WISE
WORLD INSTITUTE OF SUSTAINABLE ENERGY

World Institute of Sustainable Energy

Annual Report 2010–11

(From L to R) G M Pillai, Founder Director General, WISE; and V Subramanian, Former Secretary, Ministry of New and Renewable Energy, Govt. of India, at the inauguration of the 'Stakeholder Interaction Workshop on the National Clean Energy Fund' held in WISE, Pune, on 26 June 2010.

Ajay Nayak, Principal Secretary (Energy), Govt of Bihar, speaking at the 'Project Initiation Workshop' held on 23 February 2011 in connection with preparation of a Renewable Energy Action Plan for Bihar. Sitting on his left is Sanjeev Ghotge, Jt. Director (Research) and Head, Centre for Climate and Sustainability Policy, WISE.

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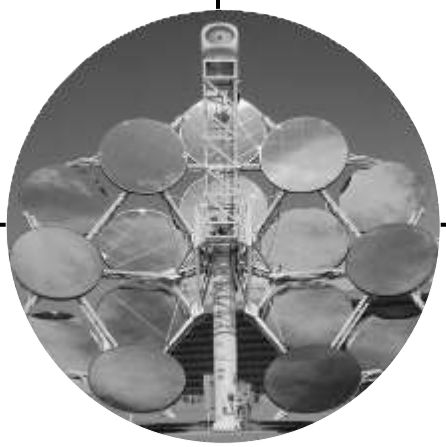

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Reflections...

The year under report has been a watershed in WISE's evolution. Ever since our inception in 2004, it has been our dream to have our own building for our headquarters. In February 2007, our dream began to take shape as we laid the foundation stone of our own premises in the same serene surroundings of Kalyani Nagar, a few feet away from our previous rented location. The dream came to fruition in April 2010, as we took possession of our new office. WISE had just turned six, and the fulfillment of this dream—in such a short span of time—meant a lot for a not-for-profit institution such as ours. What made it possible was the sheer hard work and dedication of WISE's core team. Institutions are not built up of cement, steel or mortar alone; its structures rise tall because of the strong foundation laid down by its people, their hard work and perseverance, and of course, their skills and knowledge. Our core team exemplifies all these.

Making our dream a reality did not divert our attention from our objective of furthering the development of sustainable energy in India. During the year, our activities and clientele expanded across many more states and new areas of work. From providing concept-to-commissioning support to wind power projects in Karnataka to taking up retainership consultancy for renewable power start-ups in Kerala, WISE's *Centre for Wind Power* provided multifarious services to the wind sector in India, maintaining its position as the *numero uno* knowledge hub for wind power. Our *Centre for Solar Energy* (CSE) also continued its vital role in the sector. CSE was appointed by the Tamil Nadu Energy Development Agency (TEDA) to prepare a Solar Road Map for Tamil Nadu—a first ever such roadmap to be prepared by an Indian state. They also worked as consultants to the National Thermal Power Corporation (NTPC) and the Maharashtra Energy Development Agency (MEDA). During the current year, WISE's *Centre for Climate and Sustainability Policy* (CCSP) successfully completed the UKFCO-funded project on preparation of 'Clean Energy Technology Action Plans for Climate Mitigation' for Rajasthan, Karnataka, and Maharashtra. The Centre also undertook two other very prestigious assignments; one was for MNRE titled 'Comparative evaluation of incentives in the RE sector for evolving normative guidelines for revised incentives for renewable-energy-based off-grid systems', while the other was the preparation of a 'Renewable Energy Action Plan' for Bihar.

The youngest Centre in WISE is the *Centre for Renewable Regulation and Policy* (CRRP) which was set up in 2009. Its progress within a short period of time has been remarkable. CRRP undertook a unique pioneering study on the implications of achieving '15% green electricity by 2020', with a focus on 12% by 2017, and this effort was supported by our new partners, the Shakti Sustainable Energy Foundation, New Delhi. CRRP also undertook many other important regulatory assignments, thus positioning WISE as one of the few institutions in the country with extensive experience and expertise in the field of electricity regulation and renewables. Our *Centre for Training and Conferences* (CTC–formerly known as Centre for Human Resource Development) undertook several training programmes to support manpower development in the RE sector. They also completed the landmark study on 'Capacity building of six State Nodal Agencies in the country'—another pioneering assignment given to WISE by MNRE and co-funded by the United States Agency for International Development (USAID). WISE's *Centre for Communications and Coordination* (CCC–formerly known as the Centre for Communications), continued publication of our flagship publication 'Green Energy', making quality improvements in the magazine and further extending its reach across the globe. Besides undertaking information technology and public relations related activities, the Centre played a critical supportive, advisory, and co-ordinating role in many of our other activities like conferences, training programmes, workshops, projects, etc. Another Centre, *WISE Press*, brought out an important and comprehensive book on solar development titled, *A Solar Future for India*. The book has undergone extensive research and work for over two years, and hence finds immense value in today's times.

As we complete seven years of our existence (end of 2010–11), we feel immensely proud when we look back and reminisce on our growth and achievements. As always, during this eventful journey, we received tremendous encouragement from our Chairman, the Governing Council, and the renewable energy sector in general. My sincere gratitude to all of them.

G M Pillai
Founder Director General
WISE

Centre for Wind Power

The Centre for Wind Power (CWP) is today recognised as the 'Knowledge Management and Consultancy Hub' for the wind industry in India. It functions as the nodal centre for developing industry-institution tie-ups, providing a network for disseminating information to the wind power sector, and establishing collaborative partnerships with global leaders for project development, technology transfer, JV identification, human resource development, and policy research. The Centre also possesses in-depth expertise in wind resource analysis and management, and wind farm design, and is equipped with state-of-the-art software to carry out these activities.

CORE ACTIVITIES

- Conducting training programmes in wind resource analysis, wind power management, etc., for policy makers, professionals from the wind industry, academicians, students, etc.
- Consultancy services to project developers, industries, research institutes, investors, state nodal agencies, power utilities, regulatory commissions, etc., for:
  - Due diligence 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.
  - Wind resource assessment, micrositing, and wind farm design.
  - Performance analysis of wind turbines and wind farms.
  - Policy support, and financial advisory knowledge management for setting up wind power projects.
  - Research and development studies, surveys, as well as analytical inputs for wind power development.
  - Knowledge exchange with the academia and industry.

In line with WISE's objectives, the following activities were carried out during 2010–11.

