

SKI ANNUAL SUMMIT

DIGITAL PLATFORMS WORKSHOP

Enabling Decarbonisation and Energy Transition
through Open Networks with Beckn.

WORKSHOP INSIGHTS

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Contributors

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About Sattva Knowledge Institute

Sattva Knowledge Institute (SKI), established in 2022, is our official knowledge platform at Sattva. The SKI platform aims to guide investment decisions for impact, shedding light on urgent problems and high potential solutions, so that stakeholders can build greater awareness and a bias towards concerted action. Our focus is on offering solutions over symptoms, carefully curating strong evidence-based research, and engaging decision-makers actively with our insights. Overall, **SKI aims to shift intent and action toward greater impact by influencing leaders with knowledge.** All of our content proactively leverages the capabilities, experience and proprietary data from across Sattva.

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Executive Summary

Over the last decade, India has significantly increased cumulative (68%) and per capita (47%) carbon emissions. In response, the country has shifted its focus towards augmenting its renewable energy capacity, aiming for carbon neutrality and now ranking fourth globally in renewable energy production. Despite these efforts, the integration of renewable energy into the national grid faces considerable obstacles, leading to a discrepancy between installed capacity (41%) and actual energy generation (11%). This gap underscores the persistent reliance on fossil fuels, which account for 73% of India's energy generation.

To address these challenges, a workshop conducted under the aegis of the Sattva Knowledge Institute Annual Summit 2024 brought together a diverse group of stakeholders, including experts, corporate leaders, policymakers, and social organisations, to investigate the potential of Digital Public Infrastructure (DPI) and Open Network approaches to foster decarbonisation. The pivotal event underscored the importance of building public goods to enable further innovation and impact in the clean energy domain.

The workshops identified the need for an ecosystem that supports green energy transitions through DPIs, highlighting the significance of addressing challenges and developing pilot plans collaboratively. It outlined India's digital advancements, such as Aadhaar and UPI, as models for tackling complex issues through DPI, suggesting that similar approaches could be instrumental in addressing climate change and sustainability. By moving away from solution-first approaches and fostering open networks, discussants agreed on the need for a foundational infrastructure that enables community-based innovation and conceptualisation of solutions for climate action.

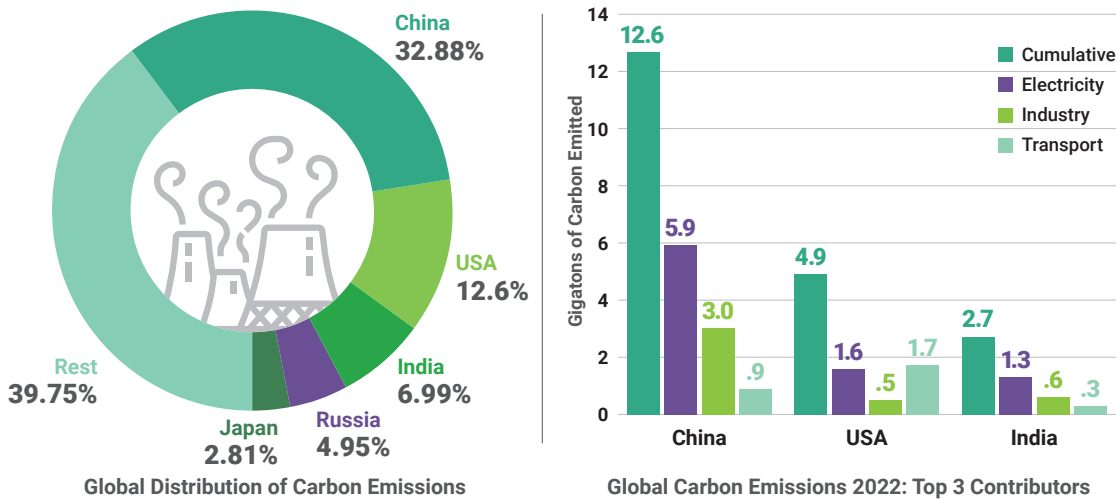
India's green energy value chain could significantly benefit from DPI and open network thinking, particularly in overcoming discoverability challenges within green financing, EV infrastructure, and renewable energy sectors. The Beckn Protocol was highlighted as a key enabler of open, decentralised networks that facilitate exchange among participants, thus addressing critical issues in the green energy ecosystem.

In conclusion, the workshop called for a collaborative approach, supported by agile policy and incremental problem-solving, to create population-scale impact through DPIs. It outlined a vision for a community of infrastructure innovators and the transformative power of DPIs and Open Networks in the energy sector, aiming to accelerate clean energy solutions and transform India's energy landscape for a sustainable and resilient future.

