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# Preface

## The Way Forward...

Human society thrives by developing the potential of energy, material, water and knowledge. Solutions from the world of science and technological successes determine how efficient society has become in utilising the potentials of the four elements for economic growth and human well-being. However, societal problems are complex and technologies alone are often inadequate in offering sustainable solutions. Devoid of relevant social and economic policies and implementation initiatives, technologies languish with unfulfilled potential. The vision of the Center for Study of Science Technology and Policy (CSTEP) is to explore and formulate policy options for harnessing the power of new and emerging technologies that are relevant to India's current needs and future growth.

CSTEP was established as a policy research organisation eight years ago, with a desire to enrich the national policy debate with quality, evidence-based research contributions, focusing on areas where science and technology are enablers. CSTEP continues to grow healthily, not just in the number of professionals who have chosen to work in the organisation, but also in the number of projects that various institutions and stakeholders have entrusted it with.

The new projects that CSTEP has undertaken in the past year have an additional flavour: the programmes are on an international scale and include a number of participating institutions. To cite, the Indo-US project on renewable energy, titled Solar Energy Research Institute for India and the United States (SERIUS), which CSTEP is a part of, has more than six participating universities along with research institutions like the National Renewable Energy Laboratory and RAND Corporation from the USA. CSTEP is similarly a part of two European Union supported consortiums: one is working on developing offshore wind in India and the other is building a solar-biomass hybrid power plant in Bihar, India.

CSTEP continues its engagement in developing protocols that would provide fast response to such unexpected events. The models developed by the Centre are already being tested in simulated environments, and more complex models that have embedded verisimilitude to real life accidents are under development. These endeavours hope to address catastrophes and accidents, which are unexpected, quick and inflict heavy damages to life and property.

I have cited just a few examples of CSTEPs work in the past year to provide a flavour of the type of projects CSTEP undertakes and implements. CSTEP also believes in actively engaging with its various stakeholders and the wider research community. CSTEP organised 19 workshops and published 5 reports last year. The quality of the output continues to be excellent and this can be gauged by the favourable reviews the Center continues to receive.

The number of projects has grown to 30 and CSTEPs income is around Rs 17 crores. After growing for years under the tutelage of the Defence Research and Development Organisation (DRDO) that so kindly provided office space, CSTEP has moved into a new office space. Soon, with support from charitable and learned foundations and individuals, CSTEP hopes to build its own campus on a 14 acre plot it acquired from the Government of Karnataka at a concessional rate.

We continue to believe that the nation needs institutions such as CSTEP to provide advice on issues of relevance to national growth and wellbeing. This is the focussed mission CSTEP is engaged in.



*Dr. V S Arunachalam  
Chairman & Founder, CSTEP*

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## Executive Director's Report Card

**January 2013**

**CSTEP released its report on re-assessing the offshore wind power potential in the states of Karnataka and Andhra Pradesh.** The report titled, "**Wind Power in Karnataka and Andhra Pradesh: Potential Assessment, Costs, and Grid Implications**" was jointly released by Mr. S.V. Ranganath, Chief Secretary, Government of Karnataka and Mr. Alok Srivastava, Joint Secretary, Ministry of New and Renewable Energy, Government of India. Shakti Sustainable Energy Foundation (SSEF) supported this study.

## Snapshots from January 2013 - March 2014

**July 2013**

**CSTEP was appointed as technology resource institution to the Government of Karnataka.** In this role, CSTEP will undertake studies in energy, urban planning, transportation infrastructure and security for a two year period.

**June 2013**

**CSTEP signed a Memorandum of Understanding (MoU) on the 24th, with the Planning Commission** to develop an integrated energy planning system for India. Mr. Anil Jain, Advisor (Energy), Planning Commission and Dr. Anshu Bharadwaj, Director, CSTEP signed the MoU. Following this, CSTEP closely worked with the Planning Commission and helped develop the India Energy Security Scenarios (IESS) 2047. CSTEP worked on nuclear, hydro, agriculture and energy efficiency. The Planning Commission launched the project IESS in February 2014.

In a workshop co-organised with Karnataka Electricity Regulatory Commission (KERC), **CSTEP released a report on Karnataka's power sector.** The report titled, "**Roadmap for Karnataka's Power Sector for 2021-22**", was developed to estimate the future energy demand, evaluate the existing plans for capacity addition and determine potential shortfalls. Mr. M.R. Sreenivas Murthy, Chairman, KERC and Mr. S.V. Ranganath, Chief Secretary, Government of Karnataka released the report.

**CSTEP and the Centre for Techno-Economic Mineral Policy Options published a report on "Rare Earths and Energy Critical Elements: A Roadmap and Strategy for India";** under the aegis of the Ministry of Mines (MoM). This report was widely circulated by MoM in July. This report was the result of a Steering Committee formed earlier, with Dr. V.S. Arunachalam, Founder Chairman of CSTEP, as the Chairperson of the Steering Committee constituted by MoM.

**CSTEP has been granted funds by the Bill and Melinda Gates Foundation to develop "A Platform for Integrated Sanitation Investment Planning-Proof of Concept".** As a first initiative, CSTEP showcased the tool in a fair in New Delhi in March at the Reinvent Toilet Fair.



Dr. Anshu Bharadwaj  
Executive Director

*"In the Think Tank eco-system CSTEP has harnessed the power of technology for the benefits of Indian masses and for the benefit of socio-economic development. As a growing organisation CSTEP is learning and has a long way to go. However, the past year CSTEP has been able to garner some rich evidence-based research which has resulted in several outstanding outputs to the different stakeholders we work with closely."*

### September 2013

**CSTEP leads a consortium that was granted an award by the European Union Co-operation on Renewable Energy, to implement a 3 MW Solar-Biomass Hybrid Plant in Bihar.** The other consortium members are Thermax Limited and Bihar State Power Generation Company Limited (from India) and Energy Centre of Netherlands and French National Centre for Scientific Research (from Europe).

**CSTEP is part of a consortium funded by the European Union, under the Indo European Co-operation on Renewable Energy Program. The project is titled, "Facilitating India's Transition towards Low Carbon Development by Supporting Implementation of National Policies and Programmes for Offshore Wind Power" (FOWIND).**

The main objective is to facilitate offshore wind development in India, through close engagement with Ministry of Renewable Energy (MNRE), and the state governments of Tamil Nadu and Gujarat. The consortium led by the Global Wind Energy Council (GWEC) also has the Centre for Study of Science, Technology and Policy (CSTEP), Garrad Hassan India Pvt. Ltd (GL GH), Gujarat Power Corporation Limited (GPCL) and World Institute of Sustainable Energy (WISE) as consortium partners.

**CSTEP was granted a fund to publish a bulletin with a Think Tank Initiative grant from International Development Research Centre (IDRC).** The key objectives of the bulletin will be to strengthen policy research discipline, highlight importance of policy research, improve perception of Think Tanks among various stakeholders, including donors, government and academia; and share voice ideas, thoughts, success stories, learnings from frequent experiments in ideas/strategies. The bulletin is titled Aditi, and the first issue was published in March 2014.

**CSTEP has been chosen under the Think Tank Initiative to produce a documentary on its work, in the area of energy efficiency.** The documentary will be filmed by the US based GLP Films, and will showcase the efforts and impacts of TTI-funded Think Tanks. The documentary will primarily focus on the role played by CSTEP, by addressing some of these issues. The film will also highlight CSTEP's contributions in the energy sector, in particular, the alternative energy options in India. This documentary will be shared publicly through the IDRC website, and at their public engagements.

### December 2013

CSTEP published a study on technology policy options, to improve the energy efficiency of iron and steel manufacturing plants. This report titled "A Study of Energy Efficiency in Iron and Steel Industry" was released in a workshop by Dr. Ajay Mathur, Director General, Bureau of Energy Efficiency (BEE). CSTEP also published a study of industrial units, which could be included in the second cycle of Perform Achieve Trade (PAT) scheme, for improving energy efficiency. The report titled, "The Study of Potential for Widening the Coverage of Perform Achieve Trade (PAT)" was also released at the same workshop. Shakti Sustainable Energy Foundation (SSEF) supported both these studies.

### January 2014

**CSTEP was awarded a grant by IDRC to conduct a study on "Climate Change Adaptation in South Asia."** This is a joint project undertaken by three Think Tank Initiative grantee institutions: Public Affairs Centre (PAC), Centre for Study of Science, Technology and Policy (CSTEP) and Institute for Social and Environmental Transition -Nepal (ISET-N). The objective of this study is to improve knowledge on impact due to climate change, integrate science in social science models and tools, build capacity in climate vulnerability and adaptation studies, and prepare to undertake large-scale future projects in this area.

