



Resilience

ANNUAL REPORT
2020-21

CHAIRMAN'S MESSAGE



Dr VS Arunachalam

Resilience is a term that has dominated discussions across the board ever since the world came under the grip of the deadly coronavirus pandemic. I am happy to see that CSTEP embodied this trait in full measure in the current financial year by continuing to stand strong and thriving in possibly one of the worst times that many of us may have ever encountered in our lives.

The fact that our work continued unhindered in the most challenging of circumstances stands testimony to the grit and determination of every single person working at CSTEP unified in the common desire to change things for the better. What makes this even more heartening is the fact that the organisation could achieve the goals it had set for itself without compromising on the health and well-being of its employees and their families.

While many organisations are working towards developing newer applications in Artificial Intelligence, we have developed and applied CSTEP's AI applications (Sameekshke, and SNEHA) as solutions in a big way to address the humungous challenge posed by malnutrition to hundreds of thousands of children and women at the Anganwadi centres. The fact that CSTEP was also actively associated with Sameekshke, a first-of-its-kind integrated health survey digital platform in India launched by Karnataka, was also no mean achievement. Our AI team, moreover, piloted a solution called 'SNEHA VISION' during the year for detecting stunting in children through mobile images.

I began CSTEP with a vision to create a set of missionaries who would go out to transform the world by using the evidential power of science and technology as their wand to bring about the change that they want to see around them. What I witnessed at CSTEP this year has shown that the missionary spirit continues to burn bright among all those associated with the organisation. There are similar stories where technology is being harnessed for public good.



Dr Jai Asundi

EXECUTIVE DIRECTOR'S MESSAGE

Tough times never last, but tough people do.

In keeping with this adage, CSTEP, too, did not allow the constraints imposed by the global pandemic in FY21 to get in the way of its aim to leverage the evidential power of science and technology to improve the lives of people impacted by its work.

By quickly pivoting to a work-from-home arrangement towards the end of March 2020 itself, CSTEP could ensure that there was minimal loss in productivity, and, also, that the health and well-being of our employees and their families were not compromised in any manner. All our Sectors and support functions like HR, Finance, Communications, and IT stepped up to ensure that the organisation could move forward in an environment, that, in the year under review, was marked by volatility, uncertainty, complexity, and ambiguity worldwide.

We also had the good fortune to have active Board members working with us on providing the guidance and support through these trying times. Here I would like to acknowledge the contribution of Dr Dipankar Banerjee who as Sr. Advisor worked closely with the Committee of Directors comprising Dr K C Bellarmine, Mr Munish Sapra, and myself to address the strategic issues facing the organisation. Sri Praful Anubhai, Mr Rajat Gupta, and Ms. Soumya Rajan provided valuable guidance and help on fund-raising. We also thank our funders who stepped in during our time of need and provided the support needed to continue our work.

This fiscal saw many of our Sectors working actively to create impact in their respective areas. They came up with new initiatives, entered into new collaborations, and obtained recognition from Government and independent entities. Our researchers, too, found extensive mention in the media and published several articles in reputed scientific journals. We hope to see this momentum continue into the coming year with a greater focus on creating impact and providing thought leadership in the areas of our work.

With COVID vaccinations set to gain pace in the Financial Year 2021-22, CSTEP is hopeful that FY22 would see us take much bigger strides to emerge as the foremost institution for policy innovation and analysis in India with our studies and recommendations forming the bedrock of important policy decisions in the world's second most populous nation.

BOARD OF DIRECTORS



Dr VS Arunachalam
Former Scientific Advisor to
Raksha Mantri (1982-92),
Padma Vibhushan



Shri Suresh Prabhu
Indian Member of Parliament and
PM's Sherpa to G7 & G20 Summits;
Former Minister of Environment &
Forests, Govt. of India



Shri Prafull Anubhai
Educationist and
corporate advisor



Prof. Dipankar Banerjee
Former Chief Controller -
R&D, DRDO,
Padma Shri



Shri Rajat Gupta
Senior Partner,
McKinsey & Company



Ms Soumya Rajan
Founder, MD & CEO,
Waterfield Advisors



Dr Jai Asundi
Executive Director,
CSTEP



Dr Ajay Mathur*
The then Director General,
TERI
Currently, Director General,
ISA



Prof. S Ranganathan*
INAE Distinguished
Professor,
IISc, Bengaluru

* Were Board members for part of FY 2020-21



STEP

FUNDERS

Domestic

Jamsetji Tata Trust

Narotam Sekhsaria Foundation

Rohini and Nandan Nilekani Philanthropies

Shakti Sustainable Energy Foundation
(SSEF)