PROJECTS

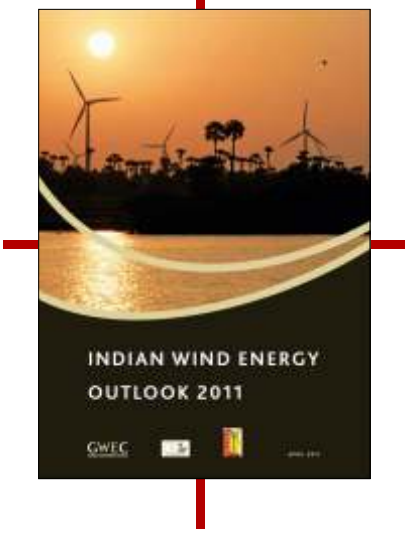
The *Centre for Wind Power* initiated various project assignments as follows:

- Concept-to-commissioning technical and advisory support for 18 MW wind farm project in Karnataka for captive power usage for Bharat Earth Movers Ltd., Bengaluru.
- Three-year retainership consultancy support to Anurav Power Pvt Ltd., Thiruvananthapuram.
- Feasibility study for setting up wind power projects in Kakdwip, Kalingar, and Dadanpatrabar sites in West Bengal, and working out suggested tariff structure and land lease rent at these sites for Suzlon Energy Ltd., Pune.
- 'Wind Power Market in India 2010–2015: A Market Survey Report' for Pioneer Wincon Pvt Ltd., Chennai.
- Detailed project report (DPR) for installation of 51.25 MW wind power project in Orissa for Suzlon Energy Ltd., Pune.
- 'Validation Report on Market Outlook: Wind Power Sector in India', and 'Validation of Project Cost Estimates' for Powerica Ltd, Mumbai.

OTHER ACTIVITIES

Formation of Small Wind Association

In order to promote the small wind industry in the country and give it the much required impetus to expand its market value, both in terms of quality and quantity, it was felt that an association be formed which would comprise manufacturers, dealers, project developers, users, etc., from the small wind sector to aid the above objective. The *Centre for Wind Power* thus organised meetings with like-minded individuals from the sector and convinced them of the importance of united efforts for accelerated development of small wind through the proposed association. Subsequently, a final decision regarding formation of the association was arrived at. At present, more than 20 manufacturers/dealers have evinced interest for membership in the association, and another 20–25 members from all over the country are expected to join soon.



WISE is supporting the association formation activity, viz. completion of the legal formalities, registration, bank account opening, selection of Board of Directors, etc. The official launch of the proposed association has been planned during the upcoming, 'Wind Power India 2011' event, after which full-fledged functioning of the association is expected to commence.

Preparation of Report titled 'Indian Wind Power Outlook 2011'

WISE, in collaboration with the Global Wind Energy Council (GWEC) and the Indian Wind Turbine Manufacturers' Association (IWTMA) prepared a report titled 'Indian Wind Power Outlook 2011'. The Indian counterpart of the 'Global Wind Energy Outlook' series brought out by GWEC, the report was the first-of-its-kind in the Indian context; a valuable tool for wind industry professionals and policy makers alike to learn about the market opportunities present, and the legal and regulatory framework existing for the wind industry in India. The report would be released at the forthcoming 'Wind Power India 2011' conference and exhibition to be held in April 2011 in Chennai.

Knowledge Partner for DIREC 2010

The Delhi International Renewable Energy Conference (DIREC) 2010, was organised by the Ministry of New and Renewable Energy on 27–29 October, 2010. WISE was the Knowledge Partner for the parallel workshop, 'Wind Energy: Leapfrogging to a New Era', organised in association with the Centre for Wind Energy Technology, the Indian Wind Turbine Manufacturers' Association, and the Indian Wind Energy Association. CWP was involved in the preparation of a background note, 'Wind Energy: Leapfrogging into a New Era' for the event. The report which comprehensively documented the status of the wind sector in India, and south and south-east Asia, was widely circulated among ministers, high-level decision makers and policy-level thinkers from various countries, and was well lauded by one and all for its well-researched and comprehensive coverage. G M Pillai, Founder Director General, WISE, made the concluding address at the workshop.

Software Update

The *Centre for Wind Power* is now equipped with the advanced version of 'Windographer' software, a powerful wind data analysis programme which accurately

analyses the given data sets and calculates air density, wind power density, turbulence intensity, power law exponent, and surface roughness, and provides output in tabular and graphical formats.

INTERNATIONAL VISITS

Visit to Sri Lanka

Rajendra Kharul, Sr. Fellow and Head, *Centre for Wind Power*, participated in the second 'Institute of Electrical and Electronics Engineers (IEEE) International Conference on Sustainable Energy Technology' held in Kandy, Sri Lanka, from 5–10 December 2010. The programme conducted under the South Asia Regional Initiative for Energy (SARI–Energy) Renewable Energy Partnership Executive Exchange Programme, funded by the United States Agency for International Development, was organised by the United States Energy Association, and hosted 14 energy professionals from Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. The conference focused on renewable energy, with particular emphasis on generation and distribution. This was the second conference of a regular series of international conferences, to bring together professionals and executives in the energy sector, electrical power companies, manufacturing industries, research institutes, and educational bodies, to share and exchange ideas and information pertaining to sustainable energy technologies.

Rajendra Kharul, Sr. Fellow and Head, CWP *(fourth from left)* with other participants of the second 'Institute of Electrical and Electronics Engineers (IEEE) International Conference on Sustainable Energy Technologies 2010' conference held in Kandy, Sri Lanka.

Visit of Steve Sawyer, Secretary General, GWEC, to WISE

Steve Sawyer, Secretary General, Global Wind Energy Council (GWEC), visited WISE in July 2010. Mr Sawyer's visit to WISE was to understand WISE's activities in general, and in particular, discuss the organisation of 'Wind Power India 2011', the international conference and exhibition to be held in April 2011 in Chennai, jointly by WISE, GWEC, and the Indian Wind Turbine Manufacturers' Association (IWTMA). The visit included a brief presentation on WISE, followed by some major discussions on how to accelerate the growth of the wind market in India through the upcoming conference and exhibition. Prior to joining GWEC, Mr Sawyer was the CEO of both Greenpeace USA (1986–88) and Greenpeace International (1988–93), and also served as head of delegation to many sessions of the Kyoto Protocol/UN Framework Convention on Climate Change negotiations.

FUTURE ACTIVITIES

- To acquire state-of-the-art software such as Windfarmer and WAsP, which would help strengthen the Centre further in terms of capacity building, and aid the process of consultancy to stakeholders more effectively and efficiently.

- WISE, in association with GWEC and IWTMA, will organise 'Wind Power India 2011', an international conference and exhibition from 7–9 April 2011 in Chennai. Participation of more than 1000 delegates, 200 exhibitors and 100 speakers from the national and international wind power industry is expected.

Centre for Climate and Sustainability Policy

The Centre for Climate and Sustainability Policy (CCSP) works at the cutting edge of RE policy and implementation covering major areas of research such as climate-energy scenarios, future energy security issues, accelerated deployment of RE technologies through RE action plans and policy support, and enhancement of complex decision making capabilities at institutional levels. The Centre has developed an integrated vision spanning climate policy and energy security, combining expertise in energy economics and technologies with sustainability of development.

CORE ACTIVITIES

The *Centre for Climate and Sustainability Policy* (CCSP) works in coordination/collaboration with both central and state governments, as well as private and corporate entities, and international agencies for carrying out the following major activities :

- Preparation of state-level climate action plans
- Preparation of state-level RE action plans
- Policy research into the techno-economics of RE generation
- Policy research into incentives for RE power
- Training and capacity building
- Publications for policy dissemination

The various activities carried out by CCSP in 2010–11 are as follows.