### February 2014

**The Planning Commission constituted a Committee to examine India's options for Low Carbon Inclusive Growth.** As a member of this committee, CSTEP coordinated the work on the Industry and Power sectors and examined the technology-policy options for these sectors. The findings of the Committee will act as the Government of India's official policy on low carbon strategy, which will be released as a report titled **"The Final Report of the Expert Group on Low Carbon Strategies for Inclusive Growth"**.

*I'm very impressed with the innovative work that is being done at CSTEP and the commitment of staff. We're happy to be a partner in this journey.*

**Dr. Anindiya Chaterjee**  
Regional Director, (TTI) IDRC South Asia

July 18, 2013

CSTEP continues to work on the key domains that were identified. The following section provides the highlights for each of the Domain – Energy, Infrastructure, New Materials and Security Studies.

## Energy

CSTEP focusses on developing science and technology-based options for India's low carbon energy growth for Demand-side management and Supply-side management.

- ▲ "CSTEP released a report on, 'A Study of the Potential for Deepening the Scope of Perform Achieve and Trade (PAT)' in December 2013. This report was initiated in the context of the National Mission for Enhanced Energy Efficiency (NMEEE) under the Prime Minister's National Action Plan for Climate Change (NAPCC). Dr. Ajay Mathur, Director General of Bureau of Energy Efficiency (BEE) was the Chief Guest and released the report which was a result of an eleven month study. The report identified new industrial units in the existing PAT sectors and also estimated energy consumption and provided sector-wise comparison for the first cycle of PAT. At the same event, Dr Mathur also released 'A Study of Energy Efficiency in the Indian Iron and Steel Industry'."



Dr. Krishnan S S  
Principal Investigator

- ▲ "CSTEP is a part of the SERIUS consortium, which is a virtual research centre under the Indo-US PACE partnership. Under this project, last year we took up geospatial resource assessments, engineering economic modelling of solar PV and CSP systems, and started exploring novel materials for storage and grid integration of solar power."



Dr. Sharath Rao  
Principal Investigator

**Green-Growth, Low-Carbon and Climate Change-Resilient Development for Karnataka** – The project in a capsule includes, "Use of cost optimization model (to develop energy scenarios) and benefits (jobs, land and water availability, local pollution etc.) analysis to arrive at a set of prioritised policy opportunities". This is a first of a kind exercise which has never been pursued at a state level before. It is being funded by the Global Green Growth Institute (GGGI)."

**Addressing the challenges of RE-Manufacturing in India: Horizon 2032** - The key finding of the study suggests that "The manufacturing policy should assist manufacturers of sub-components in the PV module supply chain such as encapsulant, glass and backsheet. Secondly, R&D and near commercialisation of breakthrough silicon or non-silicon based technologies should be promoted. This project has been funded by Shakti Sustainable Energy Foundation. "

- ▲ "CSTEP undertook a short study, commissioned by the Karnataka Electricity Regulatory Commission (KERC). The objective of the study, titled 'Karnataka's Power Sector Roadmap for 2021 – '22', was to evaluate Karnataka's current and future power position from 2021 – '22. The intended audiences for this report are government agencies, policymakers, and power sector experts. The Bangalore Chamber of Commerce and Industry conducted a workshop based on this report. The findings of the report were presented by KERC to the Energy Ministry, Government of Karnataka."
- ▲ "Facilitating Offshore Wind in India (FOWIND), an EU-funded project executed in a Consortium mode, started its activities in December 2013. Its main objective is to facilitate offshore wind development in India through close engagement with the Ministry of New and Renewable Energy (MNRE) and the State governments of Tamil Nadu and Gujarat."



Meera Sudhakar  
Principal Investigator



Thirumalai N C  
Principal Investigator

- ▲ "Receiving a grant from the European Union for a project to develop new and renewable energy sources through development of a 3 MW power plant using hybrid solar-biomass technologies is an interesting project where CSTEP is working in a consortium with Thermax, Bihar State Power Generation Company Ltd, French National Centre for Scientific Research and Energy Research Centre from Netherlands."
- ▲ "A decision making tool was designed and developed by CSTEP's Solar Techno Economic Model (CSTEM) for the assessment of Parabolic Trough Technology which could be used by various stakeholders like policymakers, developers, investors, researchers to name a few."
- ▲ "CSTEP completed an MNRE sponsored project titled, "Engineering Economic Policy Assessment of Concentrated Solar Thermal Power Technologies for India". The main objectives of this project was to prepare a comprehensive report on engineering-economic evaluation on the prospects of large scale deployment of solar thermal power technologies in India and develop an intuitive Graphic User Interface (GUI) desktop computational tool which could aid in performing a pre-feasibility analysis for the CSP projects. A report and the GUI tool have been submitted to MNRE in August 2013."

## Energy Policy

## 2013

## National Level Engagement

**January 18** - Dr. Sharath Chandra Rao, Shweta Srinivasan attended 'A Co-benefits Approach to Climate Change in India' in New Delhi, organised by the Centre for Policy Research.

**February 01** - Mohd Sahil Ali attended 'The Global Challenge of Resource Efficient Growth and Development' in New Delhi, organised by The Energy & Resources Institute (TERI).

**February 22-23** - Debapriya Das participated in 'Equity, Adaptation & Sustainable Development' in Mumbai, organised by the Tata Institute of Social Sciences (TISS).

**April 17-18** - Dr. S.S. Krishnan and Dr. Anshu Bharadwaj attended the Fourth Clean Energy Ministerial in New Delhi, organised by the Planning Commission.

**June 10** - Ritesh Jain, Nihit Goyal attended a workshop on 'India's Long-Term Low-Carbon Development Pathway: India's Energy Technologies to 2050' in New Delhi, organised by Grantham Institute for Climate Change & TERI.

**June 12** - Ritesh Jain attended 'Modelling Tools for Energy and Climate Policy in India: Lecture/Discussion Meeting' in Bangalore, organised by the National Institute of Advanced Studies.

**July 15-19** - Mohd Saquib, Shweta Srinivasan, Mohd Sahil and Bishal Mazumdar attended 'Using the Long-range Energy Alternatives Planning (LEAP) Model for Greenhouse Gas Mitigation Assessment' in Bangkok, organised by United States Agency for International Development (USAID).

**July 19** - Dr. S.S. Krishnan and Nihit Goyal attended a workshop on 'India Energy Planning Tool' in New Delhi, organised by Planning Commission.

**August 14** - Deepthi Swamy attended the '8th Annual International Conference on Public Policy and Management' in Bangalore organised by Centre for Public Policy, Indian Institute of Management.

**September 06** - Mohd Sahil and Nihit Goyal attended a workshop on 'India Energy Planning Tool' in New Delhi, organised by Planning Commission.

**October 14-15** - Dr. Anshu Bharadwaj, Mohd Sahil Ali and Deepthi Swamy participated in 'India Energy Planning Tool Workshop' in New Delhi, organised by Planning Commission.

## State Level Engagement

**March 15** - Dr. Sharath Rao, Meera Sudhakar and Deepthi Swamy attended the 'State Clean Energy Fund Roadmap' in Bangalore organised by International Institute for Energy Conservation (IIEC).

**May 22** - Deepthi Swamy and Mohd Saquib attended 'Load Forecasting, Generation Planning & Perspective Planning for the state of Karnataka for 12th & 13th Plan Period' in Bangalore organised by KERC and Karnataka Power Transmission Corporation Limited (KPTCL).

**June 22** - Dr. Anshu Bharadwaj, Meera Sudhakar, Deepthi Swamy, Dr. Jai Asundi, and Mohd Saquib attended a Round Table discussion on the 'Roadmap for Karnataka's Power Sector: 2021-22' in Bangalore organised by Karnataka Electricity Regulatory Commission (KERC).

## 2014

**February 28** - Dr. Anshu Bharadwaj, Shweta Srinivasan and Nihit Goyal attended 'The launch workshop for the India Energy Security Scenarios 2047 (IESS)' in New Delhi, organised by The Planning Commission and Confederation of Indian Industries (CII).

## Conference Participation

## Newspaper Articles



## 2013

**July 15** - 'Economic Reasoning in Energy Security-Book review' by Dr. N. Balasubramanian in *The Hindu*.

**July 15** - 'Power sector's crucial role in climate change' by Dr. B.K. Chandrashekar, Dr. Sharath Rao in *Deccan Herald*.

