NordicsInIndia

INDO-NORDIC RESEARCH AND INNOVATION DIALOGUE ON SUSTAINABLE, CIRCULAR AND BIO-BASED ECONOMY

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A NORDIC-INDIA INNOVATION PARTNERSHIP ON CARBON NEUTRALITY AND A SUSTAINABLE CIRCULAR AND BIO-BASED ECONOMY

DATE: 31.1.2022
TIME: 09:30 - 12:30 CET/14:00 - 17:00 IST

NordicsInIndia

The Nordic-India Innovation partnership project (NordicsInIndia) aims to promote and showcase Nordic research-based innovations and solutions to encourage a green transition in India. NordicsInIndia builds collaboration among the Science and Technology Counsellors at the four Nordic embassies (Norway, Finland, Denmark, and Sweden). While highlighting the Vision2030, the NordicsInIndia will work to increase cooperation in science, technology, and business between Nordics and India in the field of carbon neutrality and a sustainable circular and bio-based economy. The project targets highly prioritized Indian infrastructure programs (e.g. Waste-to Wealth mission and Smart City Mission) and initiatives in green transition. The NordicsInIndia will bring Indo-Nordic capacities, including companies, research institutions, investors, and public authorities, into close dialogue. The project will organize a high-level Nordic-Indian policy dialogue on national level and two political and business workshops at a state level (Karnataka: Bangalore and Maharashtra: Pune). These activities will facilitate policy and knowledge exchange as well as business and R&D partnerships for accelerating the green transition. States are selected based on existing Nordic engagement, future investment potential, and their positions as frontrunners in an Indian context. Outcomes from the project will be disseminated in the Nordic region and in India to target upcoming funding calls for collaboration.

This particular High-Level Science and Innovation Dialogue meeting on Sustainable, Circular, and Bio-based Economy aims to provide a platform for peer-to-peer discussions on innovation, technology, policy amongst experts from Governments, academia, and industry from India and Nordic countries . It will promote Nordic interests through interaction between Nordic and Indian experts, policymakers, companies, and researchers. The dialogue meeting will lead to meaningful knowledge sharing, exchange of ideas, information and experience, and market entry/expansion for Nordic solutions in India, on various aspects of Sustainable, Circular, and Bio-based Economy.

INAUGURAL

09:30 - 10:00 CET / 14:00 - 14:30 IST

Welcome and Introduction to the Project

Dr. Maan Singh Sidhu, Coordinator NordicsInIndia & Counsellor Science, Innovation, Higher Education, Embassy of Norway

Chairperson's Remarks

Prof. K. VijayRaghavan, Principal Scientific Adviser to the Government of India

Ambassadors' Remarks

H.E. Mr. Freddy Svane, Ambassador of Denmark to India

H.E. Ms. Ritva Koukku-Ronde, Ambassador of Finland to India

H.E. Mr. Hans Jacob Frydenlund, Ambassador of Norway to India

H.E. Mr. Klas Molin, Ambassador of Sweden to India

Vote of Thanks

Ms. Christabel Royan, Director, Nordic Centre in India

SESSION 1 - INNOVATION AND INDUSTRY

10:00 - 11:10 CET / 14:30 - 15:40 IST

Moderator

Dr. Chagun Basha, Office of the Principal Scientific Adviser, Government of India

Panelists

- Sweden - Dr. Somya Joshi, Stockholm Environment Institute
- Denmark - Professor Lene Lange, Danish Academy of Technical Sciences
- Finland - Mr. Suresh Kumar, Finland Chamber of Commerce in India
- India - Mr. Masood Mallick, Ramky Enviro Engineers Limited
- Norway - Mr. Morten Hegge, Cambi Group
- Sweden - Ms. Sara Larsson, Swedish Chamber of Commerce
- India - Lt Col Monish Ahuja (Retd), Confederation of Biomass Energy Industry of India
- Norway - Mr. Sanjiv Kanwar, Yara India
- India - Mr. Varun Dilip Boralkar, Geocycle India
- Finland - Dr. Antila Heli, Fortum Limited
- Denmark - Dr. Henrik Bisgaard-Frantzen, Chr. Hansen A/S

SESSION 2 - RESEARCH AND DEVELOPMENT

11:15- 12:25 CET / 15:45 - 16:55 IST

Moderator

Dr. Sanjeev K. Varshney, Department of Science and Technology, Government of India

Panelists

- Finland - Dr. Mika Tirronen, Embassy of Finland in India
- India - Dr. Brajesh Dubey, Indian Institute of Technology, Kharagpur
- Norway - Professor Tone Tønjum, University of Oslo
- Sweden - Dr Per-Arne Wikström, Embassy of Sweden in India
- India - Professor Indumati Nambi, Indian Institute of Technology, Madras
- Sweden - Dr. Louise Staffas, Formas, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning
- Norway - Professor Margareth Øverland, Norwegian University of Life Sciences
- India - Professor K K Pant, Indian Institute of Technology, Delhi
- Finland - Mr. Timo Mäkelä, The Finnish Innovation Fund Sitra
- Denmark - Professor Claus Helix-Nielsen, Technical University of Denmark
- India - Professor Suneel Pandey, The Energy Research Institute
- Denmark - Dr. Jakob Williams Ørberg, Embassy of Denmark in India

CLOSING REMARKS

12:25- 12:30 CET / 16:55 - 17:00 IST

Dr. Maan Singh Sidhu, Coordinator, NordicsInIndia & Counsellor Science, Innovation, Higher Education, Embassy of Norway

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SPEAKERS

PROF. K. VIJAYRAGHAVAN

PRINCIPAL SCIENTIFIC ADVISER TO THE GOVERNMENT OF INDIA

Prof K. VijayRaghavan is a distinguished professor in the field of developmental genetics and former director of the National Centre of Biological Sciences. His fields of specialization are developmental biology, genetics, and neurogenetics.

Prof. VijayRaghavan graduated with a Bachelor of Technology degree in Chemical Engineering from IIT Kanpur in 1975. He completed his doctoral work in 1983 in the field of Molecular Biology and holds a Ph.D. from the Tata Institute of Fundamental Research, Mumbai, India. He worked as a Research Fellow from 1984 to 1985 and then as a Senior Research Fellow from 1986 to 1988, at the California Institute of Technology. In 1988, he joined the Tata Institute of Fundamental Research as a reader. He was instrumental in establishing the National Centre for Biological Sciences (NCBS), Bengaluru, under the aegis of Tata Institute of Fundamental Research (TIFR) in 1992.

Prof. VijayRaghavan spearheaded groundbreaking research to understand the important principles and mechanisms that control the nervous system and muscles during development, and how these neuromuscular systems direct specific locomotor behaviours.

Prof. VijayRaghavan's tenure as PSA, GoI saw major initiatives like the PM's Science, Technology, and Innovation Advisory Council (PM-STIAC) and the Empowered Technology Group (ETG) that are making a significant impact on the STI landscape of the country.

H.E. MR. FREDDY SVANE

AMBASSADOR OF DENMARK TO INDIA

Freddy Svane is Ambassador to India, Bhutan, Sri Lanka, Maldives and Nepal. This is his second time in this role. He has been a key driver in the establishment of the innovative and high level Green Strategic Partnership between India and Denmark. He has previously been ambassador to Japan and has a background as Director in the Danish Agricultural Council among several other important positions he has held. Born in 1957, Freddy is married with four children.

H.E. MS. RITVA KOUKKU-RONDE

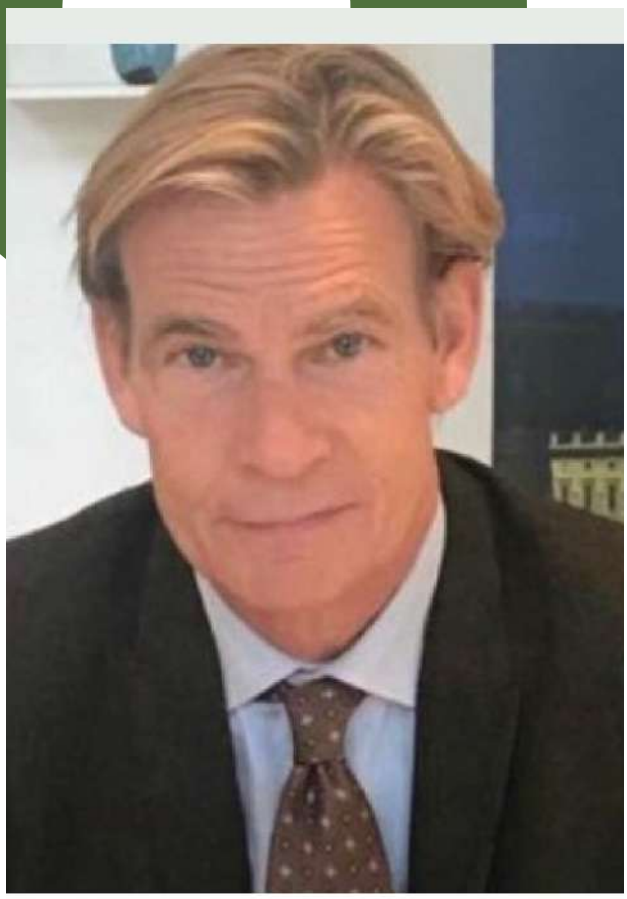
AMBASSADOR OF FINLAND TO INDIA

Currently the Ambassador of Finland to India, Ritva Koukku-Ronde, has previously served as the Ambassador of Finland to Germany and the United States of America. She has also been the Chairman of the Board of Directors, Finnfund (Finnish Fund for Industrial Cooperation) and the Finnish Governor, African Development Bank, Asian Development Bank, and the Inter-American Development Bank. She has been honoured with titles including Commander, First Class, of the Order of the Lion of Finland, Das grosse Verdienstkreuz mit Stern, Commandeur in de Orde van Oranje-Nassau, and Knight, the First Class, of the Order of the Lion of Finland. Born in 1956, she is married with two children.

H.E. MR. HANS JACOB FRYDENLUND

AMBASSADOR OF NORWAY TO INDIA

Hans Jacob Frydenlund is presently Norwegian Ambassador to India. Before coming to India, he was Director for UN Policy in the Norwegian Ministry of Foreign Affairs. Frydenlund has served in Chile, at the Norwegian Mission to the European Union in Brussels, at the Norwegian Mission to the United Nations in New York and has been Norwegian Representative to the Palestinian Authority. He has worked for thirteen years in different capacities with conflict resolution in Africa. He has been Press Spokesman for International Development in the Ministry. Frydenlund was born in 1959, is an economist by education, is married and has three grown-up children.



H.E. MR. KLAS MOLIN

AMBASSADOR OF SWEDEN TO INDIA

Ambassador Klas Molin was appointed the Ambassador of Sweden to India starting Sept 1, 2017, and presented his credentials to the President of India on Nov 23.

Ambassador Molin began his service with the Ministry of Foreign Affairs in 1985 and have served in many different roles since. He has extensive experience from the Asian region, having served as the Ambassador to Thailand (2011-2015), accredited also to the Lao People's Democratic Republic, the Republic of the Union of Myanmar and the Republic of the Philippines.

He has also served as the Second Secretary, Permanent Representation of Sweden to the UN, New York and before assuming office as the Head of Mission at the Embassy of Sweden in New Delhi, he was Ambassador and Chief of Protocol at the Ministry of Foreign Affairs, Stockholm.

DR. MAAN SINGH SIDHU

Dr. Maan Singh Sidhu is Science, Technology and Higher Education Counsellor at the Royal Norwegian Embassy in New Delhi. He is representing the Research Council of Norway, Innovation Norway and the Norwegian Directorate for Higher Education and Skills (HKDir) in India. Previously, he has worked for the Research Council of Norway, since 2010. Dr. Sidhu got his doctorate degree (food science) from the Norwegian University of Life Sciences (NMBU) and accomplished his postdoc from the Norwegian School of Veterinary Science, Oslo. Dr. Sidhu has extensive experiences from research, innovation, public administration as well as from international industries. He has worked as a National Contact Points (NCP) for business to strengthen Norway's participation in the EUs biggest Research and Innovation programme (Horizon 2020). He has led severalscience & technology projects, author of many scientific publications and book chapters, and have significant contributions to the international scientific world.

DR. B. CHAGUN BASHA

Dr. B. Chagun Basha is a Senior Technical Specialist at the Office of Principal Scientific Adviser to the Government of India. His work focuses on Data, Policy, and International Engagement aspects of Science, Technology, and Innovation (STI). He is engaged in the formulation of India's 5th national STI policy; also serves on several national and international committees, working groups, and multilateral forums on STI data and policy. Dr. Basha holds a Ph.D. in Space Electronics & Digital Systems from the L'institut d'électronique et de télécommunications de Rennes (UMR CNRS 6164) at the University of Rennes-1 followed by postdoctoral research with the École Polytechnique de l'Université de Nantes, France.

DR. S K VARSHNEY

Sanjeev Kumar Varshney is Head of the International Scientific Cooperation in the Ministry / Department of Science & Technology, Government of India. He joined DST in 1990 and is facilitating international scientific cooperation from the Department of Science & Technology with its bilateral, multilateral and regional scientific partners.

He is Indian Co-Chair, Governing Body, Indo-German Science & Technology Centre and Indo-US Endowment Fund; Member, Board of Directors of a private limited company, Global Innovation & Technology Alliance (GITA) and is Member, Governing Councils of the: (1) US-India Education Foundation (USIEF), and (2) International Advanced Research Centre of Powder Metallurgy (ARCI). He is Indian Focal Point for BRICS Working Group on Science & Technology and OECD Committee on Science & Technology Policy. He is Member, Board of Research Studies in Department of Geology, Aligarh Muslim University.

He has worked as Counsellor (S&T) with Embassy of India in Moscow to facilitate bilateral scientific cooperation between India and Russia during April 2008 - June 2011. He has been contributing to promotion of international scientific cooperation as well as scientific – industrial cooperation.

He completed Master in Geology in 1984 from Aligarh Muslim University with University Medal for obtaining first position. He pursued research at University of Delhi during 1985-1990 on Himalayan river systems, sedimentation, diagenetic and tectonic modifications. He was also awarded Dr DN Wadia Research Fellowship in 1986 for his research on Himalayan Geology.

He is Life Fellow of Geological Society of India, Bangalore; Nepal Geological Society, Kathmandu and member of International Association of Sedimentologists, Oxford. He also has numerous certifications to his credit. He also taught at Kurukshetra University in 1990.

