thinkstep Sustainability Solutions Pvt. Ltd. organised its first "Academic LCA India 2018" workshop on 21st february, 2018 at Hotel Marriott Courtyard, Mumbai. The aim was to bring together all researchers, scholars, scientists and academic practitioners to share their experience and expertise on how life cycle assessment has helped and added real value to their institutes, researches, environment and the society.

This will further lead to creation of a platform to exchange research on LCA, use LCA for design for environment, environmental innovation, new product development, new production processes, technologies, new methodologies and deeper insights into regional and localized impacts.

The workshop provided inspiring presentations & posters, information sharing sessions from LCA Expert, Academicians, Industry Experts. Through this workshop, thinkstep aims to impart learning and help discover unique approaches using LCA as a vehicle to improve environmental performance in a holistic manner from experienced LCA practitioners from academia in India.

The participants talked about their experiences on product sustainability, challenges, outcome, applications and best practices.

Welcome Remarks and Context

Dr. Rajesh Kumar Singh, Managing Director, Thinkstep India

Dr. Singh, delivered his opening remarks by highlighting thinkstep's vision of "helping organizations worldwide succeed sustainably". He elaborated the benefits of LCA from design for environment, environmental innovation and new product development, new production processes, technologies and products, new methodologies and deeper insights into regional and localized impacts.

He shared the experience and expertise on how life cycle assessment has helped and add real values. He talked about GaBi software, supporting education and research at universities over 5000 licenses worldwide with free Gabi education software for students and researchers. He also spoke about four fundamentals of life cycle

sustainability as standards, know how business case and software and databases. thinkstep has extensive experience across all the four fundamentals. Dr. Singh highlighted to create the platform to exchange the new ideas of the research organisations and universities from India related to life cycle approaches. He emphasized on the fact that it is the academia coming up with new methods, frameworks and ideas creating value for the industries on the practical side and the need to promote the same to the best of efforts. **thinkstep India has already signed the MoU with Institute of Chemical Technology (ICT), Mumbai in October, 2017.**

Global Best Practice on LCA

Dr. Martin Baitz, Director Content, thinkstep AG, Germany

Dr. Baitz, set the context about the global best practices on LCA from academic research to company innovation and policy support. He talked about the trends of succeeding sustainably with different examples.

He emphasised on the need of industry and practicalities of LCA.

He focused on different Global LCA activities and roles of universities and academia for scientific works to help to develop best practises in terms of suitable methods, meaningful content, Individual aspects and professional software databases. And integration into academia and teaching as requirements of foresighted students with sustainable mindsets, roles as researchers for new ways to assess, analyse and conclude on life cycle aspects and share findings and chances for students to get innovative jobs. And talked on ten important aspects to overcome the gap between theory and practise.

He assured the Indian academia could be accelerated way ahead with thinkstep's experience gained in the past over the quarter of the century. He highlighted the fact that there is a big gap between LCA as theoretical and practical approach in terms of miscommunication, discontinuity and misunderstanding.

He talked about roles of standards and political schemes to achieve Life cycle approaches over the years to save the planet and develop fundamentals of best practices.

He set the vision 2020 for Indian academia as "improved visibility in publications, cooperated with industry", "ongoing development of Indian region specific data and supported by government and associations".

He also thanked all the participants in India for entrusting thinkstep and congratulated Dr. Singh and his team for their continuous efforts in taking thinkstep India to greater heights over the years.

