Annual Report 2007–08

World Institute of Sustainable Energy

Dr Hermann Scheer *(second from right)*, German Parliamentarian and world renowned renewable energy expert, and Chief Guest, 'Solar India 2007', lighting the ceremonial lamp at the inauguration of the two-day event organised by WISE at NIMHANS, Bangalore, on 19–20 July 2007. Seen along with him are *(R to L)*, G M Pillai, Director General, WISE; V Subramanian, Secretary, MNRE, GoI; and P Jayakumar, Organising Secretary, 'Solar India 2007'.

Vilas Muttemwar *(second from right)*, Minister of State for New and Renewable Energy, GoI, releasing the 'Proposed Policy Roadmap for Solar Energy Development in India' developed by WISE, during the Valedictory Session of 'Solar India 2007'. Also seen are *(L to R)* V Subramanian, Secretary, MNRE, GoI; Ajai Vikram Singh, Former Secretary, MNRE and Ministry of Defence, GoI; and G M Pillai, Director General, WISE.

Annual Report 2007–08

World Institute of Sustainable Energy

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Reflections...

WISE is four years old. In this short span of time we have received huge international and country-wide support for our numerous endeavours; our assets being sincerity of purpose, quality work and commitment to the cause.

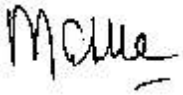
During the year under review, the most notable event for WISE and the renewable energy sector in India was ‘Solar India 2007’ organised by us in July 2007 in Bangalore. When everybody else was holding general 'renewable energy' or 'green power' conferences, WISE pioneered the concept of in-depth, sub-sectoral conferences like 'Wind India 2006' held in the previous year. This exclusive wind power event was a grand success. But then, wind power in India was largely commercialised with a good manufacturing base and power generation infrastructure in the country.

When we planned 'Solar India 2007', we were advised that it was ill-timed and India was not ready for such an event. But we forged ahead with confidence and perseverance. The conference and exhibition was a huge success with over 400 delegates and 36 exhibitors participating. The highlight was the inauguration of the event by Dr Hermann Scheer, German Parliamentarian, and world renowned R.E. expert and author. His eloquent and hard-hitting speech set the tone for the event. We also presented a draft of an innovative solar policy document for India which we continued to re-work and refine throughout the year, by constituting a 13 member Working Group consisting of various stakeholders. With all humility, we claim that 'Solar India 2007' helped focus attention on the need for solar energy development in India.

During the year, we completed few very unique research projects. A two-year in-depth field level research into subsidies availed by conventional power projects was completed. The report exploded the myth that renewables were being subsidised. It was found that over the lifetime of conventional power projects, many of them received subsidies amounting to 1.5 times their capital cost! Many other unique policy-level projects were completed or initiated by our *Centre for Policy and Sustainability Research*. All of these are a pointer to WISE's growing credibility and stature as *the* policy think-tank in the field of sustainable energy.

We continued our R.E. Law advocacy by holding the third seminar in August 2007 in Chennai, launched a web-campaign, approached 300 Members of Parliament seeking their support for the effort, and finally, formally submitted the refined draft of the model law to the Hon. Minister for New and Renewable Energy. Our *Centre for Regulatory Affairs*, besides continuing to provide support to state electricity regulatory commissions, also highlighted the need for introduction of Renewable Energy Certificates in the country through an event held in Chennai, which was well attended by many top-level policy makers and regulators. Our *Centre for Wind Power* carried out another prestigious assignment for the Ministry of New and Renewable Energy, Govt. of India, for re-powering of old wind power sites in India. The *Centre for Bioenergy*, launched in early 2008, will work in critical areas like new applications and innovations in biogas, biomass, waste-to-energy and liquid biofuels.

The outreach activities of WISE through our *Centre for Communications* continued with increased fervour. The Centre brought out three special collector's volumes on solar energy, renewable energy law, and climate change of our flagship bimonthly publication 'Green Energy', besides the regular issues. Internal capacity building activities also continued through keeping our library up-to-date with latest books and journals to aid our faculty in research and knowledge acquisition. Truly, our only asset is our cutting-edge knowledge in all aspects of sustainable energy. As always, I take this opportunity to record my appreciation of the commitment and hardwork of WISE’s faculty and staff, as well as the unstinted support provided to us by our Governing Council and other well-wishers.



G.M. Pillai
Director General

Centre for Policy & Sustainability Research

The *Centre for Policy and Sustainability Research* is responsible for strategic analysis and conducting in-depth studies in the areas of renewable energy and sustainable development. It aims to uncover truths about resource availability and use and study its economics from an environmental perspective. It is the only multidisciplinary centre in India with an integrated vision and expertise in energy engineering, environmental economics, ecology and development.

The core activities of the *Centre for Policy and Sustainability Research* (CPSR) include policy research and advocacy, strategic consultancy, and fostering debate through conferences/ seminars and publications. For the year 2007–08, CPSR carried out the following activities:

RESEARCH PROJECTS

1. Comparative Public Cost of Conventional Electricity Generation in India: The project was completed on schedule and the findings presented to the Indian Wind Turbine Manufacturers' Association, the funding agency for the project. The summary of the report which is in two volumes will be released in the form of a book in 2008–09.

2. Renewable Energy (R.E.) Vision 2020 for Union Territory of Puducherry: The second report for developing a renewable energy roadmap for the Government of Puducherry was duly submitted to the government in October 2007. It covers the various policy options, financing options and HR options available to the government in terms of implementing a renewable energy vision for Puducherry.

3. Production Tax Credit (PTC) for Wind Energy Development in India: Sponsored by the Ministry of New and Renewable Energy (MNRE), Govt. of India, the study revisits the current policies which benefit capacity addition in the wind energy sector and are beneficial for balance sheet financing of wind projects. The objective of this study was to link incentives to actual electricity generation so that benefits become available to IPPs in a non-discriminatory manner, thereby promoting the growth of the wind energy sector. The final report has been submitted to MNRE on schedule.

4. Model Tariff for Grid-Connected Solar Power Projects in India: This MNRE supported project aims to study the tariff range for various solar power technology configurations and to suggest appropriate policy measures in support of these emerging technologies. The project is ongoing and likely to be completed by the end of July 2008.

STRATEGIC CONSULTANCY

1. Identifying Optimal Legal Frameworks for Renewable Energy in India: This project was conducted under the Asia-Pacific Partnership on Clean Development and Climate, in collaboration with Baker & McKenzie, a leading international law firm from Australia. It studied the existing structure and pattern of legislation and regulation in India and identified the need for a Renewable Energy Law for India. The final report was submitted to Baker & McKenzie on schedule.

2. Collaboration with New Energy Foundation, Japan: WISE collaborated with the New Energy Foundation, Japan, for exploring the feasibility of a renewable energy-based micro-grid to serve areas not connected with the existing grid network. The project was once again undertaken under the Asia-Pacific Partnership on Clean Development and Climate. The R.E. sources explored were small hydro, wind, solar and biomass. Along with the site identification in a remote location in Maharashtra. The CPSR team was able to provide data and analytical support for pre-feasibility testing that would indicate the policy framework applicable for any future project of this nature. The collaboration was to the satisfaction of the visiting Japanese team over a period of time and is likely to continue.

3. Integrated Development of Durbuk Block (Leh District) using Renewable Energy Resources: This assignment was undertaken in collaboration with the Indo-Canadian Environment Foundation (ICEF), New Delhi, and the Final Evaluation Report was presented to ICEF / MNRE at a seminar in New Delhi, where representatives of the Ministry of Power were also present.