PROF. LENE LANGE

Professor (f), Dr. Scient, Lene Lange, "Bioeconomy, Research & Advisory"

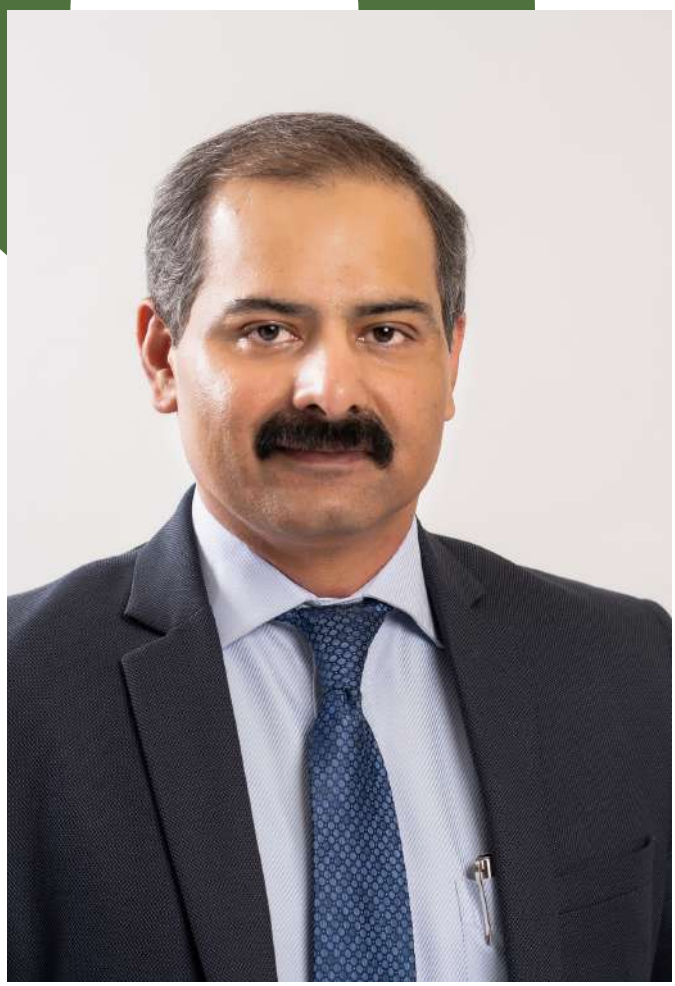
Lene Lange has been Research Director in both public (university) and private (Novozymes) R&D; has been Board Chair for CIMMYT and Program Chair for IRRI and has held full professorships at three Danish universities. Now, having her own company: Current research portfolio includes EU-, Nordic- and Danish-funded projects. Research focus: Discovery of new enzymes for converting biomass to higher value products. Is inventor of new State-of-the-Art peptide-based functional annotation method (CUPP, Barrett & Lange, 2019), has a strong publication record (54 peer-reviewed paper since 2017) and experience from upgrading a spectrum of different types of biomass, green biomass (e.g. grass), yellow biomass (e.g. straw), blue biomass (e.g. macroalgae and fish), and red biomass (e.g. chicken feather or bristles), and most importantly upgrading of agroindustrial side-streams, plus municipality waste and sludge. Experience from a broad spectrum of bioeconomy advisory roles, internationally, in the EU, the Nordic countries, and in Denmark; e.g. Vice-Chair of the Scientific Committee for BBI JU, a 3.7 billion Euro program, member of Danish Bioeconomy Panel, member of the Nordic Bioeconomy Panel, and of Nordmar Bioref, advisory to Nordic Council of Ministers.

MR. M. C. SURESH KUMAR

Suresh is Managing Director of Cargotec India Pvt Ltd, a wholly owned company of 3.5 Billion Euro Cargotec Corporation, Finland. As MD, he manages the Kalmar business in India, having nationwide sales and services business serving the Logistics sector in field of providing end-to-end services for ISO container handling equipment like 45 Ton Reach Stacker, Empty Container Handling equipment and Heavy duty forklifts for Steel, Aluminium and Port Sectors. Globally Kalmar as a signatory to UN 1.5 Degree Company is committed for Sustainable development. Keeping with commitment to environment all Kalmar equipment, currently being diesel driven, will also be electric driven by end 2021. In his capacity of Director Services IMEA, he is responsible for Kalmar Services sales and operations covering the India, Middle East and Africa regions. Suresh joined Cargotec India in 2008 after 12 years in Wartsila India serving last assignment as GM Sales.

Cargotec have their marine business unit MacGregor supplying to Indian Navy & merchant vessels, truck mounted cranes business unit HIAB supplying to Indian Army and Software development and support operations unit Kalmar Automation Solutions operating in India.

Suresh is a graduate engineer from Bangalore University and Diploma in Management from SPJIMR Mumbai.



MR. MASOOD MALLICK

Mr. Masood Mallick is the Joint Managing Director of Ramky Enviro (REEL) and is responsible for operations and business development of the Company globally, across business verticals. Mr. Mallick has been working closely with industries and investors for close to 25 years to manage resource and sustainability risks across the business life cycle. He is also recognized as a subject matter expert in the management of hazardous materials, waste management & rehabilitation of contaminated sites. Prior to joining REEL, Mr. Mallick was the Managing Director for ERM and a member of ERM's Global Senior Leadership Team (SLT). Mr. Mallick has also been involved in advising the Government of India, including the Ministry of Environment, Forest and Climate Change (MoEFCC), the Central Pollution Control Board (CPCB), and the Planning Commission (now Niti Aayog) on policy, legislation and technical aspects, including regulatory frameworks, standards, and the SDGs. Mr. Mallick holds a Bachelor's degree in Environmental Sciences; a Master's degree in Environmental Sciences and Technology; and a Diploma in Environmental Law. He has also completed an advanced management program at Harvard Business School.

MR. MORTEN HEGGE

Mr. Morten Hegge is the Regional Director of Cambi Group India working on advanced technology for sustainable wastewater treatment. He is also the Managing Director of Wipro ISR IT focusing on software development and IT outsourcing to India of software developments and maintenance of systems India for large international and Nordic corporate clients. He was also the Sales Director of Norway's largest mutual funds, DNB Investor, and the Head of Nordic Banking Group - Union Bank of Norway with the responsibility for business activities in the Nordic Countries. Mr. Hegge completed his Master of Science Business University fro BI Oslo, Norway, and further acquired a Master of Business Administration (MBA) degree from Arizona State University, USA.

MS. SARA LARSSON

Sara Larsson is the head of the Swedish Chamber of Commerce India since 2014 and has held several managerial positions within Ericsson, in both Sweden and India, over the last several years.

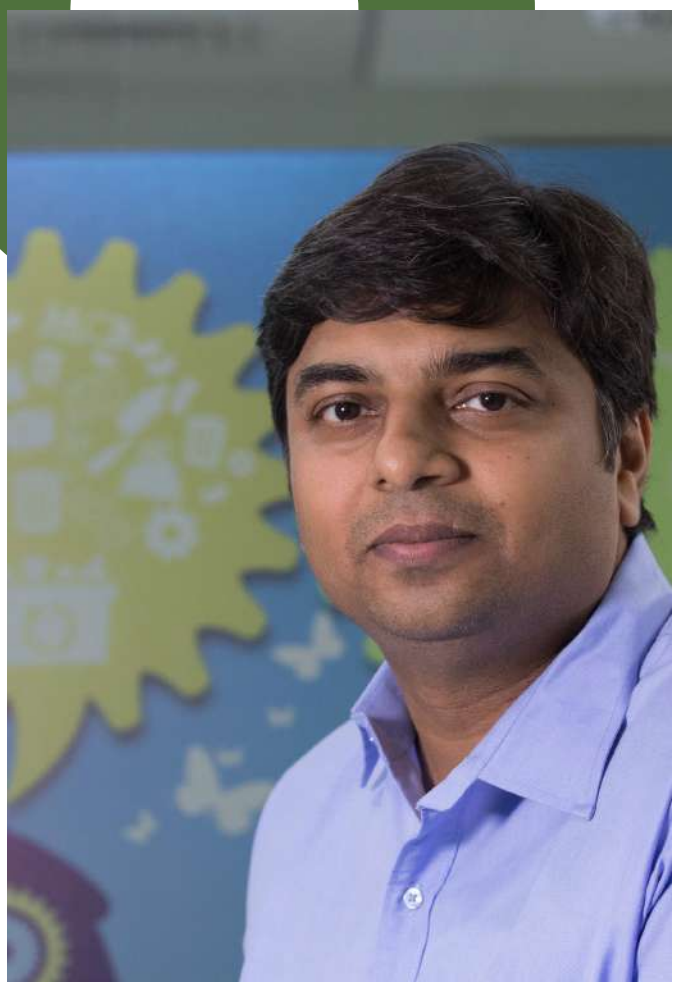
The Chamber is a hub for the Swedish business community in India. About 220 Swedish companies are currently established here, doing business in many different areas and all over the country. Swedish values of sustainability, innovation, creativity and equal society are embedded in the companies' approach and commitment to India and also the guiding principles for the Chamber.

LT. COL. MONISH AHUJA (RETD.)

Lt Col Monish Ahuja (Retd) is Chairman & Managing Director, Punjab Renewable Energy Systems Private Limited (PRESPL) and Chairman, Confederation of Biomass Energy Industry of India (CBEII). In a short span with the understanding of the Biomass IPPs and Biomass Supply Chain Management, he set up the first of its kind in India, biomass fuel aggregation and supply company Punjab Renewable Energy Systems Private Limited (PRESPL). The company has grown from a start-up to INR 1000 million Turnover Company in 8 x Years' time. This business is a big force multiplier to support biomass IPPs, process industry boilers, cogeneration plants, biofuels industry & other industries using agri-residues biomass feedstock. Known in the Biomass fraternity as a dedicated and knowledgeable leader, he has been advocating the barriers faced by Biomass-Bioenergy Project Developers at various seminars and forums and has been instrumental in impressing MNRE (Ministry of New and Renewable Energy, India), MoPNG (Ministry of Petroleum & Natural Gas), Ministry of Agriculture & Farmers Welfare, NITI Aayog towards the use of agri-residue biomass-bioenergy based industry in India.

MR. SANJIV KANWAR

Sanjiv Kanwar is a Country Manager of Yara Fertilisers India Private Limited since 2004.In his current role, Sanjiv is responsible for providing strategic leadership for all aspects of the Yara Fertilisers business that includes growth through innovation and focus on growth excellence, emerging markets, operational excellence and building organizational capability. Sanjiv was the instrumental for Yara to acquire Tata Chemicals' 1.20 MN MT annual capacity urea plant located in Babrala, UP, for USD 421 million becoming the first foreign multinational company to invest in the Indian fertilizer sector. Before joining Yara, Sanjiv worked in various capacities in Norsk Hydro, Sabic, Indo Gulf Fertilisers and PT Indo Bharat Rayon, Jakarta.He has around 33 + years of professional experience in fertilizer and agriculture sector. Sanjiv holds a Master's Degree in Business Administration from Himachal Pradesh University, Shimla. Sanjiv is in board of Norwegian Business Association of India and The Fertiliser Association of India and he has elected for the Chairmanship of FAI-NRC (Northern Regional Committee) for the year of 2020-21. Sanjiv also Member of Confederation of Indian Industry(CII) National Council on Agriculture, National Committee on Nutrition and Federation of Indian Chambers of Commerce & Industry (FICCI) National Committee on Agriculture. Sanjiv also one of the signatories of TERI's initiative on Business Actions for a Green Recovery and also one of the Coalition of Partners for Food System Transformation in India.



MR. VARUN DILIP BORALKAR

Varun Boralkar is working as Head-Commercial, Geocycle India leading their sales, advocacy, and growth initiatives. Geocycle is a business unit of Ambuja and ACC cement providing co-processing as a waste management solution for various waste streams. Varun is a waste management professional with more than a decade of experience in wastewater and solid waste (MSW & Industrial waste) management. He is a mechanical engineer from Pune University with a master's in environment management and environmental technology from England.

DR. HELI ANTILA

Dr. Heli Antila is Vice President, Biobased solutions, Fortum. Heli received her Doctorate in Control Engineering from the Tampere University of Technology, Finland in 1997. She has been working in energy sector management consulting for 15 years. She joined Fortum in June 2012 as Chief Technology Officer. Since 1.11.2018 she has acted as Vice President, Biobased solutions. Heli is the Chairman of the Board of Directors in Chempolis Oy and a Member of the Board of VTT, Infinite Fiber Company Oy, and Assam Biorefinery Private Limited (India).

The Clean Energy Ministerial (CEM) has nominated Heli Antila as an ambassador for clean energy.

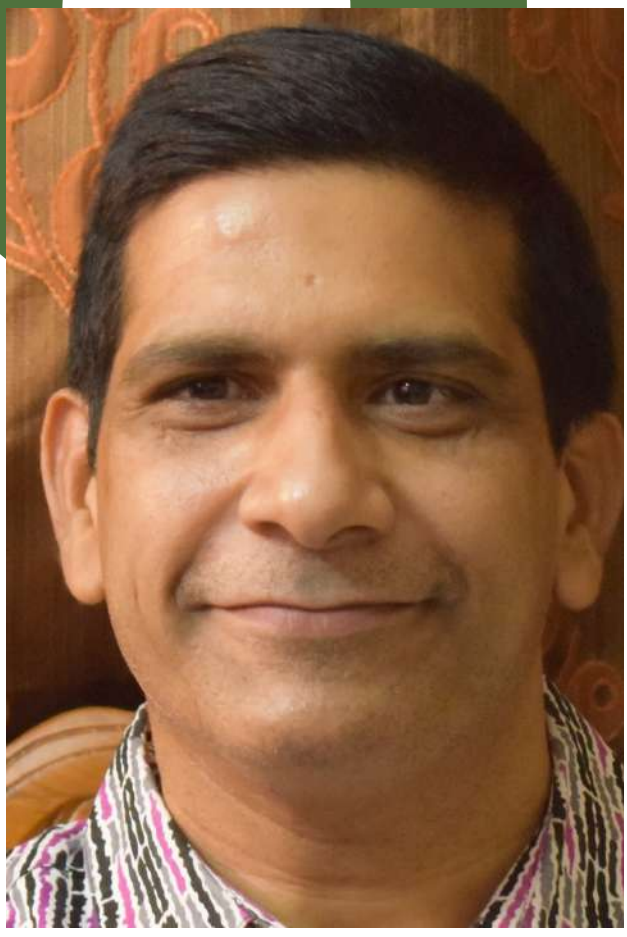
DR. HENRIK BISGAARD-FRANTZEN

Dr. Henrik Bisgaard-Frantzen is currently employed by Christian Hansen a world leader in Industrial microbes for a range of applications like probiotics, cultures for Dairy, human/animal health, and plant protection. Dr. Henrik has been working with technology foresight, technology development & innovation sourcing within areas of strategic interest to Chr-Hansen like the start-up environment, seeds, and maturation of new technology platforms. Dr. Henrik was previously, Director at Novozymes A/S. Novozymes develops industrial enzymes and microbes for a variety of Industries like; household care, BioEnergy, Plant protection, Food, etc. He has also managed dept. applied and basic Biotech R&D for most industry segments. For the past 15 years, been the Director of the technology dev. & scouting activities.

