Malaviya National Institute of Technology Jaipur
J.L.N. Marg, Jaipur - 302 017 (Rajasthan) INDIA

Centre for Energy and Environment

Information Brochure
Institute Vision

"To create a centre for imparting technical education of international standards and conducting research at the cutting edge of technology to meet the current and future challenges of technological development."

Institute Mission

“To create technical manpower for meeting the current and future demands of industry: To recognize education and research in close interaction with industry with emphasis on the development of leadership qualities in the young men and women entering the portals of the Institute with sensitivity to social development and eye for opportunities for growth in the international perspective.”
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MNIT not only believes in dreams but also strives to turn them into reality. All efforts are pooled in to develop leadership qualities, interpersonal skills, creativity, human skills along with strong values and morals.

We are in continuous integration with industry through training and various projects. We are constantly innovating and setting new goals. The Institute has an environment conducive to the intellectual, moral and physical development of its students. We have a team of dedicated, experienced and highly qualified teachers, who, through motivation, counselling and training, prepare our students to meet the challenges of the modern era. Our thrust is to provide higher standards of education thus, enabling our students to achieve professional competence in their chosen fields.

"A leader has the vision and conviction that a dream can be achieved. He inspires the power and energy to get it done."

-Ralph Lauren
Energy and environment are going to remain two big thrust areas for research and development, not only in the next few decades, but for the entire period of mankind survival. In order to appreciate and do meaningful research in both of these areas, understanding and inclusion of interdisciplinary knowledge is necessary. Nearly every attempt to harness or utilize the smallest amount of energy is associated with some impact on environment... Addressing energy or environment in isolation would be as good as seeing half of a picture. Over past decade, several new products and practices have been evolved for saving energy, using renewable energy so as to cause as less possible damage to the environment as possible. India, primarily due to its large population base, is one of the biggest contributors of greenhouse gas emitters. However, at the same time, it is also among the world leaders in promoting renewable energy projects.

Industry, academia, NGOs, government organizations, students, and their family members are welcome to join us in our endeavor for providing trained manpower in the field of energy and environment, do cutting edge research as well as showcasing, promoting and deploying technology and products that can help the society, country and the globe as a whole.

“Our dependence on fossil fuels amounts to global pyromania and the only fire extinguisher we have at our disposal is renewable energy.”

-Hermann scheer
Faculty Members Associated with CEE

**Dr. G.D. Agarwal**, Assoc. Prof. (Mech.)
B.E. (Mech.), M.Tech., Ph.D.
Areas of research: Solar thermal systems, Refrigeration and Air conditioning systems, Application of Nano Materials in heat transfer
Years of teaching/research experience: 20
Publications in refereed journals: 24
Papers in conferences/seminars: 52
Books: 3
Email: gdagrawal2@gmail.com

**Dr. Rajesh Kumar**, Assoc. Prof. (Electrical)
Areas of research:
Years of teaching/research experience: 18
Publications in refereed journals: 28
Papers in conferences/seminars: 110
Email: rkmur.ee@gmail.com

**Dr. Sanjay Mathur**, Assoc. Prof. (Civil)
B.E. (Civil), M.E. and Ph.D. (Environmental Engg)
Areas of research: Environmental Impact Assessment, Waste water treatment, Sustainable buildings
Yrs of teaching/research experience: 21
Publications in refereed journals: 5
Papers in conferences/seminars: 30
Books: 3
Email: sanjay_mnit@yahoo.co.in

**Dr. Urmila Brighu**, Assoc. Prof. (Civil)
Areas of research: Environmental policy, Environmental Impact Assessment, Waste water treatment,
Years of teaching/research experience: 21
Publications in refereed journals:
Papers in conferences/seminars:
Email: ubrighul1@yahoo.com

