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CONSULTING EXCELLENCE DELIVERED

**GTI** GLOBAL™  
TECHNOLOGY  
INTERFACE

## Green Innovations in Developing Countries: How to Address the Challenges

LEENA PISHE THOMAS, Director, GBI



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# About GBI

**Global Business Inroads (GBI)** is an international business, technology and innovation management consultancy with offices in India, Europe, UK, USA and SE Asia that is specialized in technology access and deployment.

**Access to a network of technology clusters and organizations** across the Americas, Europe and APAC

**12 years of proven success stories** - Supported over **200 institutions**, SMEs, corporates, government bodies, startups in various capacities

**Focused on very niche sectors with a social impact**

Cleantech



Biotech



Digital



Startups and Innovation



## Contact us

**Leena Pish Thomas**

**lthomas@globalbusinessinroads.com**

**+91 98450 10271**

**Harsha Lingam**

**hlingam@globalbusinessinroads.com**

**+91 94825 29497**



[www.globalbusinessinroads.com](http://www.globalbusinessinroads.com)

Technology Collaboration portal: [www.globaltechinterface.com](http://www.globaltechinterface.com)

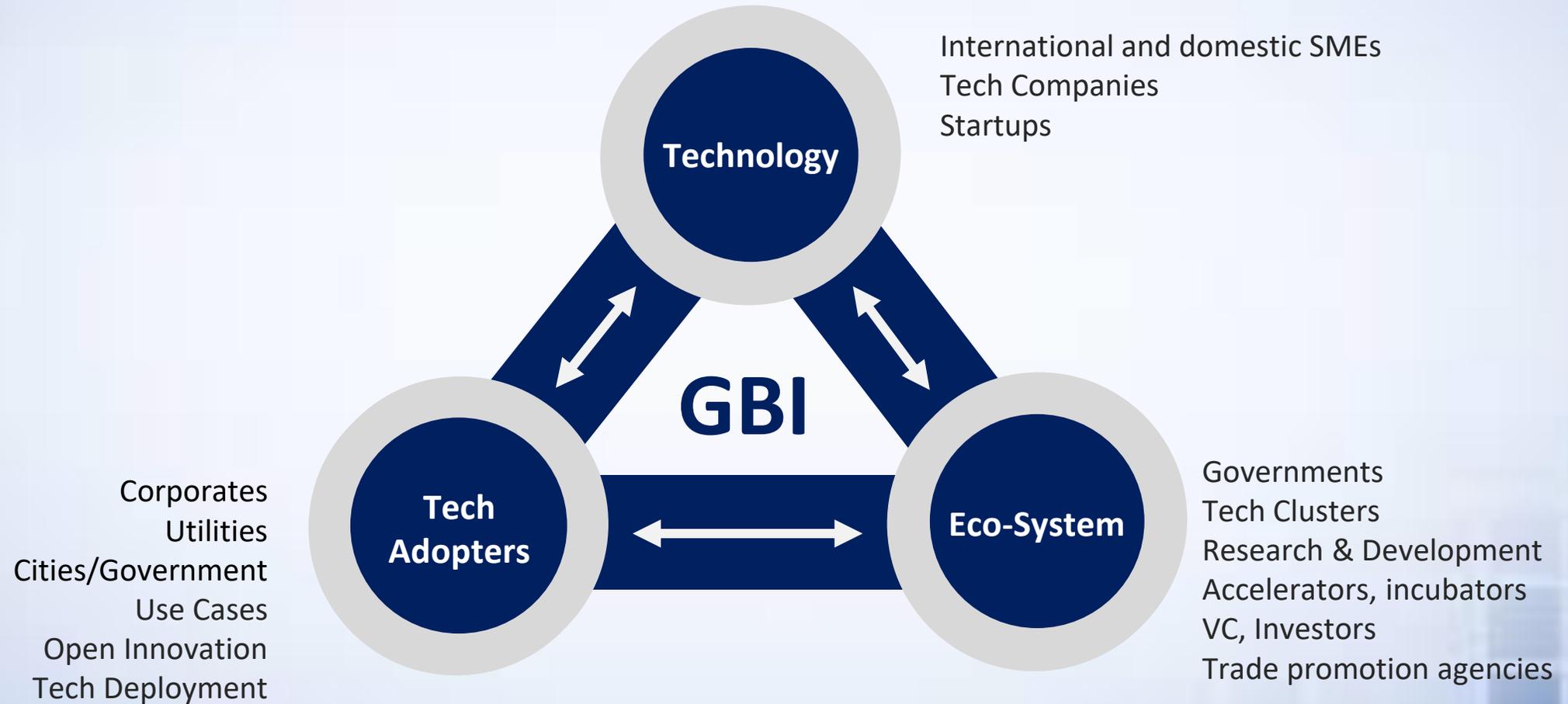


Global Business Inroads

Golden Square, 53/A, 16 C Main, 4 Block,  
