Mainstreaming Low-Carbon Pathways

Mainstreaming low-carbon pathways is critical to achieving a sustainable, climate-safe future. We work to integrate decarbonisation strategies into policies, programmes, and investments, ensuring that economic growth aligns with environmental stewardship. Our approach combines climate-smart planning, clean technology adoption, and innovative financing to drive measurable emissions reductions while enabling inclusive development. From advancing renewable energy transitions to embedding low-carbon considerations, we champion solutions that deliver both local benefits and global impact. Because shifting to a low-carbon future is not just an ambition - it's an imperative.

Mapping Climate Readiness Index (India) to Mainstream Low-carbon Pathways at a Sub-national Level, 2024-2025

Project Background

As India advances its climate transition agenda, there is a growing need to assess how prepared are states for low-carbon pathways. However, data gaps, fragmented implementation, and limited decision-support tools have slowed sub-national climate action. This project aims to bridge that gap by creating an evidence-based framework to measure, compare, and accelerate climate readiness in India's top 10 GHG-emitting states - Andhra Pradesh, Rajasthan, Gujarat, Chhattisgarh, Tamil Nadu, Odisha, Uttar Pradesh, Madhya Pradesh, West Bengal, and Maharashtra.

The study takes a multi-dimensional view of preparedness - systemic, financial, and technological - while tackling questions on renewable energy adoption, policy bottlenecks, and climate finance mobilisation. Our goal is to give state-level stakeholders actionable insights and tools to fast-track low-carbon transitions.

Our Role

We served as the technical anchor for conceptualising, designing, and rolling out India's **first-of-its-kind AI-ML based Climate Readiness Index (CRI).** Demonstrating sector-leading expertise in climate analytics and transformative digital systems, we developed the CRI as an integrated assessment framework and digital platform tailored to India's state-level decarbonisation challenges. Through advanced analytics, stakeholder-driven metrics, and close collaboration, we positioned the CRI as a central evidence base for evaluating how well India's top greenhouse gas-emitting states are prepared to pursue equitable low-carbon growth. The team worked closely with partners across government, industry, and civil society to co-create an intuitive, scenario-driven across three key dimensions - Systemic, Financial, and Technological Readiness. This holistic approach has guided climate investment, just transition planning, and renewable energy adoption.

Aligned with national climate strategies, the CRI equips states with actionable intelligence, scaling innovation and accountability in India's transition to a climate-resilient, low-carbon future.

- **Systemic Readiness:** Assessing the strength of governance structures, policies, and institutional coordination to implement climate strategies.
- **Financial Readiness:** Analysing existing and potential climate finance mechanisms at both state and central levels to support renewable energy and low-carbon infrastructure.
- **Technological Readiness:** Evaluating the technical capabilities of states, with a focus on solar infrastructure and workforce development.

Mapping Industrial Readiness to Climate Change, 2024-2025

Project Background

India's industrial sector faces growing climate risks but lacks detailed, evidence-based assessments for resilience planning. To bridge this gap, we, in partnership with CSI and key stakeholders like FICCI, are mapping industrial climate readiness using geospatial analysis and physical climate models. Our goal is to boost adaptive capacity and enable climate risk-informed decisions for long-term, low-carbon, and resilient growth for hard-to-abate sectors.

Our Role

Our work includes geospatial risk mapping, scenario analysis, and stress testing to assess industrial vulnerabilities and quantify financial risks. We map direct, indirect, and spill over climate impacts on industrial clusters, link climate data with business operations, and promote blended finance solutions. While the focus is on climate adaptation, our analysis of financial and operational risks tied to carbon-intensive operations also drives transition responses - such as process decarbonisation, clean tech shifts, and emission-linked disclosures. This approach bridges adaptation and mitigation, showing how climate risk exposure can push industry toward low-emission, resilient models.

Preparation of Organic Waste Strategy and An Enabling Framework of Maximised Recycling for Climate Mitigation and achieving Circular Economy Models in Delhi, 2022-2023

Project Background

Organic waste comprises 50-50% of total municipal solid waste in Delhi. The primary aim of this project is to improve the efficiency of organic waste management by

- Establishing comprehensive mapping of organic waste fractions generated across Delhi.
- Analysing the existing organic waste system value chain focussing from generation to collection, transportation till processing/dumping.
- Carrying out quantification and characterisation of different organic waste streams.
- Providing technical support by analysis of suitable technology for adoption and implementation for organic waste recycling.
- Providing detailed recommendations and roadmap for developing an enabling framework for improving the organic waste handling.
- Promoting efficient recycling and management of organic waste, thereby reducing emissions from landfills, and enhancing circular economy practices in urban waste systems.

