

Education for the Sustainable Future

**International Symposium on Energy and Environment
McDonnell International Scholars Academy
Washington University in Saint Louis
May 4 – 7, 2007**

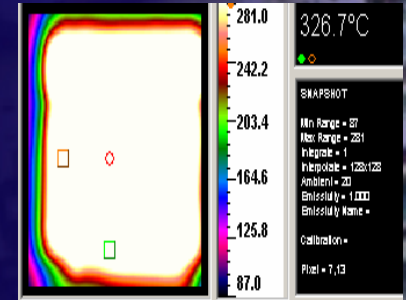
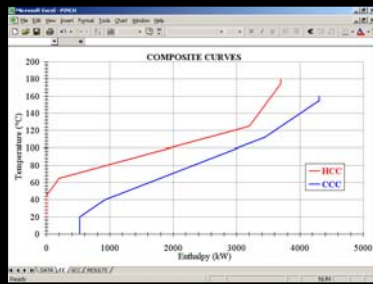
**Shyam R. Asolekar
Head
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**Indian Institute of Technology
Bombay**

Existing Energy Research in IIT-B

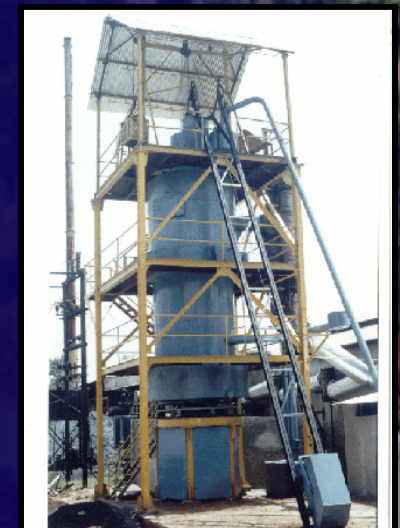
Energy Efficiency,
Process Integration,
Demand Side Management



Solar Thermal

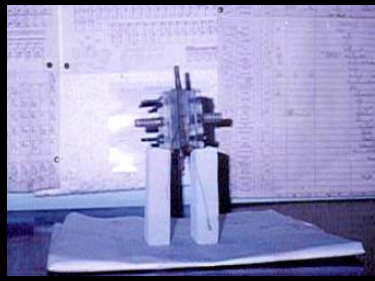


Biomass Gasification
&
Pyrolysis



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Upcoming Energy Research in IIT-B



Fuel Cells and Hydrogen



Solar PV



Wind Energy



Clean Coal Technologies

Carbon Sequestration/ Capture



PEM Test Station



Bipolar Plate



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Environmental Research Areas in IIT-B

- 1. Aerosol and Air Quality**
- 2. Water and Wastewater**
- 3. Environmental Biotechnology**
- 4. Solid Wastes**
- 5. Modelling, Planning and Management**
- 6. Environmental Policy and Sustainable Development**



Upcoming Environmental Research Areas in IIT-B

- 1. Urban Planning**
- 2. Recycle & Reuse of Wastewaters**
- 3. Rural Development**
- 4. Disaster Management**
- 5. Risk Assessment**
- 6. Eco-habitats and Eco-housing**



Imminent Challenges

- **Amendments to India's Constitution**
- **Newer Laws & Regulations**
- **Climate Change, Ozone Depletion, Desertification**
- **Poverty, Health, Development Deficit, Gender Equality**
- **Millennium Development Goals, Agenda - 21**
- **Balancing National Development Goals & Global Environmental Priorities**
- **India is Signatory to Several Int'l Initiatives**
- **Inter-disciplinary approaches – Biotechnology, Nano-Technology, Materials Science, Systems approach**
- **Strategic Global Linkages and Collaborations**



Educational Activities and Possibilities for Collaboration

- **UG students exchange (semester-long / year-long)**
- ***Action Learning Projects* for UGs – Semester-long, Field-work based, Combine UG/Grad student projects**



Educational Activities and Possibilities for Collaboration

- Faculty exchange
- Ph.D. projects, co-guiding
- Co-teaching of UG & Graduate courses
- Quality Improvement Training for faculty from other engineering schools



Possibility # 1

UG Course: *Environmental Studies*

One-semester duration

Sophomore-level

Several McDonnell partnering universities can co-teach

4 month-long modules

Beamed to subscribers



Possibility # 2

UG Course:

Engineering for Sustainable Futures

One-semester duration

Senior-level or First-year Masters

Several McDonnell partnering universities can co-teach

2 or 3 modules + Action Learning Project

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Environmental Information System for Achieving Growth and Equity

ENVISAGE

Launched a new initiative for providing critical information and expert advice to Govt. and NGOs

Empowerment of people through collecting, owning, and disseminating env & dev data

Knowing the reality in diverse regions of India will help CESE in searching the right focus



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SUSTAINABLE *CAMPUS*

Launched a new initiative for transitioning to sustainability in IITB campus

Several efforts have already been made on IITB campus (e.g. Dorm kitchen)

Environment and Energy Audit

Assessment of Biodiversity

Powai Lake Rejuvenation and Conservation

Nation-wide movement

(Academic, Industrial, Commercial Premises)



Possibility # 3

**Graduate Courses
or
Modules of Courses**

**Several McDonnell partners can co-teach
4 month-long modules
Beamed to subscribers**



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Engineering the Future



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