**October 24** - 'Contribution to the KERC Report' by CSTEP in *Deccan Herald*.

## Reports

**July** - 'Roadmap for Karnataka's Power Sector: 2021-2022' by Deepthi Swamy, Mohd Saquib and Meera Sudhakar.

## Conference Publications

**April 17, 2013** - Dr. Anshu Bharadwaj presented 'experiences and challenges faced by the country's mini-grid development' at the Fourth Clean Energy Ministerial, New Delhi.



Conference on Climate Trends, Green-Growth, Low-Carbon and Climate Change-Resilient Development for Karnataka

## Energy Policy

### Events

#### National level Engagement

#### 2013

**April 09** - Dr. Jai Asundi attended a workshop on 'Energy Modelling' organised by the Planning Commission.

**June 01** - Dr. S.S. Krishnan presented 'LEAP tool in Overview of PPP Models in Energy Sector' in Mysore organised by the Administrative Training Institute, Government of Karnataka.

**July 20-22** - Dr. S.S. Krishnan 'Regional Training on Using LEAP for GHG Mitigation Assessment' in Bangkok organised by USAID.

**September 30-October 04** - Dr. S.S. Krishnan, Shyam Sunder and Saptak Ghosh attended a workshop on 'ASIA LEDS Forum' in Manila, Philippines organised by ICF International, Climate Change Commission of Philippines and Asian Development Bank.

**November 28** - Shweta Srinivasan and Deepthi Swamy attended the 'Final Stakeholder Consultation Workshop for the India Energy Planning Tool (IEPT) being developed by Planning Commission' organised by the Planning Commission.

**December 02** - CSTEP organised a workshop on 'Overview of PPP (Public Private Partnership) Models in the Energy Sector' in Mysore.

**December 05** - CSTEP and Public Affairs Centre organised a workshop on 'Growth in a Carbon Constrained World' in Bangalore.

#### 2014

**March 04-05** - Dr. S.S. Krishnan and Shyam Sunder attended a workshop on 'Geo Spatial Assessment and Working Group for Sustainable Growth Meeting' in New Delhi organised by the Planning Commission.

**March 27-28** - Shweta Srinivasan and Nihit Goyal attended a workshop on 'Deconstructing South-South Cooperation: A South Asian Perspective' in New Delhi organised by NCAER and CPD, Bangladesh.

#### State Level Engagement

#### 2013

**February 23** - Dr. Sharath Rao attended 'Climate Trends, Green-Growth, Low-Carbon and Climate Change-Resilient Development for Karnataka' at Vidhana Soudha, Bangalore organised by Global Green Growth Institute.

**June 22** - CSTEP with KERC organised a workshop on 'Roadmap for Karnataka's Power Sector: 2021-'22' in Bangalore.

#### 2014

**February 07** - Meera Sudhakar and Deepthi Swamy attended a workshop on 'Karnataka's Power Sector Roadmap: 2021-22' organised by the Bangalore Chamber of Industry and Commerce (BCIC).

## Energy Efficiency

### Conference Participation

#### 2013

**January 08-09** - Shyam Sunder attended the 'International Conference on Research into Design' in Chennai organised by the Indian Institute of Technology.

**January 17-18** - Dr. S.S. Krishnan and A. Murali Ramakrishnan attended the '2nd Annual International Summit on Fly Ash Utilisation' in New Delhi organised by Mission Energy Foundation.

**January 28-30** - Saptak Ghosh attended 'Hazardous Waste Management' in New Delhi organised by Centre for Science & Environment.

**January 29-30** - Venkatesh Vunnam attended 'Industrial Waste Heat Recovery' in New Delhi organised by Federation of Indian Chambers of Commerce and Industry (FICCI).

**February 25** - Venkatesh Vunnam attended 'Technology Roadmap: Low-Carbon Roadmap for the Indian Cement Industry' in New Delhi organised by World Business Council for Sustainable Development.

**February 27- March 01** - Dr. S.S. Krishnan and Shyam Sunder attended 'Low Emissions Development Strategies (LEDS) Global Partnership Learning and Leading on LEDS' in Thailand organised by LEDS Global Partnership.

**May 09** - Shyam Sunder attended 'Green Norms for Green energy' in New Delhi organised by Centre for Science & Environment.

### Conference Publications

#### 2013

**April 02-04** - Dr. S.S. Krishnan presented 'Update on India's Perform, Achieve, and Trade (PAT) program for Industrial Energy Efficiency' in Asia Low Emission Development Strategies (LEDS) Partnership Workshop on Climate Finance, Manila, Philippines.

**April 29, 2013** - Dr. S.S. Krishnan presented 'Coal Gasification: A National Resource Efficient Inclusive Energy Policy Perspective' in a conference titled 'Coal Gasification Technology in India' organised by Thermax Ltd, Pune

#### 2013

### Newspaper Articles

August 22 - 'Gasification Technology to Produce Power from Municipal Solid Waste in Bangalore' by Saptak Ghosh in Citizen Matters.

## Wind Power

### Energy Efficiency

#### Journal Articles

**September 2013** - 'Introducing Energy Quarterly' by Dr. V.S. Arunachalam and E.L. Fleischer in *MRS Bulletin*, Volume 35.

2013

#### Events

**April 02-04** - Dr. S.S. Krishnan attended a workshop on 'Asia LEDS Partnership Workshop on Climate Finance' in Manila, Philippines organised by Asian Development Bank and the Climate and Development Knowledge Network.

**April 29** - Dr. S.S. Krishnan and V.S. Jagani attended a workshop on 'Gasification Technology for India' in Pune organised by Thermax Limited.

**June 26** - CSTEP organised a talk on 'Shale Revolution in the US and its likely Impact on India' by Dr. Bhamy V. Shenoy, Advisor, Great Lakes Institute of Management, Chennai.

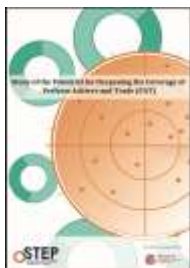
**December 20** - CSTEP with Bureau of Energy Efficiency, Ministry of Power, Government of India, and several steel industries of India organised a workshop on 'Energy Efficiency of the Iron and Steel Industry: Interactive Meet on PAT Mechanism under NMEEE' in Bangalore.

#### Webinars & Podcasts

2013

**September 04** - Webinar on 'Energy Efficiency Policies' presented by Shyam Sunder, Senior Research Engineer, <http://www.cstep.in/node/463>

**November 21** - Webinar on 'Demystifying the Volatile Rupee' presented by Debapriya Das, Research Economist, <http://www.cstep.in/node/472>



#### Reports

2013

**November** - 'Study of the Potential for Widening the Coverage of Perform Achieve and Trade' by Dr. S.S. Krishnan, Shyam Sunder, Kiran Pal and V.S. Jagani.

**November** - 'A Study of Energy Efficiency in the Indian Iron and Steel Industry' by Dr. S.S. Krishnan, Venkatesh Vunnam, Shyam Sunder, V.S. Jagani and A. Murali Ramakrishnan.

#### Conference Publications

2013

**August 12** - Deepthi Swamy, Meera Sudhakar and Mohd Saquib presented 'Resource Variations and Resultant Tariffs for On-shore Wind Potential in Karnataka' at the Eighth Annual International Conference on Public Policy and Management Infrastructure: Hard & Soft organised by the Indian Institute of Management in Bangalore

#### Journal Articles

**March 01, 2014** - 'An Empirical Model of Power Curve of a Wind Turbine' by Abhik Kumar Das published in *Energy Systems*.

2014

#### Newspaper Articles

CSTEP featured in the following news articles:

**January 29** - 'EU Contributes 4 million Euros to Indo-European Cooperation on Renewable Energy Programme' in *Business News*

**January 27** - 'EU and India Join Hands to Facilitate Offshore Wind' in *North American Wind Power*

**January 27** - 'EU to Help India Venture Offshore' in *ReNews*

**January 27** - 'India to Make Offshore Wind Plan With EU Help' in *Bloomberg Business Week*

**January 14** - 'India to Prepare Offshore Wind Plan' in *Business Standard*

**January 17** - 'National Wind Energy Mission on cards' in *The New Indian Express*

**January 23** - 'MNRE starts process for a National Wind Energy Mission' in *Yahoo India News*

**January 27** - 'EU Partners with India for Offshore Wind Development' in *The Hindu*

**February 28** - 'India to reduce energy import dependence to 21% in 2047 at optimal levels projects India Energy Security Scenarios (IESS) 2047' in *India Environment Portal*

**March 01** - 'India to reduce energy import dependence at optimal levels' in *ANI News*

#### Reports

2013

**January** - 'Wind Power in Karnataka and Andhra Pradesh: Potential Assessment, Costs, and Grid Implications' by Meera Sudhakar.

