

Renewable Energy Activity Report and Roadmap



at

Malaviya National Institute of Technology
Jaipur

Centres of Excellence

- Centre for Energy and Environment (brought up mainly with support from MNRE grant)
- Centre for Advance Design
- Centre for Building Technology and Construction Materials (C-DOS Chair)
- Centre for Earthquake Design and Mitigation Centre
- Centre for Material Science
- Centre for Steel (SAIL Chair)

Introduction of Centre for Energy and Environment

- Conceptualized in June 2011 with objectives and roadmap (after launch of solar mission)
- Formally inaugurated on January 26, 2012
- Started M.Tech. (Renewable Energy) from July 2012 (adapting and adopting MNRE curriculum)
- Nine (7+2) faculty members (4 Mech., 2 Electrical, 3 Civil)
- Ph.D. program (3 students registered in 2012, 3 shortlisted for July 2013)

Objectives of CEE

- To promote **interdisciplinary research and innovation** in key areas of energy and environment
- To provide quality education through regular educational programs (such as M.Tech., Ph.D.) and short term programs for providing **trained manpower to industry**
- To **showcase** successful clean and green technologies
- To contribute to grass-root level research and **deployment** in the field of energy and environment

Thrust areas

- Decentralized Renewable Energy Applications
- Energy conservation in buildings and industries
- Energy systems modeling: energy planning, forecasting
- Development of test procedures, standardization, rating and labeling for energy efficiency and RE products
- Demand Side Management in power systems, smart grid
- Integrated/hybrid power generation systems
- Environmental impact assessment
- Green building design
- Application of Nano Materials in solar thermal systems
- Solar airconditioning
- Passive air cooling and heating systems such as EATHE

RE activities @ MNITJ

- Organizing National Level Quiz on Rajiv Gandhi Akshay Urja Diwas since 2010 (2007)
- MoU with Rajasthan Electronics and Instrumentation Ltd. For R&D, capacity building and deployment.
- Commissioning of more than 150 stand alone SPV systems for Panchayats and Panchayat Samities in 8 districts of Rajasthan
- Field performance monitoring of 5MW SPV plan (ongoing)
- Field performance of 5 roof top solar installations

Present Research Areas

- Development of nano fluid based solar water heater
- De-rating correlations for earth air tunnel systems
- Long Term Energy Policy Modelling
- Hybrid active and passive cooling systems
- Weather analysis
- Solar and Wind based smart grid

Building Integrated Renewable Energy Systems (Indo-US PACE-R Project)

- Roof top PV
- Building Integrated PV
- Solar Air-conditioning

Utilization of MNRE Grant-in-aid

- Disbursed: Rs. 41.03 lac
- Payment under process: 7.21 lac
- Committed: 2.57 lac
- Total: 50.81 lac

Extended utilization of MNRE grant

- Online weather data on MNIT website
- Achieving and availability in public domain
- One floor of Admin block off grid utilizing the system under study
- Utilization of equipment in training programs
- Energy Newsletter (hard copies +available online)

Other Projects

- Capacity building for RRECL
- Energy Resource Centre of RRECL
- Solar Induced Ventilation: MNRE project
- Nano Fluid Based Solar Water Heater: DST
- Weather files for simulation: BEE
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Major events organized (2011-13)

- 2 Training programs on SPV system design
- 9 Training programs on ECBC
- 2 Training programs on Green buildings
- 4 Workshops on sustainability
- 1 Training Program on EIA
- 1 National Conference on Built Environment
- 6 Student events
- 3 community development programs
- 4 Deployment projects (ongoing)
- Publishing quarterly News Letter

Major consultancy assignments

- Review and roadmap for thermal Standards for Lebanon (World Bank)
- Knowledge exchange portal for Energy Conservation Building Code of India
(similar portal for RE education can be developed)

International Collaborations

- Lawrence Berkeley National Lab., USA
- Pacific Northwest National Lab., USA
- Oakridge National Lab., USA
- Carnegie Mellon Univ., USA
- Karlsruhe Institute of Technology, Germany
- Ruhr University, Bochum, Germany
- University of Bonn, Germany

Experience with MNRE grant

- Very useful for Library enrichment
- Useful for basic experiments
- Supporting project work of research students
- Further enrichment is required to keep pace with technology enhancement
- Fundamental research equipment is costly and could not be bought from the grant

Future Plans

(Preferably through RE Chair)

- **Training:**
Design, commissioning and maintenance
- **Support to industry:**
EDPs, Performance monitoring and improvement, troubleshooting
- **Research:**
Solar Air Conditioning, Multi-effect solar systems, Net Zero Energy Buildings
- **Policy analysis & support to Govt.:**
REC, RPO, Tariff planning, White paper



Thanks!!