

The Energy Transition Dialogues Communique

Blueprint for a People Positive
Energy Transition



Global Energy Alliance
for People and Planet
GEAPP

#LetsChangeEnergy

Preface

India, now the fifth largest economy in the world, endeavors to be among the top three economies over the next three years. The sheer size of India's population, coupled with a rapidly growing economy, has meant that India is the fastest growing energy economy in the world, with an expected annual increase in demand of 3 percent until 2030. A large share of India's energy requirements are dependent on traditional fuels like coal and imported oil and gas, which contribute significantly to greenhouse gas emissions. This has huge implications not only for the country's energy requirements, which are dependent on imported hydrocarbons, but also for global energy markets, the global energy transition, and the ongoing fight with climate change.

India is committed to meeting and surpassing its National Determined Commitments (NDC) under the Copenhagen Accord for the reduction in energy intensity and capacity addition of non-traditional fuel capacities well ahead of time. As per the updated NDC, India is now committed to reducing the emissions intensity of its GDP by 45 percent by 2030, from the 2005 level, and achieving about 50 percent cumulative installed electric power capacity from non-traditional fuel-based energy resources by 2030 while also transitioning to a net zero economy by 2070.

The country is moving towards achieving its 2030 and 2070 targets through the design of relevant programs and schemes, but several challenges still need to be addressed, which are limiting its progress in decarbonizing the economy and meeting its NDC targets. Most of these challenges lie in the domain of energy and deal with the way we produce, transform, transport, and

consume energy. Therefore, it is crucial to identify areas that are creating challenges for a People Centric Energy Transition while moving to strengthen the policy, regulatory, institutional, and market frameworks that promote energy sustainability and security.

India's achievement of its climate and energy transition targets will also depend on the participation of stakeholders and the role they play in proactively helping meet these targets. These will range from utilities and industry integrating more renewables into their energy mix, consumers transitioning to energy-efficient products, electrification of transport, a modal shift for logistics to railways, strengthening of the utility transmission and distribution highways, improved management of highly variable resources, and financing of these transitions in a people-centric manner.

To create a shared understanding around these opportunities and challenges, GEAPP, along with its partners, who have extensive experience in these areas, attempted to brainstorm and document a series of recommendations for the key stakeholders to consider as they move forward to design appropriate policies and structural enablers to ensure India's growth towards a cleaner and more sustainable economy.

GEAPP and its partners looked at six mainstream areas that we consider crucial for decarbonizing the Indian economy, i.e., the roadmap for enhanced RE and BESS ambitions of 50 GW per annum, decarbonization of transport, utility modernization, people centric energy transition, scaling up energy efficiency and clean energy financing.

The country has done well in the past in terms of RE capacity addition; however, the future requirement still remains a challenge, with the sector needing to add 50 GW annually, besides addressing certain policy and structural interventions, including land related laws, institutional capacity building, the adoption of distributed RE capacities, etc. Similarly, in the transport sector, India is currently facing challenges relating to road congestion, air pollution, and emissions. Despite the push for EVs by the government, their penetration remains low. Also, significant potential exists for shifting freight and passenger transport to more sustainable modes (like railways and water transport) and the development of integrated transport systems. Improvements in transport planning and policy frameworks are key to achieving the required transition and lowering emissions in the transport sector.

In the electricity sector, large shifts have been observed towards the adoption of cleaner generation sources. However, the distribution sector still needs to evolve and adopt new technologies to address the issues and challenges emanating from the energy transition agenda and move towards the variability of renewable energy. Reforms in the distribution sector to bring about higher accountability, upgradation, and modernization of existing distribution infrastructure are going to be crucial for the same. During this shift towards greener and more sustainable options, it is equally important that the transition be people-centric in view of the dependence of a large section of people on traditional fuel related direct and indirect employment.

Further, energy efficiency also plays a critical role in India's journey towards a sustainable future. However, the ambitious NDC target committed to reducing emission intensity can only be met through a collaborative approach of the central and state. The concept of Lifestyle for the Environment (LiFE) introduced by India at COP26 encourages each stakeholder to contribute towards the climate change initiatives. Moreover, scalable models and frameworks for energy efficiency measures need to be adopted in buildings and for sustainable cooling in the long run.

Initiatives across each of the above themes would require substantial investments, as per several studies. The quantum of climate finance to date has been insufficient, and commitments have not been met even by the emerging countries. In India, resources from the government, multilateral, bi-lateral and private sectors have been channeled to address climate change and facilitate energy transition. However, to meet India's ambitious targets for its NDCs, these resources are going to be significantly inadequate. It is estimated that achieving these targets would require US\$2.5 trillion between 2015 and 2030, or ~ US\$ 200 billion annually. Initiatives by way of banking sector reforms, innovative financing mechanisms, development of an ESG financing ecosystem, etc. could help finance part of the energy transition aspects.

While the countries embark on economic growth and development, it is imperative to reflect on the future challenges with respect to the environment and climate change. Efficient use of traditional resources is an important tool in mitigating climate change. The public policies should reflect on such aspects and decide upon the growth trajectories to be chartered by the countries. As a pivotal contributor to the global energy transition, India represents one of GEAPP's highest priority markets. India has ambitious climate goals as per commitments made at COP26 and its intention to reach the Net Zero goal by 2070. The communiqués of the respective themes aim to summarize the key priority areas that have emerged from the various stakeholder consultations and lay down the policy and regulatory interventions needed to provide the much needed impetus to India's net zero plan. GEAPP endeavors to adopt the proposed changes in its future programs and contribute towards the sustainable development of India.