Shri Sivasubramaniya Nadar Educational
and Charitable Trust

WIPRO

Government of India

Government of Karnataka

Government of Andhra Pradesh

International

Bill & Melinda Gates Foundation

Bloomberg Philanthropies

British High Commission

Children's Investment Fund Foundation
(CIFF)

Climate Parliament

European Climate Foundation

European Union

German Corporation for International
Cooperation (GIZ)

Good Energies Foundation

IBM

International Development Research
Centre (IDRC)

MacArthur Foundation

Next Generation Infrastructures

Oak Foundation

Overseas Development Institute

SED Fund

The Global Green Growth Institute

The World Bank

United Nations Democracy Fund (UNDEF)

United Nations Development Programme
(UNDP)

United States-India Educational Foundation
(USIEF)

William and Flora Hewlett Foundation

Agence Francaise Developpement

New Venture Fund

COLLABORATIONS

Government Institutions

Bangalore Electricity Supply Company Limited (BESCOM)

Bureau of Energy Efficiency (BEE)

Central Power Research Institute

Chamundeshwari Electricity Supply Corporation (CHESCOM/CESC)

Defence Research and Development Organisation (DRDO)

Department of Defence

Department of Science & Technology (DST)

Government of Karnataka

Gulbarga Electricity Supply Company Limited (GESCOM)

Hubli Electricity Supply Company (HESCOM)

Karnataka Electricity Regulatory Commission (KERC)

Ministry of Environment, Forest and Climate Change

Ministry of New and Renewable Energy (MNRE)

NITI Aayog

Planning Commission

Power Finance Corporation

Society for Elimination of Rural Poverty (SERP)

The Indo-U.S. Science and Technology Forum (IUSSTF)

University Grants Commission (UGC)

Collaborations

Asian Institute of Technology

BRAC University

Carnegie Mellon University

Centre for Policy Dialogue (CPD), Bangladesh

CEPT University

Clean Air Task Force

Council on Energy, Environment and Water (CEEW)

Ecole Polytechnique Federale de Lausanne (EPFL)

Forge Accelerator, Coimbatore

Indian Institute of Science (IISc)

Indian Institute of Technology Bombay (IIT Bombay)

Indian Institute of Technology, Kanpur (IIT Kanpur)

Institute for Social and Economic Change

Institute for Social and Environmental Transition-Nepal (ISET-Nepal)

Integrated Research and Action for Development (IRADe)

International Institute of Information Technology Bangalore (IIIT-B)

M.S. Ramaiah University of Applied Sciences

Pacific Northwest National Laboratory (PNNL)

PLR Chambers

RAND Corporation

Royal Society of Netherlands

Shell India

St. John's Institutions

The Energy and Resources Institute (TERI)

The University of British Columbia

The University of Texas

University of Agricultural Sciences, Bangalore

University of Pennsylvania

University of Washington

Urban Emissions



CLIMATE, ENVIRONMENT & SUSTAINABILITY



Priyavrat Bhati
Sector Head - Climate,
Environment, and
Sustainability

“We aim to provide, using evidence-based analysis, policy solutions for India’s intertwined challenges – development needs and impact on environment. Economic trajectory that is sustainable is the only viable option and, accordingly, our work covers a wide spectrum— from evaluating the country’s development goals and estimating the energy needs and GHG emissions to assessing pollution in cities and suggesting strategies to improve air quality.”

CSTEP is engaged in generating scientific evidence and building emission inventories for 80+ non-attainment cities under the National Clean Air Mission of the Government of India in collaboration with 20 Institutes of Repute.

We are developing state-level strategies for reducing air pollution in the states of Punjab and Jharkhand.



Acknowledged as an Institute of Repute by the Ministry of Environment, Forest and Climate Change, CSTEP will assist the urban local body and the state pollution control board in improving air quality in Bengaluru.

We conducted a mobile monitoring study in urban and semi-urban locations of Bengaluru city to identify pollution hotspots and built capacity to use satellite data for estimating PM levels.