PROJECTS

Completion of Clean Energy Technology Action Plans for 3 States—Maharashtra, Karnataka, and Rajasthan

This major project was supported over a two-year period by the Climate Change and Energy unit of the UK Foreign & Commonwealth Office (UKFCO) and was duly completed during the current year, with final submissions of the reports to the UKFCO as well as the three state governments. As a further contribution to the development of policy within the country, copies of the three Action Plans were also submitted to both the Ministry of New and Renewable Energy (MNRE), and the Ministry of Environment and Forests (MoEF), Government of India (GoI). Further, an abridged version of the Action Plan for Karnataka was sent to the Chief Secretary/Environment Secretary of all state governments to make available the methodological approach followed by the Karnataka government; another small contribution in developing a coherent response to the dangers posed by climate change.

Comparative Evaluation of Incentives to RE-based Grid and Off-grid Systems and Evolving Normative Guidelines for Revised Incentives for Off-grid Systems

This project, under the 'Access to Clean Energy' programme of the UNDP, was supported by the Ministry of New and Renewable Energy, GoI/United Nations Development Programme (UNDP). The major objective of the project was to compare the subsidies and support levels offered to grid-connected and off-grid technologies in

India, and suggest appropriate changes in policy support so as to equate this support among the different RE technologies. The project also aimed at developing appropriate mechanisms for accelerating the deployment of RE technologies in India.

Methodologically, the project takes a thorough look at all the support extended to RE technologies in both grid-connected and off-grid modes. These span across RE technologies in four areas; solar technologies in photovoltaic (PV), concentrated photovoltaic (CPV), and concentrated solar power (CSP) modes, as well as rooftop PV and micro-grids; biomass technologies in combustion and gasification as well as in off-grid mode; small hydro technologies in grid-connected and off-grid modes; and advanced biomethanation in grid-connected mode. The project computed the current levels of support to these technologies and recommended the necessary equation based on a rigorous systematic approach. Since it was probably the first time that such an approach was being undertaken, the methodology had to be simultaneously developed and applied to a large range of RE technologies in both grid and off-grid modes.

The project is ongoing and will continue through 2011–12, following revision of the methodology encompassing the range of technologies.

Renewable Energy Potential Assessment and RE Action Plan for Bihar

This project was awarded by the Department for International Development (DFID), Govt of UK, following the process of competitive bidding. The objective of the project was to conduct assessment of all RE resources in the state of Bihar and develop a State-level Action Plan to enable the government to comprehensively develop RE resources in the state.

The resource assessment included assessment of wind power potential, solar potential in both grid-connected and off-grid modes, biomass and biomethanation generation potential in both modes, and small hydro potential in the state. Based on the available RE resources, the Action Plan had to recommend the necessary steps and targets for various agencies, including development of policy and regulatory approaches and their implementation by state nodal agencies and utilities. Select central agencies, banks, and RE companies were also invited to participate in the exercise, as important roles were envisaged for them in the implementation of the State Action Plan in the future.

The project activities are ongoing and will continue into the following year (2011–12).

Materiality of Rice: Learning Workshop

This learning workshop was undertaken by CCSP at the behest of the Centre for South Asian Studies, University of Oxford, UK. In this unique workshop, academic participants were involved in self-learning of the various economic and non-economic methodologies recently developed across several disciplines. The participants included senior economists and social scientists from the Oxford University, Jawaharlal Nehru University, Madras School of Economics, and other institutions and disciplines. The major methodologies taken up for self-learning included Life-Cycle Analysis, Externality Analysis, Value Chain Analysis, and Technology Assessment. Rice

Participants at the 'Project Initiation Workshop' held in connection with preparation of a Renewable Energy Action Plan for Bihar on 23 February 2011 in Patna.

Prof Barbara Harris-White, Director, Contemporary South Asia Studies Programme, Oxford University, speaking at the 'Materiality of Rice: Learning Workshop' held in Pune. Sitting on her right are Sanjeev Ghotge, Joint Director (Research) and Head, CCSP, WISE; and G M Pillai, Founder DG, WISE.

cultivation was taken as the focal point of discussion for the application of these methodologies, to draw out the various policy implications related to sustainability, employment and equity, climate implications, and so on. Exchange of inter-disciplinary perspectives also included the role of conventional energy and renewable energy for the future.

This activity was undertaken on a no-profit basis by WISE as a contribution to further knowledge development and learning in increasingly complex spheres of sustainability policy and climate change.

Framework for Market Development for Renewable Energy in India–Phase II

In continuation of the Distribution Reform, Upgrades and Management (DRUM) Programme supported by the United States Agency for International Development (USAID) and the Ministry of Power, Govt. of India, the Centre oversaw and contributed faculty effort for seven programmes held in major cities across India in the area of 'Regulatory and Policy Framework for Market Development for Renewable Energy'. Details are given under the activities of the *Centre for Training and Conferences* (Pg 12).

OTHER ACTIVITIES

- WISE was invited by the UK Foreign & Commonwealth Office's Climate Change Unit for a consultation on climate change and renewable energy, followed by a press briefing. Robert Donkers, the Minister Counsellor in charge of environment on behalf of the European Union, addressed and participated in the consultation held in Pune.
- Sanjeev Ghotge, Jt. Director (Research) and Head, CCSP, made a presentation on climate change at the consultation, on 'Community Response to Climate Change' organised by Green Foundation in Bengaluru on 14–15 December 2010.

FUTURE ACTIVITIES

- Preparation of Action Plan for comprehensive RE development in the state of Tamil Nadu.
- Preparation of multi-centre bid for USAID–PACE-D (Partnership to Advance Clean Energy Deployment) programme.
- Conduct training programmes on 'Climate change and the future of economic development and governance', 'Climate change and strategic business planning', and 'Techno-economics of RE power generation technologies'.
- Forging partnerships with foreign institutions in the areas of climate change and

Centre for Renewable Regulation and Policy

The Centre for Renewable Regulation and Policy (CRRP) combines policy initiatives with regulatory intervention to provide a suitable economic framework for development of RE in India. CRRP works in close co-ordination with the state electricity regulatory commissions and the central and state governments to bring about suitable regulatory and policy reforms for enabling growth in the RE sector. CRRP is active in the area of policy and regulation, providing consultancy support to RE investors, utilities, regulatory commissions, etc., in preparing and analysing tariff petitions; analysing risks, returns and benefits in business models and associated techno-commercial services.

CORE ACTIVITIES

The *Centre for Renewable Regulation and Policy* (CRRP) is responsible for projects in the areas of renewable energy policy and regulation across the county. CRRP has been empanelled as a consultant by the major state electricity regulatory commissions (SERCs) of Maharashtra, Orissa, and Gujarat. The Centre aims to register with all SERCs in India and provide the required impetus and institutional support to them in a holistic and systematic manner, for facilitating the transition to a sustainable energy economy. CRRP's expertise lies in the following key areas:

- RE potential assessment
- RE tariff determination
- Preparation of tariff petition and participation in regulatory processes
- Renewable purchase obligation (RPO) mechanism
- Renewable energy certificate (REC) mechanism
- Renewable energy policy formulation
- Policy and regulatory risk assessment
- Annual Revenue Requirement (ARR) scrutiny and tariff determination for distribution licensees.
- Conducting training programmes in the area of policy and regulation.

During 2010–11, CRRP carried out the following activities.

