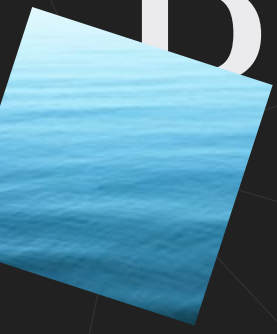
Insight and next steps

Beckn *Node* Zero 2024



Accelerating climate action with open networks

2024 beckn node zero

FIDE Foundation for Interoperability in Digital Economy

Sattva Knowledge Institute SKI

Beckn Node *Zero 2024*

Accelerating climate
action with open networks

Introduction and *acknowledgments*

The first edition of **Beckn Node Zero 2024** (BNZ) was imagined as a human network with each node acting as an equal and important contributor towards coordination for climate action. Through a wide array of talks, panel discussions, working groups and a game exploring the role of open networks, we explored ways to accelerate action across diverse themes related to sustainability including energy transition, water conservation, sustainable agriculture and other areas. Over two days in late October, BNZ brought together innovators, investors, corporates, start-ups, think tanks, philanthropic and nonprofit organisations to outline the key challenges and practical open-network solutions for coordinated climate action.

This document synthesises key learnings from all the sessions and outlines next steps. We hope that this will serve as a reference for solution makers and build a foundation for the next edition of beckn node zero.

We are grateful for the contributions of the **FIDE** team, especially Pramod Varma and Sujith Nair, along with Anirban Sinha, Sindhuja Sampath, Bharath Shankar Ganapathy, Sonam Rai and Gariyasi Garg to the conceptualization and organisation of the event.

In addition, we would like to extend our gratitude to Rathish Balakrishnan, Abhishek Modi, Ashima Chander, Meenakshi Iyer, Sohini Dutta, Prerit Shukla, Anagha Wankhede, Divya Swamy and Meghana Katam, at **Satva Knowledge Insitute**(SKI), our knowledge partner. Their valuable inputs and production support made this event possible.

We are immensely thankful for the active participation of speakers, workshop leaders and demo providers – they played a large part in making this event a resounding success. Details about these key nodes can be found in the Annexure.

Finally, we are grateful to each and every person, or **'node'** who came and contributed to rich discussions, by engaging deeply with them and asking critical questions. The journey towards a sustainable future has just begun and we are delighted to have them as co-passengers.

Foreword
note from Sujith

In a world increasingly defined by the cascading impacts of climate change, one truth stands out: No single platform, innovation, or organization can tackle this crisis alone. What we need is not just groundbreaking ideas but the ability to coordinate at a systemic level. After all, the most resilient systems on earth—whether forests, city grids, or even the human body—thrive on coordinated interactions. This principle formed the bedrock of Beckn Node Zero, where we brought together technologists, investors, farmers, community leaders, and visionaries to rethink and rebuild how we approach climate action.

At Beckn Node Zero, we asked urgent and deeply practical questions — what does humanity-centric design look like in the context of climate action? How do we design solutions that adapt to an unpredictable future? Can open networks, by dramatically reducing the cost of coordination, offer exponential benefits?

These weren't just questions for contemplation – they are already informing ingenious real-world applications in the climate space. Over two days, we witnessed open-network solutions transforming energy, water, and waste management, among others. From decentralized energy trading to regenerative farming powered by interoperable platforms, these examples proved what's possible when we prioritize collaboration over silos.

The rooms buzzed with diverse voices, engaging in frank, ambitious, and nuanced discussions on coordinated climate action. Even more impactful were the cross-sector partnerships forged—collaborations sparking solutions that will outlive and outgrow the event. This momentum and bias toward action are, for me, Beckn Node Zero's most meaningful triumph. To all the contributing nodes who made this possible, thank you for your expertise, tough questions, and openness to collaborate.

Amid the global cacophony on climate action, Beckn Node Zero amplified the often-overlooked power of coordination. But this is just the beginning. Coordination isn't a one-time effort; it's an ongoing journey we must accelerate to meet our net zero goals. Just as ONDC, UPI, and Namma Yatri revolutionized commerce, finance, and mobility, open networks can transform climate action—delivering coordination dividends at unprecedented speed and scale.

This insights document consolidates what we've learned and passes the baton to you. You are a vital node in this network, and your actions, whether they be piloting new open-network solutions, scaling innovations with open-networks, or fostering unlikely collaborations, will shape the future. While challenges remain, as the anti-panel reminded us, they are invitations for innovation and collaboration.

As you embark on reimagining climate solutions through open networks, i invite you to explore the resources at FIDE and the transformative possibilities offered by our open-source protocols like beckn. Let's join forces to design and implement scalable, coordinated solutions that address the unique challenges of your sector while uplifting others in this race against time towards net zero.

Executive *summary*

Emerging trends lay the foundation for open networks to enable effective solutions in sustainability.

Capital for climate action
Approximately USD 1 trillion is required to fund the global net-zero transition. Innovative exponential solutions in energy and sustainability are crucial to meeing this goal.

Decentralization of energy systems
The world is transitioning from centralized to decentralized energy structures necessitates technologies that optimize the full potential of Distributed Energy Resources (DERS), renewable energy, energy storage, and flexible consumption.

Corporate sustainability priorities
Regulations, stakeholder demands, and the pursuit of top talent are driving corporations to prioritize sustainability as a core part of their business strategy, presenting opportunities for leveraging open networks.

Mature Digital Public Infrastructures (DPI)
A mature DPI landscape (such as India) provides a key opportunity for scalable climate action through interoperable solutions. Some examples include using the Direct-Benefit-Transfer infrastructure for climate incentives, using the GST network for carbon accounting or using digitally verified and tokenised assets and transactions to obtain climate-related credit. Entrepreneurs, developers and policy makers can harness existing DPI, build new open networks on top of existing DPI or use emerging technologies like the combination of beckn and Finternet to devise and swiftly implement climate solutions.

Open networks are a suitable modular paradigm for orchestrating coordination in climate action at a population scale.

Infrastructure-thinking
Solving future climate challenges requires shifting from solution-thinking to infrastructure-thinking. Infinite possibilities enabled by reconfigurable technological building blocks can empower us to tackle the unknowns of tomorrow.

Reducing coordination costs
Open networks dramatically reduce costs of coordination among stakeholders, leading to faster, more efficient climate solutions.

Exponential effects
Since climate change is an exponential problem, it demands exponential solutions. In an open network, as more nodes join, the potential for exponentially greater value and transformative change through new groupings grows. Therefore, open networks can be a great way to bring out domino effects and exponential change.

Higher equilibrium
Coordinating through open networks elevates the collective system –when we can coordinate, we all achieve a higher equilibrium. None of us can solve climate change on our own, and networks allow each of us to do one thing really well while contributing to large-scale coordinated change.

Adapting to local needs
Successful open network deployments must be designed for flexibility and adaptability to the needs of diverse users and contexts.

Contributors workshopped challenges and effective open-network solutions in smaller subnets with experts across 11 sustainability themes. Here are some emerging use cases of open networks

Universal digital language for energy
Using Unified Energy Interface (UEI), efficient, low-cost, high-trust energy transactions across the value chain can optimise resources and enhance grid resilience.

- This can facilitate peer-to-peer (P2P) energy trading and integrate Distributed Energy Resources (DERS) improving grid stability while optimizing energy consumption.
- Reducing friction among stakeholders through interoperable networks can create a seamless EV charging ecosystem that accelerates electric vehicle (EV) adoption.
- Demand flexibility: By simultaneously enabling inter-connection and decentralisation, open networks can enable flexible demand response in a cost-effective and sustainable manner.

Solving the problems of discovery and transactions for market-making

- Green hydrogen & carbon markets: A standardised marketplace for discoverability and trade of green hydrogen can make these emerging sectors more accessible and scalable.
- Battery recycling: The recycling value chain can be streamlined by reducing barriers to discovery and transactions between manufacturers and recyclers.
- Stubble to sustainable aviation fuel: Open networks can seamlessly connect fragmented stakeholders in the production chain from stubble to sustainable aviation fuel, reducing air pollution.

Open data for water and disaster management
Streamlined data collection and data sharing through open networks supports coordinated water conservation efforts and enables disaster

relief coordination through the national loss platform, improving response times and resource allocation.

Agriculture
Farmers benefit from market access and capacity building, as seen with Unified Agriculture Interface (UAI), which allows for seamless exchange of crop advice and equipment rentals through interoperable platforms and digitally verified transactions.

Accelerating e-bus transition
A cohesive open network framework built upon interoperability, standardisation and incentivisation can aid greater adoption and data-driven decision making in the mobility sector, which is currently too fragmented..

The way forward is collaborative

Venture and philanthropic capital
To drive innovation through open networks, venture capital must be complemented with philanthropic capital, ensuring that high-reward projects can be funded for long-term impact.

Collaboration
The success of open networks depends on effective collaboration among various stakeholders. Entrepreneurs, corporates, and government entities must align efforts to drive large-scale climate action.

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Plenary

Leaders from diverse sectors including Nandan Nilekani, Anjali Bansali, Dr. Pramod Varma, Akshima Ghate, Srikrishna Sridhar Murthy and others came together across two days of the event for insightful discussions about the intersections of climate action and open networks, exploring both opportunities and challenges.

Emerging trends in capital deployment, energy decentralization, and corporate priorities, combined with a maturing DPI landscape, create a strong foundation for open networks to drive effective climate action.

Capital

Capital deployment for climate action is driven by the urgent need to mobilize ~ 1 trillion USD to support net-zero transitions through innovative solutions.

Anjali Bansal, the founding partner of Avaana Climate And Sustainability Fund, highlighted the two massive investment opportunities that are emerging today: Artificial Intelligence (AI) and climate action. After defining climate action as activities for mitigation, adaptation and resilience to climate change, she argued that although there is sufficient global capital, the primary challenge lies in managing costs and building effective 'pipes', or pathways, for moving and allocating funds towards impactful solutions which demonstrate the potential for sustainable and scalable climate action. In addition, she emphasised that there is limited uptake of innovative financing models like blended finance, despite their potential for de-risking early-stage solutions. Nonetheless, she spotlighted blended finance – with patient philanthropic capital and government involvement – as essential to building pathways for investments.