DR. MIKA TIRRONEN

Mr. Mika Tirronen serves as Counsellor of Education and Science in the Embassy of Finland to India. He has a PhD in Molecular Developmental Genetics. He has served as Programme Director in the Academy of Finland, being in charge of several international research programmes with EU member states, Canada, China and Russia. He has also served six years as Counsellor of Education and Science in China. He is a seasoned influencer and advocate of Finnish education and innovation excellence, and his current ambition is to create new and innovative collaborative schemes in education and science between Finland and India.

DR. BRAJESH KR. DUBEY



Dr. Brajesh Kr. Dubey is presently an Associate Professor – Environmental Engineering and Management, the Director of Sustainable Engineering and Circular Economy Research Laboratory in the Department of Civil Engineering at the Indian Institute of Technology – Kharagpur (IIT-KGP), India. Dr. Dubey received Ph.D. in Environmental Engineering Sciences from the University of Florida, Gainesville, USA. He received Outstanding International Student Award from the University of Florida during his PhD program. He has received BTech (Hons) in Civil Engineering from IIT-Kharagpur, India.

Dr. Dubey has over 16 years (post PhD) of research, teaching, and consulting experience within the broad fields of environmental, sustainable/resilient engineering and circular economy approaches, addressing the nexus among sustainability, resiliency, infrastructure, waste, energy, and the environment. His research expertise includes: (1) Life Cycle Assessment (LCA) and techno-economic assessment of emerging/next-generation technologies for solving sustainability challenges related to energy systems, built infrastructure and processing and manufacturing; (2) Decarbonization of the urban infrastructure, especially for integrated waste management systems; (3) Characterization and engineering applications of waste/recycled materials including beneficial reuse risk assessment; and (4) Resource Recovery from solid and liquid waste streams. His research has been funded by several national, international agencies. Prior to PhD, he has 4 years of industry experience as a Civil/Environmental Engineer in the area of petrochemical, refineries and offshore oil platforms.

Dr. Dubey is author of 111 journal papers, 4 edited books/conference proceedings, 25 book chapters, and 27 full conference papers (with h-index of 36. I10-index of 74 with over 4,250 citations). Dr. Dubey has given more than 50 invited presentations in various countries in the world. Dr. Dubey has served as editor for several scientific journals as well has served on various professional committees.

PROFESSOR TONE TØNJUM

Tone Tønjum is full professor at University of Oslo and chief physician and head of a research team within Genome Dynamics at Oslo University Hospital. The main focus of the Genome Dynamics group is studying the mechanisms involved in genomic variability and maintenance, in health and disease. This involves the study of DNA repair mechanism and horizontal gene transfer. These mechanisms are essential for the development of antimicrobial drug resistance (AMR). Tønjum is the founder of the new company GenoFuel Ltd, producing biofuel in a sustainable circular economy model.

DR. PER-ARNE WIKSTRÖM

Dr. Per-Arne Wikström heads Sweden's Office of Science and Innovation at the Embassy of Sweden in India and is an envoy sent from the Ministry of Enterprise and Innovation in Sweden. Dr Wikström is an expert who lead promotion efforts within the fields of research, trade, investment and innovation to help attract excellence to Sweden and to develop relations. Prior joining the Ministry, Dr Wikström worked as Director Sweden Communication, Swedish Institute, Head of External Relations, Stockholm University, Head of Collaboration and Communication, University of Gavle. Dr Wikström received his PhD in business administration from Royal Institute of Technology (KTH), Sweden.

PROFESSOR INDUMATHI M NAMBI

Dr. Indumathi Nambi is a full professor at Environment and Water Resources Division in the Department of Civil Engineering at IITMadras . Before joining IITMadras , she was a postdoctoral research fellow at University of Illinois at Urbana Champaign between 2000 to 2003. She has received her doctorate from Clarkson University, New York and Undergraduate and Masters from Anna University, Chennai.

She has research experience working on groundwater contaminant fate and transport and developing technologies for remediation involving hydrocarbon and solvent spills, and is currently involved in Petroleum, pesticide and Chromium and leachate contaminated site investigations in India. She has been involved in lake restoration activities and development of novel solid waste management technologies in Chennai. She has published over 100 journal publications She is a member of several expert committees in the Centre and in the state of Tamil Nadu including Central pollution Control Board, State environment Appraisal committee, Integrated Solid waste Management Project Evaluation committee and serves as the Coordinator of the Centre for Technology Development and Demonstration in IITM A centre which works towards providing sustainable low cost technologies in environment protection for Micro Small and Medium scale industries in Tamil Nadu. She is the Coordinator of Carbon zero challenge contest - an Innovation contest for identifying young entrepreneurs in the field of Energy and Environment.

DR. LOUISE STAFFAS

Dr. Louise Staffas has a PhD in biochemical toxicology with considerable professional experience from the pharmaceutical industry and the forest industry. Her research largely focuses on resource efficiency from a system perspective, including bio-economy. For the past four years, Dr. Staffas has been working as a senior research officer at Formas, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning, as an expert in bioeconomy and circular economy (resource efficiency).

PROFESSOR MARGARETH ØVERLAND

Professor Margareth Øverland has a BSc and MSc in animal nutrition from Montana State University, USA, PhD studies at the University of Minnesota, USA, and a PhD in animal nutrition from the Norwegian University of Life Sciences (NMBU) in Norway. Øverland has a strong background in project leadership from academia and industry, as a lead of a Center of Excellence on fish feed development and currently of a Center for Research-based Innovation, Foods of Norway at NMBU on innovative R&D on local feed resources. As a Center Director, she works closely with industrial partners to implement research innovations into agricultural and aquacultural applications. Øverland has documented the nutritional value and health effects of novel feeds such as microbial ingredients and insects in farmed animals and fish and facilitated the implementation of the innovation to commercialization.

PROFESSOR KAMAL KISHORE PANT

Prof. Kamal Kishore Pant is Petrotech Chair Professor in the Department of Chemical Engineering at IIT Delhi. He is an Adjunct Faculty at University of Saskatchewan, Honorary Faculty at the University of Queensland, Australia and also Joint Faculty in Centre for Rural Development at IIT Delhi. Prof. Pant is fellow of several academies : Royal Society of Chemistry, London (FRSC, London), National Academy of Science India, (NASI) , Indian National Academy of Engineering (INAE), Biotech Research Society of India (BRSI), Institution of Engineers India (FIE(I)), Indian Institute of Chemical Engineers (FIIChE), Fellow of Indian Desalination Association (InDA).

Prof. Pant's research contribution involves a wide range of innovative studies covering different aspects of heterogeneous green catalysis for cleaner conversion such as coal, biomass and fossil hydrocarbon conversion to clean hydrogen and fuels and chemicals, CO_2 capture and conversion, and Plastic and E waste management.

Prof. Pant has over 30 years of academic and research experience during which he has published more than 200 Journal articles and book chapters having 10000 citations (H index 52), Authored Five Books, and granted 15 national and international patents. He has been among the top 2% world's research scientists published by Stanford university. leading researchers. Prof. Pant has successfully completed over 50 high impact projects and consultancies valued more than INR 2.0 billion Indian Rupees from India and world premier companies and organizations.

MR. TIMO MÄKELÄ

Timo Mäkelä is a senior advisor helping Sitra and its Sustainability solutions theme with strategy work and international connections. It is important for Sitra to understand and learn from what is done and what happens in other countries, especially in the EU, and to increase awareness of the results of Sitra's work and promote their use internationally.

Timo has extremely extensive international experience of expert and leadership positions related to environmental protection and sustainable development in development co-operation, financial institutes and the EU alike. In addition, he has been a board member and an adviser in several companies in the field of environmental technology and the circular economy.

His positions have been related to co-operation, project funding, preparation and implementation of political decisions, and the maintenance of international relationships. Timo has also guided and advised companies in matters related to business activities and financing.

PROFESSOR CLAUS HÉLIX-NIELSEN

Professor Claus Hélix-Nielsen is the water technology & innovation and department chair of the Department of Environmental Engineering at the Technical University of Denmark. His research is centered on lipid-protein interactions, and in particular how the hydrophobic coupling between transmembrane proteins and their host bilayer may regulate protein function through changes in the bilayer mechanical properties. Also how membrane mechanical properties affect overall membrane dynamics (e.g. vesiculation). The technological goal of Claus's research is to create biomimetic membranes for biosensor and separation (filtering) applications using techniques such as electrophysiology, fluorescence-, electron paramagnetic-, and Raman spectroscopy, as well as molecular dynamics and continuum modeling.

DR. SUNEEL PANDEY

Dr Suneel Pandey is Senior Fellow and Director, Environment & Waste Management Division, TERI. In addition, he is also working as Adjunct Faculty at TERI School of Advance Studies (TERI SAS). He has more than 30 years of consultancy/ research experience in the areas of municipal, industrial and hospital waste management, waste-to-energy issues, impact assessment, air, water and soil quality monitoring, site assessments, performance evaluation of ETP and institutional strengthening and capacity building. He has obtained his Ph. D. degree in hazardous waste characterization from Nagpur University while working as Project Fellow at NEERI, Nagpur. Prior to joining TERI, Suneel has worked for ERM India and at the Hong Kong University of Science and Technology on development of landfill liner for containment of land disposed hazardous waste and deriving material balances and associated environmental pollution for Hong Kong region as part of Post Doctoral Research.

At TERI SAS, he was involved in curriculum design for module – solid and hazardous waste management on its inception and taught this module for postgraduate course in Natural Resource Management and Environmental Science for five years. Presently he is engaged in guiding students for their major projects and PhD scholars for their doctoral research.

DR. JAKOB WILLIAMS OERBERG

Dr. Jakob Williams Oerberg is Counsellor Innovation, Research and Higher Education, Royal Danish Embassy, New Delhi. Dr. Oerberg is on deputation from the Danish Ministry of Higher Education and Science, from where he brings experience in Danish and European policy making on research and university governance.

MS. CHRISTABEL ROYAN

Christabel Royan is the Director of the Nordic Centre in India, and has been working on Nordic India higher education and research cooperation for over a decade. The Nordic Centre in India (NCI) is a consortium of leading universities and research institutions in Denmark, Finland, Iceland, Norway, and Sweden. Established in 2001 with the objective to facilitate cooperation in research and higher education between the Nordic countries and India, NCI facilitates and supports a wide range of study and research activities in India and in the Nordic countries through its office in New Delhi and its Secretariat at Tampere University, Finland.

NordicsInIndia

REPORT - INAGURAL

ADDRESS BY PROF K. VIJAYARAGHAVAN

Prof K. Vijayaraghavan, the Principal Scientific Advisor to the Government of India indicated energy, biodiversity, environment, and climate change as the key pillars of discussions that need to be brought up bilaterally between the Indian and the Nordic side. There is a need to have a force setting that can effectively point out our shortcomings, and these discussions should continue to be held regularly. Prof. Vijayaraghavan pointed out that human society has changed dramatically throughout history, especially after the industrial revolution in 19th century. The rate of change has been great – mostly because we have been extracting from the planet immensely, we have access to markets, and we have a labour force that can be used too. This phase has gone where exploitation was marked, and are faced with a question of how are we to move towards development without exploitation. We are capable of using renewable energy like solar energy and also nuclear energy, once the challenges with the latter can be answered. More than anything, a shared sense of partnership must be realized. This is why he stressed on periodic discussions to be held on the lines of Chatham Lines.

Prof. Vijayaraghavan stated that India has been growing enormously, but also is facing a challenge economically. It has a salt-pepper mix, and the interconnection between these so as to make our capabilities reach everyone. Going forward, he said that India has to should identify major iconic projects, that will have large positive economic impacts, and which can be reproduced. These must be done in a collaborative manner. This is why he pointed out at the Nordic countries, who have made massive strides towards sustainability in the last 70-75 years. This bilateral meeting, therefore, is supposed to bring together innovators and ideologues under a common platform to expand the talk over sustainability.

ADDRESS BY H.E. MR. FREDDY SVANE, AMBASSADOR OF DENMARK TO INDIA

In his speech, Ambassador Svane focused on how for India, combining forces with its Nordic colleagues may prove highly profitable. He noted on how the relationship between India and the Nordic region has grown in the recent years, especially with the Indian PM and the Nordic PM's second meeting scheduled in the summer.

Ambassador Svane pointed out that the Green Strategic Partnership from Denmark could transform the current relationship both nations enjoy. Within this partnership, both nations can play on their competitive advantages for greater profits: India's scale and Denmark's skills will transform the relationship completely. Such a collaboration only stands to strengthen India, without which global challenges cannot be met. Ambassador Svane focused on two important aspects, scope and speed, and posited that the scope should be ever increasing and the speed must be fast. Furthermore, sustainability must not be taken over in India as it is done in the other countries; a subtle inspiration should be provided so that India can could play to its unique capabilities in a better way.

ADDRESS BY H.E. MS. RITVA KOUKKU-RONDE, AMBASSADOR OF FINLAND TO INDIA

In her address, Ambassador Koukku-Ronde mentioned that Nordic countries have similar goals as India which include but are not limited to sustainability, digital innovation, and education. Speaking about the situation in the Nordic region, she pointed out at how the latter is blessed with strong political structures that put sustainability and climate related actions at the center of their initiatives and policies. Talking particularly about Finland, which was recently selected as the number one country in sustainability by the United Nations, followed by Sweden and Denmark, Ambassador Koukku-Ronde pointed out that sustainability is not just a "phrase", but a "lifestyle" for the people of Finland and the Nordic region in general. Talking about the green policies introduced in Finland around sustainable forest management, she talked how the Finnish government has taken up the restoration of numerous lakes in Finland, followed by numerous policies to control and monitor the air quality and biodiversity. She pointed out at the various initiatives taken up by Finnish businesses and innovation houses to reduce plastic usage by replacing it by bio-products.

Talking about the collaboration with India that this conference seeks to establish, she said that there exist outstanding opportunities in India for the development of such green and sustainable initiatives. Explicating it as a "win-win" situation for all, she looked forward to the success of the conference.

ADDRESS BY H.E. MR. HANS JACOB FRYDENLUND, AMBASSADOR OF NORWAY TO INDIA

In his address, Ambassador Frydenlund mentioned that this project helps in bringing Nordic innovation to bring green transition into India, by closely collaborating with Indian businesses and innovation centers. He pointed out how Nordics are similar culturally and economically, albeit harboring different geographical spaces. Politics in the Nordic region has always put forward sustainability and circular economy very high up on its list of agendas. Strategies formulated and passed since 2016 have followed green construction patterns in the Nordic region, whereas the RCN in cooperation with the DST brought out calls on biotechnology. On the other hand, initiatives taken up to cooperate on marine litter and reduce plastic waste and reuse it. Norway since 2014 has worked on stopping of plastic pollution on the international fora. Ambassador Frydenlund said that Norway would be happy to share these with India.