Koramangala, Bangalore 560034, India

India | Europe | UK | USA | SE Asia

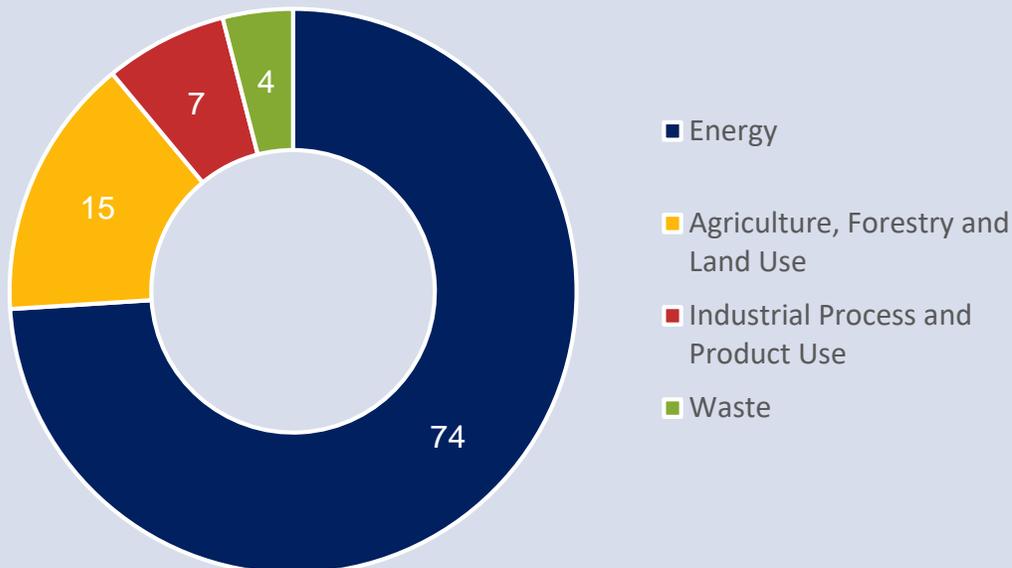
# What GBI brings together



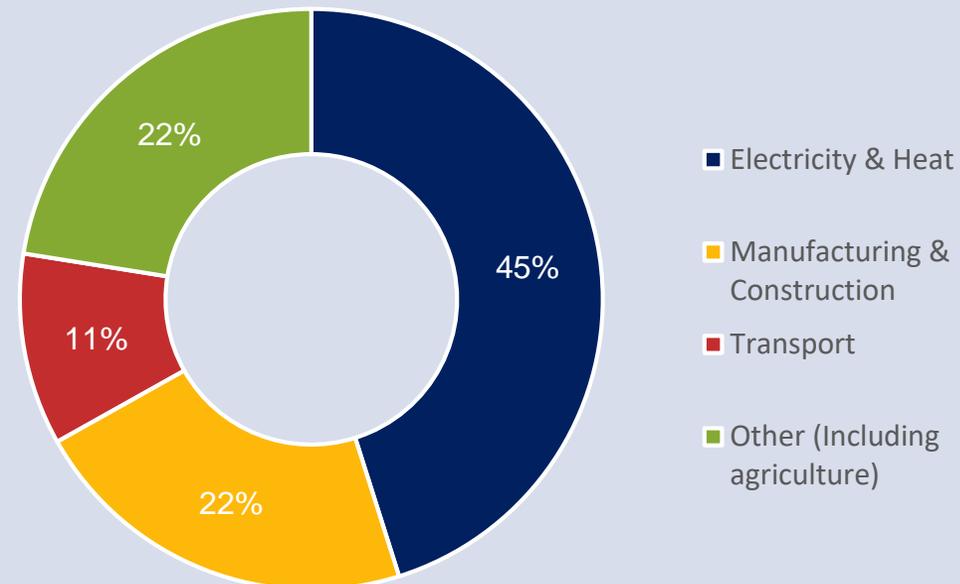
	<p>GBI is a Business Cooperation Centre of the <b>Enterprise Europe Network (EEN)</b> in India. The Network is active in more than 60 countries worldwide. It brings together 3,000 experts from more than 600 member organizations – all renowned for their excellence in business support.</p>
<p><b>200 +</b> Clients</p>	<p>GBI is also a representative of the <b>EBN network</b> in India. EBN gathers 140 quality-certified EU BICs (business and innovation centers) and 40 other organizations that support the development and growth of innovative organizations.</p>
<p><b>50 +</b> Technology Cluster</p>	<p>GBI – UK offices are a part of the Cambridge, Catapult and Oxfordshire eco-systems, which is a network of organizations supporting international collaborations.</p>
<p><b>\$ 1,000,000 +</b> Tech and Innovation projects</p>	<p>In <b>North America (USA and Canada)</b>, GBI has developed partnerships with multiple clusters and organisation across the country dedicated to developing relationships with international organisations</p> <p>GBI’s networks also include network partners in Australia, South Korea, Japan, Taiwan, Malaysia, Singapore, Thailand, Latin America and Africa.</p>