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Clean Energy Financing



In 2022, the world witnessed an unprecedented milestone in its journey towards a sustainable future when global financial commitments for clean energy and energy transition soared to a remarkable US\$1.3 trillion, marking it as a historic high-water point. However, despite this promising achievement, the current trajectory of investments falls significantly short of the quantum needed to meet the planet's ambitious climate and energy transition targets set globally as a part of the Paris Agreement.

While India has made commendable strides towards its clean energy and energy transition goals, there remains a substantial gap between what is needed and what is committed and available. By 2030, India aims to scale its non-traditional energy capacity to 500 gigawatts (GW), reduce projected emissions by an astonishing one billion metric tons, and slash carbon intensity in the economy by more than 45%. Achieving these momentous objectives entails an estimated investment of US\$2.5 trillion between 2015 and 2030, translating to approximately US\$200 billion annually. Taking this target further, the cumulative investment required to usher in India's net-zero target by 2070 stands at an awe-inspiring **US\$10.1 trillion**.

With this background, this communique serves to address the pressing challenges in accessing financing for clean energy and endeavours to pave the way for an enabling mechanism that will galvanize the flow of capital into the clean energy sector.

1. Mobilising Financing through the Indian Banking Sector

India's banking sector, the backbone of the nation's financial system, must overcome its inherent systemic guardrails to fuel the energy transition. To begin with, banks need to understand and embed climate risk within their risk frameworks, which in turn will encourage diversification of investment into low-carbon sectors, facilitating investment in sustainable energy. To ensure bank financing is available at scale for India's energy transition, banking sector reforms are required in the following areas:

- 🍃 **Increase transition risk familiarity:** The present understanding of physical risk within the banking sector is better compared to transition risk, given that the latter depends more on long term policy scenarios and direction. The RBI needs to provide very precise guidance to banks and NBFCs in carrying out scenario analysis and stress tests incorporating both physical and transition aspects of climate risk.
- 🍃 **Capacity building and training** of banking staff will be critical to financing clean energy assets, especially new or emerging technologies and distributed renewable energy technologies.
- 🍃 **Borrower Transparency:** Borrowers need to be transparent in their ESG disclosures to build trust and confidence in their commitment to sustainability goals. Banks need credible transition plans and forward-looking scenarios.

2. Leveraging Multilateral Bank Capital for Energy Transition

Recent discussions highlight the need for multilateral development banks (MDBs) to bolster their capacity and risk tolerance in financing the energy transition. MDBs, due to their developmental mandate, low-cost financing, and infrastructure asset understanding, play a pivotal role globally in energy transition financing. Some of the ways of leveraging MDBs for energy transition are as follows:

- 🍃 **Support Instruments:** Various instruments can facilitate the energy transition, including loans, guarantees, grants, and cash flow-based lending instruments. The basic role MDB should play in market making is to create the space to attract commercial capital through guarantees, and then, in turn, if commercial capital still does not come, finance market creation through loans.
- 🍃 **Going beyond conventional products:** Innovations like cash flow-linked structures or receiver-based financing where the receivables are linked to the creditworthiness of the larger corporations instead of the smaller players can be explored for hedging the risk of small projects.
- 🍃 **Expanding role and increasing risk appetite:** MDBs should assume a role beyond just providing plain vanilla lending to helping address complex risks by working with local financiers, governments, and developers to build the market for clean energy technologies. For instance, creating a business case for mini-grids in rural areas through exploring context specific blended finance mechanisms is one area where an enhanced MDB role can support scaling up the technology.

3. Deepening Domestic Capital Markets through Risk Mitigation Tools and Instruments

India, like other emerging economies, has traditionally relied heavily on the banking sector for financing, yet the optimal financing avenue for long-dated infrastructure assets like renewable energy resides within the capital market. However, the Indian corporate bond market, although making strides, remains shallow, less fluid, and underdeveloped compared to its global counterparts, posing challenges for raising debt through bond issues. On the equity side, while global investors have shown interest in India's energy transition, lingering currency risk remains a major obstacle.

Several strategies can collectively improve the attractiveness of investments in clean energy assets.

- **Credit guarantee schemes** can be pivotal in deepening the market and providing essential risk cover, making investments more appealing to private capital. The current set of guarantees lacks coverage and is relatively expensive.
- Development of **long-term foreign exchange risk mitigation tools** to bolster foreign investments in the clean energy sector to mitigate currency risks.
- **Developing the market for insurance and reinsurance products** specifically catering to climate risk mitigation. Global re-insurers that have developed expertise and know-how in the market segment should be incentivised to provide such instruments in the Indian market too.