Chief Guest Address

Mr. K.N. Rao, Director (Energy & Environment), ACC Limited

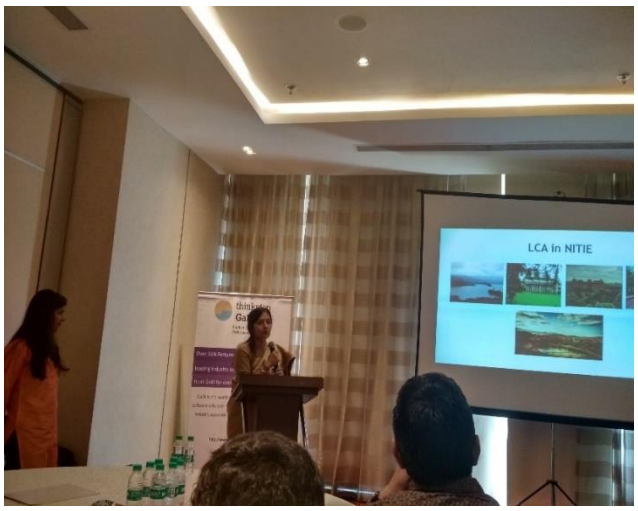
Mr. Rao shared his experiences on the drivers related to Product Sustainability in the cement and concrete industry. He elaborated that India has achieved the lowest CO_2 emission/ton of cement production setting a benchmark in the building construction and materials arena.

He discussed about the Green building vs conventional buildings in terms of cost and use phase benefits to the environment.

Over the years, Mr. Rao has been instrumental in driving the sustainability agenda in his organisation leading the company towards achieving world class standards in sustainability. He highlighted that ACC is way forward in developing EPDs of cement and concrete products in a phased manner covering approximately 30 of their products across all the manufacturing locations in India. He also motivated the Indian Academia to work very closely with his team on solving Industry's problems as well as developing innovative and sustainable products.

Presentation on LCA of Rice cultivation in Konkan region

Dr. Anju Singh, NITIE, Mumbai & Ms. Megha Sawant, NITIE, Mumbai



Dr. Singh presented the objective and expected outcome of the study followed by Ms. Sawant comprehensively presenting on her work on LCA of Rice cultivation in Konkan region. She mentioned that India is the world's second-largest rice producer and agriculture contributes about 16% of total GDP. She explained the reason for selecting the Konkan region of India for the study near the coast extending southwards.

The aim of the research study was to assess the environmental impacts due to agricultural practices and suggest the management practices to minimize the environmental impacts. Primary data was collected from the near about 150 farmers from **Sindhudurg** as well as **Raigad** region. Direct field emissions were calculated from the field survey data to build the LCA inventory

GaBi was used in this study for carrying out LCA. 1 Kg of rice was selected as a functional unit. A midpoint-based CML 2001 Life Cycle Impact Assessment (LCIA) method was applied.

She concluded that higher environmental impact in dry season is mainly because of use of electricity for irrigation and excess use of fertilizer in respective regions.

Presentation on LCA of Typical Residential Building in India

Dr. Samir Bajpai, NIT Raipur & Mr. Manish Sakhlecha, NIT Raipur

Mr. Sakhlecha projected that India will observe an unprecedented escalation in floor area of around 400% and will add about 35 billion m^2 (321.36 billion sqft) of new building floor area by 2050. He mentioned that nearly 40% of the materials entering the global economy, generation of 40–50% of the global output of greenhouse gases, and generation of large amount of debris from demolition activities (40 to 50% of total national waste) can be attributed to building construction. He talked about the main objective of his research is to evaluate environmental impact of a residential building based on life cycle assessment and comparative analysis of wall materials like burnt bricks, fly-ash bricks and light weight cellular bricks on the basis of life cycle environmental impacts, to arrive at the most environment friendly solution has been attempted.

Sustainable Engineering Course based on LCA

Dr. Sachin Mandavgane, VNIT Nagpur & Mr. Saurabh Joglekar, VNIT Nagpur

Dr. Mandavgane highlighted about the Sustainable Engineering course to be initiated by NITs based on the circular from Ministry of HRD and also explained the course at VNIT Nagpur. He also explained about the project identification approach and inventory methodology through process intensification techniques and other aspects of bio waste based projects. He also highlighted the importance of database and software for system modelling and analysis.