The *Centre for Policy and Sustainability Research* conducts futuristic policy level research of energy scenarios for enabling the transition to an energy secure and sustainable future. Besides, it also carries out policy advocacy by organising and conducting seminars and conferences related to critical sustainability issues, and documents and propagates international best practices for mainstreaming renewable energy in India.

OTHER ACTIVITIES

The *Centre for Policy and Sustainability Research* carried out considerable groundwork during the latter part of the year for the 'Climate Change India 2008' conference to be held in April 2008.

As part of the Centre's institutional efforts at wider dissemination of information, an article on 'Climate Change and its Impact on India' was published in a reputed Marathi journal dealing with environmental issues. Contributing to knowledge deepening within the institution, the Centre has been entrusted the responsibility of hosting brainstorming sessions for WISE's faculty, and senior and middle-level staff members on a variety of topics, on a bi-weekly basis.

FUTURE PROJECTS / CONSULTANCIES

i. Development of Clean Energy Technology Action Plans for Climate Mitigation: to be developed for 3 states in India and includes a policy dialogue with the state governments.
ii. Integrated R.E. based development in the Himalayan region.
iii. Carbon neutral company for corporate client.
iv. Solar and wind generation consultancy for corporate client.
v. R.E. Vision Puducherry: Third Report.
vi. Small hydro consultancy for corporate client.
vii. Power generation from biomethanation: strategic consultancy.

▶ Prof Sanjeev Ghotge, Sr. Fellow & Head, CPSR, WISE (extreme right) at the 100 kW Solar PV power plant in Durbuk Block, Leh, Ladakh.

◀ Solar dish-type cooker used in Leh, Ladakh.

The CPSR team (seated) with the visiting members from New Energy Foundation, Japan.

Centre for Regulatory Affairs

The *Centre for Regulatory Affairs* is focused on developing policy initiatives, and legislative, regulatory, and legal models for enabling the transition towards a clean, green, sustainable and energy secure future. It conducts hardcore research on regulatory issues that would aid in bringing about policy reform and works in close co-ordination with state electricity regulatory commissions for adopting measures to facilitate growth of sustainable energy in the country.

Current reforms in the power sector—especially after the enactment of the Electricity Act (EA), 2003, and subsequent National Electricity Policy and National Tariff Policy—have laid several enabling legal and regulatory provisions for promoting the renewable energy sector in India. The EA, 2003, for example, provides for policy formulation and mandates state electricity regulatory commissions to take necessary steps to promote renewable sources of energy within their area of jurisdiction. Most of the electricity regulatory commissions (ERCs) have come up with R.E. technology-specific tariff orders and have also issued RPS legislation in order to ensure a minimum percentage of renewable energy in the total energy mix.

The National Action Plan on Climate Change (NAPCC) released by the Prime Minister's Council on Climate Change has recommended the national renewables standard to be set at 5%, starting from 2009–10, to be increased by 1% for each subsequent year. The NAPCC also discussed the need for introduction of Tradable Renewable Energy Certificates to facilitate the Renewable Purchase Obligation effectively. Recognising the need for a holistic resource / knowledge centre in this critical area, WISE established the *Centre for Regulatory Affairs* in 2006–07.

The Centre thus aims to work in the areas of policy and regulation to facilitate development of renewable and sustainable energy in India. It also intends to provide institutional support to SERCs in a holistic and systematic manner for facilitating the transition to a sustainable energy economy. The Centre assists SERCs and State Nodal Agencies (SNAs) in the following activities:

- Formulating regulations for power procurement from renewable energy sources.
- Developing terms and conditions for determining tariff for renewable energy sources.
- Reviewing new tariff orders for procurement of power from renewable energy sources.
- Reviewing / designing of Renewable Purchase Obligation.
- Developing renewable energy policies for Indian states.
- Scrutinising Aggregate Revenue Requirement (ARR) filed by utilities with the ERC.
- Conducting training programmes in the areas of policy and regulation.

ACTIVITIES CARRIED OUT DURING 2007–08

ADVOCACY

Advocacy for a Renewable Energy Law for India

2007–08 saw the R.E. Law Advocacy Campaign speed ahead in the following ways:

Through Seminars: After the first seminar in August 2005 which spearheaded the R.E. Law movement in India, two more national seminars were held in 2007. While the second seminar was organised in March 2007 in New Delhi, the third was held in the current year, on 24 August 2007 in Chennai. Supported by the Vienna-based 'Renewable Energy and Energy Efficiency Partnership' (REEEP) and its Renewable Energy and International Law (REIL) project, the seminar sought to critique the model R.E. law, seek some more suggestions and tie up loose ends, so as to amend the draft law appropriately before submitting it to the Ministry of New and Renewable Energy (MNRE), Govt. of India, for processing into law. Some elite members from the government, renewable energy industry, academia, NGOs, etc., participated in this interactive seminar.

Through Networking with major NGOs and Industry Associations.

Through the Print Media: Major national mainline newspapers including the *Indian Express, The Hindu, Business Line, Deccan Herald,* etc., came forward to support the campaign through articles and editorial support.

Besides, WISE brought out a special issue of its bimonthly magazine *Green Energy* on the R.E. Law which was mailed to more than 5000 readers.

The third one-day seminar, 'Towards a Renewable Energy Law for India' was part of the nation-wide advocacy campaign to champion the cause of the R. E. Law and steer it towards its final destination...the Parliament. The seminar sought to critique the model R.E. Law and incorporate suggestions so as to amend the draft law appropriately, before submission to the Parliament.

Through the Internet: WISE launched an interactive website dedicated to the R.E. Law during the third national seminar in Chennai on 24 August 2007. A signing campaign was launched simultaneously which received good response from the public.

Through Parliamentary Advocacy: In November 2007, the Working Group on R.E. Law approached 300 Members of Parliament (both Lok Sabha and Rajya Sabha) seeking their support. The draft R.E. Law was also mailed to them. Many prominent Members of Parliament acknowledged receipt and promised to take up the matter further.

Submission of the Draft Law to MNRE: In August 2007, the draft Model R.E. Law was formally submitted to the Hon. Minister of State for New and Renewable Energy, Vilas Muttemwar, and the Secretary, MNRE, V Subramanian. Dr Pramod Deo, Chairman, MERC and Chairman of the R.E. Law Working Group along with the Member Secretary, R.E. Law Working Group and Director General of WISE, G M Pillai, personally submitted the draft law to the Hon. Minister at his New Delhi residence. Both the Minister and the Secretary promised to process the draft for government and Parliamentary approval.

BRAINSTORMING SESSION

Organisation of a Closed Door Session on 'Introduction of an REC Mechanism in India'

A closed door session on 'The Possible Introduction of a Tradable Renewable Energy Certificate (REC) Mechanism in India' was organised by WISE in August 2007 in Chennai. WISE conducted the study on the above topic in collaboration with Baker & McKenzie, Australia, as part of their project under the Asia-Pacific Partnership on Clean Development and Climate, with funding from the Australian and U.S. governments. The aim of the session was to discuss, analyse, and debate the importance and implications of introducing RECs in the country. The closed door session was extremely well attended by several senior policy makers and representatives of the renewable energy industry, including Chairmen of state electricity regulatory commissions; senior officials of MNRE, Govt. of India; and senior representatives of national and multilateral financial institutions, etc. Suggestions that emerged from the brainstorming session were incorporated in the study, which was brought out in November 2008 titled, 'Identifying Optimal Legal Frameworks for Renewable Energy in India'.