5. Tapping into the Global ESG Capital Pool with a Robust Domestic ESG Financing Framework

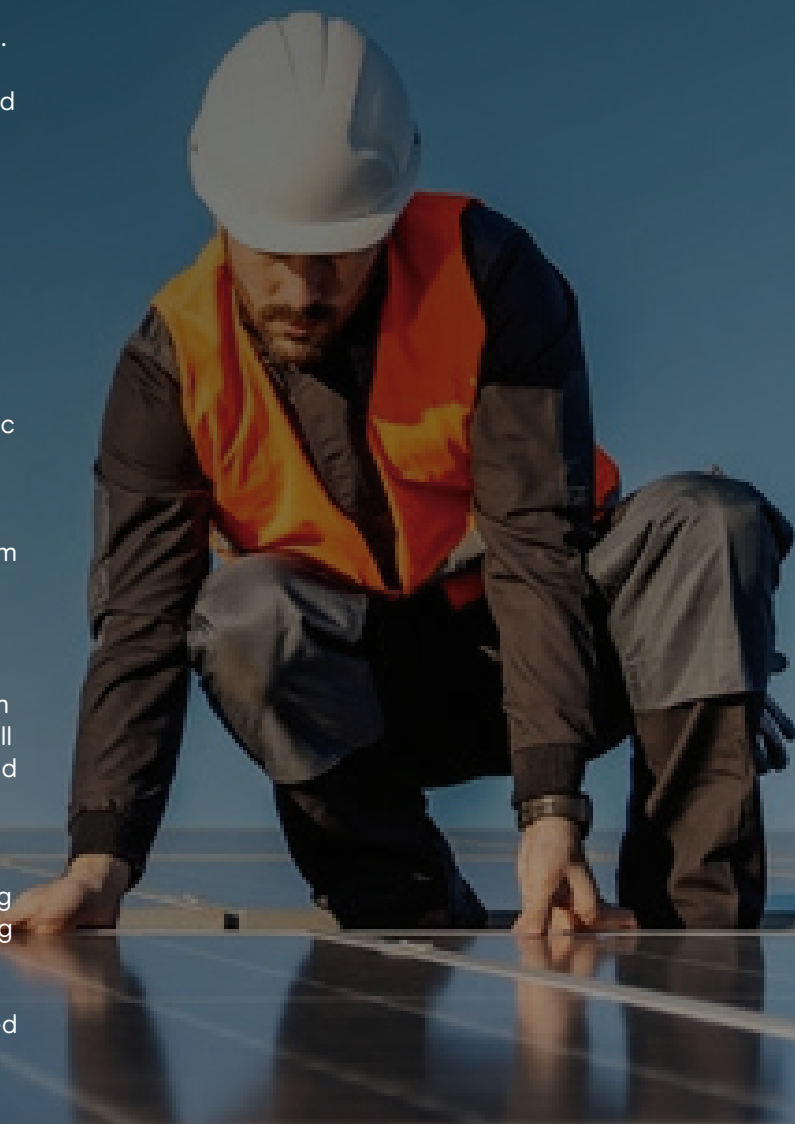
The advent of environmental, social, and governance (ESG) investing through sustainable finance instruments such as green bonds, sustainability-linked bonds, and other thematic bonds has massively channeled capital into clean energy assets globally. The sheer size of this capital pool warrants that those emerging countries, such as India, develop an ecosystem that supports tapping into it. Such an ecosystem will wade off greenwashing risks and aid investment decision-making through robust sustainability disclosures and science-based green taxonomies, among other things.

- **Green taxonomy:** introduction of a green taxonomy with a common definition of what is green and what is not will help borrowers, investors, and lenders price the risks and opportunities associated with a certain asset or economic activity.
- **ESG in Credit Ratings:** Integration of ESG in credit rating methodologies of CRA's will help in appropriately pricing climate risk. Currently, several traditional fuel aligned companies issue debt instruments that carry climate risks (particularly transition risks), that are not considered in pricing by CRAs and would otherwise lead to a reduction in their credit ratings.

4. Channelising Domestic Institutional Capital for Clean Energy

Institutional investors such as pension funds and insurance companies have been one of the driving forces globally behind greater investments in clean energy. However, Indian domestic institutional investors (DIIs) have largely been on the fence when it comes to financing clean energy infrastructure. Besides low-risk appetite and a lack of investable opportunities and mechanisms, the biggest reason has been restrictive investment regulations.

- There is a need to **reform the investment regulations for DIIs** such as pension funds and life insurers that are long term patient investors to make it more conducive for them to invest in clean energy investments.
- The development of **market instruments such as clean energy focused infrastructure investment trusts (InvITs)**, which help channel this massive capital pool into financing India's energy transition.
- Creation of **institutional capacity and knowledge base of DIIs** for clean energy and energy transition investment opportunities .





6. Promoting Finance for Emerging Clean Energy Technologies

Within the realm of clean energy, nascent technologies like battery storage and green hydrogen encounter obstacles arising from policy uncertainties, impeding their capacity to attract substantial financing.

- **Supporting Startups:** To drive India's transition toward decarbonization, it's imperative to secure capital for emerging technologies through tailored support for start-ups based on their Technology Readiness Levels (TRL), encompassing incubation partnerships with educational institutions for early-stage startups as well as enhancing bankability and offtake guarantees for more mature startups.
- **Collaborative Lending:** For established technologies such as rooftop solar and biogas, the introduction of a co-lending mechanism allows banks with different expertise to collaborate and provide technology-specific financial products, thereby increasing accessibility and adoption.
- **Standardization Initiatives:** Standardization efforts, particularly for mature technologies, are crucial as common industry standards facilitate scalability and widespread adoption, contributing to the acceleration of India's renewable energy transformation.

7. Government Interventions for Supporting the Flow of Clean Energy Finance

Facilitative policy reforms have paved the way for the massive scaling up of the renewable energy sector in India. However, for the country to achieve its ambitious 2030 goals, greater support will be required from the government. Several interventions are needed, such as:

- **A substantial reduction in the guarantee charge** applied to Multilateral Development Bank (MDB) finances by the government can substantially decrease the cost of these instruments, rendering them more accessible and affordable.
- The introduction of **green plus bonds**, along with other financial instruments, can broaden the array of financing options available for sustainable projects related to a people-centric transition.