ADDRESS BY H.E. MR. KLAS MOLIN, AMBASSADOR OF SWEDEN TO INDIA

Ambassador Molin pointed out that sustainability and circular economy are, and will remain highlights for the future projects in the Nordic region. Since the participation PM Modi at the Indo-Nordic Summit held in 2018 in Stockholm, the collaborative efforts between Sweden and India have increased manifold. As echoed by other delegates before him, he said how Nordic countries can provide innovations and impetus while India can provide scale. He expressed his pleasure to see the cooperation amongst the Nordic Counsellors.

Talking about the situation in the Nordic region, he mentioned that circular economy and bioeconomy are very much at the heart of the Nordic cooperation. The Nordic Swan Ecolabel was established in 1989 by the Nordic Council of Ministers as a voluntary ecolabelling scheme for the Nordic countries as an effective tool to help companies that want to go ahead with sustainable solutions – and thereby enable consumers and professional buyers to choose the environmentally best goods and services.

As far as Sweden is concerned, the Swedish blueprint includes Sweden's national strategy for a circular economy and concrete corporate actions from Swedish industry leaders. Furthermore, the Swedish Government has adopted a national strategy for a circular economy that sets out the direction and ambition for a long-term and sustainable transition of Swedish society. This is an important step towards Sweden becoming the world's first fossil-free welfare nation. In 2019, both countries launched a leadership group on industry transition (LeadIT) for lowering CO_2 emissions in heavy industries and building a fossil-free future.

Thus, Sweden's long history of innovation across design, energy efficiency, ICT and recycling processes, coupled with its national commitments to climate action and natural resource conservation, make it a perfect circularity partner to India. He also mentioned that Sweden and India will be opening a jointly funded call for proposals on Circular Economy. Swedish companies in India are already blending Swedish innovation and Indian ingenuity to solve waste challenges across various waste streams—Ikea's product designs with paddy straw, Ericsson's ICT applications for real time pollution monitoring deployed with IIT Kanpur, Tetra Pak's plant-based polymer packaging, Bioendev's bio-coal made at NABI, in partnership with the office of the Principle Scientific Advisor (PSA) to the Government of India.

Since the complexity of the transformation calls for a systemic transformation, Ambassador Molin said that there is a need to work together and rethink our system for economy and our consumer-based lifestyles.

NordicsInIndia

REPORT - SESSION 1

PROFESSOR LENE LANGE, DANISH ACADEMY OF TECHNICAL SCIENCES

Associated with various Indian institutions in different capacities from the beginning of her career, Prof. Lene Lange provided new insights in the upgradation of organic residues, side-streams, and wastes. Her efforts were focused on providing "fantastic opportunities" to India to use its biological resources efficiently. Prof. Lange spoke about the wide range of diverse products—for example, food and food ingredients, feed and feed additives, health promoting products, fertilizers, etc.—that can be generated from healthy and nutritious side-streams like cereal milling residues, milk, whey and waste water upgrade, and various forms of extraction pulps. One of her main focuses was on 'biorefineries', wherein she identified different zones where a lot of waste material was collected–which could then be upgraded to nutritious and other value-added products. For instance, Prof. Lange mentions that seaweed and the waste procured from fish processing can also be upgraded to useful products. The message however, of Prof. Lange's speech was loud and clear–which was to unlock the full potential of biomass and effectively manage India's bio-waste to solve the larger issues of climate change, loss of biodiversity, improving public health and livelihood in rural areas.

MR. SURESH KUMAR, FINLAND CHAMBER OF COMMERCE IN INDIA

Representing a nation and an organization that is miles ahead in adopting the 'green mindset', Mr. Suresh Kumar focused on the various steps taken by the government, communities, and other organizations in efficiently reducing emissions and stronger carbon syncs. Mr. Kumar stated the innovation friendly and sustainable nature of corporations in Finland as being responsible for this transition of the state to a 'greener' society. This, he mentioned, has been made possible because of the green transition in the supply chains of these corporations.

Talking about the two leading companies in India: Huhtumaki and KONE, Mr. Kumar mentions how both organizations have been invested in creating a more sustainable environment in India by actively taking on community initiatives. For instance, Huhtumaki has been working on cleaning the Mithi River in Mumbai. Fortum, another company that has been working closely with the Indian Government has been actively working on bio-refinery projects in Assam. Throughout his presentation, Mr. Kumar sought to buttress the point that India, in active collaboration with the Nordic companies will be able to bring about sustainable development and the green initiatives that have been the highlight of the event.

MR. MASOOD MALLICK, RAMKY ENVIRO ENGINEERS LIMITED

Slightly deviating from the points raised so far by different speakers and delegates, Mr. Masood Mallik sought to bring in the economic prospects of mainstreaming circularity from the industrial standpoint, which according to him, amounts to half a trillion-dollar opportunity in India. An investment was made a few years ago by the significant waste management company in Asia, and the idea was to see if we could transform the face of the company.

Mr. Mallik states that that the need of the hour is cooperation, not only in technology, but also to adapt it to local settings. Some of the largest dumpsites in India have been refurbished through adoption of such technologies. Lots of different partnerships have made this possible, through which different technologies flew in for example automotive filling, plastics recycling, and waste to recycled construction material. Mr. Mallik and his company have also been engaged in recovering precious metals like gold and silver from waste. All the e-waste and industrial waste goes to Western countries for waste refining.

A very interesting example of partnership and collaboration with his institution was the recycle marine waste project, where India's first waste collection ship was created. One more is the AI enable waste sorting system that came through partnership with Norway.

MR. MORTEN HEGGE, CAMBI GROUP

Internationally, the Cambi group has been focused on converting sludge into fertilizer and energy, while also taking up waste water treatment in India. Many of the rivers, lakes, and other waterbodies in India are not in a good shape because of faulty waste water treatment, and Cambi provides solutions for the treatment of sludge that causes such issues. Cambi's pre-treatment procedures use anaerobic digestion, which can be combined with the treatment process. The advantages of using Cambi's methods are that it helps in producing more biogas and electricity through the efficient treatment of the sludge.

This, however, has further advantages as the fuel created by Cambi is class A bio mass that can be used as fertilizer/soil enhancer. Cambi is the world leader in THP, catering to more than 100 million people a day. Their core technology also meets 8 out of 17 Sustainable Development Goals (SDGs) put forward by the UN.

Contributing to more sustainable solutions, Cambi produces biofuel for the buses in Oslo, which can also be reproduced and done for Delhi. Cambi-THP biosolids are certified Class A by US EPA (503), which can dewater sludge upto 35%. They have also been involved in ETV program by the Govt. of India.

SARA LARRSON, SWEDISH CHAMBERS OF COMMERCE INDIA

Ms. Sara spoke about the Green Journey – a Team Sweden initiative in India and the Swedish Business Communities in India group, which is a consortium of 220 companies employing 200,000 employees directly for over 120 years. She mentioned about how the Swedish Chambers of Commerce India have gathered companies from different sectors to come together in order to learn from each other.

In 2021, the organization undertook a sustainability mapping with 18 companies with the Counsellor General in Mumbai. This study was undertaken in Maharashtra, since Pune is a hub for Swedish companies. The Chambers sought to study how companies are applying green transition across the full value chain, in their operations, with people, and with facilities. The focus was on their direct area of influence. The Chambers also sought to identify gaps and engagement within the group on a local, state, and central level. Furthermore, a baseline was also established. A local NGO was brought in for evaluation, which found out that Swedish companies are committed to green transition across value chains.

The Chambers now seeks to build engagement and action. The second phase of the sustainability mapping has been initiated in close collaboration with the Embassy of Sweden, covering another 35 companies across India. The Chambers see working together and learning from each other as the best possible practice in order to come up with efficient alternatives for green energy solutions, waste management, circular economy. Closing the loop on the latter has been the recent IKEA project which has initiated a 2-year incubation program for microentrepreneurs.

MR. MONISH AHUJA, CONFEDERATION OF BIOMASS ENERGY INDUSTRY OF INDIA

Mr. Monish Ahuja heads the Confederation of Biomass Energy Industry of India (CBEII), which has a strong engagement in terms of partnership across diverse institutional and industrial stakeholders. Mr. Ahuja stressed the biomass industry in India has been expanding exponentially, and presented a case study of circular economy by bringing into light the organization he chairs, namely, the Punjab Renewable Energy Systems Private Limited (PRESPL). PRESPL is the largest biomass supply chain management company in India, a unique model which is present in 14 states.

A specific B2B project was presented wherein PRESPL is looking forward to empowering the rural farmer, by ensuring that biomass is aggregated in the quantity to be utilized, in this case 100 tons per day. This is then densified into pellets, then taking it to clients as steam energy for industries. This is a novel technology, where biomass is turned into steam. The project is currently operating at 98%, even after facing a lot of challenges. Their plants run 365 days a year without stop.

The circularity of the working is that the ash which comes out, is turned into blocks/bricks. The carbon also goes back to the top-soil regeneration, which is cleaner than fossil fuels, so much so that one can have a meal sitting in the boiler room.

These solutions bring decentralized renewable energy, tangible environment and health benefits, additional income through the banking channels, with a focus on the farming community and operates on the belief that let us enable policy, but not ride on government policy. All these projects are undertaken without government intervention. Using calculations on EROI, Mr. Ahuja claims that they are 22% more efficient and this readily translates into cost efficiency as well. PRESPL continues to work with various stakeholders for recognition of biomass renewable energy.

MR. SANJIV KANWAR, YARA INDIA

Yara India has been actively working to move towards a nature positive food future. Yara has focused their work into three buckets: namely- a) climate neutrality which focuses on reducing emissions and improving productivity at production sites; b) regenerative farming which is centered on improving farming productivity and nutrient use efficiency by using the right fertilizer at the right time, and c) prosperity, which seeks to improve farmer income, national income, and sustainability.

Mr. Kanwar stated that Yara is focused on producing 'nature positive' food. Yara has continued to engage with the farming community directly to increase production, and has also extended carbon credit for the farmers – Agoro Carbon Alliance – which enhances farmers income. Yara is one of the first institutions to provide incentives to the farmers for following green methods of production. By focusing on green ammonia production, it will also be first company to introduce green fertilizers to the farmers, while continuously striving towards making agriculture sustainable for the future generations.

MR. VARUN DILIP BORALKAR, GEOCYCLE INDIA

Geocycle India is part of the Ambuja and ACC cement waste management solutions providers. As one of the largest co-processors of waste in the country, Geocycles have processed more than a million tons of waste last year. The company has also diverted immense amounts of waste from landfills.

Since the technology of co-processing was made mainstream in India in the past 5 years, it has been doing well. The technology used by Geocycle is focused on pre-processing and co-processing which focuses on large volumes of waste. There is no chemical intervention involved in these procedures, but a uniform blend is created which can be fired into cement kiln. The success of co-processing has been felt across various forums, but in the case of Geocycles their presence has been felt most acutely in the rural parts of India. Here, the company has been regularly engaged in community care initiatives, especially awareness of waste and plastic. Plastic is largely used in India, and the sustainable methods to process plastic waste is not yet set up. However, Geocycle has come up with effective solutions for the same.

Geocycle has been enabling a lot of brands to be sustainable through EPR services. Beginning of the year (2022), they built the bubble-barrier project. This is a part of the prevention of marine pollution from plastic where the pilot has been successful and more such projects are being worked on, and currently are looking at increasing diversion from landfills. On the other hand as part their building materials C&D waste we have started our association with various companies to expand on opportunities.

DR. ANTILA HELI, FORTUM LIMITED

Fortum Limited has been working on the very first biorefinery using the Chempolis technology which is under construction in Assam. Such collaborations require good partnerships, through which we aim to not only procure more resources but also put them to use more efficiently. The Nordic-India partnership in this case allows the influx of the abovementioned Chempolis technology from the Nordic region to India to enable the latter to efficiently enter the green economy. There is a great impact of such management systems in the local and regional levels. The particular plant mentioned here produces bio-ethanol using bamboo as raw material, among various other bio-chemical products.

Dr. Heli mentioned that comprehensive bioeconomic policies become pertinent as bio-industries involves agriculture, textiles, chemicals, etc., which means the regulations happen in silos. In such cases, it would be highly beneficial to look at it comprehensively. A demonstration plant being built will serve as an example for this, Dr. Heli concluded.

Fortum has been focussed on introducing technologies and building partnerships for processing biomasses – typically considered as waste – for high value products replacing fossil and otherwise detrimental materials in several industrial sectors. It wishes to continue working in the same stead in India.

DR. HENRIK BISGAARD-FRANTZEN, CHR. HANSEN HOLDING

Dr. Henrik has been engaged with projects and corporate developments for India for the past 15 years. As part of the Chr. Hansen Holding, Dr. Henrik stated that the former has been focused on the B2B manufacture of microbial cultures and probiotics, and has been leading the market in the same. Varied food and agricultural cultures have been incorporated into their markets. A very important and growing area for the Company has been the stress on bio-protection applications.

Viewing that food production leads to 1/3rd of greenhouse gas emissions and that 1/3rd of fodd produced goes to waste producing 8% of global greenhouse emissions, Chr. Hansen has been focused on better food production, less waste, quality and safety. By focusing on producing good bacteria which can extend shelf life of foods and protect against pathogens, Chr Hansen has been directly involved in the creating better and healthier food with less waste. Microbial culture has also been effectively used in agriculture, which has increased farming outputs. The use of the former in agriculture has also led to a fertilizer free farming thus putting sustainability at the center-stage.

Chr Hansen looks for collaboration in the plant health, animal health, human health, and food production related areas to create more value, drive home sustainable solutions, and improving quality of life. Some collaborations with leading Indian brands has already led to these results.

NordicsInIndia

REPORT - SESSION 2

DR. MIKA TIRRONEN, EMBASSY OF FINLAND IN INDIA

Dr. Tirronen presented a broad range of projects and initiatives that were being undertaken in Finland in order to move towards sustainability. These ideas were presented both as an “inspiration” and as a “benchmark” that could facilitate the Nordic-India relations and take the latter towards more sustainable solutions. Being ahead than most advanced countries in innovation, technology, sustainability, skill development, education etc., the Finnish government has also successfully spearheaded various programs—like aiming to achieve Carbon Neutrality by 2035, Climate Change Adaption Strategy 2005 etc.—that are aimed at creating innovative and sustainable solutions. Finland has also succeeded in establishing a cyclical economy which is indicated in the high number of patents that have been issued related to recycling and secondary raw materials. The bioeconomy in 2019 added 26 billion euros to the overall economy in Finland.