PROJECTS

Study on 'Achieving 12% Green Electricity by 2017'

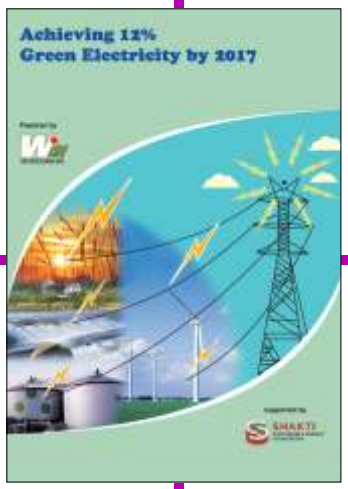
Supported by Shakti Sustainable Energy Foundation, New Delhi, with financial assistance from Climate Works Foundation, USA, CRRP undertook the study titled 'Achieving 12% Green Electricity by 2017'. The scope of the work which was commissioned in February 2011, involved verifying adequacy of government planned RE capacity addition targets vis-à-vis those envisaged by the National Action Plan on Climate Change (NAPCC), projecting the likely RE capacity addition scenarios at pan-India/state levels, and verifying the adequacy of current non-solar renewable purchase obligation (RPO) targets specified by the 25 SERCs, so as to meet the national RPO target of 15% RE by 2020. Based on the findings of the study and the feedback that would be received from a stakeholders' workshop to be organised by WISE in May 2011, WISE would prepare the roadmap for achieving 12% green electricity by 2017 and present it to the Planning Commission. The project will thus continue in 2011–12.

Comparative Evaluation of Incentives to RE-based Grid and Off-grid Systems

This project was undertaken for the Ministry of New and Renewable Energy, GoI, and the United Nations Development Programme under its 'Access to Clean Energy' project, and was coordinated by the *Centre for Climate and Sustainability Policy*. CRRP undertook and completed the incentive evaluation study for grid-connected and stand-alone small hydro power technologies.

Assessment of Options for Sale of Electricity from Tamil Nadu Wind Farm

'The Converging World Renewable Energy Ltd', a UK based not-for-profit organisation, had contracted CRRP to assess various options for sale of electricity from their proposed wind power project in Tamil Nadu and the commercial implications of the same. As part of the project, WISE studied the policy and regulatory regime in Tamil Nadu and suggested the best option for sale of electricity in the state.



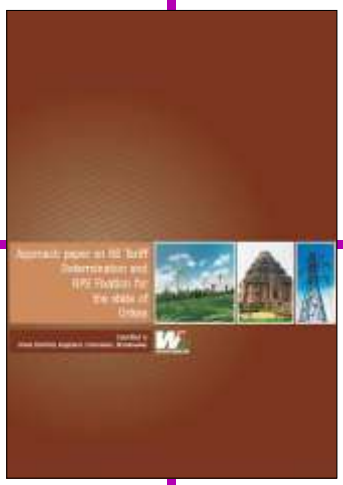
CONSULTANCY

Consultancy Support to Orissa Electricity Regulatory Commission (OERC)

The Orissa Electricity Regulatory Commission appointed WISE for preparation of an RE Policy and Approach Paper on RE Tariff Determination and RPS Fixation for Orissa. The contract was awarded to WISE in February 2009 on the basis of competitive bidding. CRRP completed the assignment in May 2010, and on the request of OERC, the CRRP team attended the public hearing at OERC and drafted the final comprehensive RE tariff order for the Commission.

Consultancy Support to M/s Solapur Bioenergy Systems Pvt. Ltd, Navi Mumbai

CRRP assisted M/s Solapur Bioenergy Systems Pvt. Ltd (SBSPL) for drafting the tariff petition and presenting the case for project-specific tariff determination before the Maharashtra Electricity Regulatory Commission (MERC) for their proposed municipal solid waste power project in Solapur, Maharashtra. CRRP successfully presented the case before MERC, responding to the queries/objections raised during the public hearing held in July 2010. The Commission issued the final tariff order on 3 September 2010, which can be termed as the first project-specific RE tariff order in Maharashtra.



Systematic Analysis of Annual Revenue Requirement (ARR) and Tariff Proposals filed by Power Utilities of Orissa

WISE was appointed by OERC as 'Consumer Counsel' for professional and systematic analysis of the ARR petition submitted by the power utilities of Orissa. The scope of the work involved analysis of the ARR petitions filed by the utilities from the consumer's perspective, and preparing summary of the petition for public view. CRRP attended the public hearing at OERC and presented the opinion on the ARR submitted by each utility. CRRP also summarised the utility-wise objectors' submissions and the feedback received from the utilities before and after the public hearing. The summaries and detailed analyses put forth by the consumer counsel were incorporated in the draft orders issued by OERC.

Consultancy Support to Lloyds Metals and Energy Limited, Mumbai

On behalf of Lloyds Metals and Energy Ltd (LMEL), Mumbai, CRRP filed a petition before MERC for determination of tariff for sale of electricity generated from LMEL's 30 MW industrial waste-heat-based-co-generation power plant located at Ghugus in Chandrapur district, Maharashtra, to the DISCOMs. The prayers made under the petition also included request to specify renewable purchase obligation for electricity generated from industrial waste-heat-recovery-based-co-generation projects in Maharashtra. The petition was admitted by MERC in January 2011. The technical validation sessions and hearings are ongoing.

TRAINING PROGRAMMES AND WORKSHOPS

Second Phase of DRUM Training Programmes

CRRP actively participated in the second phase of the USAID-Ministry of Power, GoI, sponsored series of training programmes held under the Distribution, Reform, Upgrades and Mangament project on 'Regulatory and Policy Framework for Market Development for Renewable Energy' during 2010–11. The Centre was involved in the design of the programme content and preparation of course material for the remaining seven programmes. Sr. Associate Fellow and Head, CRRP, Surendra Pimparkhedkar, and Sr. Research Associate, Satadru Chakraborty, participated as resource persons and delivered presentations on the existing and new regulatory practices governing RE business in India and tariff determination methodologies.

Surendra Pimparkhedkar, Sr. Associate Fellow and Head, CRRP, making his presentation at the DRUM worshop held from 14–15 June 2010 in Chennai.

Stakeholders' Interaction Workshop on the National Clean Energy Fund

This unique, first-of-its-kind workshop was organised by CRRP (on a voluntary basis) to discuss the contours and implementation procedures of the National Clean Energy Fund proposed by the Union Government, and its implications for the RE sector. The fund is a result of a clean energy cess of `50 per metric tonne levied on domestic as well as imported coal. The proceedings of the workshop were presented to MNRE, GoI, and the Principal Advisor (Energy), Planning Commission, who acknowledged and highly appreciated WISE's effort.

Eminent stakeholders from the RE industry engrossed in the proceedings of the 'Stakeholders' Interaction Workshop on the National Clean Energy Fund', held by WISE in its premises on 26 June 2010.

FUTURE ACTIVITIES

- Preparation of project-specific tariff and RPO petition for waste-heat-recovery-based-co-generation power projects.
- Preparation of project specific tariff petition for municipal waste-to-energy power projects.
- Completion of '12% Green Electricity by 2017' project.
- Assistance to various electricity regulatory commissions in the fields of ARR and tariff petition filed by different utilities.
- Consultancy in the area of RECs and various regulatory works for public and private sector companies.
- Policy and regulatory review for state-level renewable energy action plans.