CONSULTANCY

A. Consultancy Support to Maharashtra Electricity Regulatory Commission (MERC)

As part of a 3 year agreement between WISE and MERC, WISE has been providing consultancy to the Commission for performing specific functions related to utility operations such as monitoring compliance of directives related to operational technical areas by the licensees, standards of performance, consumer grievances, energy accounting, energy auditing, load management, and DSM, etc. Four consultants from WISE have been posted in MERC for the period of the agreement. Some major activities carried out by WISE for the Commission during 2007–08 include:

- Assisting regulatory experts in preparation of more than 30 draft orders in matters of petitions filed by the consumers, utility disputes, zero load shedding proposals, renewable energy related matters, etc. WISE has also provided assistance on issues related to renewable energy and RPS implementation.
- Drafting objection report for Maharashtra State Electricity Distribution Company Limited's Multi-Year Tariff order and MSEDCL's ARR order .
- Preparing tariff schedule of distribution licensees.
- Preparing detailed report including replies to Ministry of Power / Forum of Regulators with respect to examination of the following subject, *Role of CERC and SERCs in protection of interests of consumers* by the Parliamentary Standing Committee on Energy.

The R. E. Law Media Campaign sought to generate awareness regarding the significance of a legislation for accelerated development of renewable energy in the country. It aimed to garner maximum public support through an exclusive signature campaign for putting in place a renewable energy law for the country. Several mainline newspapers came forward to support WISE's initiative and spread the renewable energy word amongst the masses through hard-hitting editorials and articles.

- Summarising the Commission's orders for Annual Report of FY 2006–07 and 2007–08.
- Making presentations on various regulatory issues.
- Drafting press notes and public notices on various regulatory matters.

B. Consultancy Support to Punjab State Electricity Regulatory Commission (PSERC)

The *Centre for Regulatory Affairs* participated in the tender issued by Punjab State Electricity Regulatory Commission in October 2007 for finalising renewable power procurement regulation and fixation of tariff for renewable energy sources (wind / biomass / small hydro projects / co-generation) in Punjab. WISE was shortlisted by PSERC for award of the contract. Thereafter, the Government of Punjab directed the Commission to continue the tariff mentioned in the R.E. policy issued by the Department of Science and Technology and stop the tariff determination process initiated by the Commission. The Commission will initiate the process at an appropriate time.

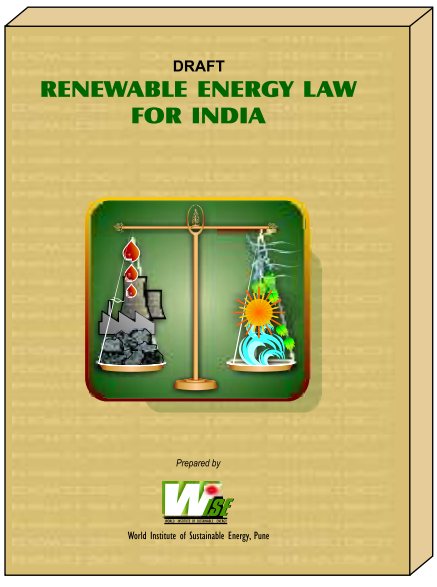
PROJECT

Fixing Intra-state Electricity Trading Margin for Maharashtra

The Electricity Act, 2003, provides for intra-state and inter-state trading of electricity with a cap on trading margin by regulator, if required. In this regard, MERC approached WISE to analyse and determine the electricity trading margin for Maharashtra. The scope of work included: collecting data from different electricity utilities, developing methodology for determination of trading margin, calculating and recommending the electricity trading margin for Maharashtra and writing the report.

FUTURE ACTIVITIES

- Some of the state electricity regulatory commissions have requested WISE to conduct short-term training programmes / seminars for addressing certain critical issues in the field of regulation. WISE will be conducting such training programmes aimed at providing specific knowledge in the areas of Renewable Purchase Obligation, matters related to utility operations, and tariff fixation for R.E. projects.
- Participation in World Bank assignment in the area of development of R.E. Policy and Regulation.
- Organising a national level conference, 'R.E. Power Regulation India'.
- Consultancy support to SERCs in the areas of R.E. tariff fixation, RPS and R.E. Policy.



Centre for Wind Power

The *Centre for Wind Power* possesses a high level of expertise in wind power development. It seeks to function as the nodal centre for augmenting the growth of the wind industry in India by strengthening industry-institution linkages, streamlining information dissemination and undertaking collaborative partnerships with global players for project development, human resource development and policy research in the wind sector.

The core activities of the *Centre for Wind Power* (CWP) are :

- Organising short-term and long-term training programmes in the areas of wind resource analysis, wind power management, etc., for wind industry professionals, academicians, students, and policy makers.
- Providing consultancy services to project developers, investors, industries, research institutes, investors, state nodal agencies, power utilities, regulatory commissions, etc., for:
  - Due diligence—independent evaluation for wind resource, project financing, technical and policy issues.
  - Evaluation of techno-economic offers for investors.
  - Preparation of pre-feasibility reports, feasibility reports, and detailed project reports for wind power projects.
  - Wind resource assessment, micrositing, and wind farm design.
  - Performance analysis of wind turbines and wind farms.
  - Financial advisory for setting up wind power projects.
  - Knowledge management for wind power projects.
- Offering policy support to state electricity regulatory commissions, state nodal agencies etc., for promotion of wind power technology.
- Conducting research and development studies, surveys, as well as analytical inputs for wind power development.
- Conducting knowledge exchange workshops and seminars with the academia and industry.
- Organising 'Wind India', the country's only biennial conference and exhibition focusing on wind power development in India. It was launched in 2006.

In line with WISE's objectives, the following activities were carried out by the Centre during 2007–08.

PROJECTS

Assessment of the potential and implications for retrofitting or repowering of wind turbines: To be carried out at two sites viz. Aralvomozhi and Palghat Pass in Tamil Nadu, the project is sponsored by the Ministry of New and Renewable Energy, Govt. of India, and was awarded to WISE in March 2007. The study is expected to be completed by September 2008.

TRAINING

WISE has signed a multi-year MOU with Vestas Wind Technology India Pvt. Ltd., Chennai, to provide customised training to its employees on various business and technology aspects related to wind power. As per the MOU, the *Centre for Wind Power* has conducted seven training programmes during this year for around 162 wind power professionals of the company. These include, three induction level programmes and four subject-specific programmes for middle level managers of the Projects, O&M, and customer relationship management (CRM) teams of Vestas India. Details of the programmes are provided in the table below.

Training Programmes Conducted by the *Centre for Wind Power* for Vestas India

Sr. No.	Date	Topic	No. of Participants	Venue
1	2–4 Aug 2007	Induction Training Programme	23	Chennai
2	11 Oct 2007	Power Factor Improvement	27	Chennai
3	12–13 Oct 2007	Balance of Plant Maintenance	30	Chennai
4	1–3 Nov 2007	Wind Power Project Development	22	Pune
5	22–24 Nov 2007	Induction Training Programme	12	Chennai
6	13–15 March 2008	Induction Training Programme	33	Chennai
7	28–29 March 2008	Failure Mode Effect Cause Analysis	15	Chennai

Participants at the 'Balance of Plant Maintenance' training programme held on 12–13 October 2007 in Chennai.