Finland has the cleanest air and water in the world, and this has been made possible by the initiatives taken by the government in coming up with various laws—like the tax on Co2, undertaking various research studies on particle pollutants in the air etc.—which has controlled emissions to a great extent. Finland has also successfully replaced non-recyclable materials like plastic with wood in various industries, including textiles. This has led to strengthening the circular economy. The Finnish government has taken its innovations to various South Asian and Southeast Asian countries, and is also hoping to expand in India. It has already partnered with India in certain areas such as digitization and sustainability, and is looking forward to more such avenues, said Dr. Tirronen.

PROFESSOR BRAJESH DUBEY, INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

An environmental engineer, Dr. Brajesh Dubey specializes in the management of solid and liquid waste. Working mostly in urban settings, Dr. Dubey talked mostly about what one can do in terms of creating a sustainable city in an urban setting. Sustainable cities can only be made possible when different processes of wastewater management, organic waste management, residual waste management, and recyclables are taken together holistically. In many of the said processes, a certain level of collaboration with the Nordic regions has already been undertaken, as is indicated by the sludge treatment projects that are being spearheaded by Cambi in collaboration with Dr. Dubey's institution.

However, solid waste becomes the major issue in India today, and Dr. Dubey points that the one important lesson to be learnt from the Nordic counterpart is to keep it source segregated. Since solid gets mixed up even in the advanced cities in India, it becomes highly unusable. However, Dr. Dubey pointed out that it cannot be a mere copy and paste technique, but has to be more Indianized. Furthermore, the education system must be incorporated into the context of the circular economy from the primary level all the way to the higher levels in order to bring lasting changes.

The need to shift to a cyclical economy is being felt in India right now than ever before because the number of resources that is required in India's new age Income Substitution Industries (ISI) being set up in the country under the Make in India scheme. Dr. Dubey and his team has been effectively working towards such solutions, trying to reduce waste and pollution in various sectors. For example, hydrochar that is created out of food and yard waste can effectively replace the usage of coal in certain industries Dr. Dubey and his team are currently working on many such projects, and are closely collaborating with the Nordic region.

PROFESSOR TONE TØNJUM, UNIVERSITY OF OSLO

Prof. Tone Tønjum heads GenoFuel a company that converts bacteria into biofuel. The biofuel produced by GenoFuel boasts of much lower greenhouse gas emissions and can be replaced with normal fuel in the aviation, maritime and onshore transport industries. GenoFuel has successfully been producing sustainable aviation fuel and biofuel respectively.

In terms of competitive advantage that GenoFuel possess, professor Tønjum claims that the game-changing fuel that is produced through the gene-editing of bacteria is a novel technology that has not yet been developed elsewhere. The entire procedure is done through the conversion of bacteria into usable fuel, whereas gene editing of anaerobic bacteria also increases its survivability. The process includes four distinct stages of aerobic pre-treatment of raw materials like plastic algae mix, marine agriculture, fisheries waste, which are then passed through anaerobic reactors, before being refined to finally obtain C4 (Butanol) and C8 products.

The whole procedure follows closely the aspects of a circular economy by using local wastes and resources to be converted to value-added products. The Genome dynamics team that is working on these processes consist of scientists from India and Pakistan. This circular-economy based biofuel production company has been in collaboration with various public and private enterprises, and is also looking forward to working in India.

DR PER-ARNE WIKSTRÖM, EMBASSY OF SWEDEN IN INDIA

Dr. Wikström mentioned that in 2021, Sweden was ranked 2 on Global Innovation Index and number 1 on Global Sustainability Index. Dr Wikström explicated on how India and the Nordic region could organize better in terms of working through to a cyclical economy, and saw collaboration as the single-most effective strategy to achieve that. From the Swedish point of view, Dr. Wikström mentioned that the nation has a political commitment towards a sustainable future and hence has been effectively working towards it. Since Prime Minister Modi's visit to Sweden in 2018, innovation partnership has become the flagship of Sweden's relations and gained strength, a common thread running through all its areas of collaborations for example digital health, circular economy, and future mobility.

Swedish enterprises and the government have already been in collaboration with the various industries in India, while also engaging in activities with the PSA. Both the governments have allocated joint funding for multi-million calls under the joint innovation partnership. Dr Wikström indicated that both countries are now entering a new era of responsible and disruptive tech innovation that is inclusive, cares for the planet and creates impact. What is important is to see how India and Sweden together can navigate this crisis and create a sustainable future for both the countries. He also added that enabling basic and applied research that can replace our traditional take, make, waste economic models with circular systems that reduce material and energy inputs is the need of the hour.

The Intsam group (Vinnova, Swedish Research Council, Swedish Energy Agency, Formas and Forte) and India's Department of Biotechnology (DBT) and Department of Science and Technology (DST) came together to discuss the development of a new joint call on circular economy to drive cross-sectoral research on circular economy. Further activities like matchmaking between the S&T clusters in Sweden and India is crucial these are planned for 2022. Furthermore, both nations are also working on a bilateral program for researcher exchange and mobility that will further enhance and strengthen the collaboration with India.

PROFESSOR INDUMATI NAMBI, INDIAN INSTITUTE OF TECHNOLOGY, MADRAS

Prof Nambi highlighted that some of the main issues that India faces today are in the area of sanitation. The Indian Government has also recently come out with a mandate of "Swaccha Bharat" which has been trying to focus on the sanitation issue and to find sustainable remedies for the same. However, the toilets that are being installed under this scheme remain unutilized or under-utilized due to various issues. The other issue is the issue of large import of fertilizers. Being a large agricultural country, these issues have been problematic in the long run. On the discharge side, the nutrient loaded waste-water that is being dumped into water bodies is becoming another grave issue today.

To address all this issues in one go has been the focus of Prof. Nambi and her team, who have been working on eco-toilets where they are trying to convert toilets and urinals that are water-free. We are also looking at working the waste into resources that can be used, especially fertilizers. The ammonia and phosphorus that are contained in the liquid waste, and even the solid waste is converted into a nutrient rich char. The ammonia that is created by using such methods is of high-quality and is also highly cost-effective. This makes the process completely circular while helping to achieve sanitation targets. This is then sent to be processed for conversion into fertilizer.

The toilets are mobile, energy efficient, and profit-based. These toilets can be used in all types of institutions. This is turning into a profitable business, and we are trying to collaborate with many companies like Yara. Since this is a start-up, there is also a lot of employment generation opportunities, and will also try and solve the sanitation issue in India. Prof. Nambi and her team already have a laboratory scale and prototype which they are looking to commercialize by focusing on both government and private enterprises.

DR. LOUISE STAFFAS, SWEDISH RESEARCH COUNCIL FOR SUSTAINABLE DEVELOPMENT

Dr Staffas highlighted the upcoming Indo-Swedish joint call in Circular Economy and stated that since circular economy has grown in the past few years, there are global value chains that require nations to arrive at a global solution. The ambition, thus, is to scale up bilateral research and innovation cooperation in areas with joint challenges and capitalizing on the strengths of both countries, as transitioning to a circular economy has now also been prioritized area in both countries.

Talking about the steps that must be taken in this direction, Dr. Staffas explained that a certain cooperation should be fostered across the scale of basic research to implementation while involving multiple agencies in both countries that have potential to increase width, depth and impact of joint venture. The transition to a circular economy is one of the important building blocks towards sustainability – since reuse, remanufacturing and recycling contribute to the long-term use of materials and other resources. Through this the excess extraction of virgin resources becomes limited and an extended material lifespan helps reduce waste as well as unwarranted extraction of natural resources.

Many Swedish agencies have been participating in this call, for instance Formas, Forte, The Swedish Research Council for Health, Working Life and Welfare, The Swedish Research Council, The Swedish Energy Agency, and Vinnova, Sweden's Innovation Agency. The participating agencies on the Indian side are Department of Science and Technology and Department of Biotechnology.

This call has seen the coming together of five RnD-funding agencies on the Swedish side and two Departments on the Indian side. In this way, together, both nations can provide support to full value chain projects. Circular economy is a global challenge because value chains are global.

A shift from linear to circular economy also involves a shift from the concept of value chains to value cycles. This is a complex process for society. It requires changes in almost all sectors. Formas will favour applications contributing to sustainable development and look at how well the efforts of the partners in the project complement each other in achieving the common goal. Furthermore, Formas will also organise information sessions and matchmaking activities related to this call.

PROFESSOR MARGARETH ØVERLAND, NORWEGIAN UNIVERSITY OF LIFE SCIENCES

To answer the questions on circular economy and bio-balanced economy, Prof Øverland provides the example of the sustainable feed ingredients that is produced by Foods of Norway. The latter has been spearheading research-based innovation in the agriculture, forestry, and aquaculture industries. The strategy as put forward by Prof. Øverland is to increase they per unit yield of food grains while at the same time minimizing environmental impact and reducing waste and decreasing pollution.

Foods of Norway has been successfully using bio-refinery processing to convert biomass and waste into high quality feeding grains. The aim is to feed fish and farm animals in order to produce human food. The resources that are used in these processes are abundantly available in Norway, and Foods of Norway has also been successful in creating a knowledge platform in creating a complete circular economy.

The organization is currently partnered with around 19 industrial partners from different sectors. Some key examples that were provided during the course of the presentation is how the company produces feed from trees by converting the former into sugar by using enzyme technologies and the conversion of seaweed into animal feed and other value-added products. In the case of the processing of the seaweed, a biorefinery approach is being undertaken. Innovations have also been undertaken to convert food waste and other waste streams to value added products.

Foods of Norway effectively carry out techno-economic study while also working on the regulatory aspects. Furthermore, they provide a wide knowledge platform for collaboration in the future.

PROFESSOR K K PANT, INDIAN INSTITUTE OF TECHNOLOGY, DELHI

In his presentation, Prof. Pant mainly focused on plastic, e-waste, and agricultural residue. Looking at the data for India, Prof Pant mentions that almost 3.5 million metric ton of e-waste and around 9.5 million ton of plastic waste is produced in India. Contrarily, the percentage of either that is recycled or reused remains abysmally low, which led Prof. Pant to signal at the "urban mine" that, if utilized, can revolutionize industries in India.

As others before him, Prof. Pant also shed some light on the importance of a sustainable economy and his organization has been at the forefront of taking initiatives to work toward a circular economy. Expanding on this, Prof. Pant explained his organization has worked on converting plastic waste to value-added products like fuel (petrol) by producing catalysts in their lab. These prototypes have an successful yield of 75%. Most types of plastics can be recycled through these procedures, and units that can process at least 50kg/day. Processes like low temperature roasting have also successfully led to the extraction of rare earth metals from the e-waste and plastic waste. IIT Delhi has thus been at the forefront of using such processes to convert all the above-mentioned types of waste into value added products.

MR. TIMO MÄKELÄ, THE FINNISH INNOVATION FUND (SITRA)

Representing SITRA, Mr. Timo stated that rather than understood as a Research & Development institute, the Finnish Innovation Fund must be understood as a foresight that wishes to develop, innovate, and test new avenues and possibilities for Finish economy and society as a whole and beyond. Other than working on data economy and democracy in the modern world, SITRA has also been actively involved in sustainability. Around 5 years ago, SITRA developed the first-ever roadmap for circular economy, which has now turned into a national strategy for circular economy with a range of policies and activities undertaken within it.

However, what SITRA has concluded in its efforts so far is that in the transition to a circular economy there have been gaps in the human capital development and skills that are required to sustain this transition to a circular economy. SITRA has been working with a wide range of educational institutions to impart these skills and knowledge to a large range of students as well as professionals to ease the transition to a circular economy as well as sensitize others to the same. Currently, SITRA has been testing curriculums in top order Business Schools and other institutes. Moreover, Mr. Timo also explained how SITRA has been efficiently working towards the global challenges of easing the bottlenecks in resource supply. This has empowered businesses, companies, and enterprises to unite and move forward, while SITRA continues to collaborate with sustainable companies and creating alternative business opportunities that are not only tech-driven but also sustainable in nature.

PROFESSOR CLAUS HÉLIX-NIELSEN

Professor Claus Helix presented the broad area of engagement of the Department of Environmental Engineering at the Technical University of Denmark (DTU) in the field of circular and bio-based economy. Prof. Claus emphasized upon DTU's fundamental aim of conducting research-based innovation that benefits the society at large through the dissemination of knowledge and education thus created has led them to develop high levels of environmental engineering methods.

The three main sectors of work that DTU has undertaken is on a) Water Technology & Processes, b) Circularity and Environmental Impact, and c) Climate and Monitoring. In the first sector, DTU has efficiently worked on the treatment of both wastewater and drinking water by employing a plethora of bio-chemical and microbial processes. DTU has also been working on system analysis of urban water systems in a more generalized manner. This is followed by environmental and economic assessments that are more focused on reducing waste and contamination. The last sector of Climate and monitoring as mentioned by Prof. Claus is focused on reducing greenhouse gas emissions, remote sensing of ecosystems, measurements of hydrological processes and many other initiatives.

Prof. Claus further emphasized that DTU and his department has been active in India and with Indian partners, and that they have an ambition to "strengthen this relationship further over the next years in light of the Green Strategic Partnership between the countries."

DR. SUNEEL PANDEY, THE ENERGY RESEARCH INSTITUTE

Dr. Pandey and TERI has been working effectively in collaboration with the Government of India. Dr. Padney explicated that recent government initiatives in moving towards a more sustainable economy has led TERI to effectively estimated that the greenhouse gas emissions in India will go down significantly by 2050. The advent of clean India initiatives undertaken by the government in 2014 has led to the expansion of government intervention in such areas. In pointing out some of the issues that lead to such emissions, Dr. Pandey in his presentation also pointed out towards the solutions for the same.

In terms of sanitation, TERI has been working on nature-based solutions, and engaging in community-based initiatives. TERI has worked towards the installing of a lot of community toilets (CTs) in Kolkata and Chennai. Moreover, they have also effectively integrated informal sector and RWA in India to improve waste segregation, and also building financial sustainability. TERI has been trying to move towards aspirational targets which have been identified as zero waste landfills, nutrient recovery from sewage, and value-added recycling. TERI also provides a wide range of opportunities for collaboration.

DR. JAKOB WILLIAMS ØRBERG, ROYAL DANISH EMBASSY IN DELHI

Dr Jakob Williams Ørberg emphasized the special role that the Nordics may have in the Indian development trajectory taking a cue from Principal Scientific Advisors introductory statement that India will grow, and it will be through the SDGs. Adding on to this he explained that it will grow in a planet-positive manner. He further highlighted ongoing bilateral collaboration under the Green Strategic Partnership and emphasized the need for Nordic engagement in the area of bio-economy and green energy. Expanding on the Danish contributions made during the event, Dr. Ørberg emphasized on how along with industrial collaboration, what is needed more than ever is to create knowledge within institutions. He noted that many researchers from Denmark have joined the NITI Aayog to collaborate on these going processes of circular economy in India.