Centre for Solar Energy

The Centre for Solar Energy (CSE) aims to facilitate accelerated growth of the solar sector in the country through multifarious activities such as techno-economic assessment and resource assessment; preparing solar roadmaps, incentive structures, model tariff, policy interventions, etc., for the government as well as industry and other public/private agencies. CSE offers expert services including those of core consultant, owner's engineer, peer reviewer, lender's engineer, and government consultant. Through dedicated, concerted and focused efforts, the Centre is progressively emerging as a credible and noteworthy authority in this field.

OBJECTIVES

The *Centre for Solar Energy* (CSE), in co-ordination with other specialised centres of WISE, aims in facilitating the specific needs of the solar sector in the country. The Centre's core objectives are:

- 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.
- Develop state-wise profiles for rapid deployment of solar energy wherever possible.
- Facilitate human resource development in the solar energy sector through curriculum development and training.
- Carry out research and objective-oriented studies to cater to the specific unidentified needs of the solar sector in India.
- Offer consultancy services to entrepreneurs, developers, industries, institutions, government agencies, regulatory commissions, etc., for the growth of the solar energy sector.

ACTIVITIES OF THE CENTRE FOR SOLAR ENERGY

- Provide consultancy support for tendering procedure, bid evaluation and project implementation.
- Prepare detailed project reports, tender documents, and detailed financial modelling for the solar projects.
- Assess solar energy resources to obtain solar grid and off-grid potential, and prepare solar roadmap for different states in the country.

In 2010–11, the *Centre for Solar Energy* was involved in the following activities.

PROJECTS

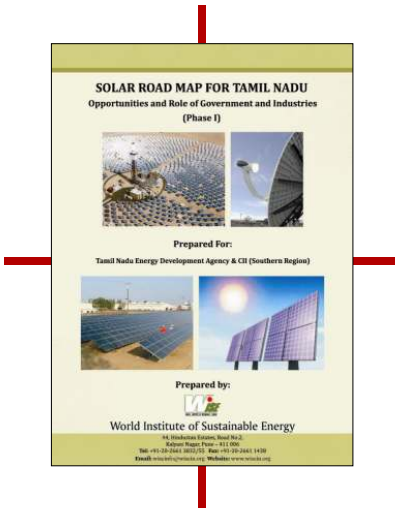
Consultancy to the Maharashtra Energy Development Agency for setting up of 5 MW Solar Demonstration Project

The Maharashtra Energy Development Agency (MEDA) is in the process of setting up a 5 MW grid-connected solar PV demonstration power project in Sautada, Tal. Patoda, Dist. Beed in Maharashtra. CSE was entrusted with the responsibility of providing consultancy services for preparation of the Detailed Project Report, expression of

interest and tender document. The scope of the work included assessment of various financial models with sensitivity analysis for implementing the project through private developers. Preparation of tender specification document for engineering, procurement, construction and commissioning of the solar PV plant is in progress, and is expected to be completed next year.

Solar Roadmap for Tamil Nadu: Opportunities and Role of Government and Industries (Phase I)

The Tamil Nadu Energy Development Agency (TEDA) and the Confederation of Indian Industry (southern region) had entrusted WISE to develop a solar roadmap for Tamil Nadu. This assignment included land identification and allotment policy; identification of potential areas for off-grid application for meeting the electricity and heating needs across the domestic, industrial and commercial sectors, suggestion of state level tax incentives, capacity building of institutions, suggestion on feed-in tariff and RPS segmentation, etc. The final report has been submitted to the state government.



Preparation of feasibility report/DPR for development of 50 MW Solar Thermal Power Project in Gujarat

The National Thermal Power Corporation (NTPC) assigned WISE with the work of preparing feasibility report/DPR for setting up a 50 MW solar thermal power project at Morwada in Banaskantha district of Gujarat. The scope of the project includes site sensitivity analysis of given sites for installation of solar thermal power plant; in-depth analysis of solar radiation and climate data along with national and international available data; suitability of technology option in view of solar energy resources available at the site under consideration; development of financial simulation model for profit-loss sheets and cash flow; financial analysis for considered options involving estimation of CoG/tariff, etc; assessment of relevant policies and regulations to identify tariff; recommendation and design of the most suitable technology for setting up the power plant and recommendation for schematic plant layout, i.e. solar block, power block and auxiliary systems. The first draft has been submitted to NTPC and comments are awaited.

FUTURE ACTIVITIES

- Preparation of a solar roadmap for Karnataka.
- Evaluation and assessment of solar power potential in Tamil Nadu for preparing the 'RE Development Master Plan' for the state.
- Rendering consultancy services to state nodal agencies for preparation of roadmap for accelerated growth of the solar energy sector.
- Organisation of training programmes on solar grid, off-grid and industrial process heat applications.
- Offering end-to-end services and solutions for the broad spectrum of solar power generation projects in the country.

Centre for Training and Conferences

The Centre for Training and Conferences (CTC), formerly called the Centre for Human Resource Development plays a pivotal role in moulding and developing a skilled workforce in the renewable energy sector, capable of dealing with the challenges of the fast-developing RE industry. By conducting well-conceived capacity building and training exercises, and organising conferences and exhibitions, the Centre endeavours to shape and build a state-of-the-art 'green collar economy'.

INTRODUCTION

There is a strong and urgent need to develop sufficient human capital and expertise in the field of renewable energy. Investing in forward-looking education and training strategies, while taking into account the urgent requirements of the RE sector, will thus be an essential requirement for sustainable energy development. Ensuring a skilled workforce for the RE sector is today an indispensable component of the policy actions intended to meet our growing energy demand, and this should therefore be a top priority policy issue in national energy policy strategies, particularly during the current economic and energy crisis. The *Centre for Training and Conferences* (CTC) is now geared up to meet this very objective by engaging in various capacity building and training exercises, besides organising conferences and exhibitions in the RE sector.

CORE ACTIVITIES

- Organising training programmes/conferences/exhibitions/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 organisation.

Some of the major programmes organised and/or conducted by the Centre during 2010–11 are as follows:

TRAINING PROGRAMMES

Regulatory and Policy Framework for Market Development for Renewable Energy in India (Phase II)

The second phase of this training programme which commenced during FY 2009–10 and held under the Distribution Reform, Upgrades and Management (DRUM) project sponsored by the Ministry of Power and the US Agency for International Development (USAID), was completed during the current year.

Seven workshops were conducted at Pune, Guwahati, Chennai, Chandigarh, Dehradun, Bhopal, and Kolkata, with participation from over 400 personnel from the energy sector. Professionals from state electricity regulatory commissions, power distribution and transmission companies, energy development agencies, state government departments, RE equipment and component manufacturers, faculty of engineering colleges, financial institutions, etc., participated and benefited from the

programmes. Participants also included those from Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, and Sri Lanka. The programmes were conducted by experts from WISE and other renowned speakers from the RE sector.

Training Programme on 'Small Hydro Power Development: Opportunities and Challenges'

WISE, in association with Wat-ere-source Technologies Pvt Ltd, Pune, organised a 3-day training programme on small hydro power from 29 November 2010–1 December 2010. Speakers included the WISE faculty and others associated with the sector, who provided information on the various opportunities available in the sector and the critical challenges faced by it. Besides organising the event, CTC also arranged a site visit to Varasgaon hydro power station as part of the programme.