Utility Modernisation

DISCOMs have a major role in the realization of India's goal of achieving net zero emissions by 2070. With the sharp increase in variable and distributed energy resources, the network of the future needs to be much more reliable, resilient, and smart, designed to facilitate the multi-directional flow of electricity and deal with the higher penetration of variable energy resources. To attract and administer the scale of investments required to achieve these objectives, utilities in the country will need to become financially strong and technically capable organizations. Additionally, the commercial structures in today's electricity market will need to be evaluated and reimaged to facilitate a different market-led structure that will foster new and clean energy sources. Studies in developed countries have emphasized the need for investment in T&D infrastructure in the trillions of dollars in the wake of the ensuing energy transition.

Based on stakeholder interactions and roundtables conducted, the following practical and impactful interventions are identified, which can potentially evolve into future long-range programmatic actions enabling DISCOMs to become sustainable and reliable vehicles for driving the energy transition agenda.

1. Modernization and augmentation of utility networks

- To create awareness and bring all stakeholders on the same page, it would be helpful if CEA (or an appropriate agency as designated by the government) could take up the exercise of assessing investment requirements in electricity distribution infrastructure in the country for 2030, 2040, and 2050 timeframes. The same can be followed by the preparation of 5-year rolling plans (on the lines of NEP) for distribution network modernization and augmentation, along with potential sources of financing.
- Given the increase in frequency of extreme weather events, it would be helpful if CEA issued the necessary guidelines and standards for the development of a climate resilient T&D network infrastructure.
- The era of radial network extensions with the primary objective of enhancing access to electricity is over. Energy transition imperatives necessitate a nuanced and meticulous approach to the planning and design of electricity distribution networks on the lines (like Transmission Planning Criteria). This calls for the introduction of regulatory frameworks for systematic distribution network planning, imbibing software-based network simulation in planning and design of networks.
- The scale as well as the meticulous approach required for the next wave of investments in distribution infrastructure call for a capacity-building roadmap for utilities (management and staff) to accelerate the adoption of modern technology in network planning and network operations.

2. Financially viable DISCOMs are essential for driving the massive scale of investments required for grid modernization and augmentation

- Given the continued confluence of political economy issues in the power sector, despite the unbundling and corporatization of utilities, fiscal discipline in DISCOMs remains a challenge across most states. Mandatory listing of state DISCOMs in stock exchanges (as an alternative to privatization) can help in creating an arm's length distance between the DISCOMs and respective state governments. This would also help in attracting the much-needed capital required to drive the massive scale of investments required by DISCOMs.

- Modernising and enabling the regulators by 2030 by means of targeted interventions in the areas of (a) the process of appointment of chairpersons or members of a commission, and/ or (b) possibility of regional or multi-state regulators, etc. can be useful in furthering their independence.

- Increasing PSP in power distribution networks through a sub-licensee model, wherein private operators can be made responsible for carrying out capex and/or O&M in a given area while the licensee/DISCOM continues to be responsible for power procurement and supply to such areas. Unlike the typical DF model, such a sub-licensee arrangement can enable regulatory oversight on capital investments by the private operator in the handed-over area, thereby creating a framework for sustained investments throughout the contract term.

- Introducing the concept of micro rural franchisees that can support DISCOMs in converting loss-making rural areas into profit centers by integrating smart metering, distributed renewables, BESS, microgrids, and other efficiencies into the network.

3. Digitally enabled intelligent utilities with enhanced situational awareness are an essential component of future energy systems

- Evolving a mechanism for periodic review of the DIGITAL Maturity of DISCOMs across relevant and important parameters at a national level will pave the way for tracking and driving IT interventions across utilities in the country. This would also help in keeping track of evolving technologies and developing tailored plans for upgrading the IT capabilities of Discoms as per their level of digital maturity.
- A benchmarking-based guidance study to give directional input on the volume and capability of IT personnel required by DISCOMs (relative to their size and complexity) would be useful. Most DISCOMs are finding it difficult to move forward on the IT talent agenda due to a lack of robust and scientifically determined norms.
- An approach for SLA-based outsourcing of IT intensive and customer facing processes (on the lines of what is prevalent in Telecom and Passport Seva Kendra) might evolve as a means of benefiting from private sector IT capabilities and customer service orientation while retaining the public sector ownership structure.
- Evolving a systematic approach for on-ground implementation of new digital initiatives through the development of a standardized framework evolving from pilot stage to full-scale deployment in a time-bound manner will be helpful for DISCOMs. Such a framework may provide guidance on the adoption as well as the assessment of justification of the adoption of new and emerging technologies, such as 5G and NB IOT, and dealing with their obsolescence.

4. Furthering market modernisation as a key enabler of the energy transition

- Increasing penetration of distribution energy resources at downstream voltage levels calls for fast-tracking the introduction of DSOs by means of policy clarity on need, role, function, scale of operations (coverage), and their institutional structure, along with prescribed timelines for their establishment.
- To fast track investments in intermittency management, there is a need for standardized frameworks for market-linked value assessment of energy storage (BESS, PSP, etc.) capacity procurement (or investment) by DISCOMs.
- The introduction of demand response and dynamic tariffs along with demand aggregators to encourage a wide range of distributed energy resources and consumers to participate in market-based mechanisms, would be a useful tool for grid balancing as well as emergency response. The smart meters being rolled-out under RDSS would provide the backbone for the implementation of such tariff structures.
- Enabling DISCOMs to maintain a separate power purchase portfolio for optional Green Tariff, which lends itself to an end-to-end trace-and-track assessment, will exponentially enhance its adoption by willing customers with aggressive Net Zero targets.