Our Role

We carried out a comprehensive review of Delhi's municipal solid waste management (MSWM) system, covering all three municipal authorities. Our work included:

- Reviewing MSWM master plans, technical guidelines, judicial submissions, and regulatory reports.
- Forecasting current and future organic waste generation from mixed waste.
- Quantifying and characterising waste at key points - collection sites, Dhalaos, transfer stations, processing plants, and dumpsites.
- Visiting all organic waste facilities to document handling, processing, and disposal.
- Mapping major generation hotspots - mandis, parks, slaughterhouses - and assessing leakage risks to water bodies.
- Analysing PPP contracts and engaging stakeholders to improve management.
- Studying pollution impacts, dumpsite fire trends, and GHG emissions.
- Conducting SWOT and financial analyses of the value chain.
- Evaluating CER potential to attract future PPP investments in SWM projects.

Creating Capacity-building Material on Climate Mitigation and MGNREGA for Uttarakhand, 2022

Project Background

As the world's third-largest carbon emitter, after China and the US, India faces severe climate impacts on health, livelihoods, and infrastructure, with Uttarakhand at a comparative disadvantage versus rest of states. Considering Uttarakhand's comparative disadvantage in these terms, the State required knowledge about practical solutions to tackle this problem. We worked to integrate climate agendas into the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) - a flagship programme supporting millions of rural households- thus contributing to the economy.

Our assignment focused on creating a climate-focused training module for the state, collating and contextualising capacity-building materials on mitigation and adaptation activities under MGNREGA. The module guided policymakers, implementing staff, women leaders, PRIs, and local communities on sectoral climate-resilient practices in agriculture, water, land use, and infrastructure, while advancing Green Recovery and Build Resilience (GRBR) goals.

Our Role

We developed climate change adaptation and mitigation training modules for PRIs and other MGNREGA stakeholders in Uttarakhand. The material included:

- Framework for integrating adaptation and mitigation into MGNREGA.
- Sector-specific activities and technologies in agriculture, water, land use, and infrastructure linked to climate action.
- Thematic sessions with corresponding PPTs tailored to MGNREGA's sectoral priorities.
- Criteria and weightages for evaluating MGNREGA activities.
- Final training resources and workshop notes on climate adaptation and mitigation.

Project Management Consulting Services for Solar Microgrids Project, 2016-2019

Project Background

The Solar Microgrids Project, funded by HCL Foundation under its flagship rural development initiative Project Samuday, aimed at transforming rural energy access in Hardoi District, Uttar Pradesh. With a vision for holistic development across key sectors, the project addressed the acute need for reliable, affordable, and sustainable electricity in remote villages, where grid connectivity is often limited or absent.