### Emissions from India, by Sector



### India's Contribution (7 Percent) to Global Emissions, by Sector



According to GHG Platform India, the **energy sector and industrial process and product use** (barring Agriculture) are the highest emitters in India.

- Within the energy sector the three biggest emitters are electricity and heat generation, industries and transportation.
- Within the industrial processes sector, the mineral industry (comprising iron and steel, and cement) is the biggest emitter.
- The **dominance of coal** has made electrification highly polluting, with emissions from fossil fuels contributing to 96 percent of total emissions from the electricity generation sector. Since industries are the largest electricity consumers, comprising 44.11 percent of the total electricity consumption in the country, industry reports massive emissions that need urgent attention.

# Challenges in Achieving Sustainability

## Defining the Key Indicators

The key definitions for areas, such as poverty, hunger, safe drinking water, education need to be revised in order to effectively implement the SDGs.

## Financing Sustainable Development Goals

At today's level of investment, there is a huge funding shortfall that hinders the progress of attaining SDGs.

## Monitoring & Ownership of Implementation Process

NITI Aayog that takes care of ownership of the implementation process has limited manpower to handle such a Herculean task.

## Measuring the Progress

Incomplete coverage of administrative data is yet another factor that has hampered the measurement of progress for even the Millennium Development Goals (MDGs).

## India's Commitments to SDGs

India is on the way forward towards achieving its commitments done at the Paris agreement and the country is acting on its Nationally Determined Contributions (NDC's).

- India is among the few countries which is 2 degrees compliant and has taken many decisive actions, in fighting Climate Change, not only at the government level but even at the private level.
- **The Declaration of the Private Sector on Climate Change** signed by 24 key industry captains and Ministry of Environment, Forest and Climate Change at the virtual India CEO forum on Climate Change, by private sector companies, voluntarily, is a historic step.

# Sustainability in India and the region

## Green Growth Interventions

Energy efficiency and conservation measures in energy demand sectors (agriculture, transport, industry sector, commercial building, and residential sector)

Enhancement of modern energy access

Promotion of clean energy supply through renewables and cleaner fossil-fuel-based energy generation technology

Resource (soil and water) conservation in the agriculture sector.



The extent to which its economy will “grow green” will depend on its ability to reduce the quantity of resources required over time to support economic growth that leads to enhancement of social equity and job creation. Green growth could play an important role in balancing these priorities.

[Source: National\\_SPM.pdf \(teriin.org\)](#)

# Sustainability in India and the region:

## Role of Federal Government

### Electrification and Heat generation

- India introduced the **National Mission on Enhanced Energy Efficiency** focusing on the industrial and commercial sector.
- India's proportion of RE rose from 17 percent to 24 percent, while coal-fired power declined from 76 percent to 66 percent.
- This steady rise in the demand for electrification presents an opportunity for RE to overtake coal as the main source of electricity generation — that is, provided that market access and demand for RE is boosted.

### Construction and Manufacturing

- With increased emphasis on infrastructure, housing, real estate and industrial development, cement production in India is expected to be 800 million tonnes by 2030.
- Significant efforts will be needed to meet the 2050 objective of a 40 percent reduction in CO<sub>2</sub>-based emissions from cement production.
- **The National Steel Policy, 2017** envisages 300 million tonnes of production capacity by 2030-31.
- This anticipated demand in manufacturing and construction creates an excellent opportunity for India to reduce emission.

### Transportation sector

- Current projections indicate that road transport traffic will grow more than five times from 2011-12 to 2031-32.
- The **National Action Plan on Climate Change (NAPCC)**, launched in 2008, includes “sustainable transport” under the National Mission on Sustainable Habitat.
- The Indian government is focusing on decarbonizing the transport sector through increased efficiency, cleaner fuels (promoting the use of Liquefied Natural Gas [LNG] and Compressed Natural Gas [CNG]), electric mobility (Electronic Vehicles [EVs]), creating an enabling environment, and modal shift.