PROJECTS

Study on 'Funtioning/Strengthening of State Nodal Agencies (SNAs) and Preparation of a Roadmap for Capacity Building'

The *Centre for Training and Conferences* completed this study for six SNAs, namely West Bengal, Andhra Pradesh, Chhattisgarh, Puducherry, Rajasthan, and Himachal Pradesh, under the able guidance of Dr Sudhir Kumar, who was the Team Leader for the project. The study, jointly funded by the Ministry of New and Renewable Energy (MNRE), and the United States Agency for International Development (USAID) was aimed at enhancing the capabilities and functioning of the SNAs, especially in the wake of renewables going mainstream. The reports for the six SNAs were submitted to USAID, MNRE, and heads of the respective SNAs. Subsequently, many of the SNAs have implemented WISE's recommendations with a view to enhance the quality of their functioning.

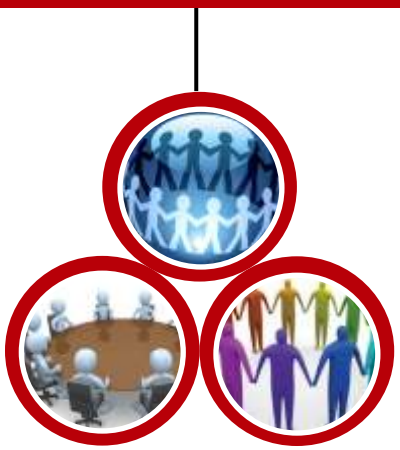
WORKSHOPS

During 2010–11, the Centre offered suitable logistical and organisational support for the following programmes.

- 'SNA Capacity Building, Training and Interactive Programme' held on 4–5 May 2010 in Pune, as a follow-up of the above project.
- 'Stakeholders' Interaction on the National Clean Energy Fund', held on 26 June 2010 in Pune (Details on pg 9).
- Introductory workshop on preparing a 'Renewable Energy Action Plan for Bihar', held on 23 February 2011 in Patna (Details on pg 5).

FUTURE ACTIVITIES

- Conducting training programmes on renewable energy certificates, small wind and hybrid systems, climate change and the future of economic development and governance, solar heating and drying for industries, etc.
- Undertaking preparatory work for organising a major international conference and exhibition titled 'Wind Power India 2011' to be held in Chennai on 7–9 April 2011, in collaboration with the Global Wind Energy Council (GWEC) and the Indian Wind Turbine Manufacturers' Association (IWTMA).



(From L to R) S G Koli, Chief Engineer (Retd), Water Resources Department, Govt. of Maharashtra; G M Pillai, Founder DG, WISE; and D S Kulkarni, MD, Wat-ere-source Technologies Pvt Ltd, Pune, at the inauguration of the workshop on 'Small Hydro Power Development'.

Seated *(First from right)* is Dr P C Pant, Director, MNRE, and holding the mike is Dr Sudhir Kumar from WISE, Team Leader of the programme, at the 'SNA Capacity Building, Training and Interactive Programme' held at the WISE office from 4–5 May 2010.

Roshan Sunkaria, IAS, Commissioner, Chandigarh Municipal Corporation, inaugurating the DRUM workshop in Chandigarh. To his left is Sumedh Agarwal of PA Consulting Group, and to his right is Pradip Vesvikar, Senior Fellow and Head, Centre for Solar Energy, WISE.

Centre for Communications and Coordination

Going beyond its established role of being an information and knowledge provider in the RE sector, the Centre for Communications has now been rechristened the Centre for Communications and Coordination (CCC). The Centre has widened its scope of activities to play a more proactive role in the field, fusing the entire gamut of communication activities with concerted coordination, starting from within the organisation to communications networking with national and international agencies, thus taking communications to the next level...that of synchronised and multi-level communications networking.

In 2010–11, the *Centre for Communications and Coordination* carried out the following activities.

PUBLICATIONS

Green Energy

Over the past seven years, *Green Energy* (GE), WISE's flagship bimonthly magazine has seen its readership soaring, with the print copy reaching out to more than 55,000 readers and the e-copy to more than 3000 individuals and organisations from diverse sectors. The magazine is much sought after by RE professionals, students, researchers and those belonging to the scientific community, who find the credible and in-depth information extremely relevant to their fields of study. *GE* is also well received by the government sector and the corporate community, since it is the only magazine of its kind totally devoted to dissemination of information on the sustainable energy sector. The magazine carries balanced and well-researched essays on a wide range of issues related to the sustainable energy sector. By presenting the latest news, in-depth analyses of government policies, and critical reviews of books relevant to the energy sector, the magazine endeavours to create a 'sustainable temperament' in the minds of its readers and has thus set the ball rolling for a green future.

Besides the content, the visual presentation of the magazine is attractive and it is aesthetically designed, with printing done on high quality paper. It is the Centre's endeavour to continuously update the format and content of the magazine on a periodic basis to sustain the readers interest in both the visual and textual content.

Four issues of the magazine were brought out during the current financial year which focused on and discussed themes critical to the clean energy sector. While the March–April to July–Aug 2010 combined issue highlighted the 'Global Green New Deal'—a major international development which is expected to accelerate the growth of renewable energy, the Sept–Oct 2010 issue articulated the vision for a 'Renewable Energy Grand Plan' for India. The Nov–Dec 2010 issue of *Green Energy* carried a critique of the Planning Commission's report on low-carbon growth strategy for India. The Jan–Feb & March–April 2011 combined issue of *Green Energy* was a special issue brought out in connection with 'Wind Power India 2011', the mega international conference and exhibition on wind power to be organised by WISE in collaboration with the Global Wind Energy Council, and the Indian Wind Turbine Manufacturers' Association in April 2011 in Chennai. The issue was a voluminous one, carrying a wealth of information centred on the theme of the conference, 'Towards 50 GW Wind Power by 2020'.

Annual Report 2009–10

The *Centre for Communications and Coordination* came out with the Annual Report for the year 2009–10, which had a very aesthetic look and was well-received by the institute's clientele.

PUBLICITY

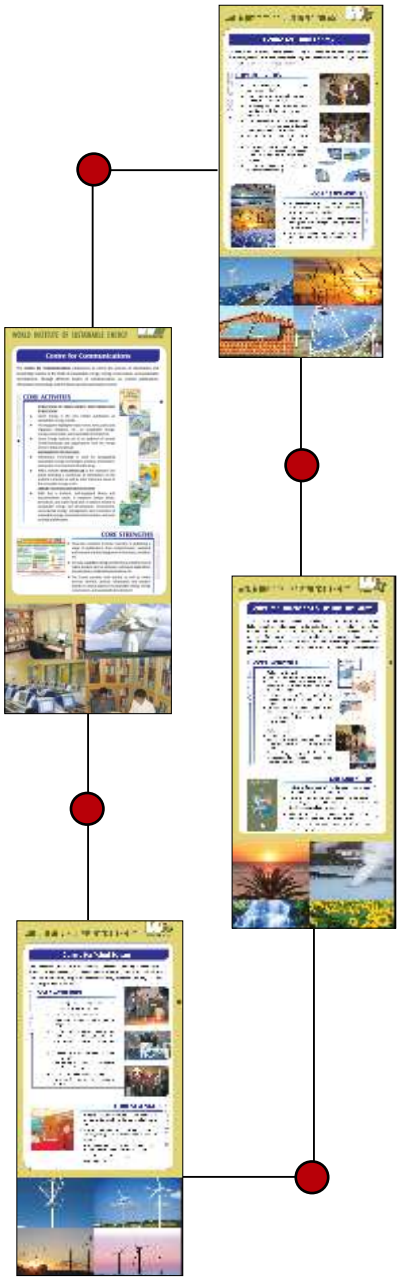
Participation in Exhibitions and Conferences