As the Danish systems are made for partnerships, Dr. Ørberg stated that the Danish arrangements can easily be extrapolated to India, thus benefitting both countries. Focus areas that have been developed can help getting industries and educational institutions on board, and have high scalability options. Several missions that have been initiated by the Danish side are actively looking for collaborations, and especially on the Indian side. He noted that in the week following this conference a joint bilateral R&d call has been initiated by both the Indian and the Danish sides to collaborate over Green Hydrogen.

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INDO-NORDIC CIRCULAR ECONOMY AND BIO-ECONOMY WORKSHOP

26TH MAY, 2022
VENUE: SAVITRIBAI PHULE PUNE UNIVERSITY

27TH MAY, 2022
VENUE:BANGALORE BIOINNOVATION CENTRE

NordicsInIndia

A NORDIC-INDIA INNOVATION PARTNERSHIP ON CARBON NEUTRALITY AND A SUSTAINABLE CIRCULAR AND BIO-BASED ECONOMY

Background

The Indo-Nordic Circular Economy and Bio-Economy Workshop (NordicsInIndia) aims to create a platform with key stakeholders in a triple helix format covering government, private sector, and academia to provide overall strategic direction for joint programs in Circular Economy and Bioeconomy. Nordic research-based innovations and solutions have resulted in lower waste volume and high degrees of upcycling, recycling, and recovery of resources from waste. These innovations and technologies can bring positive impact in India, thereby, supporting the green transition to a low carbon economy. This project is funded by the Nordic Council of Ministers. It is a collaboration between the embassies of Denmark, Finland, Norway, and Sweden with Norway playing coordinator and the Nordic Centre in India acting as facilitator.

Workshops in Pune and Bengaluru

The NordicsinIndia are committed towards joining hands with the leading states in India to explore research and innovative collaboration opportunities in the areas of circular and bio-economies. In line with this commitment, the NordicsInIndia plan to engage Nordic delegations (researchers, companies, and policymakers) in two Indian cities: Pune and Bengaluru, that are being positioned centrally in and are committed to India's green transition. The delegations in collaboration with Indian stakeholders will conduct theme-based workshops under sustainable, circular, and bio-based economy. The invited stakeholders will include governmental authorities (urban development department, municipal corporation etc.), leading companies, key research, and technical institutes with an ambition to establish relationships and joint innovation and research projects. The workshop will also cater to the strong need to setup research collaborations among leading research agencies and universities from Nordic countries and India to develop next-generation circular economy solutions that can be tested in local conditions.

These workshops follow the High-Level Science and Innovation Dialogue meeting on Sustainable, Circular, and Bio-based Economy that was held on the 31st of January, 2022, in cooperation with the Office of Principal of Scientific Advisor, Government of India. The aim of that event was to provide a platform for peer-to-peer discussions on Innovation, technology, policy amongst experts from Governments, academia, and industry from India and Nordic countries.

NordicsInIndia

PROGRAMME

26 MAY 2022
SAVITRIBAI PHULE PUNE UNIVERSITY

NordicsInIndia

NETWORKING LUNCH AND REGISTRATION

Time: 12:30 to 13:30
Venue: Main Building, SPPU, Ganeshkhind Road, Pune, Maharashtra

INAUGURAL

Time: 13:30 to 14:35
Venue: Dnyaneshwar Hall, Main Building, SPPU, Ganeshkhind Road, Pune
Moderator - Ms. Christabel Royan, Director, Nordic Centre in India

Welcome and Introduction

- Welcome by Professor Suresh Gosavi, Head, Department of Environmental Sciences, SPPU
- Introduction to NordicsinIndia Dr. Maan Singh Sidhu, Project Coordinator, NordicsInIndia, and Counsellor for Science, Technology & Higher Education, Royal Norwegian Embassy in India

Remarks from Guests of Honour

- Mr. Arne Jan Fløtlo, Consul General, Royal Norwegian Consulate General, Mumbai
- Ms. Anna Lekvall, Consul General, Consulate General of Sweden, Mumbai
- Professor Karbhari Kale, Honorable Vice Chancellor, SPPU
- Professor Nitin Karmalkar, Former Vice Chancellor, SPPU

Keynote Address

- Dr. Sapna Poti, Director Strategic Alliances, Office of Principal Scientific Adviser, Government of India
- Dr. Vasudev Joshi, Praj Industries Limited

Vote of Thanks

- Dr. Per-Arne Wikström, Counsellor for Science and Innovation, Embassy of Sweden in India

NordicsInIndia

PART I - NORDIC STRENGTHS AND INTERESTS IN CIRCULAR ECONOMY AND BIO-ECONOMY

Time: 14:45 to 16:00

Moderator

Professor Vijay Khare, Head, Department of Defence and Strategic Studies and Director of International Centre, SPPU

Sweden

- Ms. Rupali Deshmukh, Country Manager India, IVL Swedish Environmental Research Institute
- Mr. Ashutosh Manohar, Managing Director, Tetra Pak South Asia

Norway

- Professor Sulalit Bandyopadhyay, Norwegian University of Science and Technology
- Professor Hans Olaf Delviken, Inland Norway University of Applied Sciences

Finland

- Mr. Shridhar Rao, Sales Head, Elematic-India Private Limited
- Mr. Kimmo Siira, Counselor Trade and Investments, Embassy of Finland in New Delhi

Denmark

- Dr. Asha Kembhavi, Head, Technology Lab, India, Christian Hansen
- Professor Lene Lange, Danish Academy of Technical Sciences

TEA BREAK

Time: 16:00 to 16:15

PART II - INDIAN PERSPECTIVES, CHALLENGES, AND OPPORTUNITIES

Time: 16:15 to 17:30

Moderator

Professor Soumak Ray Chaudhary, Director, Inter-University Centre for Astronomy and Astrophysics and Pune Knowledge Cluster

Speakers

- Mr. Deepak Mhaisekar, Ex Divisional Commissioner, Advisor to Chief Minister and Chairman State Expert Appraisal Committee on Environment for EC, Government of Maharashtra
- Dr. Ashish Lele, Director, National Chemical Laboratory
- Professor Ajit Kembhavi, Principal Investigator, Pune Knowledge Cluster
- Dr. Vasudev Joshi, Praj Industries Limited

CLOSING REMARKS

Time: 17:30 to 18:00

- Dr. Maan Singh Sidhu, Counsellor for Science, Technology & Higher Education, Royal Norwegian Embassy in India
- Dr. Per-Arne Wikström, Counsellor for Science and Innovation, Embassy of Sweden in India

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REPORT - INAUGURAL

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The Indo-Nordic Innovation programme that was launched in January of 2022 saw an amalgamation of intellectuals and innovators from across borders to discuss long-term solutions of the global economic and climate crises. Envisaged as a one-stop solution to this is the development of new methods that would not only help in waste management, but also radically create policies that would encourage the development of circular economy in India through the active collaboration of resource persons, companies, innovators, start-ups, academicians, think-tanks, and institutions in both India and the Nordic region. In the inaugural session of the event held in Pune on 26th May, Dr Maan Singh Sidhu, Counsellor for Science, Technology and Higher Education, Royal Norwegian Embassy in India reiterated the importance of this two-day workshop as a great place to discuss and explore opportunities, and to discuss key transitions in India and the Nordic region.

The importance of such global-level discussions was also highlighted by Mr. Arne Jan Flølo, Consul General, Royal Norwegian Consulate, Mumbai. Mr. Arne pointed out that the issues of humanity are existential, which at various levels occupy our minds. Indubitably, the big background issue is the climate crisis which has to be fixed. This is a global challenge, so there is a need to work together to make the necessary changes and to find solutions, such as reducing emissions. According to him “this initiative among the Nordics is a good way to show our commitment to working together, and we are happy to include India. There should be a key focus on renewable energy, solar, and applications in the maritime sector. By bringing together our stakeholders under one roof, such as this event, we can show it is important to bring people together.”

The same sentiments were also echoed by Ms. Anna Lekvall, Consul General, Consulate General of Sweden, Mumbai. The Nordic-India cooperation will lead to quick and viable solutions which are important in the on-going crises which is a “race against time”. Ms. Anna also highlighted the importance of circular economy in achieving these goals by sharing solutions with Indian government, scientists, and industry.
Talking about the partnership that Sweden and India have shared since 2018, Ms. Anna pointed out that incredible innovations taking place in India have sustainability is at its heart of this. Swedish companies in India are providing 2 million jobs, and are part of Make in India. Swedish environmental research institutions have also been engaged in conversion of waste to energy and water treatment plants.

Talking about Savitribai Phule Pune University (SPPU) and its strategic placement in this initiative, Professor Suresh Gosavi, Head, Department of Environmental Sciences, spoke about how SPPU is always one-step ahead, when it comes to implementing international issues. SPPU has been working on many new fronts, such as with Norway on the material for energy production, on bio-hydrocarbon generation, and also have started working on PPE kits to hydrocarbon, where the yield is 65 %, which saves 35 %. Being one-step ahead on their carbon footprint, they have also set up a power plant in Shivre village.

The next generation of innovation is hydrogen generation by splitting water and storing said hydrogen. This is very important for fuel cell technology and battery-operated vehicles. It covers crucial areas of technology. SPPU has also been working with MPCB and CPC to monitor the air quality of Pune. They have projects in association with IIT Kanpur. In addition, there is one monitoring center with MPCB and CPCB, where the data on the site is from SPPU.

Professor Nitin Karmalkar, Former Vice Chancellor, SPPU also noted the fact that being one of the largest universities in Maharashtra with 1000 affiliated colleges and more than half a million students graduating, the environment and sustainability are very important in its faculty. Any resource used needs to be recycled and reused, in accordance with the motto of the campus.

SPPU has been working closely with PKC, and with Agakrar Research Institute on biofuel and other such organizations to tackle major issues such as air, energy, fuel etc.

Dr Sapna Poti Director Strategic Alliances, Office of Principal Scientific Adviser, Government of India also noted the importance of Pune as center of knowledge in this set up. Talking about bio-economy in general Dr Sapna noted that such advancements, although nascent in India, has led to huge developments over the past decade, so much so that such developments have led to reverse migration of technology wherein Indian technology is being supplied to Finland. Pointing towards the STEM prowess that India currently possesses, Dr Sapna stated that with the help of global networking systems and industrial inputs, India can benchmark with the best and indigenize technology. Instead of copy-pasting, India needs to develop its own technology that would be cost-effective, and what it requires is the amalgamation of the demand—industry and government—and the supply—innovators and researchers—sides. Forums likes these are thus inevitably geared towards this process. Dr Sapna also echoed points made by Professor Karbhari Kale Honorable Vice Chancellor, SPPU, who cited the importance of introducing such technologies in the field of farming and agriculture.

The two parts of the session at Pune were dialectically designed, wherein the first session cited the Nordic strengths and interests in the bio-economy followed by the next which highlighted the perspectives, opportunities, and challenges prevalent in an Indian setting. This dialogue would become highly imperative in understanding the position of Indian industry vis-à-vis the development of institutions related to circular economy and how the Nordic expertise and experience can help fill the lacunae.

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REPORT - PART I
NORDIC STRENGTHS AND INTERESTS IN CIRCULAR ECONOMY AND BIO-ECONOMY

MS. RUPALI DESHMUKH, SWEDISH ENVIRONMENTAL RESEARCH INSTITUTE

Ms. Rupali Deshmukh represented the Swedish Environmental Research Institute, a leading institute on applied research based in Sweden whose goal is to help the client to pack a cost effective and efficient product and make such a transition. Sweden, which is the smartest city in the world has a Smart City plan, the core of which is circular economy. Sweden is also the first in the world to recognize waste water as a resource.

Ms. Rupali noted that a similar project with a Mumbai waste water plant will be kicking off soon, which includes Bandra and Worli. On this waste-to-energy program, the institution worked with Adar Poonawalla in Mumbai and a similar pre-study was conducted in Goa this year.
The SERI has a concrete plan for developing a Nordic Urban Integrated System Solutions, and according to Ms. Rupali is ready to collaborate with all Nordic countries. She said, “by enhancing or amplifying sustainability we can help companies communicate with the client, which is why circular economy is important.”

MS. NIRJARA RASTOGI, TETRA PAK SOUTH ASIA

Ms. Nirjhara Rastogi represented Tetra Pak South Asia in place of Mr. Ashutosh Manohar, Managing Director, Tetra Pak South Asia. Ms. Nirjhara stated that Tetra Pak is committed to making food safe and available in a way that protects what is good – the people and the planet. Tetra Pak has been reporting low environmental footprint since 1999.
Innovations like Tetra Pak become a necessity in a country like India, especially if a product has to travel a long distance. For the above purposes a cold chain is required which is filled with challenges such as GHGs, litter, and the lack of infrastructure. Tetra Pak proves that the solution, although multifaceted, is possible. The method is to use around 70 % paper in the packaging, but there will be some amount of aluminium and polymer, which will be recycled at scale.

However, Ms. Nirjhara pointed out that it can be further recycled. “As part of our 2030 business strategy, we have a pillar called ‘lead the sustainability transformation’. We have committed to net zero emission by 2050. We have capped our own operation at 2010 levels, and reduced the value chain. Even though our packages are 75 % paper, we want to increase this level. Our commitment is to have 70 % recycling by 2050 across Europe, 50 % by 2030. We have collection partners for recycling. There are currently four in India, and one extra coming soon,” said Ms. Nirjhara.
Tetra Pak has been functioning in India for more than 18 years, covering 26 states and union territories. Their mission is to deliver on their extended producer responsibility, with an ambition to have the most sustainable, fully renewable, fully recyclable, and carbon neutral package. Being the first company to be FCS certified package, they are currently working on replacing aluminium with a fibre-based polymer, which is safe for food. They are also working on how to use recycled paper in the carton.
What remains important for Tetra Pak is to figure out how to make our package better, to create consumer awareness on waste management and recycling, the end of life applications for recyclable material, and to be collaborative.

MR. MIKA TIRRONEN, COUNSELLOR FOR SCIENCE AND EDUCATION, EMBASSY OF FINLAND IN NEW DELHI

Mr. Mika Tirronen, Counsellor for Science and Education, Embassy of Finland in New Delhi talked about sustainability and its implications on Smart Cities. Smart city development is a process—they have to keep developing continuously, only then can they really flourish. Decisions have to be environmental and economic. He cited that the need is to find these solutions for an Indian context. So, for smart cities it is all about sustainability, and energy is the key to connectivity here.

Citing the case of Finland, Mr. Mika said that it will be the first industrialized country to be carbon neutral by 2035. It has a unique approach to climate roadmaps for carbon neutrality. Smart cities are designed to make people's lives easier and more efficient. However, "it is also about creating new types of jobs, which need to be discussed more," said Mr. Mika.