Enhanced Adoption of Renewable Energy (RE) and Battery Energy Storage System (BESS)

The rapid adoption of Renewable Energy (RE) remains the key lever for decarbonizing India's economy as well as meeting the Net-Zero target by 2070. The target of 500 GW of non-traditional fuel installed capacity by 2030 reflects the importance the Government of India places on accelerating the RE deployment in the country. However, achieving this near-term target seems like a significant challenge given the fact that so far, India has been able to add only a maximum of 15-16 GW of RE capacity annually, against a requirement of 40-50 GW per year. To meet this short-term goal, concerted efforts and actions are required both at the national and state levels. This communique aims to focus on decisive actions needed to accelerate the deployment of RE at the national and state level, in a manner that not only meets the short-term goal of achieving **500 GW of non-traditional fuel capacity by 2030** but also moves decisively towards the long-range goals set by India's energy transition roadmap.

1. Concerted action by Central and State Governments to enhance the annual rate of RE capacity addition.

The national target of achieving a non-traditional fuel installed capacity of 500 GW by 2030 does not find a reciprocal reflection in targets set by State Governments. At the same time, significant capacity addition potential exists with Industry and Corporates through Open Access and initiatives like Net-Zero and RE100. The stakeholders emphasized the need for the following to advance the adoption of RE at the state level:

- **Detailed Short to Medium-Term RE Plans for States:** States also need to put in place the institutional mechanisms to draw up their own net-zero plans, RE deployment targets roadmaps and implementation frameworks for RE. These plans need to be developed in conjunction with the Resource Adequacy planning being undertaken by DISCOMs.
- **Identify Granular Resource Requirements to meet RE Targets:** States need to undertake a detailed assessment of key resources like land/ water availability, evacuation planning and RE Park Infrastructure planning at a granular level for the short to medium term. This would require the identification of large landbanks/ water bodies and the development of Green Energy Corridors in the states.
- **Accelerate deployment of Green Tariffs and Green Open Access:** Accelerate the deployment of Green Tariffs and Green Open Access to enhance RE uptake by Industry and Corporates.



2. Ramping up the deployment of traditional utility-scale RE technologies along with tapping the potential for new and emerging technologies

Over the near term, it is well recognized that the rapid capacity addition of low-cost utility-scale solar and wind will provide India with the best chance of meeting its 500 GW target by 2030. However, with plain vanilla RE procurement patterns reaching very high levels, Distribution Utilities (DISCOMs) have started moving to a more demand-based dispatchable form of RE procurement like Round the Clock Power or Schedulable RE procurement. This would require diversification and development of India's RE mix to include schedulable Bioenergy and hydro (large, medium, and small) coupled with a portfolio of Energy Storage Projects. The stakeholders feel that the following actions will be critical in meeting the 2030 targets in the most cost-effective manner:

- **Recognize the role of non-solar/non-wind RE and Energy Storage in meeting 2030, 2035 and 2040 targets:** Identify the role that emerging RE technologies (biomass, Compressed Biogas, Hydro, Agri/ Floating Solar, Offshore Wind, Rooftop Solar, etc.) and Energy Storage (BESS, Pumped Hydro etc.) will play in achieving these targets in a cost-effective manner and move to develop them.
- **Make large-scale RE Procurement Demand Responsive:** Eliminate standalone plain vanilla RE tenders and move to demand-responsive tenders like RTC and Schedulable Peak Supply Contracts.
- **Enhance the institutional capacity of DISCOMs for bespoke RE Procurement:** Create state level institutional capacity (like state level SECI's) which leads design of bespoke procurement models which allow DISCOMs to optimally manage the grid.
- **Development of RE+ Parks & hybridization of Supply:** To create schedulable RE supply, move to create integrated RE+ (RE+Storage) Parks and focus on dedicated park infrastructure development, especially land and evacuation. Identify and designate RE Zones with significant potential for schedulable RE.

3. Development of Energy Storage Market for complete RE Integration

Substantial grid-scale energy storage (both seasonal (pumped hydro energy storage) and 4 to 8-hour battery energy storage systems (BESS)) will be required to accommodate the high penetration of variable RE by 2070 to maintain grid stability. The Central Electricity Authority estimates BESS capacity addition is between 22 GW / 113 GWh – 49 GW / 247 GWh by 2030 and PSP capacity addition of another 18 GW by 2032. The stakeholders feel that the following actions will be critical in meeting the 2030 targets in the most cost-effective manner:

- **A Comprehensive Framework for BESS Capacity Addition:** A comprehensive policy framework with regulatory clarity, financial and taxation incentives, and technical standards for large-scale deployment of grid-scale battery energy storage.
- **Energy Storage:** Set in motion the auction of the first 4 GW of Energy Storage capacity at the earliest and move to create pilots that adhere to this trajectory.
- **Operationalization of an Ancillary Services Market in India:** The addition of a fully operational ancillary services market in India will encourage investments in Energy Storage projects by allowing monetization of a variety of value streams from essential grid support functions, ultimately enhancing their economic viability.
- **Fast-tracking PSP in a Mission Mode:** Identification of PSP potential, scheduling of PSP projects and infrastructure required for their deployment need to be taken up and executed in mission mode with very stringent oversight by the PMO/ CMO.