# Sustainability in India and the region: Policies in Sectors

Sector	Initiative
Agriculture	<ul style="list-style-type: none"> <li>According to the budget 2017-18, the government seeks to double farmers' income in the coming 5 years.</li> <li><b>Paramparagat Krishi Vikas Yojana (PKVY):</b> This scheme ensures the promotion of organic farming.</li> <li><b>Pradhan Mantri Krishi Sinchai Yojana (PMKSY):</b> This scheme aims to increase agricultural production &amp; productivity by increasing availability of water and its efficient use.</li> <li><b>Niti Aayog, Contract Farming Law:</b> In February 2017, as an effort to protect the farmers against price volatility, <b>Niti Aayog</b> came up with a law on contract farming, to protect the farmers' interest.</li> </ul>
Renewable Energy	<ul style="list-style-type: none"> <li>India's <b>National Mission for Enhanced Energy Efficiency</b> implements the Perform, Achieve and Trade (PAT) mechanism, covering the country's largest industrial and power generation facilities.</li> <li>Draft <b>National Renewable Energy Law (2015)</b> –The goal of the Act is to create legislative framework for further deployment of renewable energy in India.</li> <li><b>National Solar Mission:</b> The project promotes electricity generation from both small and large scale solar plants.</li> <li><b>Paris Agreement NDC:</b> India needs to achieve certain targets by 2030 including lowering emissions intensity of GDP by 33%–35% below 2005 levels; increase the share of non-fossil based power generation capacity to 40% of installed electric power capacity (equivalent to 26–30% of generation in 2030); and create an additional carbon sink of 2.5–3 GtCO<sub>2</sub>e through additional forest and tree cover.</li> <li><b>National Tariff Policy (2016):</b> In order to promote the use of renewable energy, solar Renewable Purchase Obligation (RPO) is proposed to be increased to 8 per cent by 2022.</li> <li><b>Low-interest funds:</b> Low-interest-bearing funds to be provided from <b>National Clean Energy Fund (NCEF)</b> to <b>Indian Renewable Energy Development Agency Ltd (IREDA)</b> for on-lending to viable renewable energy projects.</li> <li><b>Power to the people:</b> Implementation of 2 schemes – <b>Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY)</b> and <b>Integrated Power Development Scheme (IPDS)</b> for rural &amp; urban areas. Implementation of a new scheme – <b>Ujwal DISCOM Assurance Yojana (UDAY)</b>, which would enable electrification for all villages by reducing losses through programmes that involve public participation.</li> </ul>

# Sustainability in India and the region: Policies in Sectors

Sector	Initiative
Construction	<ul style="list-style-type: none"> <li>The MoEFCC released a draft notification in 2015 that mandates that construction activities happening 500 km around power plants to use only fly ash bricks. So far, 1 state has adopted this policy.</li> <li><b>The Energy Conservation Building Code</b> was formulated in 2007. It targets building energy efficiency and is likely to become a mandate in the coming future.</li> <li><b>Green Rating for Integrated Habitat Assessment (GRIHA)</b> was adopted as the national rating system for green buildings in India, in 2007.</li> </ul>
Transport	<ul style="list-style-type: none"> <li><b>Bharat Stage Emission Standards (BSES) VI</b> (comparable to Euro VI norms) were released in 2017 to regulate the output of air pollutants from internal combustion engines and spark-ignition engines equipment, including motor vehicles.</li> <li>The government is close to launching the <b>Voluntary Vehicle Fleet Modernisation Programme</b> which is aimed at encouraging people to scrap their old vehicles and replace them with modern, more fuel-efficient ones, by offering tax and other benefits.</li> <li><b>FAME India Scheme:</b> On April 8th, 2015, the Government of India announced FAME (Faster Adoption and Manufacturing of Electric/Hybrid) Vehicles in India – a scheme under the Ministry of Heavy Industries and Public Enterprises.</li> <li><b>National Electric Mobility Mission 2020</b> was launched in 2017 for promotion of hybrid and electric mobility in India, by the Ministry of Heavy Industries and Public Enterprises. The mission aims to increase the population of EV to 6-7 million by 2020 and contribute to national fuel security by providing incentives at both supply and demand ends of the industry. Indian automobile company Mahindra and Mahindra, and taxi aggregator Ola, have begun introducing a fleet of electric taxis and charging ports in three Indian cities.</li> <li>In 2016, the government announced plans for new policy initiatives to encourage private investments in climate friendly and sustainable public transport systems, like Metro Rail, Non-Motorised Transport and other low carbon emitting systems in urban areas. New initiatives under consideration, <i>including Green Urban Transport Scheme</i>, new <b>Metro Rail Policy</b>, revision of Metro Acts, and Standardisation and Indigenisation of Metro systems, are aimed at increasing private sector participation.</li> </ul>