During 2010–11, WISE participated in conferences and exhibitions held in various parts of the country. These included:

- Delhi International Renewable Energy Conference (DIREC) 2010, held in New Delhi from 27–29 October 2010 and organised by the Ministry of New and Renewable Energy, Govt. of India. WISE was the knowledge partner for the parallel workshop, 'Wind Energy: Leapfrogging to a New Era'. (For details please refer to pg 2). WISE also participated in the exhibition which was organised as part of the conference. WISE's stall displaying its books and the bimonthly magazine *Green Energy* was well-appreciated by visitors, including luminaries from the renewable and allied sectors.
- India Solar Energy Summit 2011 held from 17–18 February 2011 in New Delhi organised by Noppen, a leading international business facilitator. G M Pillai, Founder DG, WISE, was a VIP speaker at the event. WISE was also the official association partner of the summit. Its stall, which displayed all the WISE publications garnered tremendous interest from the visitors.

Publicity Material

The *Centre for Communications and Coordination* prepared various information panels detailing the activities of all the centres of WISE. These stand-alone flex panels are to be displayed at various conferences and exhibitions in which WISE participates periodically.



WISE Information Panels (Details of 3 Centres)

INFORMATION TECHNOLOGY

The Information Technology (IT) sub-centre under the *Centre for Communications and Coordination* is an integral part of the organisation providing the necessary technological edge to the functioning of the organisation. By introducing the latest tools available in the market, the IT Centre helps WISE to enjoy a leading position in the virtual world. During FY 2010–11, the Centre was engaged in the following activities.

WISE Website Updation: The WISE website was updated periodically incorporating the e-copies of the latest issues of GE, and information provided on forthcoming training programmes, projects and conferences organised by WISE, news and events, etc.

Wind Power India 2011 Conference Website: The IT section developed the website for the upcoming 'Wind Power India 2011' Conference and Exhibition to be held in

April 2011, providing comprehensive information of the event along with other material related to marketing and publicity of the conference.

Information Broadcasting: The e-copy of *Green Energy* has been widening its reach all over the world with the subscriber base touching over 3000. This year, a new theme was introduced for the magazine.

Software Development: Major changes were made in the payroll software of the Accounts and Administration Department, in order to make it more comprehensive and enhance its efficacy for smooth functioning.

LIBRARY AND DOCUMENTATION CENTRE

The WISE *Library and Documentation* Centre has emerged as a one-of-its-kind specialised information centre on energy, environment, and sustainable development. The Library houses a comprehensive collection of books, journals, audio-visual resources and news clippings.

The core subject areas are as follows:

SUSTAINABLE ENERGY
- Sustainable Energy (General)
- Bio-Energy
- 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
- Material Science & Industrial Ecology
- Restoration Ecology
- Sustainable Agriculture
- Water

WISE Website

Wind Power India 2011 Website

GE Home Page

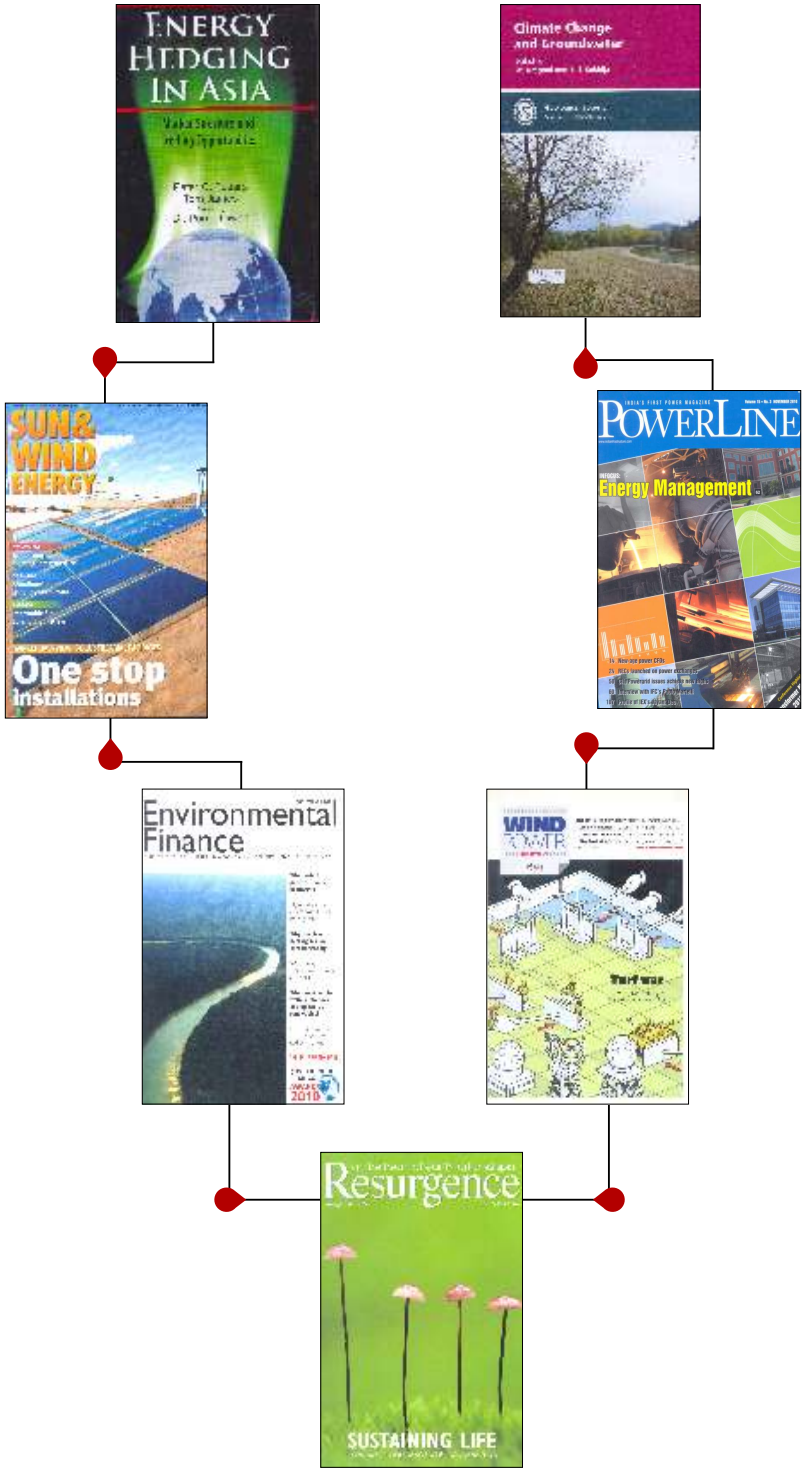
- Environmental Management
- Biodiversity
- Green Building / Green Architecture
- Emissions, CDM & Carbon Trading
- Cities
- Sustainable Transport
- Climate Change
- Climate Change India
- Futurology
- HRD/Education/Training
- Environmental Engineering
- Environmental History
- Environmental Law/ Legislation