Historically, government policies, like the Extended Producer Responsibility (EPR) for recycling, have catalysed industries to reach their sustainability goals. Similar regulatory frameworks have the ability to stimulate investments in sectors like water and biofuels. By acting as market enablers, governments can provide the necessary de-risking to attract commercial investment for innovative solutions deploying open networks and AI. For instance, solar power saw widespread adoption with the lowering of production costs, leading to scale and lower consumer prices through the national solar mission. The adoption of emerging sustainable solutions at scale could be driven by following a similar cost curve.

The Panchamrit model, India's pathway to net zero, emphasises the need for technology transfers from multiple nodes, as opposed to one-directional flows of technology. There is a need to move away from traditional linear models of technology and knowledge transfer from a single dominant source to passive recipients; in fact, solutions must be diverse, decentralized and affordable in order to further sustainability goals and global targets. Here, she highlighted the key opportunities for climate action through open networks.

> "About 1 trillion [US Dollars] is required to make the transition for developing countries over the next 10 to 15 years...which requires a blended finance model".
>
> - Anjali Bansal

Energy

The shift from centralized to decentralized energy highlights the need for technology like open networks to unlock its full potential while ensuring inclusion.

Akshima Ghate, Managing Director of Rocky Mountain Institute (RMI) India, outlined how the energy landscape is making a significant shift from a linear energy model. An increasing number of citizens are becoming both producers and consumers (prosumers) of electricity, establishing a decentralized model of energy production. This transformation is visible even in smaller towns, with the increased adoption of technologies like net metering and electric vehicles signaling a shift toward clean energy.

Although the per capita electricity consumption remains low at 1.3 MW, which is one-third of the global average, India is making strides with 450 GW of renewable energy installations and 150 GW of variable renewable capacity. By 2047, India's energy landscape is projected to expand 40-fold in solar and 20-fold in wind capacity. Additionally, driven by wider EV adoption and cooling requirements, energy demand is projected to increase. All these trends highlight the need to optimise the existing grid infrastructure and harness the potential of a decentralised ecosystem.

Akshima summarised that decentralization calls for technological innovation that can scale and support these emerging systems. As India moves towards ambitious goals, such as 40% electric vehicles by 2030 and significant green hydrogen production, the emphasis on interoperable, efficient systems becomes critical. Open networks and digital infrastructures, including unified smart grids and advanced grid management tools, can serve as the backbone of this transition, ensuring cost-effective and scalable solutions.

> "We have the opportunity to create much of our infrastructure, unlike the ? rest of the world, in a very different, and hopefully clean, way."
>
> - Akshima Ghate

Corporates

Corporates are increasingly prioritizing sustainability, driven by regulations, talent demands, and shifting stakeholder expectations.

Srikrishna Sridhar Murthy, Ceo of Sattva Consulting, spoke about environmental sustainability rapidly becoming one of the primary areas of corporate social responsibility (CSR) investment, with around USD 267 million annually dedicated to these initiatives in India, two-thirds of which come from the public sector. Besides the CSR framework, other policies like the Business Responsibility and Sustainability Reporting reporting framework (BRSR) in India, and similar policies worldwide, also push companies to not only allocate resources toward environmental sustainability, but also fund innovation and research towards lasting environmental and social impact. Notably, corporates are not just complying with mandates but are beginning to view sustainability as a strategic imperative.

> "Regulation has really pushed the corporate ecosystem to the next level. But regulation alone won't keep them there if it doesn't convert to value."
>
> - Srikrishna Sridhar Murthy

However, corporate sustainability is still in a 'stuck in the middle' phase. While strategic thinking around sustainability has progressed with the rise of serious intent, comprehensive adoption remains elusive. Srikrishna argued that corporates in India must integrate sustainability more seamlessly into their operations and design initiatives that are not only 'best in the world' but also 'best for the world.' With a growing CSR budget of around USD 2.5 million crore annually, corporates can

leverage the innovation ecosystem that presents unique opportunities for corporates to lead in sustainable solutions. Innovations like vegan eggs and advanced waste management can help meet sustainability goals. To unlock this potential, greater collaboration, funding, and ecosystem-building are essential. Aligning CSR capital, digital trust-based open networks, and material technology innovation enables companies to shift from merely complying with regulations to embedding sustainability into their business models, addressing global challenges, and leading in sustainable innovation for the Global South.

Digital Public Infrastructure

The maturity of Digital Public Infrastructure (DPI) will be key to developing and scaling solutions for climate action and sustainability.

The world has entered execution mode when it comes to efforts toward a low-carbon growth model, with expanding solar and wind energy and EV charging adoption. However, significant coordination gaps, such as grid integration issues, fragmented data systems, and limited resource circularity, are slowing the pace of climate action to dangerous levels. DPIs, like open networks, offer a way to bridge these gaps by enabling large-scale interactions – they have a proven record of solving coordination issues at scale and with speed in the past, as shown by the success of Adhar-based KYC, ONDC and UPI. These systems can create a unified network where every stakeholder—public or private—functions as a 'node,' driving exponential, high-value exchanges.

Nandan Nilekani, Co-Founder of FIDE, highlighted three ways by which coordination for climate action can be enabled: 1. harness existing DPIs; 2. create new digital infrastructures/open networks; and 3. utilise the interaction of Beckn and Finternet. He discussed how digital infrastructures, such as UEI, support decentralized energy production and distribution through micro-energy transactions paving the country's path towards a net-zero future. Open Networks can also enable the circular economy through agri-waste – such as creating aviation fuel from stubble – and build an interoperable grid for climate action – across, forest conservation, smart city planning, and so on. Nandan underscored the potential to repurpose existing systems for climate action. For example, India's GST network, which handles filings for over 12 million businesses, could be adapted to track carbon footprints, while the Direct Benefit Transfer (DBT) system could efficiently distribute climate subsidies. Finally, a new global infrastructure – built by combining existing market innovations, the beckn-enabled decentralized transaction network and the emerging decentralized asset network or the Finternet – can accelerate climate action by driving adoption of all the use-cases as a global scale.

Ankit Jain (StepChange) and Kuntal Shah (Deloitte) also highlighted how these techniques are already being used to create and scale solutions for sustainable growth, from building an open data grid for climate to facilitating the model of turning agriculture stubble into sustainable aviation fuel.

Open networks are on a path to establish an international sustainability model that has the potential to be both cost-efficient and inclusive.

Open network thinking is a crucial and evolving paradigm for the systematic and population scale impact required for climate action.

Open Networks are based on interoperability and decentralization. This means that they enable the unbundling of services and specialization to reduce reliance on specific platforms. This enhanced flexibility empowers sellers to access demand without platform dependency thereby building a more equitable and efficient ecosystem. Open Networks, unlike closed platforms, promote collaboration, innovation and inclusivity without compromising competitiveness. Beckn Node Zero 2024 highlighted the potential of open networks to enable climate action creating flywheel effects that balance economic and business growth.

Open Networks are based on infrastructural-thinking, and allow us to create present and unknown future climate solutions by reducing the cost of coordination

Dr. Pramod Varma, Chief Architect of Aadhar and the India Stack, explained that traditional economic growth models have failed to account for the value of natural resources. To develop sustainable solutions that prioritise ecological and social value along with economic gains there is a need for multi-stakeholder coordination to tackle the complex challenges of climate change. By enabling discovery, trust and coordinated action, open networks allow collaboration such that each stakeholder can contribute to larger solutions, creating pathways for innovation.

> "No single company can solve. No single government can solve. No single individual can solve. No NGO can solve. So then the question is who will solve?"
>
> - Pramod Varma

Open networks, built on open protocols such as the beckn protocol, foster network-driven thinking, and reduce the coordination costs associated with complex problems like climate change. By installing a user-centric, universal and unified approach into a high-trust, low-cost architecture, open networks enable collective action across sectors and scales. They democratise access, thereby empowering not only large companies, but also smaller businesses and individuals to build solutions for sustainable development. Similar to UPI, which rapidly expanded from a few users to hundreds of millions in a few years, open networks centred around people and small businesses can drive climate solutions at unprecedented scale.

Open networks provide the foundation for exponential solutions required to solve complex global challenges.

Sanjay Purohit, CEO And Chief Curator Of The Centre For Exponential Change, highlighted that open networks reduce coordination and trust-related costs, enabling interconnected networks to solve multi-dimensional challenges more effectively. There is a need to design networks that not only consume but also generate value. These networks create conditions that allow multiple self-organizing systems to emerge and compound their effects. This approach can help move beyond traditional hierarchical structures, enabling a more dynamic and responsive approach to systemic challenges.

Exponential change is at the core of this network approach, where small, strategic interventions can trigger significant transformations. Just as digital infrastructures like KYC and Digilocker have expanded economic access by reducing transaction costs, similar principles can be applied to climate action and other multi-dimensional challenges. The goal is to create a 'flywheel effect' where each network node not only contributes but also amplifies the potential of others. By aligning economic incentives with sustainability and creating environments that support diverse, simultaneous initiatives, open networks could potentially orchestrate the kind of systemic, non-linear transformation needed to address planetary-scale issues more effectively than traditional, siloed approaches.

> "We have no option but to find an exponential response to an exponential problem, because the problem is not linear."
>
> - Sanjay Purohit

Open networks redefine solutions for complex climate and sustainability challenges by enabling a humanity-centric design approach.

Traditional systems often focus on isolated, industry-specific needs, while a humanity-centric design takes into account the broader impact on communities, ecosystems, and the future of our planet. Sujith Nair, CEO And Co-Founder Of FIDE, discussed how open networks create a space where multiple stakeholders can collaborate to build towards shared climate goals.

One example of this collaborative approach is the recent participation of around 50 Farmer Producer Organizations (FPOS), innovators, academics, and investors in an open network for agriculture, empowering communities to address local sustainability issues with the support of global expertise and resources. Similarly, Namma Yatri was developed by Bengaluru's Auto Rickshaw Drivers' Union (ARDU) as a direct-to-driver application on an open mobility platform.

Open networks dramatically reduce coordination challenges by creating clear and open channels for communication and collaboration.

Open networks ensure that stakeholders all have the same information by breaking down barriers impeding collaboration. The event facilitated an 'open network game' to viscerally demonstrate this core principle.