# Sustainability in India and the region:

## Active State Governments

Steps Initiated	States
States that initiated steps to ban the use of single-Use Plastics	Sikkim, Himachal Pradesh, Meghalaya, Assam, Telangana, Uttar Pradesh, Maharashtra, Tamil Nadu, Karnataka
Top States with best Renewable energy Installations in the last 4 years	Karnataka, Gujarat, Andhra Pradesh, Tamil Nadu, Rajasthan, Telangana, Maharashtra, Madhya Pradesh, Sikkim, Uttar Pradesh
States with Organic Certification Agencies	Madhya Pradesh, Gujarat, Telangana, Sikkim, Bihar, Karnataka, Odisha, Rajasthan, Uttarakhand, Chhattisgarh, Tamil Nadu, Uttar Pradesh
States with Approved Electric Vehicle Policy	Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Delhi, Tamil Nadu, Telangana, Uttarakhand, Uttar Pradesh
State with Dedicated Water Policy	Meghalaya

### Top States in SDG Index

• Kerala	<b>75</b>
• Himachal Pradesh & Tamil Nadu	<b>74</b>
• Andhra Pradesh, Goa, Karnataka & Uttarakhand	<b>72</b>
• Sikkim	<b>71</b>
• Maharashtra	<b>70</b>
• Gujarat & Telangana	<b>69</b>

[Source: Smaller states are leading India's path to a greener economy | ORF \(orfonline.org\)](#)  
[SDG 3.0 Final 04.03.2021 Web Spreads.pdf \(niti.gov.in\)](#)

# Regional successes in Green Innovation:

## India on Climate Change

### Targeted

- Improve emission intensity of its GDP by 33-35% by 2030 below 2005 levels
- 40% cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030
- Enhance forest cover, which will absorb 2.5-3 billion tonnes of CO2 by 2030
- Indian Railways is targeting full electrification of board gauges by 2021.
- IR has also set a target of becoming a net zero carbon emitter by 2030.
- We have set target of 20% ethanol blending in petrol by 2025



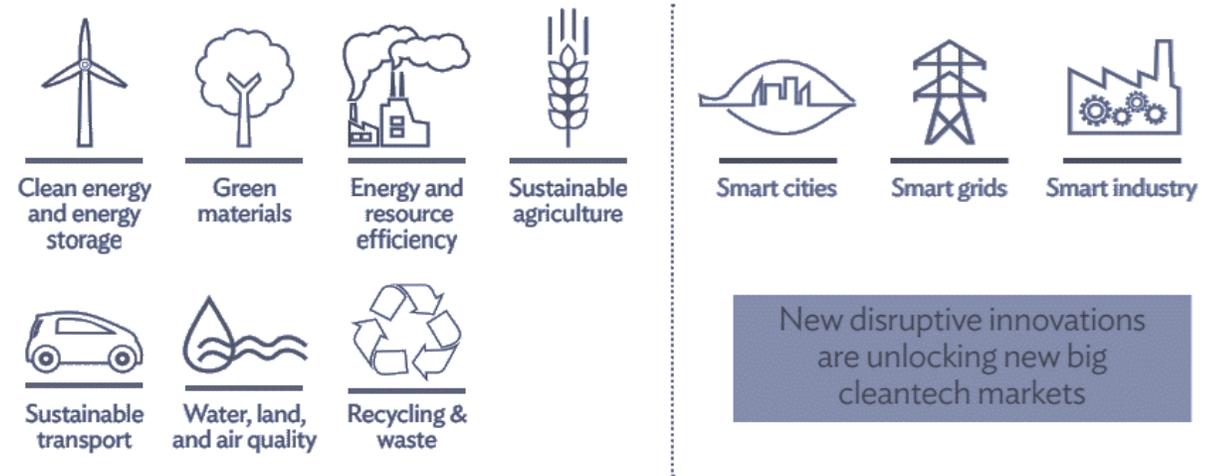
- Reduced emission intensity of its GDP by 24% between 2005 and 2016, thereby achieving its pre-2020 voluntary target.
- India's non-fossil fuel based installed capacity is 151 GW, around 39% of its total installed capacity
- India's forest and tree cover stands at 24.56% of country's total area
- India's carbon stock increased by 42.6 million tonnes from 2017
- India started its first green hydrogen electrolyser manufacturing unit

### Achieved

# Innovation in Cleantech Sector

## Overview

- From start-ups to large corporations and national governments, organizations across the globe are embracing cleantech as a means of growth, efficiency, sustainability and competitive advantage worldwide
- Entrepreneurs and start-ups are driving disruptive innovation and the growth of clean technology. They develop the technologies, business models, products, and services required to deploy and finance cost-effective cleantech solutions at scale.