Reference

- Yearbook
- Dictionary
- Encyclopedia
- Directory
- Statistics/Guidebooks
- Reports

Others

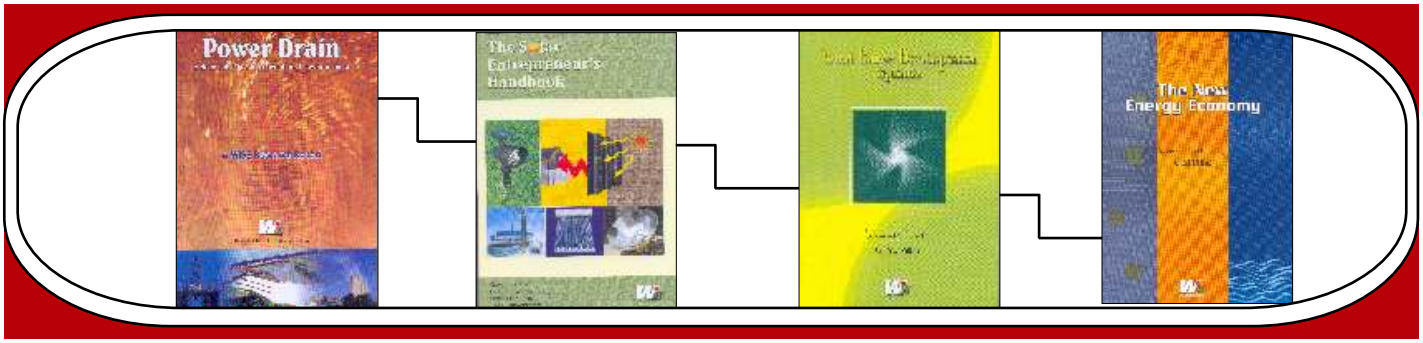
- Economics
- Management
- Library and Information Science
- Globalisation
- Information Technology
- Nanotechnology
- General



Status of Books/Periodicals/CDs for 2010–2011

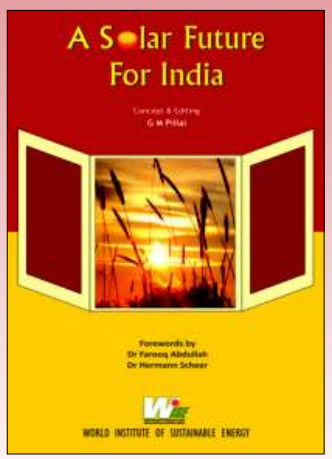
▪ Total number of books purchased	147
▪ Total number of books available	1896
▪ Total number of periodicals available (28 subscribed and 14 complimentary)	42
▪ Total number of CDs available	84

WISE Press



WISE Press evolved out of the urgent need to fill the void existing in the area of books published on renewable energy and sustainable development, especially in the Indian context. WISE Press has been producing books catering to these sectors and has now gained a firm foothold in this niche area. Written by experts drawn from relevant fields, books by WISE are well-known for their succint interpretation, their clarity of thought, and indepth knowledge of the subject at hand.

WISE's Latest Release



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

A Solar Future for India was published in February 2011. Conceived and edited by G M Pillai, the founder Director General, WISE, the 650-page volume contains 36 chapters contributed either singly or jointly by a total of 37 experts and two forewords, one contributed by Dr Farooq Abdulla, Hon'ble Minister for New and Renewable Energy, Govt of India, and the other by the late Hermann Scheer, German parliamentarian and well-known solar proponent. Written to serve all those who will play a major role in meeting the challenge to take India's grid-connected solar capacity to 20,000 MW, the book is about realising the vision of a new solar economy. In keeping with the Institute's mission to contribute to the growth of sustainable energy, *A Solar Future for India* offers comprehensive and up-to-date information on all aspects of harnessing solar energy—not only the 'nuts and bolts' but also a peek into the future, not just the materials but also the human resources necessary to usher the solar future into India and how to organise them into institutions, not just the economics but also ways of financing solar development. The concern for sustainable energy goes way beyond merely generating it: the book also covers aspects such as regulation and deployment, a 'smart' grid that ensures efficient distribution of electricity, and end-uses such as solar drying of farm produce, generating process heat for industrial use, and heating water for domestic use, as well as producing potable water from brackish water using solar energy.

OTHER ACTIVITIES

Copy Editing

WISE Press undertook copy editing of project reports, project proposals, business plans and other documents, including a tender specification for Bharat Earth Movers Limited, proceedings of the workshop on the National Clean Energy Fund, the Exhibitors' Manual for 'Wind Power India 2011', petitions before electricity regulatory commissions, and reports on site feasibility studies, and others such as future market for wind power, levying a green cess for Andhra Pradesh, and 'Indian Wind Power Outlook 2011'.

Dr P C Pant, Director, Ministry of New and Renewable Energy, Govt. of India, addressing the participants at the two-day 'SNA Capacity Building, Training and Interactive Programme' held in WISE on 4–5 May 2010. Sitting on his immediate left is Dr Sudhir Kumar from WISE, Team Leader of the programme.

(From L to R) Sanjeev Ghotge, Joint Director (Research) and Head, CCSP, WISE; Prasad Ranjan Ray, Chairperson, West Bengal Electricity Regulatory Commission, Kolkata; Monali Zeya Hazra, Project Management Specialist, USAID/India; and Rakesh Kumar Goyal, Chief of Party, DRUM Tetra Tech, at the inaugural session of the workshop on 'Regulatory and Policy Framework for Market Development for Renewable Energy in India' held in Kolkata on 4-5 October 2010.

ABOUT WISE

The World Institute of Sustainable Energy (WISE) is a not-for-profit institute set up in June 2004 to promote sustainable energy 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 low-carbon, energy efficient and sustainable energy-based economy. In April 2010, WISE shifted to its own premises, a six-storeyed office building located a few blocks away from its old building in Kalyani Nagar. This was a major milestone in WISE's career. Since its inception, WISE has pioneered several initiatives for accelerating the development of sustainable energy in the country. Some of these include:

- Drafting a model Renewable Energy Law for India and its advocacy. This effort gained wide national and international support, and in 2008, the Govt. of India decided to enact a Renewable Energy Law for India.
- Undertaking nation-wide research projects on 'Achieving 12% Green Electricity by 2020' (as per NAPCC targets), preparation of 'State-Level Action Plans for Clean Energy Technologies for Climate Mitigation', 'Comparative Public Cost of Conventional Electricity Generation in India', quantifying externalities of commercial power generation, etc.
- Undertaking major public policy initiatives for introduction of Renewable Energy Certificates, development of an innovative Solar Energy Policy for India, preparation of long-term RE vision documents for various state governments, research into repowering of old wind farms in India, etc.
- 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.
- Conducting the first-ever study of '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 international conferences and exhibitions titled 'Wind Power India', 'Solar India', 'Climate Change India', and 'RE Regulation India', all of which were extremely successful.

The different centres and units of WISE function 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

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