The game revealed how open networks can elevate a fragmented system to a higher equilibrium, allowing more participants to win. In the early rounds, participants struggled with inefficiencies caused by unclear roles, misaligned incentives, and information asymmetry. As the rounds progressed, introducing clearer rules and shared protocols demonstrated that collective action thrives when transparency and alignment replace chaos. Each node's contributions became more coordinated, allowing the network to operate as a unified whole.

Key learnings centered on the interplay of roles, incentives, and clarity. The transition to smoother operations occurred when participants understood their tasks and acted with shared purpose. By reducing confusion through visible cues like color codes and fostering alignment between stakeholders, the system became significantly more efficient. This underscored the transformative power of clear communication and shared frameworks in achieving progress, even in complex networks.

> "This idea of coordination itself, this connecting glue between various complex sytems itself, requires a systematic thinking
>
> - Sujith Nair

Rather than aiming for an ideal state in one leap, the game illustrated the importance of moving incrementally between equilibriums. Each adjustment—whether in policies, signals, or incentives—strengthened the network's capacity to collaborate effectively. This progression not only enhanced immediate outcomes but also provided a blueprint for sustainable improvement on a larger scale.

Despite their promise for addressing complex societal challenges, open networks have a number of open challenges.

While open networks hold immense promise for addressing societal challenges, several hurdles remain to be tackled. One key issue is the gap between the vision of reduced coordination costs and the reality of high onboarding expenses, often driven by digital literacy barriers and cultural resistance. Overcoming these challenges requires significant effort to ensure inclusivity and meaningful participation, especially in contexts where communities lack technical readiness.

Open networks also face the risk of unintentionally widening inequities if not designed with care. Marginalized populations, such as rural communities or individuals with disabilities, can be left behind without deliberate safeguards. Addressing these gaps demands an inclusive approach that meets people where they are, rather than assuming uniform readiness or access. The examples of Namma Yatri, which is designed to address needs of individuals with disabilities, as well as the involvement of farmers in the development of UAI, prove that it is possible to design more inclusive open networks and their applications all while empowering marginalized communities through technical, community-driven solutions.

> "If you look at a country like India, we're talking about a country of 1.4 Billion people. So there is a diversity of problems unknown, and the kind of solutions required to solve them in their own context are unknown."
>
> - Sanjay Purohit

> "...How do you continuously... Recalibrate and readjust to a better equilibrium. That's what we did with the three games (sic). Every round we recalibrated, readjusted to go to a better equilibrium."
>
> - Pramod Varma

Finally, effective governance and accountability are critical for realizing the full potential of open networks. Clear ownership structures and robust safeguards are essential to manage high-stakes domains like public health, where system failures can have far-reaching consequences. By prioritizing resilience, stress-testing, and inclusive frameworks, open networks can better navigate these challenges while driving equitable and sustainable outcomes

In order to address these varied challenges, there is a need to design flexible and adaptable open networks that can recognize and incorporate the nuances of local contexts and user-specific needs.

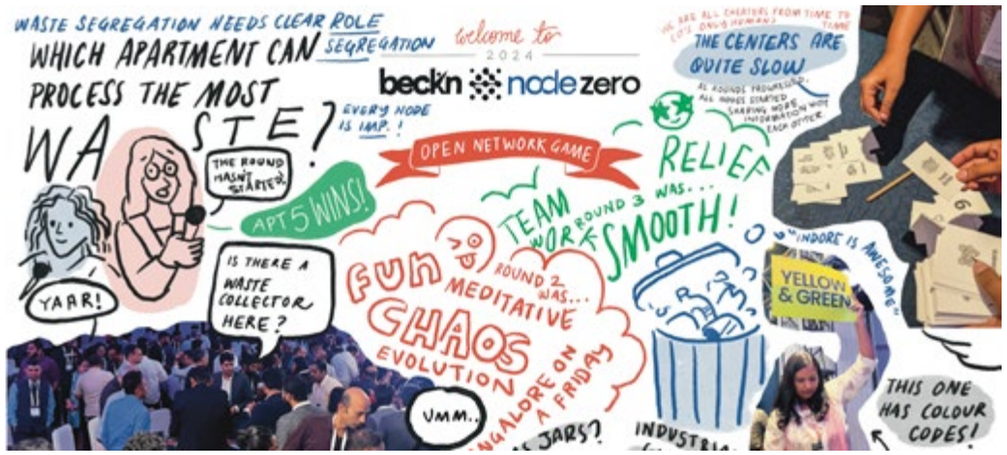


Fig. 01: The open network game simulated waste management scenario to demonstrate the challenge of coordination and value of open networks. Source: Illustrated live by noteworthy at BNZ, 2024.

Workshops

The plenary at Beckn node zero observed important broad trends, but much time was spent brainstorming the potential of open networks and identifying new use-cases and areas for collaboration in focused group workshops. We invited implementors and experts from varied fields to lead 11 working groups across 7 sustainability themes. Led by these ‘catalyst nodes’, the workshops engaged participants from a variety of backgrounds in close-knit conversations, each bringing their domain-specific expertise to generate innovative strategies, entry-points and actionable solutions in partnership with others. The following pages in this document record the key insights from these workshops.

Energy

Open networks enable peer-to-peer (P2P) energy trading to enhance grid stability while empowering energy producers and consumers

Arshi Chadha
Trillectric

Mohit Sethi
Krypc

Overview

The world is witnessing an increase in decentralized energy production driven by the push for solar energy production and the widespread installation of solar panels. Simultaneously, consumption of electricity has also increased, with growing EV adoption adding pressure to the existing grid infrastructure. However, due to the highly disaggregated energy production market, there is a lack of discoverability which results in underutilisation of renewable energy. There is poor coordination among all market players, with each operating in silos, leading to increased transaction costs and overall inefficiencies.

Open network *use case*

In order to ensure grid stability by empowering energy producers and consumers, a decentralized energy system is required. Open networks can enable decentralization through the peer-to-peer energy trading model where consumers and prosumers can sell energy directly to each other without an intermediary, at an agreed price. With this model, consumers can potentially buy or sell at better prices and utilities also have access to the network, giving them a share of the revenue.

An application of the model is in the **green EV charging ecosystem** where EV owners can be connected with green energy sources directly through P2P platforms. In order to do that, and for a more efficient integration of renewable energy with the grid, there is a need for predictability of the grid demand to ensure stable supply. The existing EV charging ecosystem through the open network can help with designing heat maps to highlight high-density areas with high energy demand. Additional EV charging sections may be deployed here to support the demand and also allow predictability for the grid. Consumers will also be able to track their energy costs easily and choose where their energy comes from, increasing renewable energy adoption. Furthermore, the grid can incentivise consumers' access to distributed energy, during peak demand periods, in order to enhance grid stability.

Alternatively, **P2P trading can also be utilised in residential commercial trading between homes with solar panels and other homes** and businesses without solar panels. This model creates financial incentives for consumers to save electricity and prosumers to profit off their surplus energy trading. By allowing consumers to trade in energy, such an open-network enabled market enhances the use of the existing physical renewable infrastructure and encourages greater investment in home-renewable infrastructure.

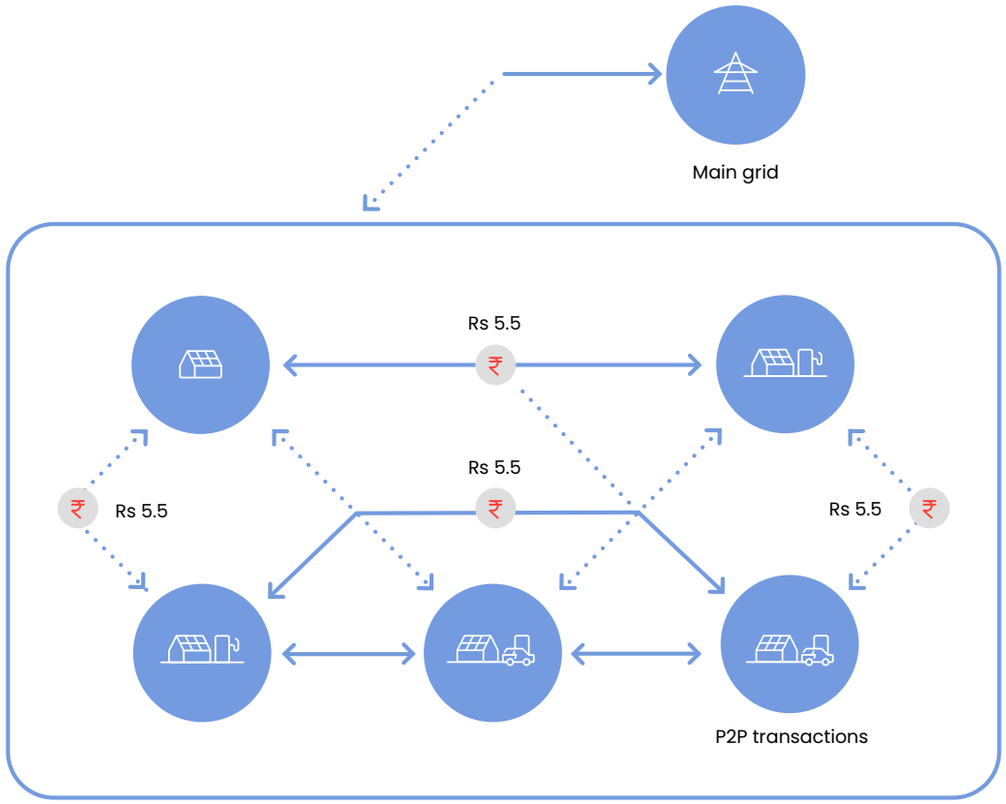


Fig. 02: Interoperable open networks enable coordination among system operators, consumers and prosumers. Source: Trillectric, 2024.

Way *forward*

1. **Design and deploy pilots** for P2P open networks in states where policies for P2P energy trading exist, such as Karnataka, Delhi and Uttar Pradesh.

2. **Collaborate with grid operators** to identify, design, and develop peer-to-peer (P2P) use cases for smart grid infrastructure.