 **250 +**  
Incubators & Accelerator  
Network

  
**4 of top 10**  
global electric car  
manufacturers are less than  
15 years old

  
**75%**  
of India's solar PV  
capacity installed by  
young entrepreneur

  
**8 of top 10**  
global solar PV  
manufacturers are less  
than 20 years old

# Drivers for Innovation in Cleantech

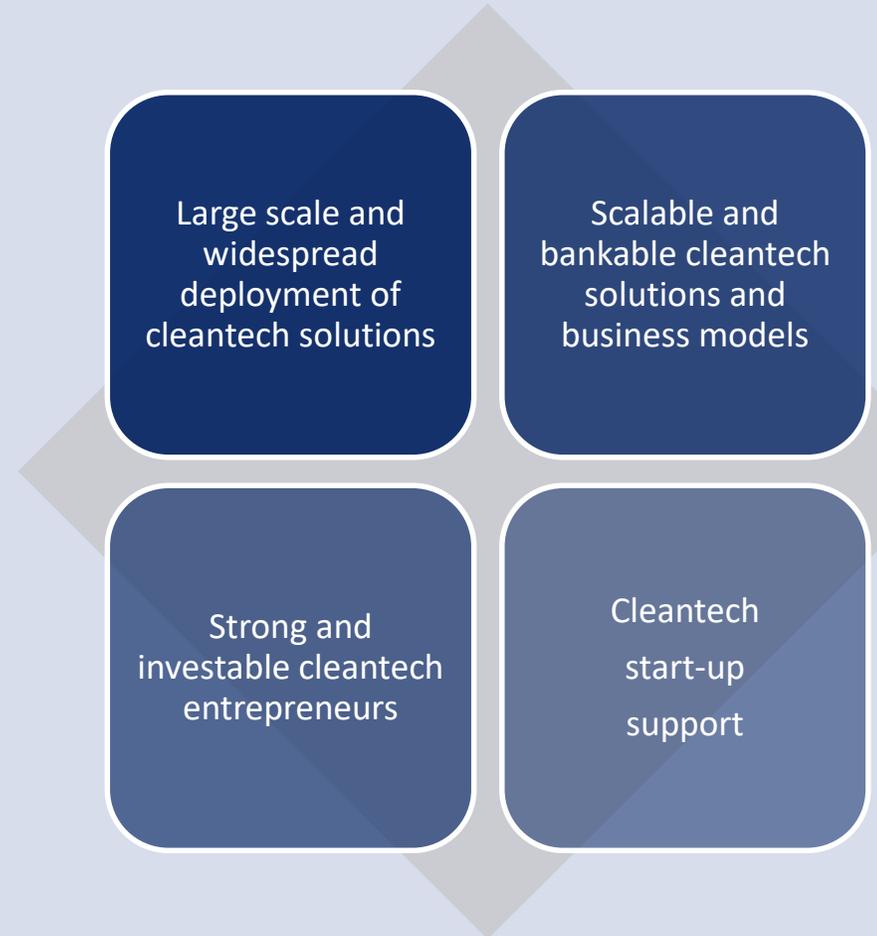
Rapid growth in India's RE sector is driving demand for new technologies to modernize the power sector. At the same time, there is a growing need to develop and deploy a broader suite of solutions aimed at reducing pollution. In response, a vibrant ecosystem of sustainability-oriented **startups, incubators, accelerators, corporates, impact investors and government** is taking shape to drive innovation in the cleantech sector

India's cleantech start-up ecosystem is shaping up, supported by hyperlocal players, a mix of public-private funding, and production incentives for specific industries.

An estimated **20 percent** of all startups in incubators in India are focused on some aspect of sustainability. Today, a growing number of them are focused on clean electricity.

Various incubators, accelerators and investors are expected to deploy collectively more than **Rs 20 Crore** to accelerate clean energy innovations over 24 months to realise the goal of net-zero emissions

Ventures such as **Social Alpha, Indian Angel Network** etc. provide venture development support to startups that aim to address the most critical social, economic and environmental challenges.