Vestas India employees engrossed in a session during the 'Wind Power Project Development' programme held on 1–3 November 2007 at the WISE office, Pune.

CONFERENCE

In 2006, WISE launched 'Wind India', the-first-of-its-kind event in the country on wind power development. The event was organised in Pune and around 250 national and international delegates attended this event. Inspired by its success, WISE decided to hold this event on a biennial basis. The Centre initiated the planning of the next event i.e. 'Wind India 2008' to be held in Chennai on 25–26 November 2008. The preparatory activities for this mega international event started this year.

COLLABORATIONS

A. MoU with Science and Technology Park, University of Pune

Science and Technology Park (STP), University of Pune, and WISE signed a memorandum of understanding on 18 February 2008 for co-operation in the field of sustainable energy. STP is mainly engaged in providing support to projects and investors in diversified areas such as communications, environment, green buildings and energy, including renewable energy. As per this MoU, WISE will be offering its techno-commercial services on sustainable energy solutions for the joint projects to be developed in the next three years. The *Centre for Wind Power* was actively engaged in this activity.

B. Collaboration with DUWET, Denmark

CWP is in discussion with the Danish University Wind Energy Training (DUWET), Herning, Denmark, for a collaboration on technical training and other assignments. As per discussions, WISE and DUWET will jointly conduct technical and R&D-based training programmes on wind power development in India. Faculty support will be provided by DUWET which has more than 250 researchers on its board from three Danish Universities.

INTERNATIONAL VISIT

Rajendra Kharul, Fellow & Head, Centre for Wind Power, and Milind Deshpande, Manager (Admin & Accounts), WISE, visited RISØ National Laboratory, Denmark—the largest wind energy research laboratory in the world—from 20–22 September 2007. The purpose of the visit was to acquire in-depth understanding of RISØ's various activities. The Test and Measurement Programme of the Wind Energy Division, RISØ National Laboratory, also operates a test station for large wind turbines at Høvsøre on Jutland's west coast. The station verifies both performance and the wind turbine design bases for all operating conditions relevant to large wind turbines. The test station operates five test beds for wind turbines.

PROJECT INTERNSHIP

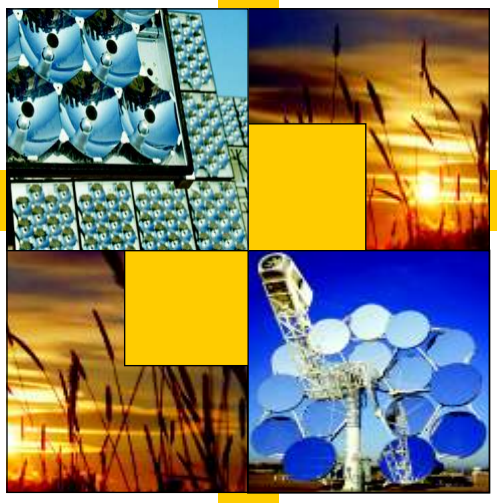
Paritosh Kanade, a student in B.Tech (Agriculture Engineering) from the Mahatma Phule Agriculture University, Ahmednagar, did his three month project on 'Study on Wind-SPV hybrid systems as decentralised power supply solutions for agricultural farms in Maharashtra' from 4 May–30 June 2007 with the *Centre for Wind Power*.

FUTURE ACTIVITIES

Future activities of the *Centre for Wind Power* include:

1. Organising 'Wind India 2008', international conference-cum-exhibition in November 2008.
2. Conducting an exclusive survey of the Indian wind market and publishing it as a report.
3. Taking up R&D on Wind Energy Forecasting.
4. Offering advisory services to investors for setting up of renewable energy and wind projects.

Centre for Solar Energy



The *Centre for Solar Energy* aims to facilitate integrated development of the solar energy sector in India by conducting training programmes, undertaking research activities, and offering consultancy services to stakeholders. Besides undertaking in-depth technology assessment and providing human resource development support to the solar industry in India, the Centre also extends its corporate investment advisory services to the solar sector.

The *Centre for Solar Energy* was established in December 2006. Its core objectives are:

- To document global best practices in solar energy policy and technology deployment, assess their suitability to the Indian environment, and advocate their implementation in the country.
- To develop a long-term Solar Energy Policy Roadmap for the country and follow up its implementation.
- To develop state-wise profiles for rapid deployment of solar energy wherever possible.
- To facilitate human resource development in the solar energy sector through curriculum development and training.
- To carry out research, surveys and analytical studies for the solar energy sector.
- To offer consultancy services to entrepreneurs, developers, industries, institutions, government agencies, regulatory commissions, etc., for the growth of the solar energy sector.

During the year under review, the Centre carried out the following activities:

CONFERENCE

Organising 'Solar India 2007'

India's premier conference-cum-exhibition on solar energy, 'Solar India 2007' was organised by WISE at NIMHANS, Bangalore, on 19–20 July 2007. The event was supported by the Ministry of New and Renewable Energy (MNRE), Govt. of India, state nodal agencies, a wide cross-section of experts from the global and Indian solar energy industry, financial institutions, the academia, etc.

Around 400 national and international delegates which included solar industry professionals, government officials, regulators, investors, financiers, academicians, consultants, etc., participated in the conference. It highlighted global best practices in the areas of innovation in policy, regulation, financing, market development and awareness creation, besides continued R&D. Case studies of innovative financing and grassroots market development from across India were presented. Panel discussions to suggest recommendations to the government and initiate innovative policy measures for encouraging the growth of the solar energy sector in the country were also held. A poster session on technical papers particularly focusing on emerging technologies in the solar energy sector was part of the conference.

About 36 exhibitors from the solar sector, including solar equipment manufacturers, service providers, major deployers, investors, financiers, component suppliers, state nodal agencies, publishers, media, etc., from all over the country and abroad took part in the 'Solar India 2007' exhibition. The exhibition highlighted state-of-the-art technologies, R&D, and major innovations and applications in the solar energy sector.

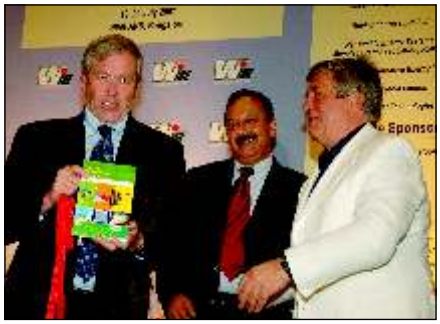
The 'Proposed Policy Roadmap for Solar Energy Development in India' was unveiled by the Minister of State for New and Renewable Energy, Govt. of India, Vilas Muttemwar at the conference.

POLICY

Drafting an 'Innovative Solar Policy for India'

To carry forward the 'Solar India' initiative on the policy front, 'The National Working Group for an Innovative Solar Policy in India' was constituted by WISE in August 2007. The creation of the Group had the blessings of the Ministry of New and Renewable Energy, Govt. of India. It comprises thirteen senior-most representatives from WISE, the government, and the solar industry, and is chaired by Ajai Vikram Singh, Former Secretary to Government of India in the Ministries of New and Renewable Energy and Defence. The Group began work on drafting an innovative policy for solar energy development in India. Four committees were set up in the areas of solar PV, concentrating solar thermal, HRD and finance. The sub-committees were mandated to take up detailed study in each of the areas allotted

S P Gon Chaudhuri (second from right), Director, WBREDA, one of the seven awardees honoured at 'Solar India 2007' for his contribution to the solar energy sector in India. Also seen (*from R to L*) are Dr Hermann Scheer, renowned renowable energy specialist; V Subramanian, Secretary, MNRE; and G M Pillai, DG, WISE.