**Dr. Rohit Bhakar**, Asst. Prof. (Elect.)
B.E. (Elect.), M.Tech. (Power Systems), Doctorate (Elect.)
Areas of Research: Power systems Restructuring, Power Systems Economics, Network Pricing, Public Policy, Electricity Markets, Regulation
Years of teaching/research experience: 14
Publications in refereed journals: 5
Papers in conferences/seminars: 22
Email: rohitbhakar@gmail.com

**Dr. Sandeep Shrivastava**
Assistant Professor
Ph.D. (Design, Const, Plan (ConstMgmt)), M.Tech. (Environmental Eng and Mgmt), B.Tech. (Civil Engineering)
Yrs of teaching/research experience: 5
Publication in journals: 6
Email: san.civil@gmail.com
Established in 1963 as a joint venture of the Government of India and the Government of Rajasthan, the Malaviya Regional Engineering College, Jaipur started functioning from its temporary campus at Pilani with 30 students each in Electrical Engg. and Mechanical Engg. The college shifted to Jaipur in 1965. The great visionary, Prof. V.G. Garde, as its first Principal, moulded its destiny, with his characteristic plan, into a renowned Institute. The effort to maintain the high standard and committed approach of the College to the cause of technical excellence was recognized by the Ministry for Human Resource Development and University Grants Commission, New Delhi which granted it the status of a National Institute of Technology and Deemed University on June 26, 2002. It is one of the 30 NIT's established in different states of the country. Governed by the NIT Council, the Institute has four statutory bodies, namely, the Board of Governors, the Finance Committee, the Building and Works Committee and the Senate.

The Institute is fully funded by MHRD, the Government of India, New Delhi. Spread over 312 acres of lush greenery, the campus of MNIT enthral and inspires. The Institute is actively engaged in research, consultancy and developmental activities and collaborates with leading industrial houses and IT companies in various projects.

**Quality Policy:**

*MNIT shall strive to impart knowledge in such a manner as to achieve total satisfaction of students, parents, employers, and the society.*
About the Centre

Welcome to the Centre for Energy & Environment at Malaviya National Institute of Technology, Jaipur. The Centre for Energy and Environment has been established to promote interdisciplinary research and development in the field of energy and environment.

The major objectives of the Centre are:
- To develop facilities for research and development in the area of energy and environment.
- To enable innovations in science and technology in the interdisciplinary areas of energy and environment.
- To provide quality education through regular educational programs (such as M. Tech., Ph.D.) and short term programs (with duration 1 week, 2 week, 1 month), for providing trained manpower to industry.
- To promote education and awareness related to energy and environment by becoming a nodal centre for north-western India.
- To develop testing and standardization methods/protocols for equipment and devices related to energy and environment.
- To showcase successful renewable energy technologies and energy efficiency.
- To showcase clean/environment friendly technologies.
- To contribute to grass-root level research and deployment in the field of energy and environment.

Contact Information:
Head, Centre for Energy & Environment
Malaviya National Institute of Technology
JLN Marg, Jaipur-302017
Phone no: 0141-2713211 | E-mail: headcee@mnit.ac.in
Website: http://www.mnit.ac.in/new/dept_cree/index.php

Strategic Plan of the Centre

In order to achieve its objectives, the centre has developed the plan with following action points:
- Running full time and part-time programs (M.Tech. and Ph.D.) for meeting the requirement of trained manpower in the field of energy conservation, renewable energy, environmental engineering.
- Organizing short term training programs dissemination of knowledge to skilled as well as semi-skilled professionals.
- Taking part in energy and environmental planning at regional and national level through modeling approaches, policy papers.
- Demonstrating use of successful technologies such as ‘hybrid wind-PV system’, ‘solar refrigeration system’, ‘solar passive cooling techniques’, for increasing awareness and to promote use of these technologies by other organizations/individuals.
- Providing support to neighboring industry and government through technical inputs. This will be done through assignments such as product development, process development, policy analysis, field studies, and evaluation work.
- Conducting high level research in the field of renewable energy, energy conservation and environment through establishing research labs, and working on R&D projects as per priorities of govt. /industry. Setting up standardization and testing facilities for energy efficiency and compliance of environmental norms.
Academic Programs

The Centre presently offers the following programs:

a) Masters Programme: M. Tech (Renewable Energy)

The Centre has started to offer postgraduate program in Renewable Energy from the academic year 2012-13. This program is being offered as per the mandate of Ministry of New and Renewable Energy, New Delhi for capacity building in the field of Renewable Energy.