## GBI Initiatives

- If all current pledges and plans to cut or limit emissions were delivered completely and on time, global emissions would still keep growing in the next 10 years, under present trends. More stringent actions to reduce greenhouse gas emissions, in particular by industrialised nations, cannot be postponed much longer.
- Strong action is essential to the global transition into green economic growth, and, most urgently, to help the world, especially the most vulnerable, adapt to impacts that are now inevitable.
- GBI is part of two such programs that are focused on Biodiversity in India



### Central Highlands Restoration Project (CHiRP)

GBI is implementing with multiple stakeholders from the international and domestic public, private, NGO and financing sector to scale access to innovative solutions for biodiversity and landscape restoration in Chhattisgarh State, India

### Lead the Green Change

Lead by Delegation of the European Union to India where GBI is a partner connecting tech/solutions, financing, projects/markets for biodiversity.

# Central Highlands Restoration Project (CHiRP)



The project will build on existing strengths (agroforestry, farming skills and forest knowledge), on community assets (farmland and community forests) and external resources (funding and market knowledge) to develop community-driven landscape restoration.

## Needs Assessment

- Access to energy
- Agro forestry / agritech Product yield improvement
- Bamboo – identification of other opportunities to up cycle
- Non-timber forest product (NTFP) focused technology –for processing, storage, electricity, packing.
- Environmental technologies - clean cooking technologies
- Tele communications / internet: Internet bandwidth amplification for improved access to markets
- Healthcare and nutrition - adding nutritional value to local produce
- Water and sanitation

## Technology Scouting

- To identify a competitive pool of global organizations that offer disruptive solutions focused on
- NTFPs Processing and value addition
  - Bamboo Processing
  - Crop Management
  - Agro-forestry
  - Market Linkages and Supply Chain
  - Supporting Livelihoods

77 companies applied for CHiRP Innovation Call

## Technology Deployment

### Short term:

- Processing and Value addition of NTFPs
- Bamboo processing - Bamboo cultivation processing tools and technologies
- Renewable energy based mini / microgrids  
Clean cooking solutions

### Medium term:

- Market linkages and supply chain
- Data collection and analysis for long term monitoring of biodiversity

### Long term:

Digital solutions for improving agriculture / food and NTFP production

# Lead the Green Change

- EU's Lead the Green Change campaign launched in April 2021 supported by GBI
- The Delegation of the European Union to India along with Global Business Inroads (GBI) and Confederation of Indian Industry (CII) organized the “**Biodiversity means Business: Industry**” webinar, which gathered over 60 representatives from companies, investors, international cooperation and business associations to underline the contributions of biodiversity and ecosystems services across value chains and sectors.
- Under a general title “Biodiversity means LIFE”, the proposed outreach and advocacy strategy is to illustrate in the first place the socio-economic benefits of the EU Green Deal Strategy in India (in particular as regards biodiversity in land use and coastal areas, and biodiversity in green infrastructures/nature-based solutions).



## Biodiversity means Business: Industry

International Cooperation and its Facilitation for Biodiversity

- Presenting a platform connecting Technology with Business/Markets on a continuous basis
- Investment scaling for project and business opportunities
- State-State co-operation
- International enabling frameworks



## Biodiversity means Business: Industry

Scalable Economic and Market Opportunities and Driving Inward Investment in Biodiversity

- Presenting investible technologies and projects
- Bringing together key industry and businesses that express interest/commit to work on various projects and deployment actions
- Post event facilitation of connections between technology/projects – businesses/investors



## Global Technology Interface® (GTI®) – Display and Discover

### Technology Showcase

Display the technology; Discover the technology seekers

## Technology Management - Develop and Deploy

### Market Validation

Market research and Customer Identification- Understanding the needs of the market, competition and identifying customers

Identification of local use cases and project opportunities in the relevant sectors

Technology viability assessment and feasibility studies

Ecosystem development

### Market Discovery and Visit

Connect and facilitate meetings with potential partners and customers

### Commercialization/ Deployment

Local representation in India

Technology Indigenization (bill of materials, supply chain, pricing), IP Management

Business analytics & strategy; Business Model Development

Technology demonstration and deployment, Finance and Investment Advisory, Company Incorporation and Government Liaison

## Global Tech Experience Centers (GTEC)

Access to physical demonstration, piloting and use cases in India

# CASE STUDY: Technology Deployment

Arbnco, UK into Indian market

## Indoor Air Quality Monitoring



# arbnco™

### Scope of Work:

We are supporting arbnco, UK to pilot and deploy their indoor air quality monitoring system in India under the Innovating for Clean Air (IfCA) programme.

