renewable sources of energy and non-conventional sources of energy**) for rural areas.
 - Section 61(h) - Tariff Regulations by Regulatory Commission to be guided by **promotion of generation of electricity from renewable energy sources** in their area of jurisdiction.
 - Section 86(1)(e) - Regulatory Commission to **specify purchase obligation** for licensee from renewable energy



Regulatory Framework ... 2

- **National Tariff Policy:**
 - SERCs to fix minimum percentage for purchase of energy from Renewable Energy sources taking into account availability of such resources in the region and its impact on retail tariffs
 - National tariff policy prefers procurement of power from NCES based on preferential tariff
 - Future procurement of power from NCES through competitive bidding under section 63 within suppliers offering energy from same type of non-conventional sources
 - In the long-term, these technologies need to compete with other sources in terms of full costs



Policy Initiatives

- Independent Nodal Ministry
- Nodal Agencies in Each state
- Accelerated Tax Depreciation benefit
- Capital Subsidy
- Tax Holiday – Section 80 IA
- Mandatory Procurement of RE Power for Distribution Licensees
- Facilitation of Grid Connectivity
- Carbon Credits



Services by IL&FS - Activities

Project Preparation

- Conceptualization
- Identification of Sites
- Pre-feasibility Studies
- Statutory Clearances
- Regulatory Clearances
- Risk Management Framework

Project Development

- Project Structuring
- Detailed Studies
- Contractual Arrangements
- Marketing Strategies
- Business Plan & Modeling
- Financial Structuring

Project Financing

- Preparation of IM
- Debt & Equity Syndication
- Financing Agreements
- Security Agreements
- Financial Closure

Project Execution

- Engineering & Procurement
- Project Management
- Construction Supervision
- Operations Management



Experience in RE Sector

- **Wind Energy**
 - Owns 6.5 MW Wind Farm in Andhra Pradesh
 - Advisor for 50 MW ONGC Wind Farm in Karnataka
- **Municipal Waste to Energy Projects**
 - 16 MW Project in Delhi - First RE Project through Competitive Tariff Bidding Process
 - 10 MW Project at Ghazipur in Delhi
 - 6 MW Projects at Kanpur & Pune



Experience in RE Sector ... 2

- **Co-Generation Projects**

- Urja Ankur Fund for development of Bagasse based Co-Generation Projects in Maharashtra
- Sole Transaction Advisor & Fund Arranger for Integrated Cane Processing Project in Maharashtra
- Represented Maharashtra sugar federation, SISMA, REDAM before MERC for fixing Tariff & creating Regulatory framework



Experience in RE Sector ... 3

- **Hydro Projects**

- Identification and development of small hydro projects in Uttarakhand, Assam, Meghalaya, Arunachal Pradesh, Chhattisgarh & Sikkim
- Joint Development of Hydro Projects in Nepal

- **Bio-Diesel**

- Energy Plantations proposed in Western Maharashtra on 4,500 Acres of Wasteland



Experience in RE Sector ... 4

- **Solar Power & Geothermal**

- India receives solar energy equivalent to 5,000 trillion kWh/year – IL&FS has been working with MNRE & TERI to facilitate a few grid connected & roof top systems for tapping this resource
- Geothermal is an upcoming area where the potential in India is estimated at 10,000 MW
- IL&FS has initiated the discussions with state governments of Chhattisgarh and J&K for development of Geothermal projects



Experience in RE Sector ... 5

- **Financing**

- Equity Fund
- Managing Various Lines of Credits
- Association with IIFSL & other funding sources



Institutional Frameworks

- Association with Technology Development Board (TDB), Department of Science & Technology (DST) for project development funding support
- Association with APTDC, a society set-up by CII, GoAP and DST, for technological support
- MoU with TERI for cooperation in facilitation for implementation of renewable energy projects
- Financial support from ADB



Case Study

- **Timarpur Okhla Waste to Energy Projects**
 - 16 MW Municipal waste to Energy Project
 - Project in association with New Delhi Municipal Corporation & Municipal Corporation of Delhi
 - Project would process 2,050 MT waste per day – 1/3rd Municipal Waste Generated in Delhi
 - Implementation through PPP structure
 - First Project in India in RE sector to implemented through Tariff Based Bidding
 - A Pioneering Project with immense potential for replication



Case Study ... 2

- **Project preparation**
 - All clearances incl. environmental clearance in place
 - All contractual agreements in place
 - Power Purchase Agreement draft approved by DERC
 - Competitive Bid Documents approved by DERC
 - Tariff arrived through would be accepted by DERC
 - Appraisal & in principal sanction for funding by REC, IREDA & HUDCO
 - Funding committed by ADB
 - Project registered with UNFCCC



IL&FS Competitive Advantage



Leadership in Infrastructure

- Leadership in Project Development
- Strong Domain Knowledge
- Extensive Networking & Relationships
- Strong Partnerships with State & Central Governments, PSU's
- Geographic Spread
- Access to Financing



Contact Information

Dr. Ashok Harane

Chief Executive - Power Business Group

IL&FS Infrastructure Development Corporation

IL&FS, Bandra – Kurla Complex, Mumbai

Tel: +91 22 26593334

Fax: +91 22 26533038

Email: ashok.harane@ifcindia.com

Haziq Beg

IL&FS Infrastructure Development Corporation

IL&FS, India Habitat Center, Lodhi Road, New Delhi

Tel: +91 11 2684060

Fax: +91 11 24682070

Email: haziq.beg@ifcindia.com

Thank You