4. Mission mode approach to enhancing distributed/renewable energy (D/RE)

Distributed RE represents substantial potential for addressing the country's energy requirements, particularly in domestic and agricultural sectors while alleviating the subsidy burden faced by utilities. India boasts a significant DRE potential, estimated at approximately 200 GW. India needs to aim for a minimum of 10% of electricity demand to be met through on-site generation. Based on stakeholder consultation, the following action points emerged:

- **Mission-Oriented Framework Transformation:** A mission-centric transformation of the regulatory and policy landscape to mandate DRE deployment in high-potential regions and across high-value chains is advocated.
- **Development of bespoke Business Models for Rooftop Solar and Solar Irrigation:** Identification and implementation of bespoke models for Rooftop Solar and Solar Irrigation are critical. These mechanisms need to ensure that utilities serve as equal partners in deploying and benefiting from DRE adoption at scale. Enhanced engagement with farmer-based organizations to encourage farmers to benefit from the central and state government schemes.
- **Enhanced Utilization of Existing Schemes:** Substantial resources are available through existing schemes. These need to be leveraged by allowing the use of flexible business models which unlock a variety of value streams.

5. Fostering Inter-Ministerial and Inter-Sectoral Synergy to Augment RE Capacity Addition


The stakeholders feel that through collaborative efforts and strategic actions, stronger synergies amongst various departments of the government and the private sector can elevate states' ability to harness and deploy RE. The stakeholders feel that the following actions will be critical in meeting the 2030 targets in the most optimum manner:

- **Coordination Agencies at the Federal/ State level:** As India moves towards Net Zero and large-scale energy transition, there is a need for an agency to coordinate the actions of ministries at the federal and state level.
- **Formation of Inter-Departmental Advisory Groups at the State level:** Anchoring these coordination agencies will be an advisory group led by Chief Secretary at the state level and Cabinet Secretary at the Federal level to coordinate the energy transition/ RE deployment in partnership with the demand-side ministries.

6. Tangible Actions to Foster Awareness and Skill Development

Two key obstacles which have significantly impeded the widespread adoption of RE technologies across diverse value chains and sectors are a persistent lack of awareness/ information at the grassroots level and the availability of skilled and trained manpower. The group proposes the following actions to ensure enabling future policy and regulatory developments in the sector:

- **Sectoral Training Needs Assessment:** A comprehensive sector-specific training needs assessment with a roadmap that bridges the knowledge and skill gaps.
- **Development of Targeted and Tailored Training Programs:** Design and roll-out of Government supported specialized training programs and vocational courses with a focus on RE deployment.
- **Strategic Awareness Campaigns:** Designing and executing highly effective promotion campaigns which target large-scale RE adoption by consumers.



Decarbonisation of Transport

India is the fifth largest economy and one of the fastest growing ones in the world. As India's economy continues to grow, changes in the structural composition of the economy, including urbanization and industrialization, will impose higher demands on transportation, both passenger and freight. Passenger travel demand, encompassing urban and regional travel, is projected to more than double over the next **50 years**, whereas freight travel demand is expected to increase by five times over the same period.

The Indian transport sector is the third largest emitter, accounting for approx. 13% of the total annual emissions in India, of which the road sector's is 90%, followed by civil aviation (6%) and railways (3%) as per the MoEFCC. At the current rate, transport related emissions are expected to increase considerably due to the growth in passenger and freight demand, which in turn is expected to double and quadruple by 2050, respectively, from the year 2021 (TERI, 2021). It has become crucial for India to explore opportunities to strengthen sustainability and energy security in the transport sector to meet its NDC and Net Zero commitments. In line with its commitment, this communiqué highlights and discusses the 5-I multi-pronged approach needed to decarbonise the Indian transport sector, further strengthening the pathway to achieve India's net-zero target.

1. Intensifying the electrification of road and public transport

The Indian road transport sector accounts for 70% of freight and 90% of passenger movements (MoEFCC, 2021) and 20-30% of urban air pollution in India (NITI Aayog, 2023), nurturing the need for mitigation measures such as electrification and modal shift. The share of electric vehicles (EVs) in year-wise newly registered vehicles has rapidly increased from 0.5% in 2018 to 5% in 2022 (Vahan Dashboard, 2023). Central government schemes such as **Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles (FAME), Production Linked Incentives (PLI) schemes, PM e-Bus Sewa**, etc. have focused on accelerating EV adoption in India. Leveraging India's potential to lead manufacturing and adoption of EVs, following interventions may further aid in accelerating the electrification of road and public transport:

- Targeting government and departmental fleets in the **next stage of policies and incentive schemes** to promote the EV ecosystem, starting with large government entities and public service undertakings (PSUs)
 - All PSUs/Government departments to shift to a 100% zero emission vehicle (ZEV) fleet by 2030
 - 30% electrification target for off-road vehicles and tractors sold in India by 2030
 - Purchase incentives for the electrification of hard-to-abate vehicle segments: medium and heavy-duty vehicles, and the charging infrastructure
 - Need of charging infrastructure: National Roadmap and City-level Plans to be developed and capacity building for all Local Planning Authorities for planning and implementation of charging infrastructure
 - Non-fiscal demand side interventions: Creation of low emission zones, entry restrictions for non-EV vehicles, preferential parking for EVs, etc. to promote EVs
- Establishing a **sustainable Payment Security Mechanism (PSM)** for effective roll-out of e-buses, zero emission trucks (ZETs) and rooftop-solar-based charging infrastructure in India
- Allocating **budget for upskilling and reskilling manpower in EV industry**, as a part of the just transition
- Establishing **dedicated last-mile connectivity cells and departments** in State Road Transport Undertakings (SRTU's) and capacity building of SRTU's