Sustainability of Textiles through LCA

Dr. Madhuri Nigam, Lady Irwin College, New Delhi

Dr. Nigam presented on her work on understanding the sustainability of textiles through LCA – a comparison of four cellulosic fibres. She mainly focused on how the consumption pattern has been influenced by the fashion now days. In her study comparative Life Cycle Analysis of four natural cellulosic fibres, namely; Cotton, Flax, Sun-hemp and Jute was conducted. The study was carried out in "Cradle to Gate" boundary, including fibre production, yarn production and fabric production stages. Life cycle impacts of selected textiles were calculated using CML baseline methodology. She concluded that cotton has the highest impacts in almost all categories, with fibre stage having the highest impacts among the life cycle phases analysed.

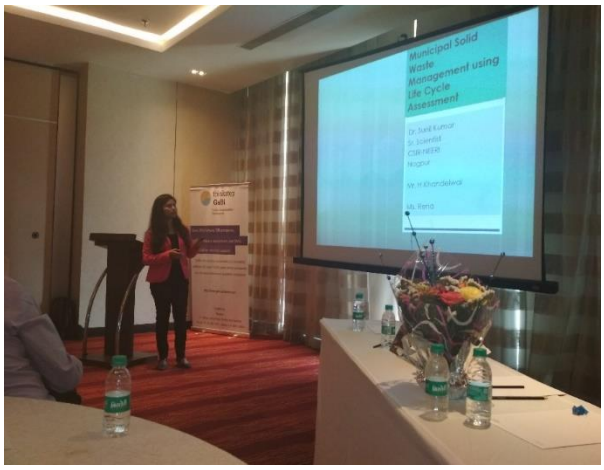
Presentation on LCA of Aluminium Products

Dr. P.K. Banerjee, Chief Technology Officer, Hindalco Industries

Dr. Banerjee spoke about Life cycle assessment approach for Aluminium Production. He talked about Aluminium production life cycle from cradle to grave and different scenarios with comparison to base line production of Aluminium. He discussed about Aluminium sector challenges in India. He told that adoption of LCA thinking in an organisation leads to various benefits when the same takes place at the product conceptualisation stage.

Presentation on Comparison of various LCAs on MSW Management

Ms. Rena Sufi, NEERI Nagpur

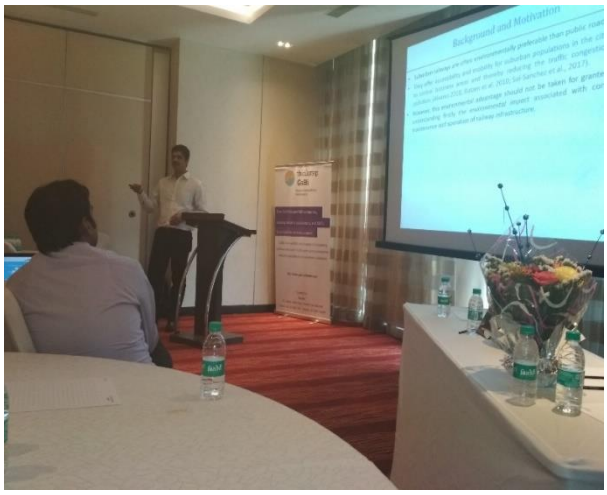


Ms. Sufi discussed about the various LCA studies conducted in the recent years on municipal solid waste management using Life cycle assessment. She talked about the various objectives, software, outcome, interpretation of the various studies and the limitations.

Presentation on LCA of Sustainable Urban Transportation

Mr. Amar Shinde, IIT Mumbai

Mr. Shinde presented the poster on Life cycle assessment for sustainable urban transportation of Suburban Railway, Public Bus Transport, Taxi, Autorickshaw and Metro Transit System. He comprehensively discussed about the objectives of the present study. His study has laid the foundation for life cycle energy and environmental assessment of suburban railways in developing countries, especially India. He also emphasized that his research outcome can be utilized for setting EIA norms for environmental clearances. His experience of collection inventory data from the various stakeholders (RTI) is definitely commendable.