Introduction

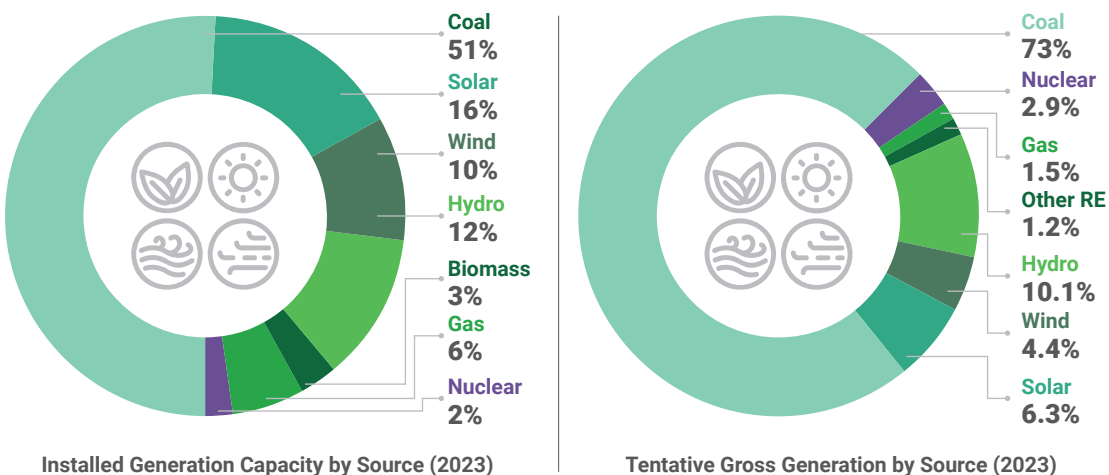
India is the world's third-largest carbon emitter in cumulative terms. Its historical dependence on fossil fuels for energy generation has significantly increased India's cumulative (68%) and per capita (47%) carbon emissions in the last decade.

Figure 1: Global Distribution of Carbon Emissions, 2022¹



India has increased its focus on producing renewable energy capacity, to reduce its emissions intensity and achieve carbon neutrality, currently ranking fourth among all countries. However, challenges pervade the clean energy value chain—across generation, transmission, storage and consumption—making integration into the grid infrastructure challenging. This results in a gap between installed renewable capacity (41%) and actual generation (11%), forcing India to remain reliant on fossil fuels (73% of generation).

Figure 2: India's Installed Generation Capacity and Gross Generation, by source²



Innovative solutions are needed to overcome these challenges. **The Digital Public Infrastructure (DPI) framework and Open Network approach can accelerate decarbonisation, fostering greater collaboration, decentralisation, and democratisation in the clean energy sector by creating tools for future innovations.**

In this context, the [Sattva Knowledge Institute Summit 2024](#), called for building public goods that enable further innovation and impact. The summit took place on February 23, 2024, and witnessed participation from subject matter experts, corporate leaders, investors, policy makers, philanthropists, entrepreneurs and social organisations. It featured workshops across five practice areas: Education, Agriculture, Health, Digital Platforms and Future-Ready Nonprofits.





The [Digital Platforms practice area](#) hosted a workshop aimed at using DPI and open networks to unlock innovation in the green energy ecosystem, explicitly focusing on distributed energy storage, green EV chargers, accessible green finance, and distributed clean energy sources for India's green energy transition.

The three primary objectives of the workshop conducted within the summit were:

- Building an ecosystem around solving green energy transitions through DPIs
- Validating problems/challenges in green energy transitions;
- Developing pilot plans and working groups with ecosystem leaders.

To guide the workshop and achieve some of the mentioned objectives, we developed a set of problem statements for the participants, highlighting key problems in the energy ecosystem. Participants in the workshop explored specific roadblocks in the energy landscape to lead to an implementable solution.

Figure 3: Problem Statements for participants' workshop discussion

 Enabling Prosumers	 Green Financing	 Energy Storage Solutions	 Greenification of EV Chargers
<p>The rise in localized renewable energy production, particularly solar energy presents a unique opportunity for prosumers to engage in energy trading with DISCOMs and others. However, realizing this potential requires overcoming current limitations in energy data availability, discoverability, and open access options. Addressing these challenges can unlock new avenues for energy commerce and collaboration.</p>	<p>The crucial role of climate finance in renewable energy investments underscores a unique opportunity for both individuals and businesses. By improving financial capabilities in energy transaction it can lead faster transition to green energy.</p>	<p>The untapped potential of existing energy storage solutions, such as EV batteries, offers a promising opportunity for energy producers and DISCOMs to relieve grid strain, marking a path toward improved energy distribution efficiency and sector-wide innovation.</p>	<p>The dominance of fossil fuels in India's energy mix, juxtaposed with the growing adoption of electric vehicles (EVs), underscores an opportune moment for transformative change. With only 35% of energy for EV charging coming from green sources, enhancing the discoverability of and incentives for green energy sources can significantly reduce the transport sector's carbon footprint.</p>

A diverse group of participants, well-researched pre-reading materials, a cohesive facilitation deck and specific problem statements helped us set the stage for a collaborative environment. This resulted in valuable insights and innovative solutions for open networks addressing key challenges and green energy transitions.