2013

**January 16** - CSTEP with Karnataka Renewable Energy Development Limited and Shakti Sustainable Energy Foundation organised a workshop on 'Roadmap for Accelerated Wind Power Development in India' in Bangalore.

August 14 - Meera Sudhakar attended a workshop on 'Offshore Wind Energy' organised by The Ministry of New and Renewable Energy in New Delhi.

2014

**January 09** - Deepthi Swamy attended a workshop on 'Consultation for National Wind Energy Mission for India' organised by Ministry of New and Renewable Energy in New Delhi.

#### Events

## Solar Power

## Nuclear Power

## Conference Participation

2013

**October 03-04** - Debapriya Das attended the '3rd India Nuclear Energy Summit' in Mumbai organised by Knoppen.

2014

**January 27-29** - Debapriya Das attended the 'UK Trade and Investment's (UKTI) Civil Nuclear Export Showcase' in London organised by UK Trade and Investment's (UKTI) and the British High Commission (BHC).

## Books

**June 01, 2013** - Chapter-2, 'Converging Nuclear Energy Programmes –View from India' in The China-India Nuclear Crossroads by V S Arunchalam, Meera Sudhakar, S. Rajgopal and Dipak Sundaram.

## Conference Participation

2013

**February 06** - Saptak Ghosh attended a 'Roundtable on Solar PV Rooftops and Manufacturing in India' in Pune organised by Prayas and Pune International Centre.

**February 11-12** - Saptak Ghosh and Venkatesh Vunnam attended 'Solar PV Rooftop Installation Training Program' in Bangalore organised by Enerplus Solutions.

**April 03-05** - Meera Sudhakar, Shyam Sunder, Thirumalai N.C., and Venkatesh Vunnam attended Asia regional workshop on 'Renewable Energy Resource Assessment and Geospatial Analysis' in Bangkok organised by National Renewable Energy Laboratory.

**April 23** - Saptak Ghosh and Varun Jyothiprakash attended 'Addressing Challenges to Renewable Energy Manufacturing Industry in India - Horizon 2032' in Pune organised by CSTEP and World Institute of Sustainable Energy (WISE).

## Smart Grid

## Conference Participation

**April 10, 2013** - Mohd Saquib attended 'Grid Integration of Renewable Energy Sources and Energy Efficiency' at Bangalore organised by the Ministry of New and Renewable Energy.

**August 03** - Thirumalai N.C., Mohd Saquib, Ritesh Jain, Bhupesh Verma, Venkatesh Vunnam and Saptak Ghosh attended 'Balancing Energy Supply & Demand in the region – the need for a complete PV eco-system from materials to power generation' in Bangalore organised by Solarcon India 2013.

**August 21** - Badri S. Rao attended a one day 'Certificate Course on Industrial Solar Heaters' in Chennai organised by Council of Scientific and Industrial Research (CSIR) and Central Electronics Engineering Research Institute (CEERI).

**September 23** - Saptak Ghosh and Dr. Sharath Rao presented 'Electrical Storage Technologies - Options for India' at the 'Future of Solar Energy in India' in Gandhi Nagar, Gujarat organised by Centre for Science Environment -Gujarat Energy Research And Management Institute.

**October 18** - Dr. Sharath Rao attended 'Accelerating 'Behind-the-Meter': Solar Energy Penetration through Market Transformation and Enabling Policies' in New Delhi organised by TERI.

*"CSTEP is now one of our important partners and the EU is very much looking forward to pursue renewable energy development in India. We are fortunate to be working with dedicated staff members of CSTEP"*

**Smita Singh**

Project Manager, European Union, New Delhi, India

March 06, 2014

## Solar Power

### Events

#### 2013

**April 01-02** – The SERIIUS team and Dr. Anshu Bharadwaj attended the 'Symposium on Research Directions in Solar Energy - 2014' at Satish Dhawan Auditorium, IISc Bangalore organised by Indian Institute of Science (IISc), where Dr. Anshu Bharadwaj presented '100 GW of solar by 2030'.

**April 03-04** - Vaishalee Dash and Sriakshmi G. attended a workshop on 'Short-Term CEP Course on PV Module Reliability' at IIT Bombay organised by SERIIUS.

**April 23** - CSTEP and WISE organised a workshop on 'Challenges to Scale-up Renewable Energy Manufacturing Industry in India: Horizon 2032' in Pune.

**June 21** - CSTEP organised a talk on 'Frontiers in Renewables Integration' by Priya Sreedharan, PH.D, P.E., Senior Consultant, Energy and Environmental Economics ("E3"), San Francisco CA.

*"We had an extremely informative & stimulatory exchange related to climate change mitigation, energy, security & other themes"*

**Mark Newton,**

*Environment Officer, CEEQ, USAID, India*

*March 06, 2014*

*"...it has been a real pleasure to meet our collaborators and spend time brainstorming face-to-face. I look forward to my next visit".*

**Aimee Curtright,**

*Associate Research Department Director*

*RAND Corporation, USA*

*April 04, 2014*

### Reports

**January** - March 2014 - 'SERIIUS Quarterly Project Report' by Dr. Anshu Bharadwaj and Dr. Mridula Dixit Bharadwaj.



### Newspaper Articles

**September 2013** - 'Using Computation to Enrich Policy' by Abhik Das and Dr. Anshu Bharadawaj in *Connect*, Volume 5 (2).

**October 2013** - Dr. Anshu Bharadwaj's interview on 'The Study on Solar Thermal Applications' in *InSolTherm Times*, February 28, 2014 - 'Proposing a solution for Indo-US "Solar Wars"' by Saptak Ghosh in *Ideas for India*.

### Journal Articles

#### 2013

**April** - 'Analytical Expression of the Physical Parameters of an Illuminated Solar Cell using Explicit J-V Model' by Abhik Kumar Das in *Renewable Energy*, Vol. 52, Issue 1.

**December** - 'An explicit J-V model of a solar cell using equivalent rational function form for simple estimation of maximum power point voltage' by Abhik Kumar Das in *Solar Energy Volume 98, Part C*.

#### 2014

**March** - 'Analytical derivation of equivalent functional form of explicit J-V model of an illuminated solar cell from physics based implicit model' by Abhik Kumar Das in *Solar Energy, Volume 103*.

### Webinars & Podcasts

**November 07, 2013** - Webinar on 'Solar Manufacturing in India' by Ritesh Kumar Jain, Senior Research Engineer, <http://www.cstep.in/node/464>

**March 25, 2014** - Podcast on 'Learning Curves in India' by Saptak Ghosh, Senior Research Engineer, <http://www.cstep.in/node/550>

## Infrastructure

CSTEP has endeavours to address the complexity of problems that form the spectrum of social infrastructures - physical and public services, through knowledge from many perspectives and disciplines.



Sujaya Rathi  
Principal Investigator

*"CSTEP along with Public Affairs Centre organised a Colloquium on Climate Change issues titled "Climate Smart cities" on August 28, 2013 to explore how our cities can adapt better towards the changing climate and how its citizens can play a constructive role in this process."*

*"CSTEP played a key role in structuring a workshop, whereby most of the sanitation modelling teams were represented and interacted with decision makers discussing usability of such tools and models. The Sanitation Modeling Planning in India workshop was organised by the Gates Foundation during December 2-4, 2013 in Bangalore."*

### 2013

#### Conference Participation

**May 09-10** - Anantha Lakshmi P. attended 'The High Speed Rail Symposium' organised by the Sri Jayachamarajendra College Of Engineering SJCE, Foundation Caminos De Hierro (Spain), Technical Education Quality Improvement Programme TEQIP (GoK) and Conferences, and Incentives Management (I) Pvt Ltd, in Mysore.

**May 28-29** - Sujaya Rathi and Anantha Lakshmi P. attended 'ITS for Sustainable Transportation System and Choices' organised by Indian Institute of Science in Bangalore, where Sujaya Rathi presented a paper on 'Intelligent Transport System'.

**August 28** - Sujaya Rathi and Anantha Lakshmi P. attended the 'Climate Smart Cities Colloquium' in Bangalore, organised jointly by CSTEP and Public Affairs Centre.