Geoff Stapleton (extreme left), one of the authors of the book, 'The Solar Entrepreneur's Handbook', along with the dignitaries, at the release of the Indian edition of the Handbook published by WISE.

Delegates attending a session during 'Solar India 2007'.

to them. Extensive country-wide consultative process was also undertaken. The task involved extensive data collection, studying techno-economics, legal and regulatory issues, etc., and is intended to be completed in about a year.

PROJECTS

A. Conducting 'Techno-economic Evaluation of Solar Power Generation Technologies'

In December 2007, the Ministry of New and Renewable Energy, Govt. of India, entrusted WISE with an important project in the field of solar energy. The project was titled 'Techno-Economic Evaluation of Solar Power Generation Technologies for Determination of Model Tariffs and other Incentives'. The objective of the project was to make a techno-economic survey of various solar power generation technologies that are being deployed around the world as knowledge of deployment of these technologies in India is still at the preliminary level. It was thus found necessary to fill the gap between the scientific and technological knowledge and the actual solar power project development requirements.

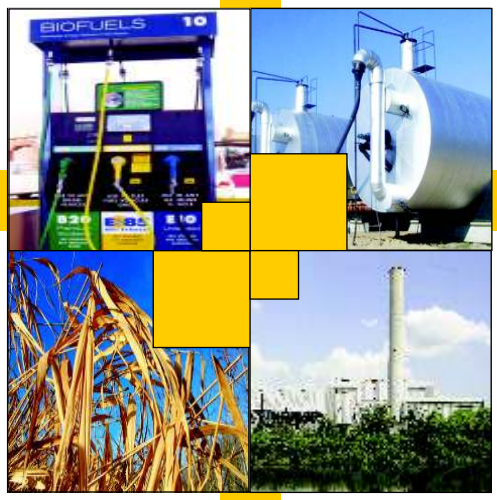
The report—which is the output of the project—is intended to capture and analyse the performance of eleven different combinations of solar power technologies with the analysis based on solar radiation data for two test sites, namely Jodhpur in Rajasthan and Nagpur in Maharashtra. A number of manufacturers of solar systems, educational institutes and consultants in the field were contacted for practical data collection. Performance of some of the solar power generating projects in Spain were observed by visiting the plants. The finalisation of the project is expected to be completed in the next financial year.

B. Preparing Detailed Project Report for Solar Cookers

In March 2008, the *Centre for Solar Energy* was assigned an important project under the 'Total Energy Security Mission' (TESM) programme initiated by the Government of Kerala. As part of this programme, a detailed energy plan preparation to assess the local energy needs at the panchayat level was undertaken by the Agency for Non-Conventional Energy and Rural Technology (ANERT), Kerala. The Centre is currently preparing a detailed project report (DPR) and tender document for solar cookers using Scheffler technology and solar steam cooker for community cooking. This project is slated for completion in 2008–09.

A view of some of the stalls at the 'Solar India 2007' Exhibition

Centre for Bioenergy



The *Centre for Bioenergy* was formally established in early 2008 to provide knowledge-based cutting-edge solutions in diversified areas viz. biogas, liquid biofuels, biomass and waste-to-energy, to industries, regulatory bodies, government organisations, urban local bodies (ULBs), NGOs and other development agencies, in order to achieve sustainable development.

The *Centre for Bioenergy* (CBE) focuses on the following six major areas:

1. Consultancy: The Centre provides concept-to-commissioning consultancy services across all fields of bioenergy related projects. These include, inventorisation, techno-economic feasibility studies, rural development studies, detailed project reports, appraisals, etc.

2. Project Development and Advisory Services: The Centre facilitates government agencies, industries, funding agencies and private entrepreneurs in various decision making processes related to bioenergy projects. The art of effective project structuring requires balancing the interests of the diverse stakeholders, addressing legal and regulatory issues, and capital structuring, apart from proposing technically sound and environmental friendly solutions. CBE formulates all such work which is then converted into contracts that clearly define the roles, responsibilities, and risks allocated to each stakeholder.

3. Bioenergy Planning and Client Engineering: The planning and engineering services provided by CBE include master planning, bioenergy infrastructure planning, detailed project reports, and design and engineering. The Centre works with clients to develop sustainable bioenergy master planning solutions for developments that are planned in phases, taking into account land use, the programme of users, location, topography, environmental impacts, business objectives, etc.

4. Bioenergy Project Management: Project Management is the application of the acquired knowledge and skills using a formal set of tools and techniques to initiate, plan, execute, monitor, control and close projects in time. In practice, CBE follows a phased approach for monitoring and evaluation of bioenergy project execution. i.e. erection and commissioning.

5. Capacity Building: The principal objective of capacity building services is to improve the quality of decision-making, sector efficiency and managerial performance. CBE combines its wide-ranging experience in bioenergy and its depth of HR consultancy to offer customised solutions to improve the capabilities of people, processes and institutions in rural and urban environments.

6. Outreach: The Centre's outreach programmes aim to strengthen networking with industries, statutory bodies, professional societies, funding agencies, bilateral and multilateral organisations, etc., through national and international conferences, workshops and publications.

Activities carried out during 2007–08 are:

A. As part of the Total Energy Security Mission (TESM) programme, the Agency for Non-Conventional Energy and Rural Technology (ANERT), Govt. of Kerala, engaged WISE for consultancy services in the following areas:
   - Biogas plants for diversified feedstocks which include fruit and vegetable waste, slaughter house waste, kitchen waste and combination of these.
   - Biomass gasifiers for electric and thermal applications for multifeed stocks, viz. wood chips, sawdust, palm bunches, coconut shells, etc.
   - Biomass gasifiers for crematoriums.

   While working on the above assignment, the Centre planned to undertake similar projects in other parts of the country. It also planned to carry out feasibility studies followed by detailed project reports on waste-to-energy projects for various ULBs.

B. The Centre in collaboration with the Centre for Policy and Sustainability Research (CPSR), WISE, carried out the planning of a feasibility study on availability of potential biofeed stocks in select states of India. The study is part of a British High Commission project and in course of time, would be extended to other states too.

C. By partnering with the New Energy Foundation, Japan, another synergistic task planned by CPSR and CBE during the current year was to carry out a detailed survey-cum-feasibility study for setting up a small biomass or biodiesel-based power plant in any village in Nandurbar district, Maharashtra.

Centre for Human Resource Development

In today's energy-driven world where technology innovation reigns supreme, continued upgradation of human resources is a prime necessity. The *Centre for Human Resource Development* strives to meet the growing demands of the rapidly developing sustainable energy sector in the country by conducting long-term and short-term training programmes, conferences and seminars, aimed at capacity building of personnel from this sector.

The core activities of the *Centre for Human Resource Development* are:

- Organising training programmes / conferences / seminars that would act as a catalyst in influencing policy decisions and bring about reforms to facilitate development of renewable energy.
- Conducting in-house training for WISE personnel so as to enhance capacity building and create core competencies within the institute.