3. **Mobilize capital** for platform developers and pilot projects to facilitate innovation and market entry in P2P energy trading.

Grid resilience

Open networks can be integrated with Distributed Energy Resources (DER) to optimise energy consumption and provide grid stability

Praphul Chandra
Atria University

Abhishek Padmanabhan
Atria University

Overview

The energy sector is facing an 'energy trillemma' as it attempts to strike a balance between environmental sustainability, energy equity and energy security. There are two main options to solve this 'trilemma': 1. Interconnection, which advocates for large-scale grids and, 2. Decentralisation, which focuses on smaller contained energy systems designed to handle local needs.

The decentralized approach can be implemented through Distributed Energy Resource (DER) systems that operate close to the consumer and are connected to distributed networks, providing flexibility and supporting the grid's stability. These include distributed solar (rooftop solar panels), distributed storage (home UPS systems), micro-grids, demand response and energy efficiency programs and evs as mobile energy sources. DER systems have the potential to reduce the grid's peak load and the reliance on fossil fuels. However, distribution companies are often resistant to adopt solar power into the grid as it may affect grid activities. This makes it challenging to integrate DER systems into the grid. From a regulatory standpoint, government subsidies for installing solar panels are often based on the potential energy generation capacity and not on the actual role of DERs in the grid, leading to underutilised green energy resources.

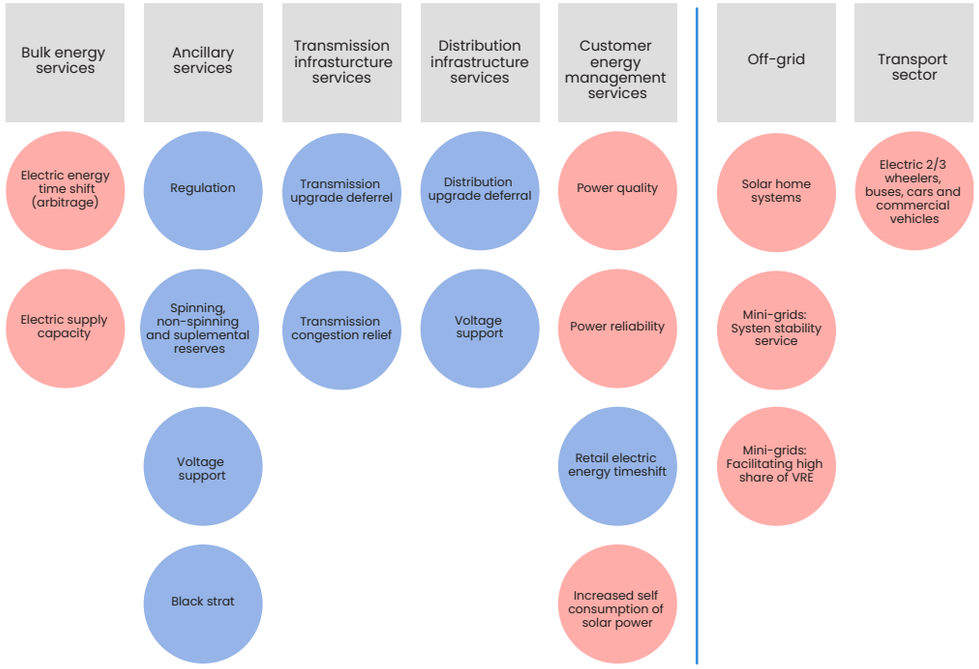


Fig. 03: DERs offer multiple services through the integration of variable renewable energy on the grid.Source, Atria University, 2024.

Open network *use case*

Open networks can help address the energy trilemma by allowing us to combine the interconnection approach with the decentralisation approach. By ensuring interoperability, open networks enable real-time visibility and bidirectional flow control between DERs and utilities, providing grid efficiency and overcoming some of the challenges to greater integration of decentralisation DER systems.

One such open network, the Unified Energy Interface (UEI) allows different energy entities to interact seamlessly. This open network enables energy discovery, coordination, and transactions among disparate participants, benefitting stakeholders across the value chain. Grid operators are able to access up-to-date information on energy production and consumption, while coordinating with market aggregators for efficient dispatch and management of DERS.

Consequently, there are multiple use cases that can be unlocked using DERs to power various utilities with a mix of solar, wind or grid power.

- **Peer-to-peer transactions** can be facilitated between two solar-panel integrated buyer and seller apps over UEI.
- Similarly, **farms producing solar energy can utilise UEI** to transfer their excess solar energy and power to a local data warehouse storing agricultural data, providing real-time analysis to farmers regarding their crops.
- The excess energy produced can also be **stored as backup and distributed in times of distress**, using DER and open protocols to facilitate the transaction.

Way *forward*

Implementing DER systems through open networks requires regulatory, technological and economic action.

1. **Advocate for comprehensive policies** that prioritise decentralisation, create mechanisms for transparent governance, and establish clear guidelines for DER system integration and market participation.

2. **Implement distributed ledger technologies (DLT) and open network architectures** that enable secure digital transactions, provide proof-of-delivery, and facilitate transparent data exchange between market participants.

3. **Establish oversight mechanisms** that prevent price manipulation, ensure fair pricing and provide grid operators with transparent access to transaction data to maintain market integrity and accountability.

Green mobility

By reducing coordination costs among stakeholders, open networks can enable a seamless and interoperable EV charging ecosystem

Akhil J.P
Pulse Energy

Overview

The global electric vehicle (EV) ecosystem is deeply fragmented, with incompatible charging networks, inconsistent payment systems, and limited interoperability among different charging point operators (CPOS). These infrastructure challenges limit widespread adoption of sustainable mobility options, such as EVs. The world requires approximately 2 billion vehicles by 2050 to achieve net-zero emissions, yet current global electric vehicle penetration stands at merely 14 million vehicles. Siloed and fragmented energy systems, which prevent seamless integration of renewable energy, create an inefficient charging experience and hinder the potential for a scalable sustainable mobility solution.

Open network *use case*

Open networks such as the Unified Energy Interface (UEI), built on the beckn protocol, address these systemic challenges by creating an open, interconnected network for EV charging and energy management. By facilitating interoperability of charging networks, it enables easier charger discovery and streamlined payments between users and CPOS. With a UEI integrated charging system, the user experience for EV adopters and charger utilization for CPOS is improved. The open network enables easy communication between operators, users, and energy providers and reduces coordination costs. Additionally, it has an existing standardized dispute resolution and payment reconciliation process which makes the entire order fulfillment process seamless. UEI has the potential to unlock energy democratization at scale with interconnected energy systems that enable use-cases related to energy storage systems (ESS) and charging solutions with renewable energy.

Way *forward*

1. **Collaborate with stakeholders in the Electric Vehicle charging ecosystem**, such as EV fleet operators, to understand business requirements for UEI to facilitate discovery of charging points.

2. **Identify use-cases and design pilots** for charging-plus use-cases to unlock value for large market shifters, such as greening of the existing EV charging ecosystem.

3. **Drive adoption of EV charging through UEI** by increasing transactions beyond pilots in real-production environments with focus on reducing charging costs, developing transparent settlement mechanisms and creating platforms to accommodate broader energy management needs.

Renewable energy

Open networks can be used to create a standardised marketplace for discoverability and trade of green hydrogen

Sumit Choudhury
Green Earthx

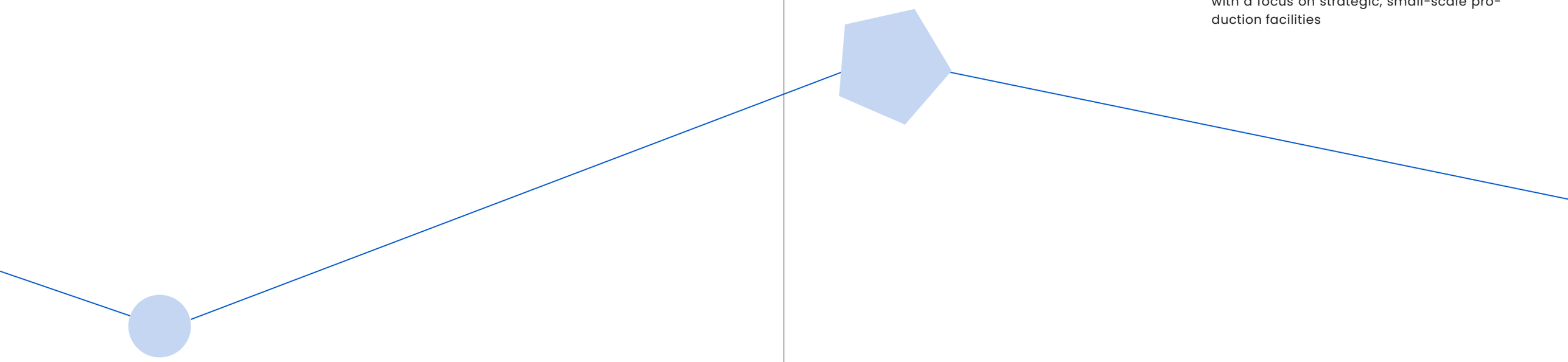
Overview

As energy demand rises, green hydrogen offers a sustainable solution that promotes energy independence, helping nations achieve renewable energy targets while reducing reliance on traditional energy sources. India's green hydrogen market is projected to be worth USD 8 billion by 2030 and USD 340 billion by 2050. However, significant technological and economic barriers arising in hydrogen storage and transportation impede widespread adoption. Fragmented demand and isolated systems among countries have created gaps between physical hydrogen production and digital transaction capabilities. Gaps in unified platforms for hydrogen credit trading and comprehensive tracking mechanisms create market information asymmetry and a lack of certified green products. Consequent uncertainty for investors and industrial consumers exacerbate regulatory barriers that limit scalability in the green hydrogen market.

Open network *use case*

The development of a green hydrogen ecosystem using open networks and establishing frameworks for global hydrogen trade and certification can boost not just the hydrogen sector but also the energy and finance sectors. Through mechanisms like the 'Hydrogen Passport', such an open network can provide verifiable tracking of the hydrogen's origin, purity and production methodology, facilitating transparent and trustworthy transactions.