**December 02-04** - Dr. Jai Asundi, Sujaya Rathi and Aarti Daryanani attended 'Modelling for City Sanitation in India'; organised by the Bill and Melinda Gates Foundation in Bangalore, where they presented 'A Proof of Concept Platform for Integrated Sanitation Investment Planning'.

**December 14** - Sujaya Rathi and Anantha Lakshmi P. attended the '2nd Conference of Transportation Research Group' in Agra, organised by the Indian Institute of Science. Sujaya Rathi co-chaired the session and Anantha Lakshmi P. presented 'Strategies to Reduce Energy Consumption from Commuting by Employees'.

### 2014

**February 3-6 and March 14-15:** Sujaya Rathi and Shrimoyee Bhattacharya presented on the 'Role of CMP in Urban Transport, Methodology of Preparing CMP and Proposals of CMP & Fitting Instruments or Synergies in Waiting – Case Study, Bangalore' at the Training Programme on Urban Transport, organised by the State Institute of Urban Development in Mysore.

#### Conference Publication

**May 09-10, 2013** - Anantha Lakshmi presented 'Decision Making for Up-gradation of Transport Infrastructure' at the High Speed Rail (HSR) Symposium, Mysore.

**May 28-29, 2013** - Sujaya Rathi presented 'Intelligent Transport Systems (ITS)' at Sustainable Transportation System and Choices, Indian Institute of Science.

**December 12-15, 2013** - Sujaya Rathi and Anantha Lakshmi P. presented 'Strategies to Reduce Energy Consumption from Commuting by Employees' at 2nd Conference of Transportation Research Group of India, Agra.

#### Newspaper



#### Articles

### 2013

**January 24** - 'Consider options other than bifurcation' by Sujaya Rathi in DNA.

**April 14** - The way out of the mess on road by Sujaya Rathi and Anantha Lakshmi in *The Hindu*.

**July 14** - 'Are Slums a Problem or Solution' by Sujaya Rathi, Mohammed Sayed Faisal, Debapriya Das in *The Hindu*.

**October 24** - 'Building towns to save our cities' by Sujaya Rathi and Anantha Lakshmi in *India Together*.

### 2014

**March 07** - 'Bangalore's planners solve its commuter woes' by Sujaya Rathi and Shrimoyee Bhattacharya in *India Together*



Reinvent Toilet Fair



Climate Smart Cities

## Events

### 2013

**February 12** - Sujaya Rathi attended a Panel Discussion on 'Next Round of JnNURM Investment in Urban Transport – Opportunities & Challenges' in New Delhi, organised by the Shakti Sustainable Energy Foundation and Embarq.

**April 12** - Sujaya Rathi and Jai Asundi attended a seminar on 'Governance of City Systems and Challenges of Mobility' in Bangalore, organised by the British High Commission and Janaagraha.

**June 07** - Sujaya Rathi attended a lecture on 'Sustainable Development and Urban Transformation: Lessons learned and Perspective' in Bangalore, organised by the Indian Institute of Human Settlement.

**October 28** - Sujaya Rathi attended a workshop on 'Universal Urban Sanitation - Smaller Cities a Priority Area for Policy Focus' organised by the Centre for Policy Research (CPR) and supported by Ministry of Urban Development (MoUD), Government of India.

**November 26** - Sujaya Rathi, Anantha Lakshmi P, and Shrimoyee Bhattacharya attended a workshop on 'Urban Transport (Mobility Strategies for Bangalore)' at Vikasa Soudha, Bangalore, organised by the State Institute for Urban Development, where Sujaya Rathi presented 'Fitting Plans - Structure Plan & Master Plan, CTP, CMP & Policies'.

**December 12** - Sujaya Rathi and Shrimoyee Bhattacharya attended a workshop on 'Cities of the Future: Smart & Sustainable, Launch of the Smart Cities Council India initiative' in Bangalore, organised by the Centre for Sustainable Development and Smart Cities Council.

**December 18-19** - Sujaya Rathi attended a Round Table on 'The Economics of Investment in High Speed Rail' at Vigyan Bhavan, New Delhi, organised by the Planning Commission, International Transport Forum, and the Asian Institute of Transport Development.

### 2014

**January 20-21** - Sujaya Rathi attended a workshop on 'Establishing Operation and Maintenance Services for Decentralised Urban Sanitation Infrastructure in Karnataka' in Bangalore organised by the Consortium for DEWATS Dissemination (CDD) Society and BORDA.

**January 22** - Shrimoyee Bhattacharya attended a workshop on 'Climate Change Mitigation: Financing Low Carbon Growth at the State Level' in Bangalore, organised by Public Affairs Centre, IFMR and Shakti Sustainable Energy Foundation.

**February 14** - Sujaya Rathi, Smita Dolly and Bhavna Sharma attended a workshop on the PAS model organised by CEPT, Ahmedabad.

**March 10** - Sujaya Rathi and Shrimoyee Bhattacharya attended 'Connect Karo – 2014' in Bangalore organised by Embarq.

**March 11** - Anantha Lakshmi P, and Shrimoyee Bhattacharya attended a workshop on 'Transport Governance Initiative (TGI) Tool' in Bangalore organised by Embarq.

**March 20-22** - Dr. Jai Asundi, Sujaya Rathi, Aarti Daryanani, Chaitanya V, and Arushi Sen participated in 'Reinvent the Toilet Fair' in New Delhi, organised by the Bill and Melinda Gates Foundation, where Sujaya Rathi presented on 'A Platform for Integrated Sanitation Investment Planning, Proof-of-Concept'.

**March 28-29** - Shrimoyee Bhattacharya and Mohd. Sahil Ali attended a short course on 'Urban Research Using Public Data Sources' in Bangalore, organised by the Indian Institute of Human Settlement.

## Webinars & Podcasts

**October 15, 2013** - Podcast on 'Urban Transport - An Integrated Agenda' by Sujaya Rathi, Principal Investigator; <http://www.cstep.in/node/461>.



## Journal Articles

**July 05, 2013** - 'Sustainable urbanisation using high speed rail (HSR) in Karnataka, India' by Ashish Verma, H.S. Sudhira, Sujaya Rathi, Robin King, Nibedita Dash in *Research in Transportation Economics*, Volume 38, Issue 1.



## New Materials

CSTEP is involved in integrating quantum mechanical simulations with data mining and the experimental validation of new materials.



Dr. Mridula Dixit  
Bharadwaj  
Principal Investigator

- ▲ "CSTEP analysed solar resource data for 22 locations across India and carried out preliminary analysis on variability of solar resource at different geographical locations. Subsequently, energy storage requirements (including economic analysis) were modeled for renewable integration in the Indian context."
  - ▲ "A fundamental R&D studies was initiated to enhance the life of the Sodium-Sulphur battery which is the front runner in the renewable energy applications related battery systems. The study was able to identify and predict a novel solid electrolyte composition for possible low temperature operation and help reduce corrosion to enhance the battery life. As a result this will improve the Levelised Cost of Energy (LCOE)."
- 
- ▲ "Work on Lithium Ion battery (LIB) system both, in connection with renewable integration as well as electric transportation applications is continuing. The efforts included predicting and analysing new cathode, anode and electrolyte materials through atomistic and molecular scale simulations. We also initiated theoretical studies on super capacitor for applications in solar energy integration."
  - ▲ "Collaborative efforts between Indian and the US partners of SERIUS (Solar Energy Research Institute for India and the United States) project. On the storage R&D side, we worked on Na-S battery and super capacitor systems with IISc, Bangalore and LIB system with IIT Bombay. The techno economics and grid analyses efforts were initiated in collaboration with Carnegie Mellon University, USA and Solar Energy Center, India. Besides SERIUS partnerships, we also have started collaborations with IIT, Kharagpur on some novel battery systems and currently are in the process of developing and testing prototypes."

**"A very vibrant and enthusiastic team at CSTEP making difference to the society through socially relevant yet very rigorous & interesting research. Good luck for all the ventures & looking forward to work with you all!"**

**Nikit Abhyankar**

Senior Scientific Engineering Associate  
International Energy Studies Group  
Lawrence Berkeley National Laboratory, US

March 18, 2014



CSTEP staff participated in 24<sup>th</sup> Annual General Meeting of Materials Research Society of India



## Conference Participation

2013

**August 12-13** - Arghya Bhowmik attended the 'First International Seminar on Nanotechnology in Conventional and Alternate Energy Systems', organised by The University of Petroleum & Energy Studies (UPES), in association with SUNY College of Nanoscale Science and Engineering (CNSE), New York, USA in Dehradun.