Addressing Climate Change Today is Based on Four Key Principles

Climate change is a multidimensional issue that can be solved like other complex value chains.

India has solved questions around identification and financial transactions with solutions such as Aadhaar and Unified Payment Interface (UPI). Such multidimensionally complex supply chains, or value chains, require significant coordination to reduce their adverse impacts. The cost of coordination can be brought down using DPI as an approach. In India, Digital Public Infrastructures (DPIs) have been developed as building blocks to enable collective problem-solving at scale. Like physical infrastructures, such as roads, DPIs connect essential services (such as schools and hospitals) with a larger population.

India is on the cutting edge—not only with its experience of the last few years in digitisation, but also due to its scale, muscle, and diversity, which has naturally lent itself to DPI thinking. India has leapfrogged into an integrated digital economy with an increase in bank accounts. Using the digital infrastructure of Aadhaar, UPI was built, enabling financial inclusion at the bottom of the pyramid. Had it used conventional methods, India would have taken 47 years more to financial inclusion.

It is necessary first to understand climate and sustainability as multidimensional issues, and then approach them collectively with DPI thinking. Micro economies need a different model to solve problems at scale, and DPI thinking offers that model. Beckn Protocol powers the third generation of DPIs, which can address challenges in climate action.

In order to address climate change, we need to move away from a solution-first approach.

The problem of climate change is multifaceted. It needs to be addressed by laying out the fundamental framework and building blocks rather than focusing on creating solutions. Open Networks are foundational infrastructures on which the community of change-makers can innovate and conceptualise solutions.

Open Networks facilitate transactions, allow negotiations and digital coordination to further fulfil the transaction and follow/trace the order post-fulfillment. This all happens

in a trusted environment that allows us to reimagine how any valuable economic resource can be discovered, coordinated, negotiated, and fulfilled on a decentralised network. Innovations on Open Networks gives us a way to address the complex problem of climate change by reimagining the supply and demand value chain around climate, sustainability, and green transition.

Open networks, through Beckn Protocol, can address challenges in climate action through green energy transitions.

Green energy transitions offer a multifaceted solution to climate change by moving away from carbon-intensive fossil fuels. The many hurdles to achieving these transitions can be addressed by innovative use cases for open networks.

The problem of discoverability pervades the ecosystems of green financing, EV infrastructures, renewable energy prosumers and energy storage solutions. Service providers cannot discover consumers, increasing their operation cost and creating participation thresholds. Open networks solve the discoverability challenge by establishing a standardised language, fostering communication and information sharing between participants in the green energy ecosystem.

The Beckn protocol creates open, direct, and decentralised networks to facilitate exchange among network participants. This can be witnessed in various Beckn-enabled use cases such as Open Network for Digital Commerce ([ONDC](#)), Open Network for Education and Skilling Transactions ([ONEST](#)), Unified Health Interface ([UHI](#)), [Namma Yatri](#) and so on. Through open communication protocol and interoperable standards, Beckn addresses challenges regarding discoverability and builds a community for solving the problem. The Unified Energy Interface (UEI), built on the Beckn Protocol, can enable a decentralised and democratised network across the green energy value chain to address its several challenges.

Policy needs to be as agile as technological advancements.

The policy to promote the development of new, pertinent DPs is lagging by at least 10-15 years. The narrative must involve samaaj, sarkar and bazaar to catalyse this change. The policy needs to support innovation, for which the push needs to be driven by the market. There is a need to integrate plus-one thinking, to solve problems incrementally, in order to create population-scale impact.

The Unified Energy Interface (UEI) Helps Mitigate Fragmented Ecosystems in the Green Energy Sector

The energy ecosystem sees multiple private and public players coming together to provide and access new solutions and services. Innovations in battery as a service, battery-to-grid, vehicle-to-grid, virtual power plants and smart demand response management are demonstrating cost and efficiency benefits to multiple stakeholders. However, these diverse solutions are also creating a fragmented market of multiple platforms and applications. On the one hand, users have to toggle between multiple platforms to access services and experience confusion in selecting the optimum solution. On the other hand, emerging service providers bear high costs of building the necessary software and engaging users to adopt and transact using their bespoke systems.