### Core Courses
- Wind and Hydro Energy
- PV and fuel cell
- Solar Thermal Systems
- Energy and Env. Policy
- Sustainable buildings
- RE lab
- Seminar
- Dissertation

### Electives
- Grid connectivity and smart grid
- Solar passive design
- LCA of RE systems
- Industrial energy systems
- Biomass energy
- Energy simulation
- Mgmt. and modelling of environmental systems
- Instrumentation and control of energy systems

Additional Certificate Course on Financial Analysis of Energy Projects,
Industrial visits: Min. Two per Semester,
Participation in RE Expo and seminars,
Invited talks: Min. 5 per semester

b) Ph.D. Programme:

Major areas for Ph.D. and research at the Centre are Energy efficient buildings, solar thermal applications passive cooling systems, hybrid renewable energy systems, energy policy modelling.
Research and Development

Following would be thrust areas for the centre:

<table>
<thead>
<tr>
<th>Renewable energy systems.</th>
<th>Energy conservation in buildings and industries.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy systems modelling: energy planning, forecasting.</td>
<td>Development of test procedures, standardization, rating and labelling for energy efficiency.</td>
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<tr>
<td>Demand Side Management in power systems.</td>
<td>Supply side management in power systems, smart grid.</td>
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<tr>
<td>Integrated/hybrid power generation systems.</td>
<td>Application of Nano Materials in solar thermal systems</td>
</tr>
<tr>
<td>Passive air cooling and heating systems such as EATHE.</td>
<td>Use of Environment friendly refrigerants such as CO2, LPG, Propane &amp; Butane.</td>
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<td>Pollution control technologies.</td>
<td>Environmental impact assessment.</td>
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<td>Green building design.</td>
<td>Life cycle assessment.</td>
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The U.S.-India Joint Center for Building Energy Research and Development (CBERD)

**Indian Partners:**
- Malaviya National Institute of Technology Jaipur (MNIT-J)
- International Institute of Information Technology Hyderabad (IIIT-H)
- CEPT University
- Indian Institute of Technology Bombay (IIT-B)
- Indian Institute of Management Ahmedabad (IIM-A)
- Auroville Centre for Scientific Research (CSR)