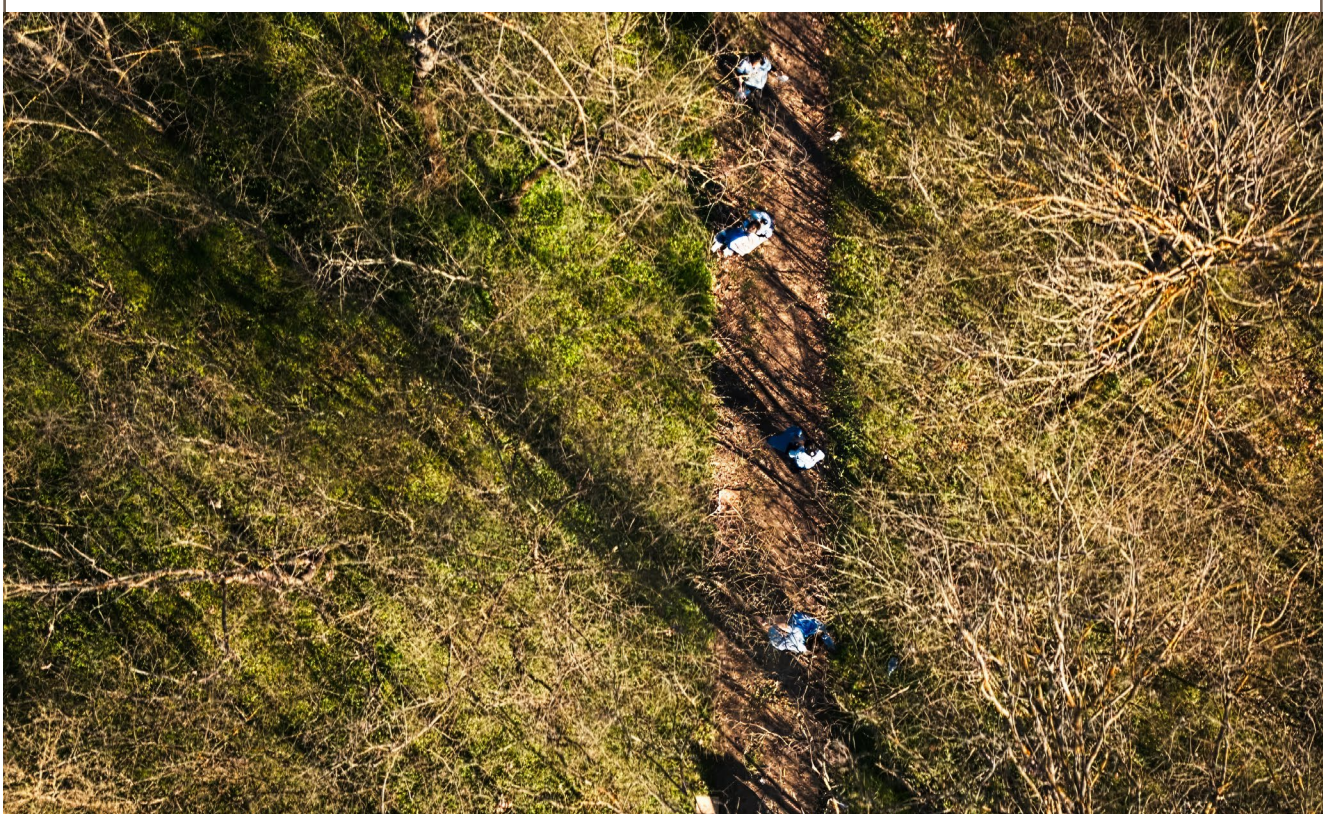
Central to this intervention was the design and deployment of solar photovoltaic (SPV) mini and microgrid systems, distributed networks, and household connections, moving communities away from reliance on fossil fuels and polluting energy sources. By shifting the rural energy landscape toward renewables, the project directly supported a transition to a low-carbon development pathway - reducing greenhouse gas emissions, cutting local pollution, and enhancing community resilience to climate change.

Our Role

As Project Management Consultant (PMC) for the project, we provided end-to-end technical and management expertise to ensure successful design, implementation, and sustainable operation of low-carbon solar solutions. Key responsibilities included:

- Comprehensive assessment of energy needs, load profiles, and socioeconomic context in selected villages, followed by designing technically robust, context-appropriate solar microgrid systems.
- Preparation of Detailed Project Reports with technical specifications, cost estimates, and implementation frameworks to guide the roll-out of SPV systems.
- Development of bid documents, vendor selection, and contract management to ensure quality and cost-effectiveness.
- Overseeing all aspects of grid installation, commissioning, and stabilisation - ensuring timely delivery, adherence to technical standards, and operational sustainability of the systems.
- Ensuring that choice of technologies, grid designs, and operational protocols advanced the project's low carbon objectives - optimizing renewable penetration, maximizing fossil fuel substitution, and embedding long-term energy resilience in rural communities.
- Facilitating training, awareness, and participation at the village level to ensure local ownership and effective maintenance of the new energy infrastructure.

By integrating SPV microgrids into rural power supply, the project not only electrified underserved communities but also set a replicable model for low-carbon rural electrification, directly contributing to climate mitigation, improved livelihoods, and sustainable rural development in India.



Evaluation Management Unit for the Forestry, Land Use and Governance (FLAG) Programme, Indonesia, 2015-2018

Project Background

Indonesia possesses some of the world's largest remaining tropical forests and peatlands - resources essential for both global biodiversity and climate stability. However, these ecosystems have faced mounting pressure from deforestation, unsustainable land use, and peatland degradation, making Indonesia one of the world's top greenhouse gas emitters, with over 80% of its emissions linked to land use change and forestry.

To address these urgent challenges and transition towards a more low-carbon development pathway, the Forestry, Land Use and Governance (FLAG) Programme was launched by the UK's Department for International Development (DFID) as a three-year (2015–2018), £32.5 million initiative. FLAG aimed to support Indonesia's efforts to reduce forest and peatland loss by strengthening land use governance, promoting cross-sectoral partnerships, and driving reforms for more transparent, sustainable, and low-carbon resource management. The programme directly contributed to global priorities on climate mitigation, low-carbon sustainable development, and poverty reduction by empowering Indonesian stakeholders with better tools, information, and incentives to manage forests and land more sustainably.