2. Improving fuel efficiency

With the adoption of Bharat Stage (BS-VI) emission standards in 2020, India has taken substantial steps to reduce vehicular emissions; however, similar measures have not been applied to fuel efficiency norms. Adoption of fuel-efficient vehicles could be increased through efforts such as **fuel economy standards and fuel-efficiency labeling efforts**. Corporate Average Fuel Efficiency (CAFE) norms and BS emission standards play an important role in accelerating the path to achieve India's net zero targets. The energy consumption of the entire road transport sector is dominated by heavy-duty vehicles (HDVs). Interestingly, only 8% of India's overall fleet falls under the HDV sector, yet it accounts for almost 38% of the nation's total diesel consumption and produces about 60% of all CO₂ emissions from the transportation sector (Shakti Sustainable Energy Foundation, 2017). Therefore, the fuel efficiency of HDVs needs to be improved to save substantially higher amounts of fuel.

The following interventions may result in reduced energy intensities in the transport sector:

- Stringent fuel-efficiency standards for private and commercial vehicle segments, tractors, and off-road construction equipment
- Design and introduction of **CAFE norms for 2W & 3W**
- Adopting the Worldwide Harmonized Light-Duty Test Procedure (WLTP) for passenger vehicles
- Simulation-based approach for Adoption of **Bharat Vehicle Energy Consumption Tool (VECTO)** for HDVs
- Higher incentives** for phasing out inefficient vehicle stock through scrappage policy; introducing phase out targets from state governments
- Clean Freight Programme** for the user industry and **Driver Training Programmes** focussed on large shippers and carriers

3. Increasing ambition for alternative fuels

India has undertaken various initiatives for the development of alternative fuels, such as allowing the use of damaged surplus food grains for ethanol production, the use of compressed biogas (CBG) for motor vehicles, and priority sector lending to CBG projects by the RBI. Further, the country has targeted E20 blending by the year 2025. India's objective of energy security as well as lowering emissions could be further accelerated by the augmentation and promotion of alternative fuels. Also, ensuring a continuous supply of alternative fuels can reduce import dependency. India is well-poised to look at hydrogen technology for clean and green transport. The demand for hydrogen is projected to increase by at least **five folds by 2050**, continuing to grow in the second half of the century (TERI, 2020). However, constraints related to cost and its storage may dampen the penetration of hydrogen. The following interventions may accelerate the transition to alternative fuels:

- Replacement of **Research Octane Number (RON) 91 fuel by RON95 fuel as base grade gasoline in India**. Higher RON value results in increased engine and fuel efficiency, also it is in line with India's ethanol-blending programme.
- Roadmap for cost-effective low carbon technologies** (such as hydrogen fuel cells) for the long-haul HDV sector and public transport services
- Research and Development (R&D)** in advanced technologies for biofuel production, its utilisation, and technology upgrades required to meet flex-fuel engine configuration
- Target-based setting up of biogas plants** and using compressed biogas as a substitute for CNG

1. E20 biofuel is a mixture of 20% ethanol and 80% motor spirit (MS)

2. Research Octane Number (RON) is the percentage of iso-octane present in the fuel. RON91 depicts presence of 91% iso-octane and 9% heptane in the fuel.



4. Inducing a modal shift to railways and waterways

Increasing the modal share of railways can bring down CO₂ emissions by 4.3 gigatons (Gt) in 2050 (Niti Aayog, 2021). India has undertaken a massive infrastructural boost through the construction of dedicated freight corridors (DFC's) that promise to decongest railway tracks for faster passenger train operation, thereby improving the speed of freight rail movement significantly. Indian Railways has committed to achieving a 100% electrification target by 2024, as part of its goal of becoming a net-zero carbon emitter before 2030. Increasing electrification and sourcing electricity from renewable sources can further reduce emissions from the most efficient mode of transport. Further, operational efficiency could be maximised by improving existing terminal infrastructure and access roads.

The following interventions may aid in promoting a modal shift to railways:

- Setting-up the “**Railway Tariff Regulatory Authority**” to analyse the market conditions and rationalise the pricing mechanism of Indian Railways.
- An **integrated development approach** may be incorporated in areas with industrial units, logistics parks, national and state highways, and rail freight terminals
- Promotion of domestic containerisation** to capture long head traffic of light goods, leading to improved efficiency and reduced logistics costs
- Roadmap for improving the energy efficiency of traction (using measures such as regenerative braking, etc.)
- A clear **long-term roadmap** for increasing the share of inland waterways (IWT) to 5% in-line with the Maritime India Vision 2030; Mapping industrial clusters pan-India to fast-track **development of multimodal corridors** for coastal shipping and inland waterways

5. The importance of International collaborations

International collaborations are crucial in accelerating the pathway to decarbonise the transport sector. Recently, India has collaborated with the United Kingdom (UK) under the ambit of Innovating for Transport and Energy Systems (ITES) to develop greener and more affordable ways of transport. Further, India has collaborated with the United States (US) to expand the e-bus network in India.