**February 10-12** - Bishal Mazumdar attended 'Materials Research Society, India Conference on Energy Materials: MRS India Annual General Meeting', organised by the Indira Gandhi Centre for Atomic Research in Kalpakkam.

**July 15-19** - Bishal Mazumdar attended 'Using the Long-range Energy Alternatives Planning (LEAP) Model for Greenhouse Gas Mitigation Assessment', organised by USAID in Bangkok.

**February 22-23** - Tanmay Sarkar and Vinay K. attended 'ADNAM-2013: Advances in Naval Materials', organised by Indian Institute of Technology, Madras and National Institute of Ocean Technology in Chennai.

**May 10** - Dr. Mridula Dixit Bharadwaj attended 'Power Control and Energy Management' under the Technical Education Quality Improvement Programme organised by the National Institute of Technology in Warangal.

**December 16-20** - Vinay K. attended 'International Union of Materials Research Society', organised by Indian Institute of Science in Bangalore.

## Conference Publication

2013

**August 12-13** - Arghya Bhowmik, Dr. Mridula Dixit Bharadwaj and Jaysree Pan presented 'Moving from Li to Na ion intercalation battery: electronic charge transfer mechanism in cathodes studied with ab-initio methods' at the First International Seminar on Nano Technology in Conventional and Alternate Energy Systems, organised by Global Status and Pathways, Dehradun.

**May 09-11** - Dr. Mridula Dixit Bharadwaj presented 'Storage options and materials for renewable applications and Fundamental R&D in batteries: Global trends and CSTEP Efforts', organised by Power Control and Energy Management, Warangal.

## Events

**February 19-21, 2014** - Vinay K. delivered a talk on 'Molecular simulation based modeling of battery materials at International seminar on Electric/Hybrid Electric Vehicle (EV/HEV)' at an event organised by the Dept. of Electrical and Electronic Engineering, Rajarajeshwari college of engineering, Bangalore.

**March 28, 2014** - Dr N. Balasubramanian attended a workshop on 'Scientific Mining Policy and Critical Minerals in Kerala' organised by SPB, KSCSTE, Science and Technology Department (Govt of Kerala), Thiruvananthapuram.

## Newspaper Articles

**March 28, 2013** - 'Promise of Lithium Batteries' by Dr. N. Balasubramanian and Dr. Mridula Dixit Bharadwaj in *The Hindu*.

**August 27, 2013** - 'Living in the material world\_Book review' by Dr. N. Balasubramanian in *The Hindu*.



2013

## Journal Articles

**January** - 'A Statistical Model for Wind Power on the Basis of Ramp Analysis' by Abhik Kumar Das and Bishal Mazumdar in *International Journal of Green Energy*

**December** - 'Electrochemical potentials of layered oxide and olivine phosphate with aluminium substitution' by Arun Kumar Varanasi, Phani Kanth Sanagavarapu, Dr. Mridula Dixit Bharadwaj, Dr. N. Balasubramanian, Arghya Bhowmik, Umesh V. Waghmare, Dipti Deodhare and Alind Sharma in the *Bulletin of Material Science, Volume 36, No. 7.*

**September** - 'Tuning Electrochemical Potential of LiCoO<sub>2</sub> with Cation Substitution: First Principles Predictions Electronic Origin' by Arun Kumar Varanasi, Arghya Bhowmik, Tanmay Sarkar, Umesh V. Waghmare, Dr. Mridula Dixit Bharadwaj in the *International Journal of Ionics, Volume 20, Issue 3.*

**October** - 'Origins of Electrochemical Performance of Olivine Phosphate as Cathodes in Li-batteries: Charge Transfer, Spin-state and Structural Distortion' by Arghya Bhowmik, Tanmay Sarkar, Umesh V. Waghmare, Arun Kumar Varanasi, Dr. Mridula Dixit Bharadwaj in the *Journal of Renewable and Sustainable Energy, Volume 5, Issue 5.*

**October** - 'Phase Transition, Electrochemistry, and Structural Studies of High Rate Li<sub>x</sub>V<sub>3</sub>O<sub>8</sub> Cathode with Nanoplate Morphology' by S. Sarkar, Arghya Bhowmik, Dr. Mridula Dixit Bharadwaj and S. Mitra in the *Journal of the Electrochemical Society, Volume 161, Issue 1.*



## Security Studies

The Security Studies Group (SSG) at CSTEP is actively involved in the development of models and simulation tools to analyse issues affecting national security including disaster management and cyber-security.

### Emergency and Disaster Management



Dr. Jai Asundi  
Principal Investigator

- ▲ "A report on an integrated command and control centre for emergency management was delivered. The report included proof-of-concept computer-based tools for training personnel (2D-3D, Triage, First-person Response Exercise), for facilitating communication between situation commanders and responders (Communication Protocol Exercise) and for assisting response operations (Vehicle Dispatch and Routing)."
- ▲ "CSTEP created a disaster management plan for a large local electric utility that includes defining the command and control structure, listing of responsibilities, detailed communication mechanisms, standard operating procedures and logistical requirements."
- ▲ "Mathematical models were developed to understand the direction and extent of dispersion of hazardous substances. The models also helps in identifying scale (geographic area affected, casualties possible), possible shelters, creating evacuation routes and locating treatment facilities. These models were presented at a workshop on Best International Practices in Building Resilient Cities organised by the Government of Karnataka."

### Crime Monitoring and Analysis

- ▲ "CSTEP has developed concept notes for methods to identify and discover crime concentrations via heatmaps, identify possible crime routes, and discover trends through the use of various computational techniques."

### Conference Participation

2013

**January 24** - Dr. Jai Asundi, Vivek Rao and Ranganathan P. attended a conference on the 'TRIAGE Method for Emergency Response' in New Delhi, organised by Institute of Nuclear Medicine & Allied Sciences.

**February 16-17** - Ganesh Prasad Pavaskar and Subhrajit Debnath attended a conference on 'Agent Based Modeling for Studying Social & Ecological Systems' in Bangalore, organised by Gubbi Labs.

**April 11-13** - Sugandha Naolekar attended a conference on 'The Fifth Elephant' in Bangalore, organised by Big Data.

### Conference Publication

**November 12-14, 2013** - Dr. Jai Asundi, Abhik Das and Subhrajit Debnath presented 'Developing GIS based Plume Rose for Industrial Chemical Incident Preparedness and Response' in Waltham, US, organised by IEEE at the International Conference on Technologies for Homeland Security.

### Events



**February 24, 2014** -

Abhijith Shastry attended a lecture on 'Working with Digital Maps: Leveraging the Power of GIS' in Bangalore, organised by Indian Institute of Human Settlement.

**March 3, 2014** - Dr. Gaurav Kapoor and Ranganathan P. attended a workshop on 'Simplification of Forms and the Process involved in the Services of BESCOM', organised by BESCOM in Mysore.

### Webinars & Podcasts

**June 26, 2013** - Podcast on 'Decision Support Platform for Public Policy Problems' by Dr. Jai Asundi, Principal Investigator, <http://www.cstep.in/node/459>.



## Think Tank Initiative Funded Activities

As a member of the Think Tank Initiative (TTI) community, other than being a recipient of the IDRC core grant, CSTEP also received several project specific grants and capacity building opportunities. While the core grant enabled CSTEP to make great strides in implementing new projects, the other benefits of being a TTI member are mentioned below:

**Aditi Bulletin** To publish a bulleting to primarily strengthen policy research discipline – issues of methodology, methods and practice, highlight the importance of policy research, improve the perception of Think Tanks among various stakeholders including Donors, Government and Academia. Aditi issue 1 was published in March 2014.



### Policy Engagement and Communication (PEC)

Practical Action Consulting (PAC) PAC Programme. The PEC-PAC programme has helped in some of the key activities ever since the first conference in Bangkok- Developed a Communications strategy. Understand the challenges and roles of other CPE team in a workshop at Kathmandu, participating in webinar's to discuss 'website audit' concepts and procedures and "Communicating with the Media"



**Matching Grant** was used for training the researchers to improve their written and oral communications skills. The grant also helped in developing a Standards and Style guide and templates for Reports, Policy Briefs, articles to name a few, to ensure that there would be consistency in the research outputs at CSTEP.

### Climate Adaption

CSTEP along with Public Affairs Committee (PAC) and Institute for Social and Environmental Transition Nepal (ISET-N) embarked on a project titled "Climate Change Adaptation in South Asia." It is a short-term project lasting over a period of 6-8 months.