This project supported climate mitigation by contributing to the lowering of emissions from deforestation and peatland degradation through improved land use governance, sustainable resource management, and strengthened institutional capacity in one of the world's most critical carbon sink regions, accelerating a shift toward a low-carbon future for Indonesia.

Our Role

As the Evaluation Management Unit (EMU) for the FLAG Programme, we led the design and roll-out of an evaluation framework central to effective delivery and learning. Robust monitoring and evaluation systems were developed to address FLAG's complex, multi-stakeholder objectives - driving evidence-based decision-making to reduce greenhouse gas emissions, promote low-carbon land use practices, and curb deforestation in Indonesia.

The framework integrated quantitative and qualitative data collection, real-time progress tracking, and comprehensive outcome assessments across all programme components. This enabled timely analysis of which interventions were most effective - not only in tackling deforestation and peatland degradation, but also in advancing Indonesia's transition to a low-carbon land use sector. Critical governance, finance, and policy levers were also identified as essential for systemic, climate-resilient change.

We ensured that evaluations were closely aligned with DFID and UK Government priorities on climate mitigation, low-carbon pathways, and poverty reduction. By enabling adaptive management and generating actionable insights, the work strengthened FLAG's accountability, learning, and impact - supporting Indonesia's long-term low-carbon development agenda.

Consultancy Services for Knowledge Exchange Programme (KEP) of Officials and Elected Representatives from KMC to Build their Capacity on Climate Smart Interventions at Municipal Level under the UK-KMC MoU on Low Carbon and Climate Resilient, Kolkata, 2015

Project Background

Kolkata faces acute climate risks - sea-level rise, flooding, and extreme weather events - intensified by rapid urbanisation and infrastructure pressures. Recognizing these challenges, the MoU aimed to foster a low-carbon, climate-resilient city by embedding climate change mitigation and adaptation into municipal planning and governance.

Through this partnership, KMC committed to integrating climate-smart interventions and strengthening institutional capacity among municipal officials and elected representatives. These efforts were designed to reduce greenhouse gas emissions, enhance resilience to climate impacts, and unlock sustainable economic opportunities, while enabling the delivery of climate-responsive municipal services across sectors.

The Knowledge Exchange Programme (KEP) was conceived to facilitate the transfer of knowledge and best practices on climate-smart urban development from UK experts and institutions to KMC stakeholders. This program supported the implementation of a strategic Roadmap for Low Carbon and Climate Resilient Development of Kolkata to advance the objectives of the UK-India bilateral collaboration in urban sustainability.

Our Role

We played a key advisory and technical role in the Knowledge Exchange Programme by conducting comprehensive reviews of Kolkata's existing climate risks, energy consumption patterns, and institutional readiness. Building on this analysis, we developed a detailed roadmap to guide KMC's transition towards low-carbon and climate-resilient urban development.

Additionally, we designed and developed an innovative GIS-based web portal that served as a real-time virtual resource centre. This platform facilitated interaction between citizens and private service providers, offering climate-related information, and integrating a help-desk facility to support climate awareness and responsive service delivery.

Through capacity-building workshops, technical support, and digital tools, we enabled KMC officials and elected representatives to enhance their understanding of climate-smart municipal interventions, improve governance frameworks, and implement practical adaptation and mitigation measures across the city. This technical assistance contributed to strengthening KMC's institutional capability to realize the goals of the UK-KMC MoU and position Kolkata as a pioneer in India's climate-smart urban agenda.

IGEN-Access - Scoping Study for Agriculture-Energy Nexus in Rural Areas of Delhi, 2018-2019

Project Background

IGEN-Access is a bilateral cooperation initiative jointly implemented by GIZ GmbH (on behalf of BMZ, Government of Germany) and India's Ministry of New and Renewable Energy (MNRE). The programme fosters an enabling ecosystem for rural renewable energy enterprises to provide clean, affordable, and reliable energy - driving sustainable, low-carbon rural development.

With a strong focus on the agriculture - energy nexus, it leverages renewable energy to make agricultural practices more sustainable while enabling livelihood diversification. In 2018 -19, a scoping study in Kapashera and Najafgarh (Delhi) assessed local agriculture, livelihoods, and energy use patterns. It identified renewable energy–driven opportunities for sustainable farming, new income streams, and reduced carbon footprints.

By integrating renewable energy into rural livelihoods, the project advances climate change mitigation - reducing fossil fuel dependence, cutting GHG emissions, and promoting sustainable, low-carbon growth in agriculture and allied sectors.