The second edition of our flagship event – the India Clean Air Summit – held over two days, was a resounding success.



Using systems thinking in the 'Sustainable Alternative Futures for India' or the SAFARI model, we estimated developmental needs up to 2050 alongside emission footprints and macroeconomic implications for achieving key SDGs. This tool helps evaluate strategies that balance development and climate action.



CSTEP contributed to NITI Aayog's Ethanol Blending Study, which is slated for release in Financial Year 2021-22.

We worked on long-term strategies for Gujarat and Chhatisgarh State Action Plans for Climate Change.



As part of adaptation and resilience studies, we did climate risk profiling of power infrastructure in Karnataka and studied climate change risks to rainfed agriculture in the state.





ENERGY AND POWER

“Our work in renewables is geared towards preparing the ground for a policy shift in India to achieve 450 GW RE by 2030.”

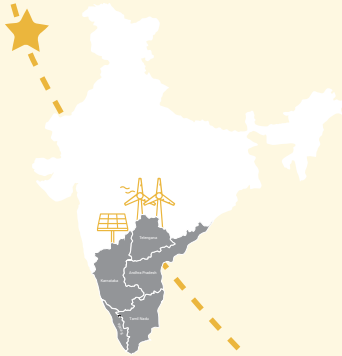


Abhishek Nath
Sector Head - Energy and Power



Bengaluru

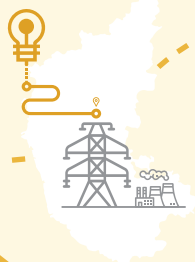
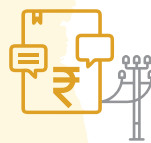
We launched CSTEP Rooftop Evaluation for Solar Tool (CREST) for Bangalore, which allows consumers and DISCOMs to identify suitable rooftops for RTPV. CSTEP will be conducting a similar exercise in other states as well.



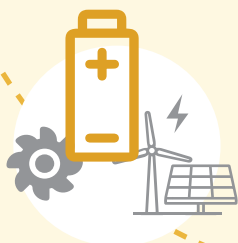
We released the findings of our study recommending infrastructure improvements to the transmission grid to transition to a high RE future. The report was launched at an event organised jointly with the International Energy Agency (IEA), NITI Aayog, and the British High Commission.



We studied the implementation of Ujwal DISCOM Assurance Yojana in Karnataka and developed a revenue accountability framework that can help the state electricity distribution companies save INR 700 crores annually.

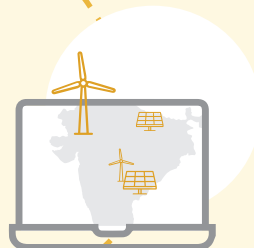


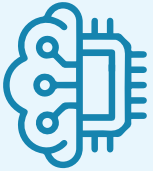
Developed a long-term roadmap for Karnataka state power generating company, Karnataka Power Corporation Limited (KPCL), to transition to RE and optimise operations of its coal assets.



Explored different types of energy storage systems suitable for the seamless integration of RE into the grid, while focusing on a new pricing mechanism for pumped-hydro storages in India.

We launched SiteRight, a decision-support tool for low-impact siting of RE projects, in collaboration with The Nature Conservancy (TNC), Foundation for Ecological Securities (FES) and Vasudha Foundation.





ARTIFICIAL INTELLIGENCE AND DIGITAL LAB

"Our ambition is to be the best in developing large-scale and impactful solutions for societal good. We do this by combining cutting-edge technology with inclusive policy and grassroots processes."



Ashish Srivastava
Sector Head - Artificial
Intelligence and Digital Lab



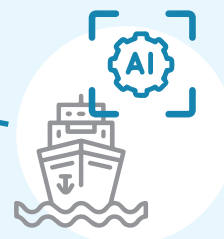
The Government of Karnataka has formally adopted SNEHA - our multi-sectoral platform for malnutrition management. This helps monitor approximately 37 lakh children and 7 lakh women in over 65,000 Anganwadi Centers.



The Karnataka Government formally launched Sameekshe, a first-of-its-kind integrated health survey digital platform in India. About 1 lakh field workers will be using the tool to collect the data of approximately 5 crore citizens.