The objectives are to improve knowledge about climate change impacts, integrate science and social science models and tools, build capacity in climate vulnerability and adaptation studies and prepare to undertake large-scale future projects in this area. With this project CSTEP envisages a continuous engagement with policy makers and stakeholders and build capacity in network of institutions and professionals working in the climate adaptation domain.

### Regional Meeting at Colombo

Members from CSTEP attended the 3rd Regional Meeting of International Development Research Centre's held at Marawila, Sri Lanka from 13-17 March, 2013. The event provided a platform to share and learn fresh perspectives from the various sessions. Discussions on positioning of Think Tanks, effective approaches, techniques and mechanisms for effective resource raising provided deep insights into this vital, challenging and critical aspect.

*"It has been a personal honour to have worked the journey together with CSTEP. I value this partnership"*

**Dr. Samar Verma**

Senior Programme Officer IDRC, New Delhi

July 18, 2013




## Funders



























CSTEP would like to profusely thank all its funders for their continued support and look forward to a long-standing partnership with all.

 Bill and Melinda Gates Foundation	 British High Commission, New Delhi	 Bureau of Energy Efficiency	 Central Power Research Institute, Government of India	 Climate Works Foundation, USA
 Climate Parliament, New Delhi	 Defence Research and Development Organisation	 Department of Science & Technology	 European Union	 Global Green Growth Institute, S.Korea
 Government of Andhra Pradesh	 Government of Karnataka	 International Development Research Centre, Canada	 Leadership with trust Jamsetji Tata Trust, Mumbai	 Power Finance Corporation of India
NarotamSekhsaria Foundation, Mumbai	 Next Generation Infrastructures Foundation, Netherlands	 OAK Foundation, Switzerland	 Planning Commission, Government of India	 Shakti Sustainable Energy Foundation, New Delhi
 SSN Trust, Chennai		 THE WORLD BANK Working for a World Free of Poverty The World Bank		

## Partners

CSTEPs working strategy includes collaborating with other research organisations, universities and Think Tanks, both at the national and international levels to ensure that the collective research outputs are effective, strong and have a wider perspective.

 <b>Scalable CSP Optimized Power Plant Engineered with Biomass Integrated Gasification</b>	 <b>Facilitating Offshore Wind in India</b>
	

 <b>Solar Energy Research Institute for India and United States</b>						
<b>Leads</b>		<b>Research Thrust Leadership</b>			<b>Partners Institutes and National Laboratories</b>	
 Indian Institute of Science, India	 National Renewable Energy Laboratory, USA	 Indian Institute of Technology Bombay	 Sandia National Laboratories	 RAND Corporation	International Advanced Research Centre for Powder Metallurgy and New Materials	 National Institute of Solar Energy   Lawrence Berkeley National Laboratory
<b>University Partners</b>						
 Indian Institute of Technology Madras	 Indian Association for the Cultivation of Science	 Arizona State University	 Carnegie Mellon University	 University of Central Florida	 Massachusetts Institute of Technology	
 Colorado School of Mines	 University of South Florida	 Purdue University	 Stanford University	 Washington University in St. Louis	Massachusetts Institute of Technology	
<b>Industry Partners</b>						
Clique Developments Ltd.	 Hindustan Petroleum Corporation Ltd.	 Moser Baer India Ltd.	 Thermax Ltd.	 Solarmar Energy, Inc.		
TurboTech Precision Engineering Ltd.	 Wipro Ltd.	 Corning Incorporated	 BHEL	SunEdison Corporation	Alpha	

## Finance

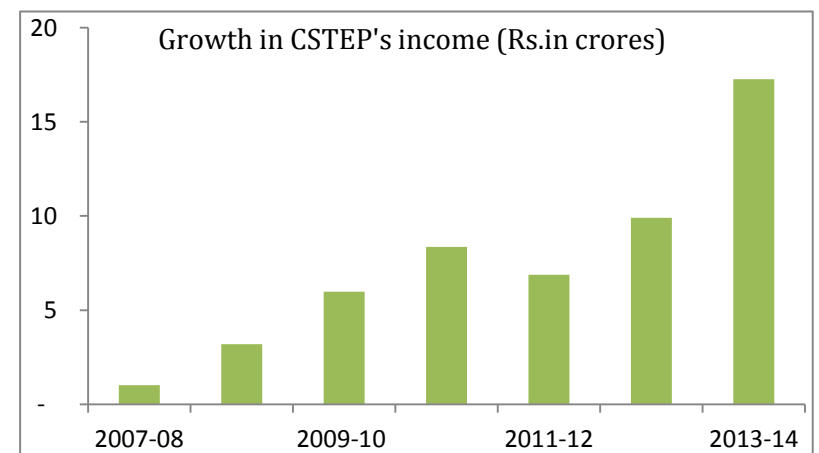
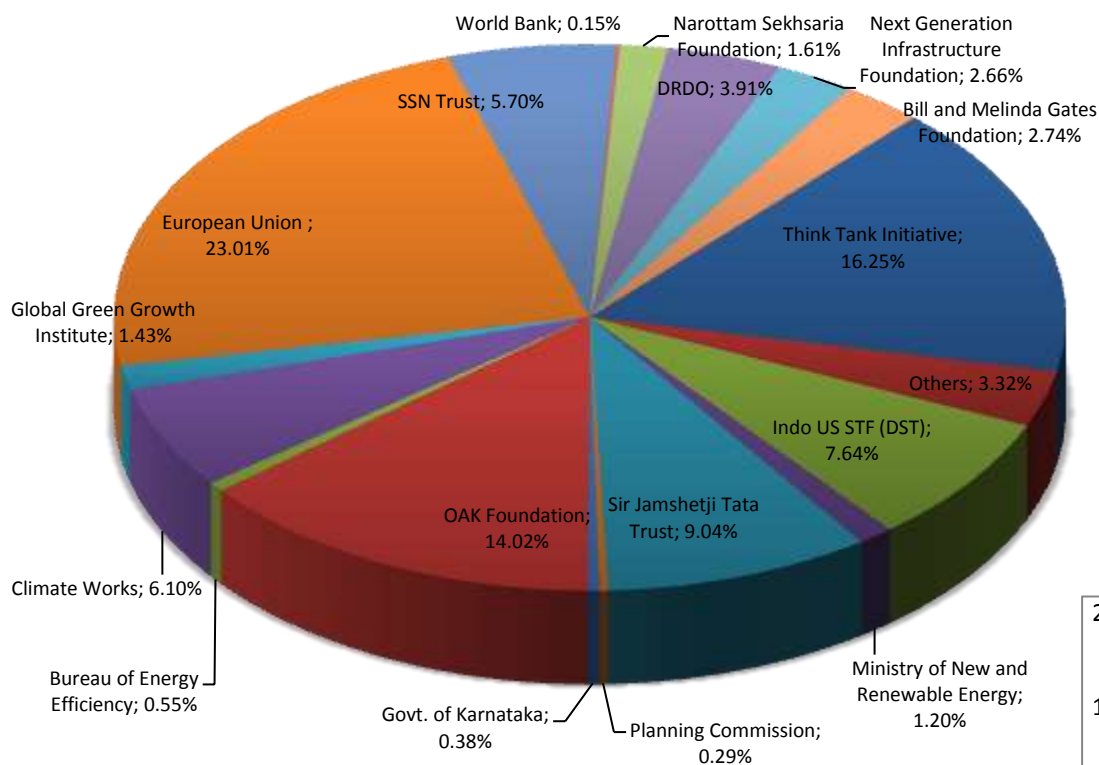


Dr. Bellarmine KC  
CFO

"CSTEP is amongst the nation's leading Think Tanks with an annual budget of around Rs.17 crores. Over the years, it has built a diversified funding base comprising domestic and international foundations, multilaterals, international aid agencies, government and private philanthropy. It also has a proven track record of raising project grants especially multi-year consortium grants. CSTEP is fortunate to have secured two long-term core grants from IDRC, Canada and the OAK Foundation, Switzerland, which has provided financial stability to the organisation.

Since its inception in 2005, CSTEP has shown significant growth in its income generation. On a cumulative basis CSTEP has so far raised grants to around Rs.75 crores from a healthy mix of diverse funding sources. As a result CSTEP is not overly dependent on any single funding source, which, besides mitigating funding risks, enables it to maintain its independence and objectivity."