This approach enables international trade without the physical movement of hydrogen molecules but with tokenized assets, optimising logistics and addressing the current shortage of transport resources. Creating a global digital grid enables green hydrogen certificates to be stored, verified and traded seamlessly across borders. Introducing tokenised assets, including ships, production facilities and fuel certifications allows for the trading of fractional ownership in these assets, making investment more accessible and the market more liquid. With green hydrogen at the forefront, this grid can expand to accommodate other renewable sources in the future.



Way *forward*

Accelerating green hydrogen adoption demands a multi-faceted strategy that combines technological innovation, policy support and innovative market mechanisms.

1. Drive **ecosystem development** through continuous research and technological advancements in hydrogen production, transportation, and certification processes **for** building a business use-case.

2. Advocate for comprehensive **government support mechanisms**, including production subsidies, tax credits, and targeted incentives, that reduce investment risks and encourage green hydrogen technology adoption.

3. Co-create innovative **financial and market mechanisms** that incentivise producers, investors, and industrial consumers to invest in and adopt green hydrogen technologies, with a focus on strategic, small-scale production facilities

Grid resilience

Demand flexibility through open networks can help meet india's growing energy demand in a cost-effective and sustainable manner

Dhruvak Aggarwal
Council for Energy, Environment and Water (CEEW)

Overview

Peak electricity load around the world has increased; for instance, India's peak load has increased with a CAGR of 7.2% From 2021. The major driver of day peak demand is the industrial sector with a projected growth from ~40% to ~60% in total electricity demand by 2030. Conversely, the evening/night peak demand is driven by residential space cooling which is projected to contribute up to 20% of summer peak demand in 2030 with the increasing penetration of air-conditioners. Demand flexibility – the ability to adjust consumer's load (or energy usage) through price signals – is a cost-effective means to meet the world's growing energy demand. By implementing demand response mechanisms, system costs are predicted to reduce by INR 0.06 Per unit saving inr 14,000 crore totally by 2030. Automated Demand Response (ADR) provides higher reliability compared to manual Demand Response (DR) measures, especially for larger commercial and industrial users with significant peak-demand reduction potential and existing building or energy management systems. The most significant barriers to ADR adoption are the lack of interoperability among appliances, building-level energy management systems, and DISCOM IT systems, along with the absence of standard communication protocols.

Open network *use case*

Open networks such as the Unified Energy Interface (UEI) can facilitate direct load controls by enabling easy interactions between DISCOMS, Building Management Systems (BMS), DR management systems and appliance controls. By ensuring interoperability among the systems, open networks can drive ADR adoption at scale across commercial and residential spaces. A case in point is California, in the U.S.A., Where a data and communication infrastructure for demand response has been established among load-serving entities, aggregators, and consumers using publicly accessible APIS and open network protocols.

In the Indian context, areas where smart appliances have already been installed can be starting points for deploying pilot programs. There is also a need for identifying key incentives for stakeholders to participate in DR programs and for designing grievance addressal mechanisms. ADR programs in India have the potential to build a resilient and reliable grid infrastructure which can be driven by creating a market for demand flexibility through open networks.

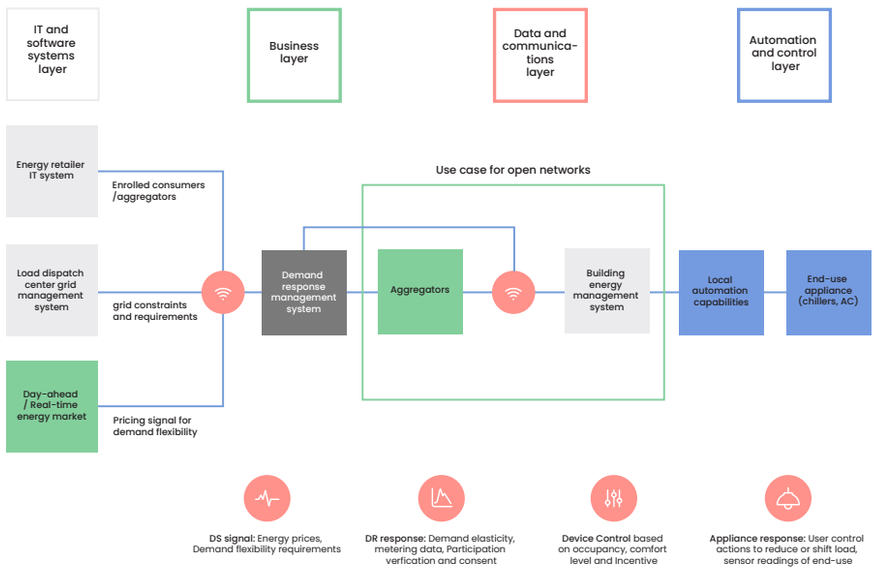


Fig. 04: Open Networks can drive ADR adoption by enabling interoperability. Source: CEEW, 2024.

Way *forward*

Integrating DR with open networks is a powerful step, but unlocking its full potential requires supportive policy enablement to scale its impact.

1. **Identify and develop high-potential pilot programs** in commercial cooling spaces, such as airports, malls and underground metro stations, along with data centres, software technology IT parks and malls; acknowledging regulatory gaps, the pilot can focus on a simple communication between the EMS and the DISCOM to participate in an DR program thereby creating a baseline for potential aggregate demand.

2. **Collaborate with policymakers to advocate for comprehensive regulatory mechanisms** that incorporate strategic initiatives, compliance penalties, and verification processes to drive effective consumer participation and program implementation.

3. **Conduct in-depth research** to identify incentive structures and technology upgrades required to encourage participation from stakeholders in adoption of ADR use-cases.

Climate finance

Venture capital must be supplemented by philanthropic capital to fund innovation through open networks

Susmit Patodia
Antler

Overview

Digital infrastructure development for open networks faces capital challenges for two key reasons: 1. Protocols don't create intrinsic economic value, it's the innovations built on top of them that do; 2. Returns on protocol investment grow exponentially – they are low in the short term, but really high in the long term. This dynamic makes it difficult for traditional venture capital to fully address the funding needs. The adoption of protocols faces investment challenges due to high capital requirements without immediate profitability. For instance, the development of UPI required over USD 11 million in investment before achieving today's successes. Venture capitalists often prioritise platforms over protocols due to higher immediate return on investment, highlighting the need for a hybrid approach to sufficiently support the development of open networks.

Need for funding *open networks*

There is immense potential in funding open networks for innovation which is fundamental for creating large-scale economic and social impact. An example of this is Antler's investment in Namma Yatri, a mobility company working with the open beckn protocol. Through its model of charging auto riders a nominal subscription fee rather than taking per-ride-commissions, it has crossed USD 10 billion in driver earnings. Using the open protocol model, Namma Yatri became the only mobility company to have achieved profitability in the first country it launched in. By reducing the work required by the drivers, it has also shown reduced carbon emission levels in contrast to other mobility platforms.

Platforms solve for high-cost access but protocols solve for low-cost access, making them key in addressing India's largest friction which is cost.

These solutions may appear inefficient at small scales but become optimal at large scales as seen in the example of Fastag's usage. Although only 3% of Indian roads are tolled, over 100 million FastTags have been adopted, demonstrating how cost reduction drives adoption. Similarly, there are many promising open network use cases in e-commerce, farm-to-folk products, energy, circular economy and others that can amplify access, but will need the 5cs for gaining the necessary capital.

Way *forward*

Success in scaling these open network solutions requires a structured approach incorporating venture capital supported by philanthropic capital. Antler and beckn have created a 5c framework for successful adoption of any protocol. These 5cs are:

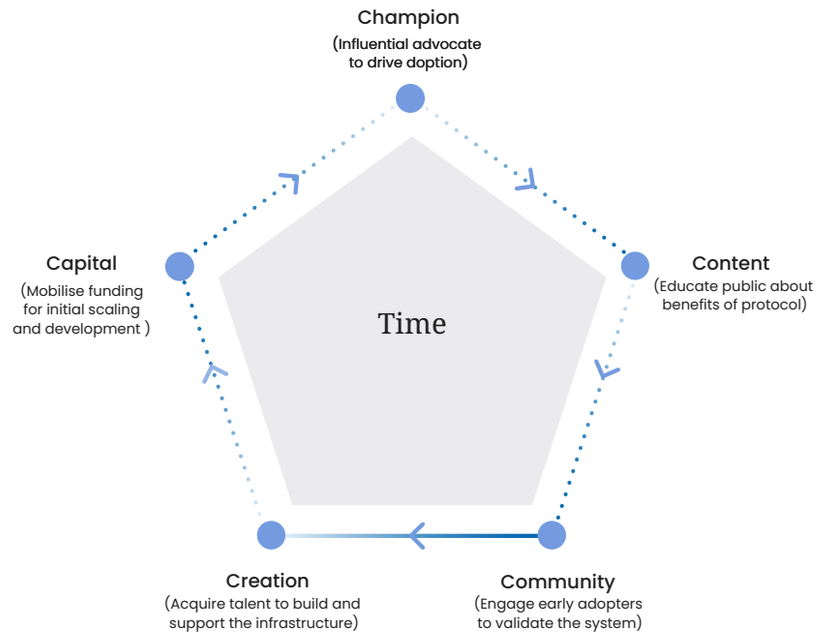


Fig. 05: The 5c protocol for successful adoption of an open protocol.
Source: Antler, 2024.

1. **Influence philanthropic/CSR capital** to fund high risk pilots and use-cases to demonstrate proof-of-concept and build the ecosystem around a DPI.

2. Design business models that **create value through auxiliary services** and ecosystem development (such as PhonePe's model which successfully monetised itself while utilising the free UPI protocol), demonstrating how platforms can generate economic benefits.

3. **Support DPI alliances to demonstrate use-cases** and develop proof-of-concept to build the ecosystem.

4. **Capture and document business and economic value unlocked** across pilots to make investment thesis for VCs and private equity capital.