**U.S. Partners:**
- Lawrence Berkeley National Laboratory (Lead)
- UC Berkeley
- Carnegie Mellon University
- Rensselaer Polytechnic Institute
- Oak Ridge National Laboratory
<table>
<thead>
<tr>
<th>Date</th>
<th>Training/Seminar/Workshop Topics</th>
<th>Organised by/Key Speakers</th>
</tr>
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<tbody>
<tr>
<td>August 24, 2013</td>
<td>Webinar on Basics of SPV System Design</td>
<td>CEE, MNIT Jaipur, First Green Consulting</td>
</tr>
<tr>
<td>SEEQ-2013,August 17-18, 2013</td>
<td>Sustainable Energy and Environment Quiz</td>
<td>CEE, ISHRAE, SAFEE, RRECL</td>
</tr>
<tr>
<td>August 10, 2013</td>
<td>Role of Valves in Energy Efficiency</td>
<td>by Mr. Tsutao Osaka (Ted Osaka) from KITZ, Japan</td>
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<tr>
<td>June 11-12, 2013</td>
<td>“ECBC Master Trainer” training program</td>
<td>CEE, MNIT Jaipur</td>
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<tr>
<td>May 25, 2013</td>
<td>9th ECBC training</td>
<td>CEE, MNIT Jaipur</td>
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<tr>
<td>March 4, 2013</td>
<td>Current research needs in HVAC</td>
<td>Mr. Tom Watson, ASHRAE President</td>
</tr>
<tr>
<td>Feb 25, 2013</td>
<td>Zero Energy Buildings</td>
<td>Prof. Charles J. Kibert (Rinker School / University of Florida, USA)</td>
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<tr>
<td>Feb. 15, 2013</td>
<td>Zero Energy Building / Sustainable Building</td>
<td>Prof. Charles J. Kibert, Rinker School / University of Florida, USA</td>
</tr>
<tr>
<td>Feb. 11, 2013</td>
<td>Building Integrated Photovoltaic Systems</td>
<td>Dr. William Bahmfleth, President Elect., ASHRAE and Professor, Pennsylvania State University, USA, Dr. Shiela Hayther, NREL, USA</td>
</tr>
<tr>
<td>January 31, 2013</td>
<td>Insight into Star Labeling Program for Energy Efficiency of Appliances</td>
<td>Dr. Sandeep Garg, Program Manager, UNDP-ZEF Project, New Delhi</td>
</tr>
<tr>
<td>Jan 18-20, 2012</td>
<td>Green Building Rating System: GRIHA</td>
<td>CEE, MNIT Jaipur</td>
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<tr>
<td>Dec 21, 22, 2012</td>
<td>Training on Building Energy Simulation using IES</td>
<td>IES India</td>
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<tr>
<td>Dec 21, 22, 2012</td>
<td>Early Design Tool: VASARI software</td>
<td>Autodesk India</td>
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<tr>
<td>Nov. 20-21, 2012</td>
<td>Environmental Impact Assessment</td>
<td>CEE, MNIT Jaipur, RSPCB</td>
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<tr>
<td>Sept 25, 2012</td>
<td>Challenges and Opportunities for Entrepreneurship in Renewable Energy</td>
<td>Mr. Ganesh Shankar, Director, FlexGEN</td>
</tr>
<tr>
<td>Date</td>
<td>Event Description</td>
<td>Organizers/Participants</td>
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<tr>
<td>Sept 22, 2012</td>
<td>Promoting green and energy efficient buildings in Rajasthan</td>
<td>CEE, MNIT Jaipur, IGBC - Jaipur chapter and CII - Rajasthan Section</td>
</tr>
<tr>
<td>Sept 16, 2012</td>
<td>Demystifying OzoneDepletion</td>
<td>Dr. C. Ghosh, Delhi University</td>
</tr>
<tr>
<td>Sept 12, 2012</td>
<td>Energy efficiency issues in airconditioning systems</td>
<td>Mr. Richard Rooley, former President ASHRAE</td>
</tr>
<tr>
<td>Sept 6, 2012</td>
<td>Green Building Rating Systems</td>
<td>IGB, Hyderabad</td>
</tr>
<tr>
<td>August 30, 2012</td>
<td>Scope of engineers and architects in Green Buildings</td>
<td>Dr. P.C. Jain, Chairman, Indian Green Building Council</td>
</tr>
<tr>
<td>SEEQ-2012,August 20, 2012</td>
<td>Sustainable Energy and Environment Quiz</td>
<td>CEE, MNIT Jaipur</td>
</tr>
<tr>
<td>April 16, 2012</td>
<td>Training program on Rajasthan Energy Conservation Building Directives</td>
<td>CEE, MNIT Jaipur</td>
</tr>
<tr>
<td>February 24, 2012</td>
<td>Indoor Air Quality and Energy efficiency in Commercial Buildings</td>
<td>Dr. S.C. Chandra, NUS, Singapore, ASHRAE India and ISHRAE Jaipur</td>
</tr>
<tr>
<td>Oct 24, 2011</td>
<td>Advanced Building Energy Simulation using Energy Plus</td>
<td>Mr. Nickolas Long, Sr. Engineer, NREL, USA</td>
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</table>
## Projects @ CEE:

<table>
<thead>
<tr>
<th>Name of project</th>
<th>Funding agency</th>
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</thead>
<tbody>
<tr>
<td>Review and roadmap for thermal standard for Lebanon</td>
<td>World Bank</td>
</tr>
<tr>
<td>Knowledge Exchange portal for ECBC Implementation: IBECC</td>
<td>Climate Works Foundation, USA</td>
</tr>
<tr>
<td>PLF study of Solar Photovoltaic Systems</td>
<td>Rajasthan Electronics and Instrumentation Ltd., Jaipur</td>
</tr>
<tr>
<td>Performance monitoring of cool roof</td>
<td>Winbuild. Inc. (jointly with IIITHyderabad)</td>
</tr>
<tr>
<td>Sustainable city analysis for Jaipur city</td>
<td>Lawrence Berkeley National Laboratory, USA</td>
</tr>
<tr>
<td>Roadmap development for building energy code implementation in Rajasthan</td>
<td>Pacific Northwest National Laboratory, USA</td>
</tr>
<tr>
<td>Setting up laboratory and library facilities for renewable energy education</td>
<td>Govt. of India, New Delhi</td>
</tr>
<tr>
<td>Conservation Building Directives</td>
<td>RRECL, Govt. of Rajasthan</td>
</tr>
<tr>
<td>Energy Resource Centre</td>
<td>RRECL, Govt. of Rajasthan</td>
</tr>
</tbody>
</table>
**Contribution in National Committees**

- Energy Conservation Building Code
- IGBC Green Building Rating Systems
- National Building Code: Panel for Sustainability, BIS
- Expert group on Low Carbon Strategies for Inclusive Growth, Planning Commission, GOI
- State Environmental Committee for Rajasthan, MoEF, GOI
- Core committee for development of standards for testing of chillers, ISHRAE-RAMA
- Technical Committee for GRIHA

**Industrial Collaboration**

The Centre is actively associated with the following industries, NGOs and Govt. Agencies:

- Rajasthan Electronics and Instrumentation Limited, Jaipur
- Indian Green Building Council
- Indian Society for Heating Refrigeration and Air-conditioning Engineers
- Rajasthan Renewable Energy Corporation Ltd., Govt. of Rajasthan
- Rajasthan Pollution Control Board, Govt. of Rajasthan
- Price Waterhouse Coopers, Gurgaon
- The Energy and Resource Institute (TERI), New Delhi
- FENESTA Building Systems, Gurgaon
- South Asia Energy Efficiency Forum, New Delhi
- IL&FS

The Centre has active collaboration with following foreign universities/research organizations:

- Lawrence Berkley National Laboratory, USA
- Pacific Northwest National Laboratory, USA
- Carnegie Melon University, USA
- Oak Ridge National Laboratory, USA
- Centre for Developmental Research, University of Bonn, Germany
- Institute for Energy Economics and Environment, Ruhr University, Bochum, Germany
- Karlsruhe Institute of Technology, Germany

**Technology Dissemination & Deployment**

1) Installation of LED tube lights and streetlights on MNIT campus
2) 300kWp Solar Photovoltaic System on the campus.
3) Replacement of inefficient air conditioners.
4) Installation of weather station and online visualization of instantaneous weather data at [http://www.mnit.ac.in/new/dept_cree/index.php](http://www.mnit.ac.in/new/dept_cree/index.php)
5) Solar steam cooking system for 600 students in girl's hostel at MNIT.
6) Quarterly newsletter 'Energy Headlines' is being published from the Centre.
Promoting Innovation, Technology Development and Deployment for Sustainable Future

Contact Information:
CENTRE FOR ENERGY & ENVIRONMENT
Malaviya National Institute of Technology
JLN Marg, Jaipur-302017
Phone no: 0141-2713211
E-mail : headcee@mnit.ac.in
Website : http://www.mnit.ac.in/new/dept_cree/index.php

Designed by: Amandeep, Prakash, Srikanth, Gaurav & Ashok