MR. SHRIDHAR RAO, SALES HEAD, ELEMATIC-INDIA PRIVATE LIMITED

Mr. Shridhar Rao Sales Head, Elematic-India Private Limited talked about his company, which makes precast green building construction. A Finnish company, it is aimed at primarily reducing pollution and making this reduction last for a long time. Precast buildings are durable, and they last 100 times more than others. That in itself is green. With a major production in India, Mr. Shridhar highlighted the increase in interest that there has been recent past. Savings in terms of materials has amounted to about 10-15 % when precasting is used. “By using less cement, we are producing less waste, so the Co2 footprint is smaller. India should implement this more. There can be a 20 % saving in concrete consumption, and a 15-20 % saving on steel,” said Mr. Shridhar.

Elematic-India provides a mechanized and efficient form of construction, which promises a longer lifespan. There is no curing required either. Operating on more than 40 factories in India, they have successfully replaced normal cement with precast concrete for a majority of walls, columns, staircases, and buildings The Galaxy Tower in Hyderabad is one such building. Precast has also been used in Sweden, where there are extreme weather conditions of -30 to 40 degrees. It can be used well in India, and just ensure that the joints are strong.

PROFESSOR SULALIT BANDYOPADHYAY , NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

Professor Sulalit Bandyopadhyay from the Norwegian University of Science and Technology stated that one must consider the mind-set of young people. “The department of chemical engineering at our university does CO_2 capture, circular processes, EV battery recycling, bio-waste, medicine, and food. We are recruiting international students from molecular levels and we are commercialising technology, going from lab to market scale. We are making particles from chemical solutions, so we can understand how they grow, and after this we can extract them to use. We also need to close the circular loop in research as well. We are working on innovations, and taking that from start-ups to industry to society. For example, we made test kits during corona last year, which has now become the company Lybe Scienfific, this is a successful example of going from Lab to Market,” said Professor Sulalit.

PROFESSOR HANS OLAF DELVIKEN, INLAND NORWAY UNIVERSITY OF APPLIED SCIENCES

Professor Hans Olaf Delviken, from the Inland Norway University of Applied Sciences works at CREED – the Centre for Research Within Digitization and Sustainability. This institution focuses on creating values through sustainability and circularity in economic activity. CREEDS is now employing PhDs and professors. It also heads the NCE Heidner Biocluster, which is a centre of excellence. There is also the Norwegian Wood Cluster, where the main target is to develop sustainable buildings and housing solutions.

“The circular economy started 1000 years ago, when houses could be dismantled and rebuilt. We have new business models currently. Loopfront, which is a platform for logistics used to build products. And Resirgel – which is storage and sale of used building products,” said Prof. Hans.

DR. ASHA KEMBHAVI, HEAD, TECHNOLOGY LAB INDIA

Dr. Asha Kembhavi, is the Head of Technology Lab India and also associated with Christian Hansen, Denmark. Christian Hansen was coined as the most sustainable company in the world in 2019. They were number two in 2020 and 2022. Christian Hansen consider themselves as a microbial powerhouse—their main work is in food culture and enzymes, amounting to around 65 %. 35 % of their work is on human, plant, and animal health. However, they also address global challenges. With an aim to prevent wastage, they are constantly on the lookout for applications to prevent food waste. They also have a plan to replace antibiotic usage in animal feed and replace pesticide in food, assisting in green transition. Their sites in Denmark are only for R&D, while production facilities are in other places. However, Pune is also a site for R&D – India has a large population, where the health consciousness is rising. Christian Hansen has also established itself firmly in Pune, since Bangalore is crowded.

Dr. Asha said that "for us it would be good to explore the biodiversity in India–it is better for society, and it could help create good solutions. There are many potential areas of research, such as plant, animals, human health, and food. We want to collaborate with nearby research institutions."

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PROFESSOR LENE LANGE, DANISH ACADEMY OF TECHNICAL SCIENCES

Professor Lene Lange, from the Danish Academy of Technical Sciences stated that the overall agenda for the whole globe should be to reduce residues. Circular and bio-based economy has a positive impact on the world, and the need is to create high value products from biomass, so its value has to be increased somehow. There are many types of biomasses, and a lot comes from agricultural-industrial side streams. Here there are opportunities for making local biomass refineries in India.

Professor Lene stated that “we should make it the farmers choice to choose millets and sorghum. We can make bio-based cereals from the residues. And we can make that delicious, because deliciousness and health should be a new driver for the green turn.”

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REPORT - PART 2
INDIAN PERSPECTIVES, CHALLENGES, AND OPPORTUNITIES

MR. DEEPAK MHAISEKAR, EX-DIVISIONAL COMMISSIONER, GOVERNMENT OF MAHARASHTRA

Mr. Deepak Mhaisekar Ex Divisional Commissioner, Advisor to Chief Minister and Chairman State Expert Appraisal Committee on Environment for EC, Government of Maharashtra has been working with the state government for 32 years, and has been advisor to the Chief Minister for 2 years. In his tenure, he had to convince people how windmills are not going to impact rainfall patters. He stated that requirements for 2030 is 70 % more food, 30 % more water, and 45 % more energy. This needs to be sustainable. An alternative would be bioethanol. For biomass, conflicts exist in India. Biomass can be sued for combustion, gasification, and anaerobic digestion. The bio-economy in India will likely grow to 150 billion dollars by 2025. He stated that India probably has the best bio pharma due to Ayurveda.

Since wheat production has been impacted due to the heat in April, there will be changes in crop patterns. Which is why he added that, “we should be working on sectors, which involve plant and animals. As the chairman of SEAC we look at if a project is carbon neutral, then what are the impacts, how is the water being recycled, and what is it being used for, is it being used for plantation? What are the mitigation measures? And we look at energy conservation. We look at how you can get the max utilisation of sunlight, how can we replace artificial light, and what is being used in the building materials? We look at the wind impact on the buildings. For plantations, we have an expert, who will advise projects what should be considered.”

In smart cities, one needs to consider waste management, and traffic analysis. And spatial planning is one of the most important aspects of a smart city. Here, Mr. Deepak and his team is also trying to examine whether solar energy is being used for water heating or electricity generation and trying to include gravity in sewage treatment.

DR. ASHISH LELE, DIRECTOR, NATIONAL CHEMICAL LABORATORY

Dr. Lele stated that the need is for an Indian perspective on plastic waste management. In India, there is an immense number of plastic generated, which finds its way to nature through various ways. The CPCB says that India generates 26 thousand tons of plastic, 16 % comes from 60 cities. Delhi is at the top with 700 tons per day. Indian PW generation is going to be doubled in the next 5 years. GHGs will reduce, if we can recycle plastic. As RE share goes up, what will be done with oil and diesel? This is the O to C transition, which means more plastics will be produced.

Dr Ashish stated that Plastic Waste Management (PWM) is a problem that is only going to increase significantly. About 43 % of plastic in India goes into single use packaging. 60 % of single use plastic is only from 2 products. There are regulatory restrictions that are coming into place–such as banning tourist destinations, increase the thickness of plastic. We must transfer the values learnt to the next generation. The first important change that one can make is a value change. 1.7 million people are dependent on the PWM chain. Dr Ashish stated that "we want to delay the time scale of incineration. We did research that showed that PPE can be disinfected and turned into value added goods. We need good technology, but we also need to provide access to ragpickers. This can only be solved through policy." He further stated that experiments with SWACH and company, which converted harpic bottles into 3d printing filaments is also on-going. The 2nd generation of ragpickers got very interested in this.

The major issue in India, however is ineffective technology. A lot of the plants here are just garbage-in and garbage-out, which has to be improved. The fourth problem is the supply chain. For pyrolysis plants to work, more and more people must segregate plastic. "The whole PWM throws very interesting challenges in terms of robust technology development. There are some new catalysts coming up," says Dr Ashish. He also notes that AI can be used to find new catalysts and blockchain can be used in supply chains. With the start-up revolution brewing in India, new ideas are being brough to Plastic Waste Management.

PROFESSOR AJIT KEMBHAVI, PRINCIPAL INVESTIGATOR, PUNE KNOWLEDGE CLUSTER

Professor Ajit Kembhavi, Principal Investigator, Pune Knowledge Cluster talked about the Pune Knowledge Clusters, which is one of the six such clusters in India. According to Prof. Ajit, their vision and mission is to bring together organisations to work on projects which are important to the city. Their engagements are with citizens, technology, innovation and automation, multi-organisational S&T based projects, and planning and strategy. Their strengths come from the partnerships and primary focus areas are: health, sustainable mobility: last mile mobility, Big data and AI: citizen science, sustainability and environment: tree census, water security, biofuels, Capacity building: courses. As far as circular economy is concerned, their work is primarily focused on natural resources, recycling, and application.

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DR. VASUDEV JOSHI, PRAJ INDUSTRIES LIMITED

Dr Vasudev Joshi attended the session in place of Mr. Pramod Chaudhari, Founder and Chairperson, Praj Industries Limited. Dr Vasudev stated that there are global opportunities for carbon neutrality, sustainable circular economy, and bio-based economy. Praj Industries has been working with different Nordic countries on this, and has developed infinity technology to convert agricultural waste into ethanol. Sekab has tech to convert forest waste into ethanol.

Together with the Nordic companies—amounting to 4 projects, out of which two are with Finland—Praj is working on converting agricultural and forest waste into ethanol. Praj has also developed technology to convert lignin to biobitumin. This will replace synthetic bitumen.

Dr Vasudev stated that "we also have a biobinder that can be added to cement. We also have end-to-end solutions for biofuels. We are working on biomobility, where we plan to convert different waste into biofuel, here we are working on sustainable aviation fuel. Bio-Prism is focused on bio-plastics and bio-material. We convert 450 tons of rice stock to bio ethanol and bio power. Our first project will be commissioned in August, the next two next year. We have 1000 references from 100 countries. 10 % of all ethanol is produced by Praj Tech."

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NordicsInIndia

PROGRAMME

27 MAY 2022
BANGALORE BIOINNOVATION CENTRE

NordicsInIndia

INAUGURAL

Time: 14:00 to 14:30
Venue: Bangalore Bioinnovation Centre, Helix Biotech Park, IBAB Campus, Electronics City Phase 1, Bengaluru, Karnataka

Moderator - Mr. Joseph Kurian, Innovation Advisor (Clean Tech), Innovation Centre Denmark

Welcome and Introduction

- Welcome Remarks by Ms. Meena Nagaraj, Director, Director Electronics, Information Technology and Biotechnology at Govt of Karnataka
- Introduction to NordicsinIndia by Dr. Maan Singh Sidhu, Project Coordinator, NordicsInIndia, and Counsellor for Science, Technology & Higher Education, Royal Norwegian Embassy in India

Remarks from Guests of Honour

- H.E. Mr. Klas Molin, Ambassador of Sweden to India
- H.E. Freddy Svane, Ambassador of Denmark to India
- H.E. Ritva Koukku-Ronde, Ambassador of Finland to India
- Mr. Eske Bo Rosenberg, Consul General, Consulate General of Denmark
- Dr. H S Subramanya, Managing - Director, Institute of Bioinformatics and Applied Biotechnology (IBAB)

PART I - INDIAN PERSPECTIVES, CHALLENGES, AND OPPORTUNITIES

Time: 14:30 to 15:00

Moderator

Dr Jakob Williams Ørberg, Counsellor for Research, Innovation and Science, Innovation Centre Denmark

Speakers

- Dr Vishal Rao, Dean, Centre for Academic Research, HCG Cancer Centre
- Mr. GS Krishnan, President, Association of Biotechnology-Led Enterprises (ABLE)
- Dr. Shannon Olsson, Global Director, Echo Network
- Dr H S Subramanya- Director, Institute of Bioinformatics and Applied Biotechnology (IBAB)

PART II - NORDIC STRENGTHS AND INTERESTS IN CIRCULAR ECONOMY AND BIO-ECONOMY

Time: 15:05 to 16:10

Denmark

- Professor Lene Lange, Danish Academy of Technical Sciences
- Dr. Asha Kembhavi, Head, Technology Lab, India, Christian Hansen

Finland

- Mr. Faizur Rehman, Head of Bio2X Programme, Fortum India
- Mr. Shridhar Rao, Sales Head, Elematic-India Private Limited

Norway

- Professor Sulalit Bandyopadhyay, Norwegian University of Science and Technology
- Mr. Hans Olaf Delviken, Inland Norway University of Applied Sciences

Sweden

- Mr. Mohit Bansal, Head Public Affairs, IKEA
- Ms. Rupali Deshmukh, Country Manager India, IVL Swedish Environmental Research Institute

CLOSING REMARKS

Time: 16:10 to 16:20

- Dr Jakob Williams Ørberg, Counsellor for Research, Innovation and Science, Innovation Centre Denmark
- Dr.Mika Tirronen, Counsellor for Science and Education, Embassy of Finland in India

Followed by a Tour of the facility and networking high tea from 16:45

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REPORT - INAUGURAL

Day 2 of the Indo-Nordic Circular Economy and Bio-Economy Workshop saw the attendance of the ambassadors of all the Nordic countries to India. The ambassadors of Sweden, Denmark, and Finland along with representatives from the Government of Karnataka and other leading personalities showed their gratitude to the organizers of the event and stated that the emergence of this Indo-Nordic relationship in actively creating solutions for a circular based economy will, in the long run, lead to new solutions and pave a new path towards sustainable development.

Speaking first, Mr. Eske Bo Rosenberg, Consulate General of Denmark, echoed these feelings and stated that this exchange of ideas through on-going participation in Bengaluru Tech Summit and GIATEM Online Summit will broaden the collaboration even more, leading to Student exchange, startup exchange, policy exchange etc. India is a hotspot right now with Bangalore leading the growth in these sectors, and focussing the workshop here will lead to the development of more opportunities. Commenting on the Indo-Danish relationships, Mr. Rosenberg mentioned the long history of scientific collaboration between both regions, with India becoming an official mission partner with the Danish based International Centre for Antimicrobial Resistance Solutions, to enable an exchange of ideas in this very crucial area of bioeconomy. On the other hand, Indo-Danish Green Strategic Partnership signed by PMs Narendra Modi & Mette Frederiksen has served as an enabler for partnership. Bioeconomy and healthcare were also discussed during Mette Frederiksen's visit to India, and PM Modi's visit to Denmark earlier this month cemented the importance of Indo-Danish relations in innovative fields like bioeconomy.

Famous for being the world's third largest and fastest growing start-up nation, India, and especially Bangalore has been and continues to be an epicentre for that development. One of the focus areas is Bioeconomy. With a great mix of research, entrepreneurship and business, Bangalore has a strong bioeconomy ecosystem and is home to prominent life science corporates and highly interesting start-ups and the same can be said about Copenhagen and Denmark. Therefore, Innovation Centre Denmark Bangalore works closely with the ECHO Network and the Danish Academy of Technical Sciences to connect these ecosystems in order to share knowledge, transfer technology and ultimately solve global challenges together.