Green mobility

Open networks bridge the fragmented bus ecosystem, enabling data-driven decision making for accelerating electric bus transition

Avinash Dubedi
World Resources Institute (WRI), India

Overview

India operates the third-largest bus fleet in the world with ~2 million buses serving as the primary form of public transportation. As part of its efforts towards net zero emissions, India has committed to electrifying 800,000 buses by 2030. However, the existing Indian mobility ecosystem faces significant challenges due to fragmentation across many small players, limiting efficiency and scalability. Over 50,000 crore rupees have been allotted to the sector, resulting in little value added and unreliable operational data capture. Currently, issues in bus discovery and utilisation hamper efficient fleet use, due to absence of data standards and limited observability of information. To achieve the established targets, India will require a decentralised approach leveraging technology and broader stakeholder involvement.

Open network *use case*

To address the rapidly evolving landscape of EVs and the integration of public transportation systems in urban areas, a cohesive framework built upon interoperability, standardisation and incentivisation is essential. This approach has the potential to create a more connected, sustainable and efficient mobility ecosystem. Innovators can build scalable solutions for various use cases, including vehicle health, battery health, energy management, workforce registries, and ticketing and beyond.

One such use-case is a **standardised ticketing and tracking system** to allow passengers to move seamlessly across various modes of transport. By introducing a National Common Mobility Card (NCMC), passengers could pay for all transit modes with a single card, enhancing convenience and promoting the use of public transport.Vehicle and battery health can also be monitored using a **'battery passport'** which is a digital record of a battery's history, performance and lifecycle. Using this data allows fleet operators to assess the safety and sustainability of the battery. **A discoverability framework for fleet tracking** and platform-agnostic data sharing can help service providers reach new audiences. Lastly, trust can be fostered by ensuring data privacy and security through blockchain-backed platforms, promoting a trusted system users and operators alike.

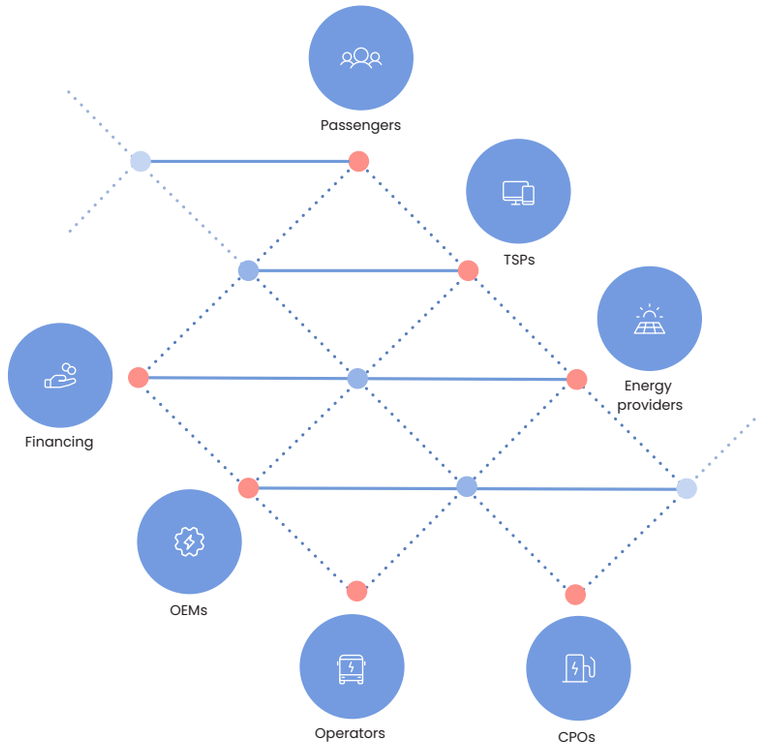


Fig. 06: A unified landscape for buses highlights the potential for scalable solutions through foundational building blocks. Source: WRI, 2024.

Way *forward*

To integrate open networks into e-bus ecosystem, a collaborative, multi-stakeholder approach is essential.

1. **Design common standards** for ticketing, battery health reporting, and tracking mechanisms with unified protocols for e-bus ecosystem interactions, while maintaining space for innovation and technological flexibility.

2. **Establish cross-sector platforms** (such as alliances and collaboratives) to facilitate knowledge-sharing, collective problem-solving, and partnership building among governments, private players, industry experts and academic institutions.

3. **Collaborate with policymakers** to design comprehensive policy and financial frameworks that incentivize responsible procurement, battery sustainability, data sharing, and ecosystem-wide innovation in public transportation infrastructure.

Climate finance

Open networks can empower farmers by providing market access and capacity building for increased agricultural productivity

Venky Ramachandran and Ketav Mehta
Unified Agricultural Interface (UAI)

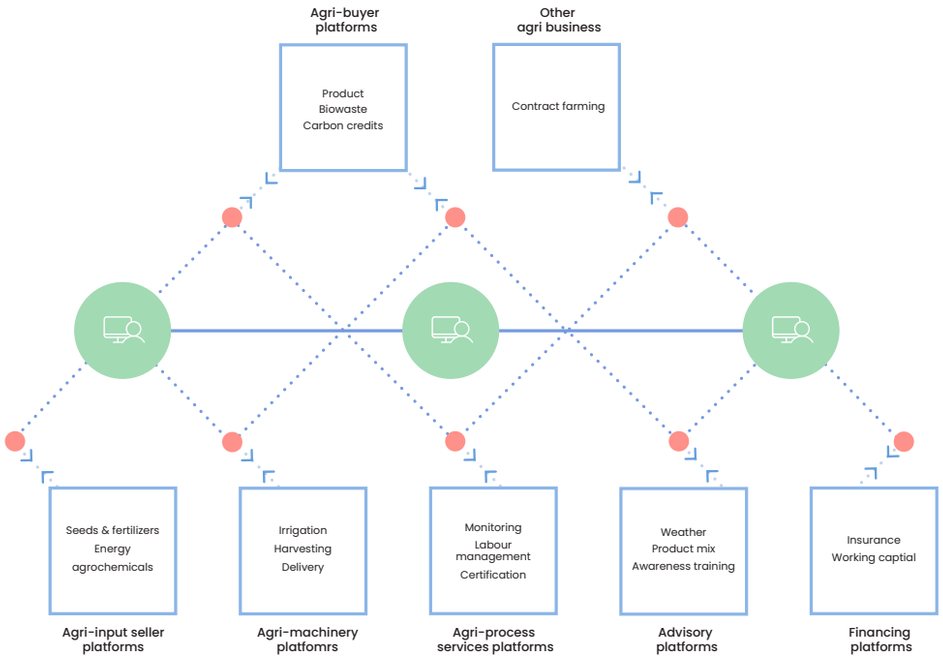
Overview

India's agricultural sector employs 45.5% Of the workforce and contributes 13.5% Of GDP , yet farmer incomes remain low, with households earning an average of just 10,218 rupees monthly . Farmers are faced with high input costs and exploitative practices, reducing their profitability while limited technology adoption and weak infrastructure restrict the sector's potential for growth. Farmers often depend on 5–6 intermediaries who bridge access and risk gaps, creating fragmented supply chains and a lack of long-term solutions. Trust issues between farmers and innovators slow down technology uptake, leaving many farmers unable to benefit from advancements that could improve their productivity and income. Additionally, the agricultural sector is hampered by redundant data collection, where each service provider gathers similar information on farmer profiles, land ownership and crop quality.

Open network *use case*

Introducing open networks into agriculture could address these inefficiencies, bringing transparency and efficiency to farmers and service providers alike. Through this network, farmers can access government-held agricultural data and national and other local agricultural networks through open networks, allowing them to make informed decisions and enhancing supply chain transparency. Through this network, service providers are also able to access a wider set of farmers, improve customer retention and reduce service costs.

An example of applying open networks in agriculture is FIDE's pilot in Nashik involving 55,000 farmers across 50+ Farmer Producer Organisations (FPOS) that have used open networks for farmers to enable market access and price discovery, freely accessing advisory and equipment rentals, among others. The pilot was envisioned to be a community-led project using open networks to provide technology-driven support with knowledge workshops and skill development for the farmers. Through whatsapp groups and the support of FPOS, the farmers were connected for real-time support and to facilitate organised engagement and resource access. This successful community-led initiative demonstrated how open networks can create more efficient, transparent and profitable agricultural practices.



Farmer platforms (BAP)

Apps used by farmers to **access all services**
Can be **multiple**
Could be **service providers' app** or any other deducated app

Benefits to farmers

Access multiple services from all providers
using an **app of their choice** (e.g. Whatsapp

Service provider platfomrs (BPP)

Backend, not customer facing
Provides services **via BAP platforms**

Benefits to service providers (Can be *BAP, BPP* or both

Access wider set of farmers on network
Improve **customer retention** by providing more services through own platform without loss of proprietary data

Fig 07: An open network for agriculture can create value for all stakeholders by putting farmers at the centre. Source: UAI, 2024.

Way *forward*

1. **Design open network models** that can reduce the farmers' dependency on traditional metids by simplifying access to information and providing capacity building tools.

2. **Implement community-led pilot programs** build upon existing successful pilots like FIDE, to scale open network approaches for agricultural sector development.

3. **Create investment & collaboration strategies** that bring together multiple stakeholders to support low-cost, farmer-centered network solutions efficiently.

Water

Water conservation efforts require streamlined data collection and collaboration through open networks

Aarti Mohan and Debaranjan Pujahari
Sattva Consulting

Overview

The water crisis is only next to the job crisis as a key challenge in India and there is a need to solve it at a population scale. Growing projections indicate the increasing water supply and demand gap, with water demand being 101% higher by 2030. Multiple initiatives are being implemented to conserve water including efforts to enrich ground and surface water, improve on-farm efficiency, reduce industrial usage of water and improve productivity per unit of water. These initiatives, although beneficial for water conservation, are siloed efforts without collaboration across stakeholders in the same water basin resulting in limited scalability and impact. A critical gap in current water management is the lack of accurate, real-time data as existing water reports are often outdated and fragmented across many stakeholders without coordination. Existing water data is used mainly by academia, researchers, and policy makers, with limited accessibility, usability or value added for local communities, frontline workers, and non-government stakeholders. Without a clear framework or incentive, stakeholders like industries and farmers are less inclined to provide accurate and timely water data. Coordinated, precise data is essential for informed decision making at critical points to ensure water conservation and improve productivity per unit of water.

Open network *use case*

However, water data collection suffers from inconsistent methodologies, fragmented standards and formats, and poor accessibility. An open network designed to support corporate water stewardship focused on operational data standardisation, establishing a common vocabulary and basin-level applications, such as supply-demand management and farmer advisories, is the need of the hour.