LCA of Sustainable Production of Microcrystalline Cellulose from Sugarcane Waste

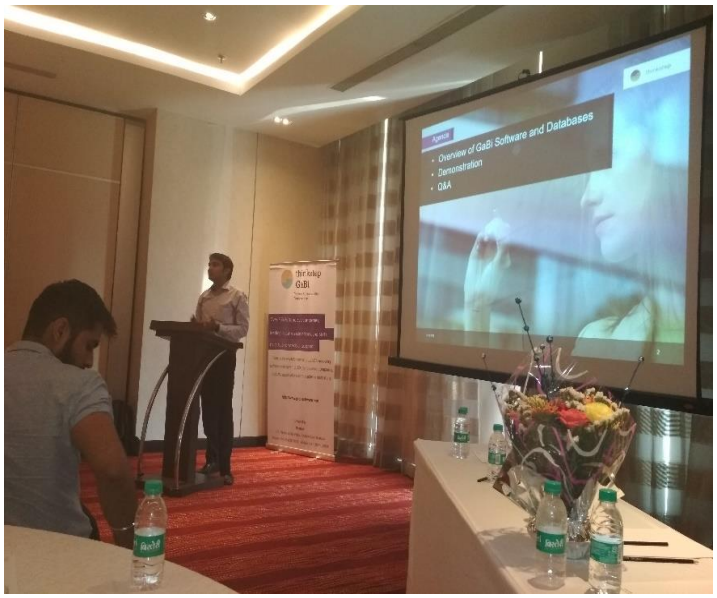
Dr. S Venkata Mohan, Mr. Ranapratap, CSIR IICT, Hyderabad

Mr. Rana Pratap introduced his research topic and he plans to conduct LCA to identify the environmental impacts and scenarios for improvement. Currently he has conducted the economic viability assessment and would further extend the framework of biorefinery approach with the help of Life Cycle Assessment.

Demonstration of thinkstep's GaBi software for Life Cycle Assessment

Mr. Ritesh Agrawal, Principal Consultant, thinkstep India

Mr. Agrawal spoke about the new features of GaBi software of thinkstep highlighting the product strategy focusing on 3 pillars as market driven, customer value and solution engineering. He highlighted the historical development of GaBi databases and talked about the how compliance is turning into professional practice from Basic standards to global guidance to general handbook and then software and database are generated. On GaBi side, he mentioned how GaBi is creating business value by reducing the time involved in LCA from many more man days to a few and GaBi is the most widely used product sustainability solution on the planet. Features like circularity indicator, natural capital accounting, supplier data hub, performance speed, Indian databases are added in the recent release of GaBi.



Visits of Participants to Poster Section

All the participants visited the Poster section. The objective of the session was to understand and evaluate the application of life cycle assessment standard and tools in the various research topics

Open Discussion on Future Collaborative projects, and way forward

Before concluding the session, an open discussion was organized to gather the feedback from all the participants on the way ahead and how Academic LCA activities can be sustained, promoted and operationalized. In this session, various feedback points were identified by the participants as under:

- Core group to be identified to execute the academic LCA activities in India
- NITIE proposed and offered to host the workshop at NITIE campus
- Short term courses and training sessions to be organized by thinkstep at various institutes
- Faculty hand holding and capability building with more practical examples
- Industry and Academia collaboration to be identified
- Indian companies and International companies approach to LCA to be evaluated and presented
- PEF and its future implications in India
- Verifiers on LCA and EPDs
- Publication of LCA based research on journals
- Best Practise Library Development
- LCA Booklet Development with list of all LCA studies carried out in India
- **You may also join the community name as "India LCA intelligence" on Linkedin.**

Recognition and Awards and Close

Dr. Singh and Dr. Baitz distributed the certificate of participation to all the participants and the best two presentations were also recognized and awarded.

You can find all the presentations and event pictures on the below links:

https://drive.google.com/drive/folders/1J-Cdj3xCEVd0IALrRnbPHXhA5xA7ioAv?usp=sharing