Echoing similar concerns and strategies of collaboration, the various ambassadors of the Nordic regions to India focussed on the impetus provided to the growth of these sectors by the initiatives undertaken by the Indian Government under Mr. Modi. His Excellency Mr. Klas Molin, Ambassador of Sweden to India added that the collaboration between India and the Nordic countries is of prime importance, and there is a wide array of solutions that Sweden can provide. Hinting at the number of Swedish companies operating in India (close to 240), Mr. Molin stated that they are currently focusing a lot on recycling, upcycling and circularity and are doing well. A project with India within the construction industry—in particular cement and steel elements has been launched recently. The memberships in offices are increasing with the joining of Japan and USA. Partnership on innovation with India has also been successful, especially after the visit from PM Modi in 2018 which has built the fundament to a partnership that is working very well.

His Excellency Mr. Freddy Svane, Ambassador of Denmark to India, also added that although there are big issues lined up, “the Nordics have the answers, the ideas, and the skills” to take the discussion forward. H.E. Ritva Koukku-Ronde, Ambassador of Finland to India stated the vision on sustainable and carbon neutral industry are shared by both the nations, and Finland has established itself at the helm of this. To the challenges posed at the Indian side, the Nordic side has answers in their cutting-edge technology.

Representatives from the Indian side were Dr H S Subramanya from the Institute of Bioinformatics and Applied Biotechnology (IBAB) and Ms. Meena Nagaraj from the Government of Karnataka. Ms. Nagaraj stated that “Bangalore is the Switzerland of India”, encompassing some of the largest unicorns. 39 out of the total 100 unicorns are located in Bangalore creating invaluable contribution to the overall ecosystem. On the other hand, the Government of Karnataka has created the Global Innovation Alliance Program, which aims for mass entrepreneurship. The Nordics are already collaborating on the program with Denmark coming in with the UNLEASH contribution, with 1000 students participating in the fall 2022. “The need of the hour is to tap into the strong business similarity of the the Indian and Nordic companies, and we need to work more together,” said Ms. Nagaraj.

Dr Subramanya also agreed to the fact that Bangalore provides a conducive ecosystem for the development of such initiatives. Being the largest innovation hub in India with over 48 incubators, Bangalore has seen massive growth in the previous years. The need for a partnership is because of the need for technology and awareness both. The economy, social and cultural situation needs to be adjusted in order to accomplish. Such workshops that stretch across the country border will be fruitful and help to spread out the awareness into the local societies. This objective was also reiterated by Dr Maan Singh Sidhu from the Royal Norwegian Embassy in India, which was to promote Nordic technologies across all industries in India. “Together with Indian universities, institutions, companies and organizations we will build up great relationships and collaborations,” he said.

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REPORT - PART I
INDIAN PERSPECTIVES, CHALLENGES, AND OPPORTUNITIES.

MR. G.S. KRISHNAN, ASSOCIATION OF BIOTECHNOLOGY LED ENTERPRISES (ABLE)

Mr. G.S. Krishnan from the Association of Biotechnology-Led Enterprises (ABLE) stated that the bioeconomy industry in India has been expanding gradually with almost 600 large companies within the field and the trend is growing. Through exchange programs with the Nordic countries, India can attain the necessary technical know-how by training students. The Nordic support is also needed to bridge the financial gap to further stabilize these industries. Mr. Krishnan stressed on the importance of R&D collaboration between countries.

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DR. H.S. SUBRAMANYA, INSTITUTE OF BIONFORMATICS AND APPLIED BIOTECHNOLOGY (IBAB)

Dr H.S. Subramanya from the Institute of Bioinformatics and Applied Biotechnology (IBAB) added on to the point raised by Mr. Krishnan and said that for the exchange programs to work properly, there has to be a governmental effort wherein the government shall allocate funds to develop partnership with the Nordic institutions, just like France and Germany has agreements with the Government and are getting financial resources for such partnerships. It is thus important to strengthen the exchange programs with Nordic research institutions. He also stressed the importance of human resource development through the establishment of a sound student exchange program that will institutionalize better sharing and communication between researchers

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DR. SHANNON OLSON, ECHO NETWORK

Dr Shannon Olson from the Echo Network stressed on the importance of Bangalore as a city and explained that the Echo Network has successfully established social innovation partnership with over 700 organizations. Echo Network has been working with both small companies and SME startups with the aim of exchange more information, knowledge sharing and interaction between researchers, institutions, partners and individuals. The primary aim of Echo Network is to take the initiatives of academia to individuals through an increase collaboration between institutions and communities. A greater investment into this was thus the primary emphasis of Dr. Olson. Furthermore, partnership with the Nordics become important as they possess greater skills that can help in the development of the bio-innovation sector in India.

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DR. PER-ARNE WIKSTRÖM, COUNSELLOR FOR SCIENCE AND INNOVATION, EMBASSY OF SWEDEN IN INDIA

Dr. Per-Arne Wikström, Counsellor for Science and Innovation, Embassy of Sweden in India, stated that India is emerging as a strong business nation with 100 unicorn startups. In 2018, India and Sweden made the Strategic Innovation Partnership which works as a framework for the new initiatives developed every day, systematically working with great focus on health, smart cities and bio economy. He also stated that India and Sweden got a call with financial resources from both Sweden and India. Both Sweden and India contribute €6 million each and 5 Swedish energy agencies and 4 Indian companies have joined the call. The need of the hour thus is to look at the long-term perspective and set a clear ambition and scope and work together to accomplish it.

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REPORT - PART 2
NORDIC STRENGTHS AND INTERESTS IN CIRCULAR ECONOMY AND BIO-ECONOMY

DR. ASHA KEMBHAVI, HEAD, TECHNOLOGY LAB, INDIA

Dr. Asha Kembhavi is the Head of Technology Lab India and also associated with Christian Hansen, Denmark. Christian Hansen was coined as the most sustainable company in the world in 2019. They were number two in 2020 and 2022. Christian Hansen consider themselves as a microbial powerhouse—their main work is in food culture and enzymes, amounting to around 65 %. 35 % of their work is on human, plant, and animal health. However, they also address global challenges. With an aim to prevent wastage, they are constantly on the lookout for applications to prevent food waste. They also have a plan to replace antibiotic usage in animal feed and replace pesticide in food, assisting in green transition. Their sites in Denmark are only for R&D, while production facilities are in other places. However, Pune is also a site for R&D – India has a large population, where the health consciousness is rising. Christian Hansen has also established itself firmly in Pune, since Bangalore is crowded.

Dr. Asha said that "for us it would be good to explore the biodiversity in India–it is better for society, and it could help create good solutions. There are many potential areas of research, such as plant, animals, human health, and food. We want to collaborate with nearby research institutions."

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PROF. LENE LANGE, DANISH ACADEMY OF TECHNICAL SCIENCES

Professor Lene Lange from the Danish Academy of Technical Sciences stated that the overall agenda for the whole globe should be to reduce residues. Circular and bio-based economy has a positive impact on the world, and the need is to create high value products from biomass, so its value has to be increased somehow. There are many types of biomasses, and a lot comes from agricultural-industrial side streams. Here there are opportunities for making local biomass refineries in India.

Professor Lene stated that “we should make it the farmers choice to choose millets and sorghum. We can make bio-based cereals from the residues. And we can make that delicious, because deliciousness and health should be a new driver for the green turn.”

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MR. FAIZUR REHMAN, FORTUM INDIA

Mr. Faizur Rehman from Fortum India stated that the need right now is to make the globe a living place. Fortum is currently working on turning biomass into value-added products. The agri-waste is a huge resource, and currently it is being burnt in the field creating a massive smog in cities as Delhi. This smog is unhealthy and kills many people a year. Fortum is working on building a new bio refinery, which will be the first of its kind. It will cost €350 million, have 5.000-10.000 employees and cover 20.000 – 30.000 households.

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MR. SHRIDHAR RAO, SALES HEAD, ELEMATIC-INDIA PRIVATE LIMITED.

Mr. Shridhar Rao Sales Head, Elematic-India Private Limited talked about his company, which makes precast green building construction. A Finnish company, it is aimed at primarily reducing pollution and making this reduction last for a long time. Precast buildings are durable, and they last 100 times more than others. That in itself is green. With a major production in India, Mr. Shridhar highlighted the increase in interest that there has been recent past. Savings in terms of materials has amounted to about 10-15 % when precasting is used. “By using less cement, we are producing less waste, so the Co2 footprint is smaller. India should implement this more. There can be a 20 % saving in concrete consumption, and a 15-20 % saving on steel,” said Mr. Shridhar

Elematic-India provides a mechanized and efficient form of construction, which promises a longer lifespan. There is no curing required either. Operating on more than 40 factories in India, they have successfully replaced normal cement with precast concrete for a majority of walls, columns, staircases, and buildings The Galaxy Tower in Hyderabad is one such building. Precast has also been used in Sweden, where there are extreme weather conditions of -30 to 40 degrees. It can be used well in India, and just ensure that the joints are strong.

PROF. SULALIT BANDYOPADHYAY, NORWEGIAN UNIVERSITY OF SCIENCE TECHNOLOGY

Professor Sulalit Bandyopadhyay from the Norwegian University of Science and Technology stated that one must consider the mind-set of young people. “The department of chemical engineering at our university does CO_2 capture, circular processes, EV battery recycling, bio-waste, medicine, and food. We are recruiting international students from molecular levels and we are commercialising technology, going from lab to market scale. We are making particles from chemical solutions, so we can understand how they grow, and after this we can extract them to use. We also need to close the circular loop in research as well. We are working on innovations, and taking that from start-ups to industry to society. For example, we made test kits during corona last year, which has now become the company Lybe Scienfific, this is a successful example of going from Lab to Market,” said Professor Sulalit.

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PROF. HANS OLAF DELVIKEN, INLAND NORWAY UNIVERSITY OF APPLIED SCIENCE

Professor Hans Olaf Delviken, from the Inland Norway University of Applied Sciences works at CREED – the Centre for Research Within Digitization and Sustainability. This institution focuses on creating values through sustainability and circularity in economic activity. CREEDS is now employing PhDs and professors. It also heads the NCE Heidner Biocluster, which is a centre of excellence. There is also the Norwegian Wood Cluster, where the main target is to develop sustainable buildings and housing solutions.

"The circular economy started 1000 years ago, when houses could be dismantled and rebuilt. We have new business models currently. Loopfront, which is a platform for logistics used to build products. And Resirgel – which is storage and sale of used building products," said Prof. Hans.

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MR. MOHIT BANSAL, IKEA

Mr. Mohit Bansal from IKEA stated that the primary aim is to promote circular business and be sustainable. It is integrated in the vision of IKEA–"To create a better everyday life for the many people". IKEA believes that being circular is both a responsibility and a good business opportunites. All IKEA products from the very beginning to be repurposed, repaired, reused, resold, or as the last resort recycled, generating as little waste as possible.

Mr. Bansal stated that IKEA is leading an initiative to create mattresses from disposed mattresses, prolonging the life of already made products by increasing the use of post-consumer recycled polyols in foam. The aim to reduce foam ending up in landfill, decrease pollution, and drive the industry agenda to develop foam solutions centered on recycled materials. Exploring to use the same recycling process in post-consumer foam as well. This opens the possibility for a circular business model where IKEA takes back, for example, old mattresses and furniture and separate the foam materials at a disassembly unit.

He said, "IKEA is not only a hardware store selling furniture, textiles and other home appliances. IKEA is also big in the food industry and are constantly developing new sustainable solutions to the IKEA restaurant and café."

MS. RUPALI DESHMUKH, SWEDISH ENVIRONMENTAL RESEARCH INSTITUTE

Ms. Rupali Deshmukh represented the Swedish Environmental Research Institute, a leading institute on applied research based in Sweden whose goal is to help the client to pack a cost effective and efficient product and make such a transition. Sweden, which is the smartest city in the world has a Smart City plan, the core of which is circular economy. Sweden is also the first in the world to recognize waste water as a resource.

Ms. Rupali noted that a similar project with a Mumbai waste water plant will be kicking off soon, which includes Bandra and Worli. On this waste-to-energy program, the institution worked with Adar Poonawalla in Mumbai and a similar pre-study was conducted in Goa this year.

The SERI has a concrete plan for developing a Nordic Urban Integrated System Solutions, and according to Ms. Rupali is ready to collaborate with all Nordic countries. She said, “by enhancing or amplifying sustainability we can help companies communicate with the client, which is why circular economy is important.”

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PICTURE GALLERY

INDO-NORDIC RESEARCH AND INNOVATION DIALOGUE ON SUSTAINABLE, CIRCULAR BIO-BASED ECONOMY


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BANGALORE
BIOINNOVATION
CENTRE
Sculpting the Future of Bioinnovation
(A Government of Karnataka Undertaking)
GOVERNMENT OF KARNATAKA


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Workshops on circular, biological economics organized by "NordicsInIndia"

Gerald Vargas · May 28, 2022

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India News | 'NordicsInIndia' Hold Workshops on Circular, Bio-based Economy

Get latest articles and stories on India at LatestLY. In a bid to explore research and innovative collaboration opportunities, the Nordic-India Innovation Partnership Project (NordicsInIndia) on Friday held theme-based workshops under sustainable, circular and bio-based economy.

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'NordicsInIndia' hold workshops on circular, bio-based economy

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New Delhi, May 27 (PTI) In a bid to explore research and innovative collaboration opportunities, the Nordic-India Innovation Partnership Project (NordicsInIndia) on Friday held theme-based workshops under sustainable, circular and bio-based economy.

The project, funded by Nordic Council of Ministers, Pune University and Bangalore Bioinnovation Centre, aims to promote and showcase Nordic research-based innovations and solutions to encourage a green transition in India, said the organisers in a statement.

NordicsInIndia builds collaboration among the science and technology counsellors at the four Nordic embassies -- Norway, Finland, Denmark, and Sweden -- with Norway as coordinator. The Nordic Centre in India is facilitating this event on behalf of NordicsInIndia.

"The workshops in Bengaluru catered to the strong need to set up research collaborations among leading research agencies and universities from Nordic countries and India to develop

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'NordicsInIndia' hold workshops on circular, bio-based economy

23:43 HRS IST

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"The workshops in Bengaluru catered to the strong need to set up research collaborations among leading research agencies and universities from Nordic countries and India to develop next-generation circular economy solutions and added value for the society that can be tested in local conditions," said Maan Singh Sidhu, coordinator of the project NordicsInIndia.

A similar workshop was also held in Pune on Thursday.

According to Ambassador of Sweden to India Klas Molin, the Swedish government's innovation partnership programmes are designed to help find innovative solutions to the societal challenges of today and tomorrow.?

'NordicsInIndia' hold workshops on circular, bio-based economy

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National

Nordics in India are committed to expanding research and innovation collaboration opportunities-Business Journal

By **BUSINESS JOURNAL** - May 26, 2022

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Nordics in India collaborates with local institutes to encourage green transition in India

By **Environment** - May 27, 2022

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Nordic Co-operation

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