This can facilitate data democratisation, providing a single platform for community, industrial, and governmental data to coexist. Through crowdsourcing or local data collection methods, granular level data can be accumulated at the basin level. Community monitoring tools like the Jaldoot mobile app enable citizens to contribute groundwater data and could be expanded nationwide. At a regional level, basin-level collaboration would allow stakeholders with overlapping interests to coordinate their water use and mitigate conflicting resource demands. Corporate accountability could also be enhanced by encouraging industrial zones to share data, promoting sustainable water management. Using high-resolution drone imagery to provide detailed data on resource conditions offers significant value for various services, such as crop insurance, water resource assessment, and ecological monitoring.

Fig. 08: An open data water highway can create an ecosystem-wide access to water data to inform decision-makers for water conservation. Source: Sattva Consulting, 2024.

Way *forward*

1. **Develop comprehensive partnership frameworks** that integrate community organisations, industry representatives, and local governance to create robust incentive structures for water data sharing and management.

2. **Establish cross-regional and cross-state data sharing mechanisms**, particularly in water-sharing regions, to bridge existing management gaps and promote comprehensive water resource collaboration.

3. **Create strategic partnerships with technology providers** to enhance data collection accuracy, verification and public accessibility, addressing current fragmentation in water data management.

4. **Create a framework to understand and address stakeholder motivations**, risks, and potential benefits of data sharing, with a specific focus on solving critical water sector challenges and pain points.

Circular economy

Open networks can play a role in enabling shared economic value for key stakeholders to make battery information transparent and traceable, thereby driving a circular value chain

Puja Jain
ElementRe

Overview

India's rapid transition to renewable energy, driven by increasing demand for energy storage systems (ESS) and electric vehicles (EVS), is poised to generate a significant volume of end-of-life batteries. With an annual waste generation of 750–800 million tons, and less than 30% being sustainably recycled ,India faces a pressing challenge in managing battery waste effectively. Despite government regulations like the battery waste management rules and Extended Producer Responsibility (EPR) for key waste streams, a substantial portion of battery waste still ends up in the unorganised sector. This raises concerns about environmental impact, resource recovery, and compliance with global standards. Historically, India has a poor record of waste management in other sectors, including plastics, construction and automotive materials, crop residue and textiles, relative to global benchmarks. Traditional efforts for managing waste have led to poor outcomes implying the same trajectory for battery waste. Therefore, there is a need for a radically different approach to address this problem.
Globally, solutions such as the EU's 'battery passport' emphasizes data transparency, traceability, and standardization to support circular economies., India faces challenges such as fragmented recycling networks, reverse logistics inefficiencies, and lack of an enabling ecosystem, which affect dismantling and recycling processes. To address these issues, the battery circularity workshop discussed the need to develop a robust and sustainable battery recycling ecosystem that can efficiently recover valuable materials, minimise environmental harm, and create economic opportunities.

Open network *use case*

Open networks can significantly enhance the battery value chain by addressing key challenges related to discovery and transaction. They can address the existing problem in the value chain of data-sharing by oems that can make battery information available to allow recyclers to optimise and downstream participants to benefit from transactions. Open networks enable OEMs to meet their ERP requirements and at the same time allow the disposal of used batteries in a cost effective and scalable manner. Use cases that incentivize sharing of battery information through open networks will help in building the ecosystem.

Key use cases include: **An EV resellers platform -** sellers have an incentive to provide battery information to remove the information asymmetry for reselling.

A network of battery information users and providers can be created. OEMs and EV owners can get more value for their battery while recyclers can access information about the battery that allows them to optimize their work. Additional players such as insurance underwriters that provide discounted premiums for recycling can provide a further push.

Certificate trading network- given that OEMs have to meet EPR requirements, issuing verifiable EPR credits and certificates by authorized recyclers will help in regulatory compliance and recycling efficiency, creating a functional market in the long run.

Way *forward*

1. **Facilitating policy advocacy for battery data standardization and sharing:** Conduct targeted policy advocacy to establish standardized protocols for battery data collection, storage and sharing across the value chain. This included leveraging global best practices, such as the EU's battery passport, to enhance traceability and regulatory compliance in India's ecosystem.

2. **Establishing a coalition of recyclers and service providers:** Create a collaborative network of recyclers and service providers to offer integrated lifecycle management solutions to OEMs, EV companies, and fleet operators. By adopting an open network, the coalition will enable seamless market discovery, transaction efficiency, and transparent stakeholder engagement.

3. **Engaging upstream participants for supply chain transparency:** Engage with upstream stakeholders, including battery manufacturers and suppliers, to identify pain points and design incentive mechanisms for transparent and traceable supply chains.

Disaster management

National loss platform can drive coordinated disaster prevention & relief actions by facilitating information flows among key participants

Manu Gupta
SEEDS

Overview

India faced an onslaught of extreme weather events in the first nine months of 2023, with 235 out of 273 days (86% of the days) marked by such occurrences. These climatic disruptions have had a devastating impact on communities, leading to the loss of 2,923 lives, damage to over 80,000 homes, and the destruction of nearly 1.84 Million hectares of crops. While states have increased their disaster spending, a significant portion of these funds is allocated to post-disaster relief & still less than 20% of the annual disaster investment is towards adaptation or preparedness. This reactive approach hampers long-term recovery efforts; a household affected in a repetitive disaster zone or a household majorly impacted by a disaster requires 19 years to recover from the loss and damage. In most cases, the compensation received by the households is 1/4th the loss that they have suffered due to the disaster.

Open network *use case*

Open networks offer a critical solution to enhance the effectiveness and efficiency of relief and recovery efforts. Open networks enable faster response times and improved resource allocation by reducing the coordination costs between government agencies, NGOs, local administrative bodies and volunteer groups. Moreover, standardised protocols and data exchange mechanisms foster collaboration and data-driven decision-making.

One such suggestion discussed in the workshop is to create a National Loss Platform (NLP) to enhance disaster response, recovery, and resilience through a centralised infrastructure. This infrastructure would serve as a **comprehensive repository** for all data related to disaster response, loss reporting, and recovery efforts. It ensures that government agencies, NGOs, private donors, and affected individuals can access, share, and update data within a single, cohesive system. Although this data repository may not exist specifically for disaster, data sets containing basic information about a demographic are often commonly used across various sectors and can be analysed contextually for the NLP.However, this data is held in government registries and is not accessible publicly in order to ensure data security. This platform can incorporate various features, including household information points for self-reporting losses and needs, loss registers and digital wallets to track aid distribution, risk profiling for targeted assistance, and interactive dashboards for real-time monitoring. Additionally, NLP can facilitate collaboration with private sector entities, such as construction companies, to expedite rebuilding efforts. This unified approach minimises duplication of effort, reduces administrative overhead, and empowers stakeholders to react swiftly and efficiently in the face of disaster.

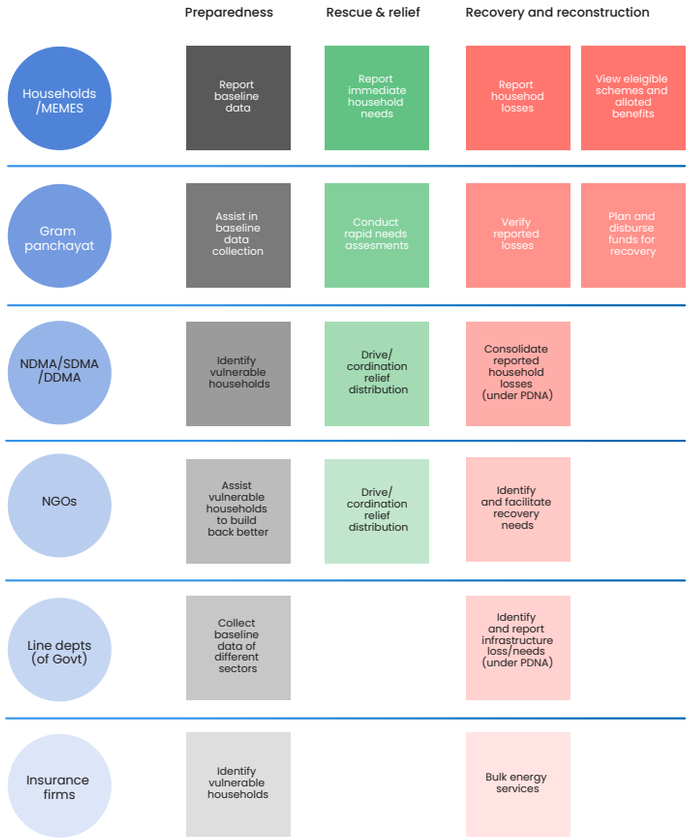


Fig. 09: Use-cases of the NLP span across actors and disaster-phases that can streamline management for disaster scenarios. Source: SEEDS, 2024.

Way *forward*

1. Identify and define **six areas of collaborative action:** data sharing, stakeholder engagement, advocacy, community connection, use-case exploration, and implementation strategies.
2. Develop comprehensive **data-sharing regulations and security protocols** that create a trustworthy environment for government and stakeholder data exchange.
3. Design a hybrid development strategy that integrates both **bottom-up and top-down methodologies,** ensuring the platform can accommodate grassroots insights while maintaining policy alignment.
4. Create an inclusive **stakeholder engagement model** that brings together diverse actors including ground-level experts, policymakers, individual specialists, and philanthropists to drive platform development and implementation with purpose.

Way forward

Beckn Node Zero 2024 aimed to achieve cross-sector collaboration with future pilots and partnerships as the outcome of the summit. Across the two days of exploring the potential of open networks for sustainability, various next steps were identified for achieving this goal.

Identifying incentives for integrating DISCOMS

As the primary entities managing electricity distribution, DISCOMS are crucial in driving the adoption of renewable energy and enabling advanced energy solutions such as demand response, peer-to-peer energy trading and green hydrogen integration. Addressing this requires creating financial incentives tied to renewable energy integration for DISCOMS to adopt open networks. DISCOMS must be integrated onto the network to reflect the physical transfer of electricity. They must be equipped to adopt technologies in order for open networks to accelerate efforts towards net zero emissions.