During the current financial year, the *Centre for Human Resource Development* was responsible for providing complete logistical and administrative support, including necessary pre-event follow-up, actual organisation of the event and post-event wrap-up activities to the various conferences, seminars and training programmes organised by WISE. These are as follows:

- 'Solar India 2007' conference-cum-exhibition, 19–20 July 2007, Bangalore (Refer Pg. No. 8 for details).
- Third Seminar on a 'Renewable Energy Law for India', 24 August 2007, Chennai (Refer Pg. No. 3 for details).
- 'Introduction of a Tradable Renewable Energy Certificate Mechanism in India', 24 August 2007, Chennai (Refer Pg. No. 4 for details).
- Seven training programmes for wind power professionals from Vestas Wind Technology India Pvt. Ltd., Chennai (Refer Pg. No. 6 for details).

WISE-USAID REGULATORY TRAINING SERIES

The *Centre for Human Resource Development* began the preparatory work for a series of training programmes to be conducted in the next financial year, in collaboration with the U.S. Agency for International Development (USAID) under its Distribution Reforms Upgrades and Management (DRUM) project. The training programmes would focus on regulatory and policy issues for officials and members of state electricity regulatory commissions, transmission and distribution companies, financial institutions, etc., from all over the country, and would take place in different locations within India.

Centre for Communications

The *Centre for Communications* is the vital link in the information dissemination pathway that connects WISE to the outside world. Its three modes of communication, namely publications, information and technology, and the library and documentation centre, work in tandem to enrich the process of knowledge transfer and create in-depth awareness regarding critical issues of sustainability and renewable energy development.

PUBLICATIONS

Green Energy

Green Energy, WISE's widely acclaimed bimonthly magazine on sustainable energy entered into its fourth year of publication. With its rich content ranging from news, views and in-depth information to critical analysis of issues pertaining to the sector, the magazine continued to spread the 'green' message to a wider audience. The growing subscriber base has proven to be a definite pointer to the wide popularity enjoyed by the magazine.

Six issues of the bimonthly magazine, starting from the May–June 2007 issue to the March–April 2008 issue were brought out this financial year. Of these, the July–August 2007 and March-April 2008 issues were special volumes brought out in connection with international conferences organised by WISE. *Green Energy* Sept–Oct 2007 was a special issue brought out for advocating introduction of an R.E. Law for India.

The July-August 2007 special issue on solar energy was released at 'Solar India 2007'. The exclusive issue featured fascinating global initiatives, policies and futuristic ideas required to propel this sunrise industry forward. With experts from the solar sector providing in-depth essays, the issue made for some very exhaustive reading. Apart from regular subscribers, the comprehensive volume also drew accolades from delegates attending the two-day conference.

The importance of renewables in ensuring future energy security for India coupled with the inadequacy of earlier legislation to holistically address issues related to production of energy from renewables, spurred WISE to undertake the preparation of a model Renewable Energy Law for India, and pursue it to its logical conclusion, viz. adoption by the Parliament. Following WISE's declaration of 2007 as the *Year of the R.E law for India*, the Sept-Oct 2007 issue of *Green Energy* was dedicated to spreading awareness regarding this initiative. The various essays and write-ups in this issue amply demonstrate the relevance, timeliness and importance of this initiative. The global experience and the impact of the R.E law in different countries were also dealt with in great detail.

Another collector's volume was the March–April 2008 issue on climate change, exclusively brought out in connection with the 'Climate Change India 2008' conference organised by WISE. With its special emphasis on India, the magazine covered the whole gamut of issues relating to climate change, from the science and impacts, to mitigation and adaptation measures and possible policy directions. While portraying the challenges posed by this imminent crisis, the issue sent a strong wake-up call to the powers-that-be to tackle the climate change crisis with utmost urgency.

In the regular issues, one of the special features included the newly introduced 'Spotlight' section dealing with topical issues influencing the growth of the R.E sector. Besides featuring news and happenings on R.E development across the globe, the issues focused on policy and regulation and also offered tips for a 'greener' lifestyle. Books related to renewable energy, conventional energy and various allied sectors were critically reviewed.

Annual Report

The *Centre for Communications* was responsible for publication of the Annual Report for the year 2006–07, which was highly appreciated by one and all.

PUBLICITY

Networking with the Media

The *Centre for Communications* has been closely working with both the print and electronic media to generate awareness regarding its myriad activities. The Centre was thus instrumental in providing publicity to major conferences and seminars organised by WISE, including 'Solar India 2007', 'Climate Change India 2008', and the 'Third Renewable Energy Law Seminar' held in August 2007.

A few brochures designed by the Centre for Communications

Homepage of the 'R. E. Law' website

Printing of Publicity Material

- The Centre designed and printed brochures to publicise major conferences and events taking place this year. These included an Event Announcement Brochure and Conference Brochure brought out in connection with 'Solar India 2007' and a Conference Brochure for 'Climate Change India 2008' .
- The WISE Information Brochure was updated incorporating the latest developments in the organisation.
- A special library brochure was designed and printed that provided information on the WISE library, arguably the greenest in India.

Homepage of 'Solar India 2007' website

INFORMATION TECHNOLOGY

Through constant technological upgradations, the Information Technology (IT) division attached to the *Centre for Communications* works to enhance the process of information dissemination. During the current year, the division developed many new applications and websites intended to maximise WISE's reach to a larger audience.

Software Development

Email Campaign Manager: The sophisticated Email Campaign Manager Web Application developed in-house enables the creation, management and dissemination of thousands of emails at the click of a button.

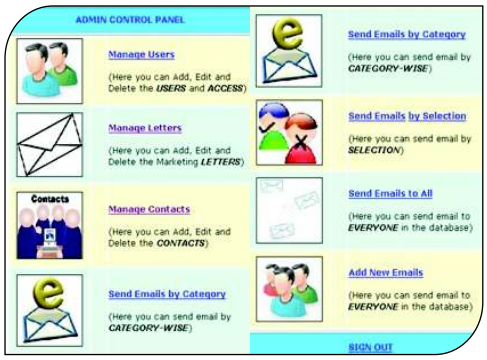
Green Energy archives page on the WISE website

Website Development

A. Renewable Energy Law Website: This website was launched in August 2007 to create awareness regarding the Renewable Energy law drafted by WISE. Besides providing background information regarding the draft law, the website also features a unique signature campaign aimed at generating support for the law.

B. Solar India 2007 Conference Website: The IT division developed the website for 'Solar India 2007', complete with pre-conference and post-conference details.

WISE's website which was created in-house was periodically updated and upgraded incorporating the latest happenings taking place in the organisation.



Email Campaign Manager

Information Dissemination

The IT division is responsible for maintaining and mailing the e-copy of WISE's bimonthly publication, *Green Energy.* Started in 2006, the e-copy today enjoys a dedicated readership of more than 500 individuals and organisations from all over the world.

LIBRARY AND DOCUMENTATION CENTRE

The Library and Documentation Centre at WISE houses a comprehensive and specialised collection of 'green' books, periodicals, reports and audio-visuals from all over the world that provides indepth understanding and holistic knowledge on energy and the environment and plausible solutions to help in carve the way for the transition to a sustainable future.

The state-of-the-art library boasts of 1490 titles of books, 53 current periodicals, and 48 titles of audio-visuals.