The Unified Energy Interface is an open network for energy that enables transactions between digital energy systems. It creates a unified ecosystem, integrating disparate digital energy solutions into a cohesive whole. By enabling interoperability among siloed platforms, UEI solves discovery, ordering, fulfilment and post-fulfilment-related challenges. It acts as a dynamic, open network where providers and consumers of energy-related services, such as EV charging, battery swapping, and renewable energy, can seamlessly connect. The existing use cases of UEI are for EV charging, virtual energy warehousing and battery monetisation. Additional use-cases of UEI were discussed at the workshop to derive the following insights:

- **For prosumers to trade energy**, prosumers with surplus energy can participate in virtual power plants (VPPs) which aggregate distributed energy resources (DERs) and provide the excess power they generate to the primary grid in times of need. They can also become a micro-grid energy source that can leverage single or connected DERs to power a defined area. A UEI-enabled digital solution can allow visibility of all DERs, allow real-time peer-to-peer energy transactions and decision-making, to unlock value for prosumers through mutual discoverability and seamless transactions.
- **For green financing**, lack of incentives for innovators and lack of consistency in terms of policy cause new-age technologies to face financing challenges. For example, small-scale solar projects, such as ones on rooftops of residential buildings or on private farmlands, lack access to funding sources and incentives to harness renewable technologies. The solution is to commoditise energy transactions to fund energy projects. An underlying transaction that enables cash flow is the easiest financing. With easy monetisation, there is visibility of cash flows, and financing will be possible.
- **For storage solutions**, the lack of standardisation of batteries, of discoverability and of end-of-life solutions are the major challenges. Additionally, there is a paucity of data caused by scepticism of OEMs to share information. Using a common protocol, such

as Beckn, BMS's can interact with vehicles to track energy consumption data (and idle energy storage data) to solve the discoverability problem. Public utilities can opt for open protocols to integrate BMS-es into the grid to optimise energy storage and usage. Lastly, end-of-life technologies discovered on the network can help scale up storage solutions.

- **For greenifying the existing EV infrastructure**, a network with EV infrastructures listed on society applications (such as MyGate) can help discover green energy sources depending on the consumer's location. Additionally, certifying organisations on the network can verify the "green"-ness of the energy sources to add credibility. Lastly, battery storage services can be integrated on the network to create a sustainable value chain for an optimised EV infrastructure.

Open Networks Can Unlock Several Use Cases to Advance Climate Action.

Besides green energy transitions, there are five areas in climate action where open networks can potentially play a role:

1. Establishing efficient carbon markets by leveraging asset tokenisation, credentialing, and financial mechanisms. An interoperable network significantly lowers expenses related to trust and business operations.
2. Facilitating the transfer of funds for climate initiatives, particularly during emergencies. India benefits from its well-established Direct Benefit Transfer (DBT) system in this area.
3. Reducing significantly the costs associated with recycling, transport, and coordination, facilitating the identification of recyclable materials and logistical strategies and thus promoting a more efficient circular economy.
4. Streamlining disaster response efforts via an open network, addressing the issues of high costs and inefficiency in coordinating the efforts of individuals involved in rescue operations across various platforms.
5. Fostering a transition to a green economy through an open network dedicated to training and employment. With the increase in eco-friendly jobs, the need for retraining and skill enhancement becomes crucial, which can be efficiently met through a decentralised network like ONEST.

Conclusion and Way Forward

At the Sattva Knowledge Institute summit, our primary focus was on a crucial element of social impact: **developing infrastructure-enabling solutions**. Our goal is to establish foundational infrastructures and public goods that empower innovators to make a greater impact. The Digital Platforms workshop underscored this principle, demonstrating how DPI and Open Networks can enable change-makers to address challenges on a population-wide scale in the energy sector. The essence of our strategy lies in a cooperative methodology supported by flexible policies and a step-by-step, inclusive approach to foster large-scale change through DPIs.

Moving forward, our objective is to nurture a community of pioneers in infrastructure innovation and underscore the significance of "solution-enabling" infrastructures like DPIs and Open Networks. Highlighting the impactful potential of DPIs and Open Networks in the realm of clean energy positions these tools as catalysts for change, encouraging a shift in investors' mindsets and underscoring the value of such infrastructures. Our vision is a cooperative ecosystem of solution-enabling infrastructures that accelerates the adoption of clean energy solutions, aiming to revolutionise India's energy sector.

The Sattva Knowledge Institute (SKI) and FIDE are committed to advancing this vision through three principal initiatives:

- Establishing an Open Network Climate DPI Community for ongoing exchange of insights and to uncover DPI opportunities for addressing and adapting to climate change.
- Forming Green Energy Transition working groups to foster collaboration and ideation on DPI and Open Network-driven solutions for clean energy transitions.
- Extending the exploration of these tools to address a wider array of climate challenges beyond green energy transitions.

With this strategic plan, we are set to leverage the transformative capacity of open infrastructures to enable faster green energy transition in the coming years.

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