Establishing unified mechanisms to implement

Open networks ensure data standardisation to enable interoperability and collaboration between various stakeholders. These standard mechanisms or methodologies must be identified to ensure data uniformity across DISCOMS, energy producers and consumers. These mechanisms will create a unified framework, minimising integration costs and ensuring the scalability of open network solutions.

Enabling collaboration across diverse stakeholders to develop open networks

Open networks require collaboration between various stakeholders including DISCOMS, renewable energy producers, consumers to foster innovation, align on shared goals and co-create solutions. This requires creating further platforms for ongoing dialogue to align objectives, address challenges, and share innovations. Beckn Node Zero was one such avenue to convene stakeholders and catalyse coordination and action and further channels for ongoing dialogue must be created. By ensuring that all stakeholders work collaboratively, open networks can achieve the scale and efficiency needed to propel India toward its net-zero ambitions.

Innovative funding mechanisms must be utilised to deploy capital for sustainability

Innovative funding mechanisms such as green bonds, blended finance mechanisms and public-private partnerships are crucial to finance climate solutions. However, there has been limited adoption of these despite their ability to de-risk early state solutions. Thus, the deployment of open networks will require significant capital investment with the support of philanthropic capital. Through these mechanisms, private sector investment can also be incentivised to ensure sufficient capital inflows for building open networks for sustainability.

Involving government entities to support open networks through policies and regulations

Policies that mandate renewable energy adoption, provide incentives for green infrastructure and promote interoperability across energy systems will lay the groundwork for open networks. Additionally, government entities can act as early adopters, piloting open network solutions in state-run DISCOMS or large public sector projects.

Accelerating climate action at scale through open networks requires a multi-pronged approach, focusing on integrating DISCOMS, standardising mechanisms, fostering collaboration, securing funding and leveraging government support. By taking these steps, India can meet its net-zero commitments by establishing a sustainable, resilient energy ecosystem that supports its economic and environmental goals and set an example for the world to coordinate on its net zero goals.

Annexure

Plenary speakers

Nandan Nilekani, Co-Founder And Chairman, Infosys Limited
Anjali Bansal, Founding Partner, Avaana Climate And Sustainability Fund
Sanjay Purohit, CEO And Chief Curator, Centre For Exponential Change
Akshima Ghate, Managing Director, RMI India
Pramod Varma, Co-Founder, FIDE
Sujith Nair, CEO & Co-Founder, FIDE
Rathish Balakrishnan, Co-Founder And Managing Partner, Sattva Consulting
Srikrishna Sridhar Murthy, Co-Founder And CEO, Sattva Consulting
Jan Kuenne, Vice President EU & India Pacific, Enterprise Development Group
Ankit Jain, Co-Founder & CEO, Stepchange
Kuntal Shah, Director, Deloitte India
Vinod Sankaranarayanan, Head - Digital Public Goods And Infrastructure, Thoughtworks India
Magizhan Selvan, CEO, Namma Yatri
Tahira Thekaekara, Executive Director - Institutional Development, WRI India
Sunita Nadhamuni, Chairperson, Arghyam

Room anchors

Akhil Jayaprakash, Co-Founder, Pulse Energy
Dhruvak Aggarwal, Program Lead, CEEW
Mirambika Sikdar, CEEW
Avinash Dubedi, Program Head - Transport **Development,** WRI India
Rajit Bhat, Consultant, WRI India
Ketav Mehta, Senior Advisor, UAI
Venky Ramachandran, Mission Director, UAI
Dr. Praphul Chandra, Professor & Director, Atria University

Abhishek Padmanabhan, Director - Centre Of Excellence In Energy Sciences And E-Mobility, Atria University
Jyotirmayee Sabat, Head Of Energy Digitalization, Atria University
Nithya Satish, Associate Software Engineer, Atria University
Arshi Chadha, Co-Founder, Trillectric
Susmit Patodia, Associate Partner, Antler
Sumit Choudhury, Founder & CEO, Greenearthx
Debaranjan Pujahari, Partner - Agricultural Practice, Sattva Consulting
Aarti Mohan, Co-Founder & Partner, Sattva Consulting
Puja Jain, Founder & CEO, Elementre
Aaditya Shetty, Engagement Manager, Sattva Consulting
Manu Gupta, Co-Founder, Seeds
Sayak Ray, Senior Consultant, Sattva Consulting

Organisations attended

Corporates

Aditya Birla, Airvoice, Amazon, Anaxee Tech, Ankur Capital, Ather Energy, Avaana Capital, Amazon Web Services, Bayer, BCG, Bolt Earth, Bosch India Carbon Mint, Carnot, Caspian, Chargepe, Cisco, Claris Health, Climate Seeds Fund, Colgate, Decharge Network, Deepak Fertiliser, Deloitte, Edg Eugenie.ai, Vanashri Technology Consulting, Evoride, Fleeter, Fluxgentech, Fortum India, Google, Gram Vaani And Commonstech Foundation, Green Mind Venture, Gridsentry, Hala Mobility, Hasten Regeneration, Hil – Research And Development, Integro, Ipsos, Jio Platforms Limited, Kazam, Krypc, Kyndryl, Limitless Institute, Lioncharge E-Mobility, Lithium Urban Technologies, Lohum Cleantech Ltd, Mahindra Group, Mahiti, Mbrdi, Mini Mines Cleantech Solutions, Mitti Labs, N3e, Nunam Technologies India Pvt Ltd, Paradigm Shift Capital, Plantix, Reapmor, Reconnect Energy, Salesforce, Sambha Agro Farmer Producer Company Pvt Ltd, Satsure Analytics India Pvt Ltd, Scaleknot, Schneider Electric, Shell, Social Bytes Technology, Solana, Spectrum Impact,

Step Change, Sunday Grids, Tapfin, Tata Motors, Tata Power, Tax Genie, Tekdi Technologies Pvt. Ltd, Thinkag, Thoughtworks, Toyota Kirloskar, Trillectric, Tune Ai, Varunastra Technologies, Private Limited, Woloo

Multilaterals /Nonprofits /Social enterprises

Airbus | Maiti Labs, All India Disaster Mitigation Institute (AIDMI), Alliance For Energy Efficient Economy (AEEE), Arghyam, Ashoka Foundation, Ashoka Trust For Research In Ecology & Environment, Bharat Cares, Centre For Agriculture And Biosciences International (CABI), Centre For Exponential Change (C4EC), E-Governments Foundation, GSMA Foundation, Haqdarshak, Hasten Regeneration, Health Care Without Harm, Humbhionline, India Climate Collaborative, Indigram Labs Foundation, Nasscom Foundation, Ola Mobility Institute (OMI) Foundation, Open Geospatial Consortium (OGC), Open Network For Digital Commerce (ONDC), People + Ai Practical Action, Rainmatter Foundation, Resolve To Save Lives, Seeds, Societal Thinking, The Aga Khan Agency For Habitat (AKAH), The Agri Collaboratory (TAC), United Way India, Villgro, Zero2positive

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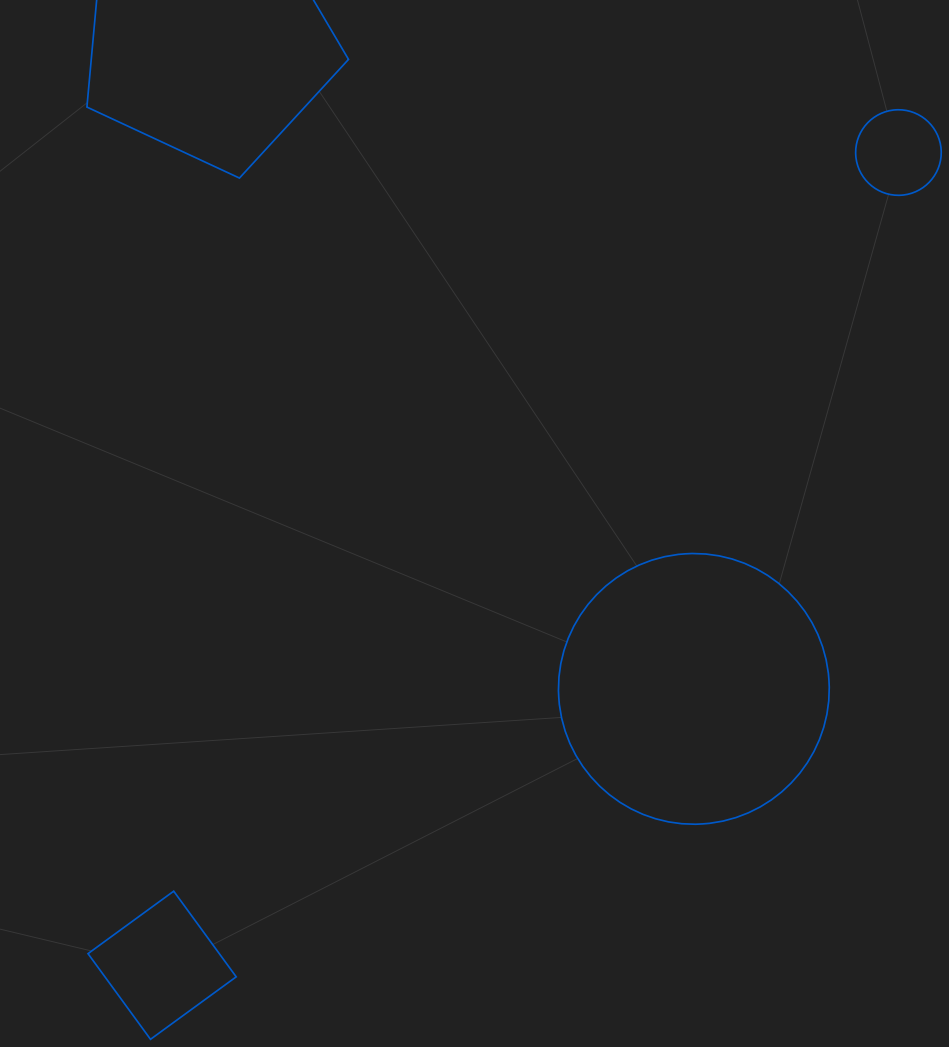

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