The core subject areas and its sub-categories are as follows:

SUSTAINABLE ENERGY

- Sustainable Energy (General)
- Bioenergy
- Solar Energy
- Wind Energy
- Hydrogen/Fuel Cells
- Other Renewables
- Rural Energy
- Co-generation

CONVENTIONAL POWER

- Electrical Engineering (General)
- Hydro Power
- Thermal Power/Coal and Gas
- Nuclear Energy
- Oil
- Transport
- Energy Efficiency/Conservation
- Energy Storage
- Energy Finance
- Policy, Reforms and Regulation

ENVIRONMENT & SUSTAINABLE DEVELOPMENT

- Environmental Philosophy
- Sustainable Development (General)
- Environmental Economics
- Sustainable Agriculture
- Water
- Biodiversity
- Green Building/Green Architecture
- Material Science
- Restoration Ecology
- Wild Life and Animal Ecology
- Futurology
- Climate Change
- Environmental Education/Training
- Environmental Engineering
- Environmental History
- Environmental Law/Legislation

- Globalisation
- Information Technology
- Nanotechnology
- Library and Information Science
- Management
- Economics
- General
- Reference

The WISE Library subscribes to the following leading national and international periodicals:

1. Akshay Urja
2. Bija
3. Biodiesel Magazine
4. Bioenergy Business
5. Biofuels India
6. Business India
7. Current Science
8. Dams, Rivers & People
9. Digit
10. Down to Earth
11. Economic & Political Weekly
12. Electrical India
13. Energy Security
14. Environmental Finance
15. Human Capital
16. India Green File
17. InWind Chronicle
18. IREDA News
19. Leisa India
20. New Energy
21. North American Wind Power
22. Nuclear India
23. Outlook
24. PCQuest
25. Power and River Valley Development
26. Power Line
27. Project Monitor
28. Project Vendor
29. PHOTON International
30. Refocus
31. Regen
32. Regulateri
33. Renewable Energy World
34. Repsovision
35. Resource, Energy and Development
36. Resurgence
37. Scientific American India
38. SESI
39. SUNergy: Solar Quarterly
40. Sun & Wind Energy
41. TERI Newswire
42. Teriscope
43. TerraGreen
44. The Ecologist
45. The Economist
46. Third World Economics
47. Third World Resurgence
48. TIDEE (TERI Information Digest on Energy and Environment)
49. WindBlatt
50. Wind Directions
51. Wind Power Monthly
52. Windpro
53. World Watch

Status of Books / Periodicals / CDs for 2007–08		
Total number of books purchased in 2007–08	:	197
Total number of books available	:	1490
Total number of periodicals available (41 subscribed and 12 complimentary)	:	53
Total number of CDs available	:	48

WISE Press

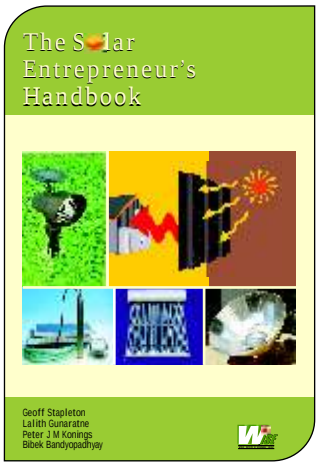
***WISE Press* aims to fill the knowledge-deficit gap emanating from lack of accurate technical information and non-availability of analytical research studies on subjects related to the renewable energy sector. The Centre conceptualises and publishes pioneering books that provide a structured and wholesome understanding of the sector, leading to an energy secure future.**

Commensurate with the first objective of WISE, namely 'To be a premier outreach centre for communications, information and knowledge transfer in the fields of sustainable energy, sustainable development and energy conservation', *WISE Press* seeks to publish books that are 'agents of change', books that promote sustainable energy through increased understanding and practical know-how. Leading experts with first-hand and continuing involvement with their topics of expertise are chosen, by invitation, to write for *WISE Press*.

Books from *WISE Press* are produced to meet high standards, not only in terms of contents but also in terms of production quality: durable and high-quality binding, attractive covers, and superior paper. The Press does its own marketing and sales promotion, and its books are almost always sold directly to customers and seldom through book dealers. In 2007–08, the following activities were undertaken by *WISE Press*:

BOOK PUBLICATION

The Solar Entrepreneur's Handbook



As planned, the Indian edition of *The Solar Entrepreneur's Handbook* was published in September 2007. Originally published by Global Sustainable Energy Solutions in Australia, the book is a practical guide aimed at those who own solar energy businesses and provides all the basic information required to get started. It also gives information on how to develop one's technical and business skills further.

The Indian edition contains a specially commissioned chapter contributed by Dr Bibek Bandyopadhyay, who heads the Solar Energy Centre of the Ministry of New and Renewable Energy, Government of India, and a foreword by Professor Chaman Lal Gupta, the doyen of solar energy research in India. The original publisher supplied the text and figures in Microsoft Word, which were copy-edited, revised as required, and the book was designed afresh and issued as a hardbound volume with a new cover. The book is selling well, and response to the first round of direct-mail marketing, targeted at private companies, is very encouraging.

A Solar Future for India

The preliminary work of conceptualising the structure and recruiting suitable authors was completed for a comprehensive volume titled, *A Solar Future for India*, which is slated for publication next year.

OTHER ACTIVITIES

Publicity and Marketing

More reviews of WISE's book, *Wind Power Development in India* appeared during the year, including those in *Current Science*, *Down to Earth*, and *Project Monitor*. A full-page, colour advertisement for the book was published in *Sun and Wind Energy* on a reciprocal basis (the magazine being advertised in *Green Energy*), and orders were received from Germany, Spain, Mexico, and Sweden.

'Solar India 2007' Souvenir

WISE Press played a major role in bringing out the Conference Souvenir for 'Solar India 2007'.

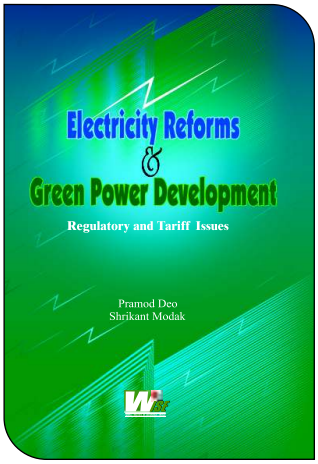
Format for Project Reports

As the institute's portfolio of projects continues to expand, it is desirable that all its project reports conform to a standard that will set project reports from WISE apart from those of other agencies and will reinforce its unique and distinct identity. Accordingly, a format was developed and standardised for all project reports from the institute to build and promote its 'brand identity'. Initial reactions to the design and format of the report have been favourable.

The forthcoming book from *WISE Press*, 'Power Drain: Hidden Subsidies to Conventional Power in India', exposes the truth regarding the heavy subsidies enjoyed by conventional energy sources and how they never appear in public accounts as they are hidden. Based on an exhaustive study of 19 representative power projects (hydro, coal-based thermal and gas-based thermal) from the public and private sectors that were commissioned or initiated in the decade preceding the Electricity Act, 2003, the book aims to demolish two myths—that renewable power is subsidised and that it is expensive.

THE WISE PRESS COLLECTION

Electricity Reforms and Green Power Development: *Regulatory and Tariff Issues*



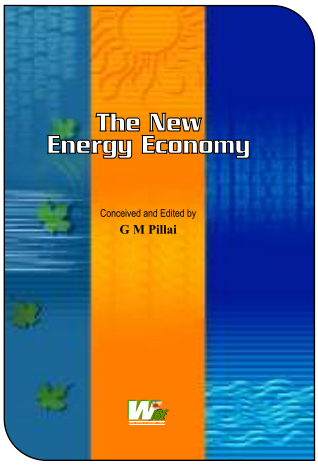
This was the first book released by WISE Press in January 2005. The book focuses on the need for an appropriate tariff regime and policy framework for encouraging renewable energy development in India.