SNEHA VISION, the AI solution for detecting stunting in children through mobile images, was piloted. This tool also captures birthweight from the scales and has the capability to record attendance through group images.

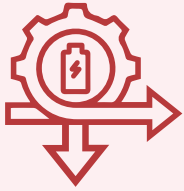


Work on SORIN, CSTEP's AI solution to optimise the complex inventory of Indian Navy, continued.



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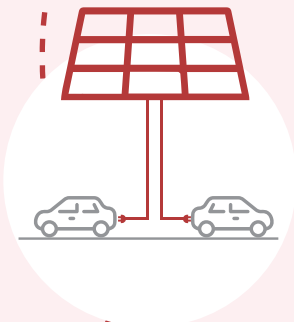


MATERIALS AND STRATEGIC STUDIES

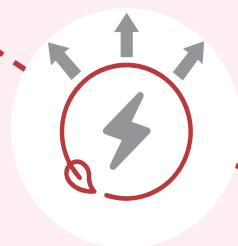
"We focus on emerging technologies and the development of sustainable solutions for a better tomorrow."



Thirumalai NC
Sector Head - Materials and Strategic Studies, and Computational Tools



We successfully demonstrated a pilot on solar PV-based charging infrastructure for electric vehicles at the corporate office of the Bengaluru Electricity Supply Company (BESCOM). CSTEP was a knowledge partner for this project, which won the International Solar Grid Forum's award under the 'Renewable-Integration' category.



Signed an MoU with Canadian firm Hygge Energy to collaborate on clean energy.

Engaged closely with Bangalore Metropolitan Transport Corporation (BMTc) to support their deployment plans for 300 electric buses in the city.



We are developing a web-based planning tool called E-Depot (E-bus Depot Electrification Planning and Operations Tool), for electric bus deployment. The tool can be used by various transport bodies across the country to assess their electrification plans/targets.



We are also examining the potential for cost reduction in precision farming practices to develop business models that can benefit marginal and small-scale farmers.



CSTEP assessed the de-risking mechanisms for investments in India's solar energy sector, proposing feasible measures to minimise them.





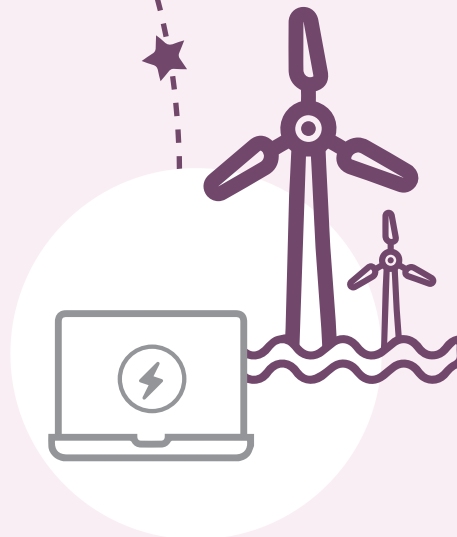
COMPUTATIONAL TOOLS



"We develop computational tools and analytical models for policy analysis. Our flexible and modular systems approach increases efficiency while decreasing the complexity of research."

Thirumalai NC
Sector Head - Materials
and Strategic Studies, and
Computational Tools