This is a 2-year joint UK-India initiative to provide UK and Indian SMEs with the opportunities to test interventions related to improving air quality and electric vehicle usage in Bengaluru. The programme is funded by Innovate UK

### Services Delivered:

- Market Research and demonstrating their technology by providing technical assistance on the ground through GTEC@NTTF
- Setting up demo wall for air quality sensors at GTEC@NTTF

# Open Innovation and Technology Scouting for Green Innovation



GBI has the expertise to scout for innovation, intellectual property (IP), technologies and/or solutions for **governments, corporates and enterprises** that are looking to improve their existing businesses or productivity.

GBI can facilitate the identification and short listing of innovative startups, companies, IP to address specific need of corporates and MNCs that can bring complementary technology solutions to support their objectives strategic growth.

# Scale, Results, Change, Impact – Vision for the future



## How?

- Tech **Scouting** – focus on 100 key problems/project opportunities in Asia + Africa (Offline+Online)
  - GBI can empower deployment ecosystem / local entrepreneurs to provide blueprints of their tech needs. The methodology is in place. Now time to scale.
  - Convert these into Innovation Challenges and post online. Announce challenges to attract tech companies to business opportunities
- Tech **Discovery** – potential to showcase 1000s of tech to solve problems (online on GTI)
- Tech **Deployment** - Curate, Select and Provide 10 technologies to each of the 100 key problems to Asia. Start with 20 problems per annum across a 5 year program for example.
- Scale Connecting tech to local entrepreneurs/market/ecosystem in Asia & Africa via an online –offline, timeline and deliverable based program

# Scaling Cross border Technology and Innovation access and deployment



## GBI Europe & GBI India: From Needs Assessment to Tech Deployment for Green Innovation

### India-EU Digital Networking

Opportunity For EU Companies To Collaborate With Indian Digital Tech Companies.

In the previous edition of the digital networking sessions , we had 27 EU companies and 50 Indian companies who participated. We facilitated over 110 B2B meetings.

### EU - India Partnership Sustainable Tech for Transport

The series of events will focus on a variety of topics, covering 2-3 topics at a time and also facilitating B2B meetings.

Panelists will be stakeholders in the EV charging ecosystem, EV manufacturers and Policy makers.

### EU-India Innovation Partnership

The EU-India Innovation Partnership initiative will provide opportunity for Europe and India to collaborate in implementing incubation, acceleration and scaling up programs that can support start-ups from both sides to co-create and scale to the other region.

### Circular Fashion & Resource efficiency in textile industry webinar and B2B meetings.

Virtual webinar and B2B meetings are organized, to bring fashion and textile producers together to enhance opportunities and commercial partnerships.

# Cross border Technology and Innovation



## GBI UK & GBI India

### Innovating for Clean Air (IfCA)

UK-India initiative to provide UK and Indian SMEs with the opportunities to test intervention for improving **air quality and electric vehicle usage in Bengaluru.**

The program is in collaboration with Catapult Network UK funded by Innovate UK

## GBI USA & GBI India

### USA - India for Waste Management

GBI USA is developing a project to design and develop modular waste-to-energy system for the Indian market that process both **Municipal Solid Waste (MSW) and Regulated Medical Waste (RMW)** streams to be combined thereby maximizing available revenue while avoiding redundant infrastructure investments.

## Africa

### Africa- India Digital Transformation

Providing access to digital and cleantech solutions for **African** companies from India and Europe.

## South Asia

### EU-South Asia Innovation Partnership

An initiative to connect the start-up ecosystems between EU, India and **Sri Lanka.**

- EU-South Asia Start-up Internationalization Helpdesk
- EU-South Asia Investor Platform
- EU-South Asia Corporate Innovation Platform

## South-East Asia

### Startup Internationalization: Malaysia to India

GBI is supporting Malaysian startups to access the Indian market in collaboration with MaGIC/Malaysian government - Global Market-Fit Program for innovative start-ups to gain international market access

## Contact us

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**Leena Pisce Thomas**

lthomas@globalbusinessinroads.com

+91 98450 10271

**Harsha Lingam**

hlingam@globalbusinessinroads.com

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T: +918041107086/41210203



[www.globalbusinessinroads.com](http://www.globalbusinessinroads.com)



Global Business Inroads

No:545, Trinity Greens,

G-03 ,Ground Floor,

8th Block, Koramangala, Bengaluru

560034, India

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