In 2003, the Parliament passed the new Electricity Act, 2003, aimed at drastically reforming the power sector in India. By this time, some of the renewables had achieved economic viability. Even so, a suitable tariff regime and policy framework was required to overcome barriers to their commercialisation.

Encouraged by the new scenario, two state electricity regulatory commissions, Maharashtra and Andhra Pradesh, set out to formulate an approach to address the issues relating to grid interconnection and tariff. Much of this book is devoted to critically analysing the larger issues arising from the pioneering orders of these regulatory commissions.

The book also elaborates on the technological and regulatory issues in India and abroad, with a focus on the structural reforms underway in the electricity sector. The book is a must-read for policy-makers, stakeholders from the energy sector, academicians, researchers, consultants, and all those interested in renewable energy development in India and elsewhere. The authors of the book are Dr Pramod Deo, Chairman, Maharashtra Electricity Regulatory Commission (MERC) and Shrikant Modak, Deputy Editor, Business India.

The New Energy Economy

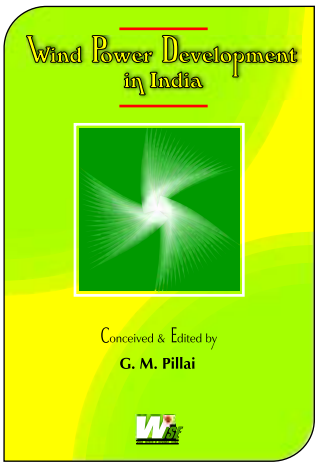


This was the second book to be published by WISE Press. The book is a trendsetter and a pointer to the future of the energy sector in the next few decades. Scientific estimates predict that by 2050, about 40% to 50% of grid power used by humans would come from renewable sources. The book surveys this epochal transformation globally, with a special focus on India.

Holistic and comprehensive, the book surveys the diverse facets of the emerging new energy economy. It looks at major trends underway, like in wind power generation, small hydro power, and biomass-based energy. There are many emerging new energy technologies such as hydrogen-based fuel cells, solar concentrating technology, decentralised stand alone off-grid systems, etc., about which very little information is available in the country. The book focuses on these state-of-the-art technologies and their futuristic potential. Other vital issues covered include, energy conscious and green architecture, energy conservation in the context of the Energy Conservation Act, 2001, transportation energy, regulatory and policy issues resulting from the Electricity Act, 2003, problems of financing the sector, and human resource development. International policy instruments like the clean development mechanism and carbon trading are critically examined, as they promise to boost development of these new technologies in developing countries.

The participant authors who have contributed essays are well-known experts in their own fields, drawn from senior-most levels of the academia, industry, non-governmental organisations, and the government. G M Pillai, Director General, WISE, is the editor of *The New Energy Economy*.

Wind Power Development in India



A transition to renewable energy has become imperative due to the converging crises of increasing fossil fuel prices, their projected extinction in the next few decades, and climate change. World over, the transition has begun and wind power is leading it. The amazing growth of wind power in the last ten years is attributable to a multiplicity of enabling factors, including the evolution of a conducive policy and regulatory framework. We are re-inventing an old, reliable, and green energy source in the run-up to a post-fossil fuel world. That green source is wind—and India now ranks 4th in the world in terms of installed capacity derived from that source, which makes the book especially timely.

Wind Power Development in India is the first-ever comprehensive attempt to place wind power in the Indian context and to deliberate on issues and actions needed to sustain this growth in the future. What makes the book truly comprehensive is the breadth of its coverage, which ranges from the history of wind power development in India through technical issues such as assessment of wind resources, certification of wind turbines, indigenisation, wind R&D worldwide, and offshore wind energy; practical considerations such as integration of wind farms into the power grid, operation and maintenance, forecasting, and small and micro turbines; and financial matters such as economics of investment, perceptions of investors and lenders, the clean development mechanism (CDM) as additional revenue stream, and regulatory and tariff regime; to social facets such as human resources and capacity building, socio-economic impacts, and environmental impacts. The concluding chapter presents an overview of global experience and a roadmap of the immediate future for India.

With contributions from leading experts with first-hand experience and continuing involvement with their subject, *Wind Power Development in India* is essential background reading for investors, policy-makers, administrators (of nodal agencies, electricity boards, and private power companies), staff of wind power sector companies, and postgraduate students on all aspects of using wind energy to generate electricity. There may be other Indian books on wind power technology—this is the only one on wind power development. The book is conceived and edited by G M Pillai, DG, WISE.

Ramesh Kymal, Chairman, CII-Godrej Green Business Centre, Hyderabad, and the Indian Wind Turbine Manufacturers' Association, delivering the inaugural address at the third Renewable Energy Law seminar held on 24 August 2007 in Chennai. Seated *(L to R)* are G M Pillai, Director General, WISE; and Lily Mathews, Senior Associate, REEEP/REIL, Vienna .

(From L to R): Ashley Stafford, Senior Representative, Baker & Mckenzie, Australia; Dr Pramod Deo, Chairman, MERC; V Subramanian, Secretary, MNRE, GoI; and G M Pillai, Director General, WISE, at the closed door session on 'The Possible Introduction of a Tradable Renewable Energy Certificate Mechanism in India' organised by WISE in collaboration with Baker & Mckenzie in August 2007 in Chennai.

About WISE

The World Institute of Sustainable Energy (WISE) is a not-for-profit institute set up in June 2004 to promote sustainable energy, energy conservation, and sustainable development. In particular, the institution is committed towards addressing the shortcomings existing in the sustainable energy sector in India, viz. lack of policy support and incentives, lack of legislative and research support, lack of qualified manpower, and lack of critical awareness that would lead to the transition to a sustainable energy-based economy. Since its inception, WISE has pioneered several initiatives for accelerating the development of sustainable energy in the country. Some of these include:

- Drafting of a model Renewable Energy Law for India and its advocacy. This effort gained wide national and international support.
- Proposing a roadmap for introduction of Production Tax Credit for wind and solar power, drafting an innovative policy framework for solar energy development and undertaking major public policy initiatives for introduction of Renewable Energy Certificates.
- Preparing renewable energy vision documents for various state governments; providing consultancy support to some major state electricity regulatory commissions, and various renewable energy industries and investors; and assisting the Ministry of New and Renewable Energy, Govt of India, in certain key areas of renewable energy development in India.
- Undertaking nation-wide field level research projects on 'Comparative Public Cost of Conventional Electricity Generation in India', quantifying externalities of commercial power generation, and research into repowering of old wind farms in India, etc.
- Conducting the first-ever study of the 'Human Resource Needs of the Renewable Energy Sector upto 2015', and initiating various cutting-edge HR programmes for the renewable energy sector.
- Sensitising and training the media, financial institutions, and the academia across the country to generate awareness among them about renewable energy, thus facilitating a conducive environment for its market expansion.
- Organising the national conference-cum-exhibition on wind power development in India titled *Wind India* and India's premier conference-cum-exhibition on solar energy, *Solar India*, both of which were extremely successful.

The different centres and units associated with WISE cohabit independently, yet work cohesively in the true tradition of inter-disciplinary learning, team spirit, and knowledge sharing. WISE is the only institution in the country to possess such expertise, most essential to propel the country towards sustainability in the 21st century.

WORLD INSTITUTE OF SUSTAINABLE ENERGY

World Institute of Sustainable Energy

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