We have developed a web-based wind power tool to assess technological and economic feasibility of off-shore wind farms. The tool will assist in optimal usage of land for setting up wind farms.



```
package com.ds.ucd.be.becore.solr;
import ...
public final class LocationUtils {
    /**
     * Parses Point from it's String representation.
     * @param locationString - String that represents location, as 2 double values split with coma. According to
     * @return org.springframework.data.solr.core.geo.Point instance
     */
    public static Point parseLocation(String locationString) {
        Preconditions.checkNotNull(locationString, "Location String should not be null");
        Preconditions.checkArgument(locationString.contains(","), "Location must be split with comma");
        locationString = locationString.trim();

        if (locationString.contains(" ")) {
            locationString = locationString.replaceAll(" ", "");
        }

        if (locationString.contains(", ")) {
            locationString = locationString.replaceAll(", ", ",");
        }

        String[] location = locationString.split(" ");
        Preconditions.checkArgument(location.length >= 2, "Location should consist of 2 double values");
        double lat = Double.parseDouble(location[0]);
        double lon = Double.parseDouble(location[1]);

        return new Point(lat, lon);
    }
}
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COMMUNICATIONS AND POLICY ENGAGEMENT

Sumali Moitra
Vice President - Communications
and Outreach



“As custodians of the CSTEP brand, it is our constant endeavour to ensure that the organisation occupies a bigger mindspace among key decision-makers in order to influence policies that leverage the evidential power of science and technology for a better quality of life.”



We did not allow the disruptions caused by the pandemic to get in the way of our efforts at reaching out to all our stakeholders and making our voice resonate in the scientific community. CSTEP's media outputs in FY21 were the highest in the organisation's history till date.

56 Op-Eds/Opinion articles in mainstream media and digital publications.



CSTEP/its studies found a mention in media on 33 occasions.





Launched two new Podcast series 'Quotes and Notes' & 'Perspective Xchange'.



Launched a new video series 'Science Says' to disseminate our research findings to a wider audience.



Launched CSTEP Space, a new blog platform on LinkedIn.



Organised 14 virtual events in FY21, including the 2nd edition of 'CSTEP Discussion Series on Role of Science and Technology in Society'.

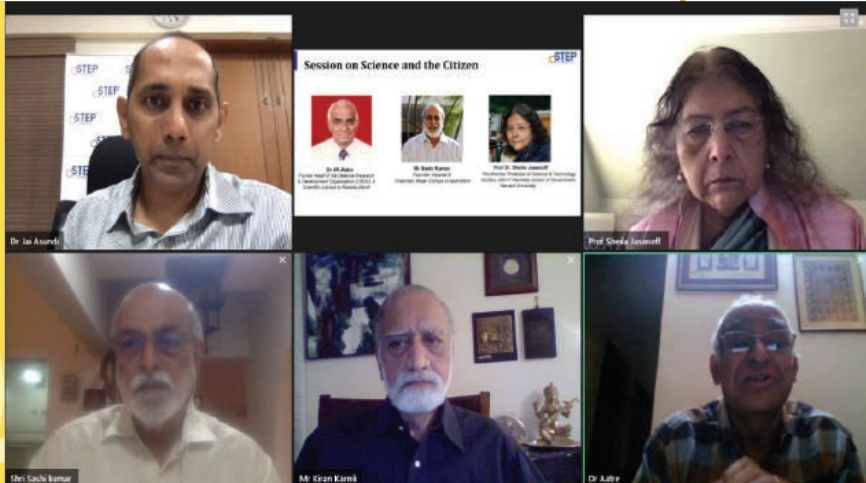


Due to increased visibility across different platforms, we received over 77,000 requests for downloads of CSTEP research outputs.



CSTEP FOOTPRINTS





PERSPECTIVE Xchange

AI4Good

Mr S Ramadorai
Former Vice-Chairman of TCS

Dr Jay Asundi
Executive Director, CSTEP



PERSPECTIVE Xchange

Mr Mohandas Pai
Chairman of the Board, Manipal Global, & Former Infosys Board Member

Mr Kris Gopalakrishnan
Chairman, Axilor Ventures, & Co-Founder and Former Vice-Chairman of Infosys

Dr Jay Asundi
Executive Director, CSTEP

Grid Impact for High RE Scenarios in Southern India

Supported by MacArthur Foundation

CSTEP

Quotes & Notes

Power Play



Climate Change Risks to Rainfed Agriculture in Karnataka: Implications for Building Resilience

IT

The IT team ensured a seamless transition to work-from-home during the pandemic.



Introduced virtual conferencing tools that helped CSTEP organise various events.



Implemented a secure VPN, which helped the staff access the required resources and software.



HR

Our HR policies evolved with the shift to work-from-home.



We organised talks by mental health experts for our employees.



The volume of hiring remained unaffected during the lockdown.



We went completely digital with the induction, orientation, and onboarding of new recruits. Initiated video-based introduction of our new employees.



Revamped the appraisal process for a better alignment of objectives, focussing on goal setting, continuous feedback, and clear-cut performance ratings.



We continued to remain fully compliant with all HR statutory compliances (PF, Gratuity, ESI, etc.). We also introduced COVID leave for all affected staff members.



To retain the fun element in a socially distant world, we organised a virtual "social hour" and encouraged our staff members to contribute to our "Lockdown stories".





CENTER FOR STUDY OF SCIENCE, TECHNOLOGY & POLICY


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