In line with the increase in number of donors, CSTEP has shown a rapid growth in its income generation. From 2007-08 to 2013-14 its income has grown at an average compounded rate of about 60% per annum.



## Communication and Policy Engagement



Dr. Annapoorna Ravichander  
Head, CPE

"CSTEPs approach to policy and outreach is shaped by its belief that any communication should be backed by rigorous and analytical research. The main focus of the CPE team is to work closely with the research staff and help increase CSTEPs visibility amongst its various audiences. CSTEP is a part of the Policy Engagement and Communication Programme, South Asia Chapter, funded by the IDRC."

### Short History of Activities

The following section mentions the various activities the CPE team has engaged in:

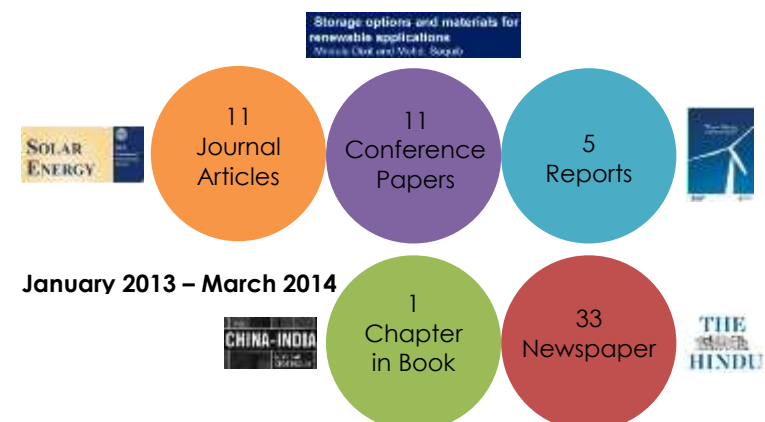
<p>Created</p> <ul style="list-style-type: none"> <li>▲ Standards and Guidelines</li> <li>▲ Templates</li> <li>▲ Editorial process</li> </ul> <p>Organised</p> <ul style="list-style-type: none"> <li>▲ In-house workshops &amp; trainings</li> <li>▲ Regional TTI meeting in Mysore</li> </ul>	<p>Increased visibility of CSTEP by</p> <ul style="list-style-type: none"> <li>▲ Revamping the website for better navigation</li> <li>▲ Publishing and distributing the CSTEP Newsletters to policymakers, external academic and scientific community and donors</li> <li>▲ Conducting Webinars and Podcasts</li> <li>▲ Promoting organisational visibility through social media</li> </ul>
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### Statistics of CSTEPs social media and internet visibility:

Since January 2013, the number of visitors to our website is 17868 with 57% being new visitors. The visitors include people from US, UK, France, Germany, China, Netherlands, Singapore, Canada and Sri Lanka



Increase in the publication of various research outputs - 125 publications were produced by CSTEP between January 2013 -March 2014

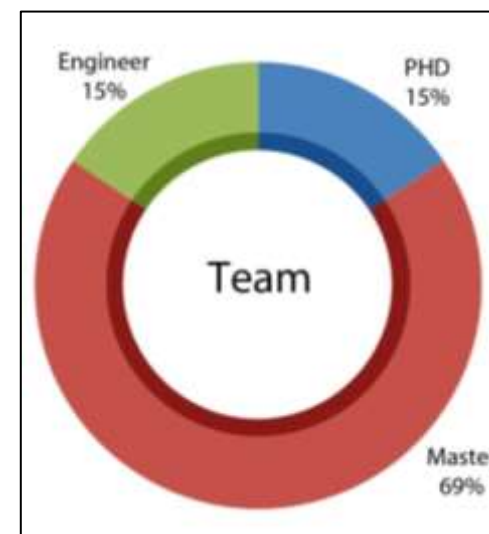


## Human Resources



Amol Mishra  
Manager  
Human Resources

*"CSTEP has grown from four employees in 2008 to 70 employees. A snapshot of the research staff is provided here."*



CSTEP has formalised and further improved HR procedures and practices to build research talent of the highest calibre through:

- Career Pathways – Based on the responsibilities well-structured career pathways have been developed for all staff members in three categories - Research, Technical and Administrative.
- Timesheets - Introduction of Timesheet to capture and assess time utilisation of each resource
- Human Resource Information System (HRIS) to streamline various processes.

CSTEP also engaged and trained 14 interns between January 2013 and March 2014.

*"As part of the Sanitation team I had the privilege to work with some incredibly gifted minds. The organisation has given me access to a plethora of knowledge and information. CSTEP has been extremely kind and encouraging and inspires me to work to the best of my abilities."*

Shramana Dey  
BITS Pilani, Dubai Campus



*"I've found working at CSTEP to be both pleasant and productive. I've met some very helpful people while working on my project and the accumulated knowledge base at CSTEP is invaluable."*

Stephen Gerlt, Texas A&M University



*"The goal of my project was to understand the trajectory and challenges of industrial development of the Indian nuclear energy program. I am very grateful to have had the opportunity to interact with the welcoming intellectual community of policy veterans, young talent, and also its proximity to decision-makers makes it a very special place that will have an impact on improving governance."*

Aditi Verma, Massachusetts Institute of Technology



## Sexual Grievance Redressal Committee

### Key Activities Conducted

**January** – A committee meeting was conducted to address issues related to sexual grievances.

**December** –

- **Meeting** – CSTEPs Sexual Grievance Redressal Committee members had a meeting with Experts to understand the process of the working of this committee. The experts also discussed the various parts (new norms) of the Act especially the scope of the Complaints Committee and the process of complaint inquiry, interim relief, etc
- **Workshop** – A workshop was conducted for the new joiners to understand the policies. The key speakers were Adv. Maria & Adv. Sumithra Acharaya. The workshop was both informative and interactive. Around 15 participants attended the same.



## Visitors @ CSTEP

**2013**

**January 25** – Dr. Leonardo Lacerda, Director, Environment Programme and Dr. Karen Regina Suassuna, Programme Officer, OAK Foundation visited CSTEP to review research programmes.



**2014**

**April 10** – Mr. Alok Srivastava, IAS, Joint Secretary, Ministry of New and Renewable Energy visited CSTEP and discussed various aspects of identification of zones, for maximum generation potential of wind energy in Karnataka.



**July 18** – Dr. Anindya Chatterjee, Regional Director IDRC and Dr. Samar Verma, Senior Programme Officer, IDRC visited CSTEP. Dr. Chatterjee delivered a talk on *The Emerging Think Tank Ecosystem*.



**December 16** – Baroness Worthington, a Labour life peer in the House of Lords in UK and Mr. Ian Felton, British Deputy High Commissioner in Karnataka, visited CSTEP to discuss Wind Energy and Off-shore wind policies in India



**March 06** – Katherine Batten, USAID Global Climate Change Coordinator, Collin Green, Senior Climate Change Specialist, USAID, Mark Newton, Environment Officer, USAID INDIA and Varghese Paul, Senior Forestry Advisor, USAID INDIA, visited CSTEP to discuss India's low carbon growth strategies, and use of geo spatial tools for energy resource planning.



**March 08** – David S. Ginley, Group Manager - Advanced Process Technology at National Renewable Energy Laboratory, Elena Berger, Fellow at Energy Efficiency and Renewable Energy Strategic Programs, U.S Department of Energy, Robert L. Sandoli, Director - International Program at U.S. Department of Energy, Usha Sunil, Economic Specialist - Energy, Embassy of the United States of America in India, and Girish Ghatikar, ADL, Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory visited CSTEP and met the SERIUS (Solar Energy Research Institute for India and the United States) team to discuss project updates.



**March 11** – A high ranking delegation from Thermax including Dr. R R Sonde, Executive Vice President, Kiran Deshpande, Head-Solar Thermal, Ajay Pillay, Head Commercial, Power Division, Deepak Thakur, Corporate Head-Solar Business, Ashish Natu, Commercial Executive, Power Division, and Sampanna Shastry, Sales and Marketing, Power Division, visited CSTEP for discussions on the Biomass Project Implementation Strategy.



CSTEPs New Office



Climate  
carbon  
ommunication  
Agri ulture

Infra S tructure  
Mea S ures  
strategy

Technology  
Was T ransportation  
e hermal

Ren wable  
Saf E nvironment  
nergy  
ty

Res P ower  
onsive  
lanning  
olicy



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Nagashettyhalli, RMV Stage II, Bangalore-560094  
Karnataka, INDIA  
[www.cstep.in](http://www.cstep.in)