Our Role

We were engaged to conduct a comprehensive scoping study that assessed the agriculture-energy nexus in the rural areas of Delhi under the IGEN-Access programme.

The study involved detailed analysis of existing agricultural practices, livelihood profiles, and energy consumption patterns, with a view to identifying viable renewable energy interventions that could enhance productivity and income diversification.

Based on this assessment, we provided evidence-based recommendations on promoting sustainable agricultural and allied livelihood practices powered by renewable energy solutions. The study emphasised renewable energy incorporation to improve the share of clean energy in the rural energy mix, thereby advancing environmental sustainability and economic resilience.

Our work also contributed to creating a knowledge base that supports market development for rural energy enterprises, informs policy formulation, and guides future investments aimed at integrating renewable energy into agriculture-driven rural economies. This role aligned with IGEN-Access's broader objectives of expanding rural energy access and enabling low-carbon growth pathways in India's rural sectors.

Technical Assistance to better Recover, Recycle, Re-use, Construction & Demolition (C&D) Waste in India, 2020

Project Background

The Foreign, Commonwealth & Development Office (FCDO), UK, provided strategic support to the Central Public Works Department (CPWD), Ministry of Housing and Urban Affairs (MoHUA), Government of India, for developing a National Strategy on Construction & Demolition (C&D) Waste Management. The strategy aimed to enhance the applicability, uptake, and scale of C&D waste recycling and utilisation across India.

The purpose of this technical assistance mandate was to equip CPWD with the knowledge, systems, and international best practices, including proven approaches from the UK - to maximize recovery, recycling, treatment, and effective reuse of C&D waste nationwide. By strengthening institutional frameworks and operational processes, the initiative worked to:

- Lower energy consumption by substituting virgin resources with recycled materials.
- Minimize environmental pollution from unmanaged C&D waste.
- Improve resource efficiency and promote material circularity.
- Optimize waste disposal and management practices.

This collaborative effort underpins India's broader climate mitigation goals by reducing greenhouse gas (GHG) emissions from the construction sector—largely through improved resource efficiency, energy savings, and the promotion of circular economy principles in the use of construction materials. The integration of global best practices not only positions India to manage its rapidly growing C&D waste stream more sustainably but also catalyzes systemic change towards a low-carbon, resource-efficient built environment.

Our Role

Under this project, we undertook the following activities:

- Drafted a comprehensive national strategy for management of Construction & Demolition (C&D) waste through stakeholder consultations, secondary research, and integration of international best practices, including from the UK. The following were being included in the draft strategy:
  - Assessment of the current C&D waste ecosystem - types, quantities generated, demand projections, existing material sciences and technologies, recycled product types and uses, value chain analysis for top recycled materials, and quality parameters with potential for wider adoption.
  - Ways to improve increase the scope of reuse of C&D waste in India, by identifying new categories of recycled products that could be introduced in India and ways to increase the range of products currently in use.
  - Conduct a detailed cost-benefit analysis of using Recycled C&D Waste in new construction and renovation works.
  - Review and report on national policy developments, including the Draft National Resource Efficiency Policy 2019.
  - Advise on viable delivery models (PPP and non-PPP) and incentives to enhance adoption.
  - Recommend standards, specifications, and technical parameters to the CPWD for inclusion of relevant recycled products in the Delhi Schedule of Rates (DSR).
  - Support CPWD in policy framework development to promote use of recycled C&D waste in future infrastructure and public works projects.
- Organised a knowledge exchange workshop in Delhi with participation of at least four international experts / organisations, including from the UK, who have expertise in the field of efficient management of C&D waste to (a) discuss the draft report and share expertise and international best practice, including from the UK, with stakeholders like Govt. Depts. (MoHUA, CPWD, MoEFCC etc.), civil society, construction and infrastructure companies, C&D waste handling companies etc. Key lessons learnt and relevant feedback and suggestions received from the workshop were factored in to refine the draft strategy.
- Developed a revised strategy based on workshop feedback and additional consultations with CPWD and relevant government agencies.
- Finalised and submitted the strategy incorporating all stakeholder inputs.
- Conducted a national knowledge dissemination workshop to share lessons, findings, and recommendations with stakeholders such as State PWDs, MoEFCC, industry, and civil society.

The Climate Change and Sustainability (CCS) practice at IPE Global is committed to climate proofing a low carbon future for a cleaner and healthier world by providing solutions to manage environmental liabilities, strengthening resilience and adapting to climate change.

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