India can leverage the collaborative approach to decarbonise its transport sector through

- Mobilising international finance** for sustainable technologies and just transition
- Increased collaborations** in research, development, and deployment (RD&D) of advanced technologies (such as sustainable aviation fuels, blending of biofuels, advanced cell chemistries for EV batteries, etc.), similar to the Global Biofuel Alliance proposed by the G20
- Introducing a ‘**cross learning alliance**’ for sharing best practices and building consensus in decarbonising the global transport sector
- Initiating new trade tie-ups between countries to explore new ways to import and export alternative fuels



Scaling up Energy Efficiency

As India strives to achieve its ambitious Nationally Determined Contributions (NDC) target to reduce emissions intensity of its GDP by 45 percent by 2030 from the 2005 level, energy efficiency (EE) will play a critical role in achieving the same. With an eye on energy security and energy efficiency, India has taken various initiatives to accelerate its clean energy transition. The Indian government has introduced demand side policies and pathways: Perform Achieve and Trade (PAT), Standards and Labelling (S&L), Super-Efficient Equipment Program (SEEP), Energy Conservation & Building Code (ECBC), India Cooling Action Plan, etc.

These energy efficiency (EE) efforts have resulted in India's energy intensity decreasing from 0.28 MJ/INR in FY 12-13 to 0.2245 MJ/INR in FY 21-22. Going forward, EE is poised to play a significant role; the International Energy Agency (IEA)'s Sustainable Development Scenario indicates that 40% of emissions abatement needed by 2040 is going to be met through EE efforts. The recent G20 summit in New Delhi, also recognized the need for doubling energy efficiency, decarbonizing energy intensive industries and sustainable lifestyle and behavior choices in the leaders' declaration. This communique aims to outline the steps that India needs to take in various spheres : activities that need to be started, activities that need to be continued, and activities that need to be dropped.

1. Promoting building efficiency in new and existing buildings

Action areas for new buildings

- i. **Accelerate implementation of ECBC and ENS:** Synthesize lessons and develop practical approaches from state-level efforts and successes in ECBC adoption and implementation.
 - A centralized high-level inter-ministerial and inter-departmental committee at national and state levels to examine and resolve issues related to code enforcement and compliance, particularly with ECBC and fast-track ENS adoption.
 - Strict enforcement and penalties for non-compliance with building energy codes in government and public buildings.
 - Create simple prescriptive requirements for the existing building codes to enable cost effective implementation.
 - The new building code under development (ESCBC) must incorporate embedded energy considerations for building materials and components.

ii. Mainstream passive design strategies for all new buildings

- Incorporate select passive design measures and specifications (for example, those related to shading, insulation, ventilation, wall assemblies and windows) into government procurement guidelines and local building regulations and bylaws.
- BEE and BIS to collaborate to set energy performance and quality standards for selected high impact passive design solutions and products, as well as develop a market-based program for energy efficient building products, like appliance labelling programs.

iii. Promote renewable energy technologies for new buildings.

- Undertake more demonstration projects and research into the application of varied RE technologies (other than RTSPV) for different building types and climate zones.
- Promote these technologies through dedicated policies and regulations and develop viable business models for these RE technologies.
- Strengthen compliance with building regulations that promote renewable energy generation on-site.



iv. Shift from asset-based performance to operational performance-based codes

- Launch a dedicated program on establishing metrics, and standards and benchmarks for operational performance (either in EPI or similar metrics) and define and clarify terms related to asset and operational performance metrics and indicators for all building types at the national level. Establish a framework for data collection, analysis, and application.
- Develop procurement guidelines to achieve EPI thresholds for government buildings.

Action areas for existing buildings

i. Develop dedicated retrofit programs for improving the energy efficiency of existing buildings

- Develop building specific, viable retrofit solution sets that incorporate proven technologies
 - Conduct research on the types of buildings that are most suitable for energy efficiency retrofits based on energy savings potential, standardized retrofit solutions, etc.
 - Expand the pool of service providers to include those who can implement system-wide solutions (e.g., EE, RE, etc.) to enhance the range and quality of retrofit projects

iii. Implement strategies for changing the behaviour of building owners, operators, and occupants

- Develop programs on the lines of RE100, EV100 that mandate meeting certain performance benchmarks covering specific building typologies, ownership and management structures can break inertia.
- Encourage the adoption of smart technologies to influence consumer behaviour.

v. States should consider designing performance-based incentive programs for green buildings and bringing DISCOMs on board to check for compliance with approved ratings.

ii. Expand definition of EE service providers and engage DISCOMs through the enforcement of DSM regulations.

- The term ESCO is to be extended to more comprehensive 'Energy-as-a-service' to include utility level solutions (e.g., cooling-as-a-service, Energy Efficiency-as-a-service, etc.)
- Create more awareness about these service providers and available solutions, and establish standard terminologies for each category to enable financing for all sets of participants
- Engage Discoms (and SERCs) as a direct consumer platform that can be leveraged to enhance ESCO based energy efficiency awareness and implementation.
- De-risk energy efficiency markets through appropriate regulatory and payment security mechanisms.
- building specific, viable retrofit solution sets that incorporate proven technologies

iv. Forge international collaboration in specific areas

- Joint research activities to identify emerging technologies and digital solutions
- Develop innovative business models that have worked in other energy sub-sectors at scale and with impact.

Scaling action on sustainable cooling

i. Streamline implementation of ICAP at the state level, monitor, and track progress

- Bring clarity on the roles and responsibilities of government actors and stakeholders at the state level for each recommended action through an implementation plan.
- Develop a framework for monitoring progress on recommended actions across all sectors to bring in accountability and transparency in ICAP governance.

iii. Provide a level playing field for entrepreneurs and start-ups

- Enable the development of indigenous manufacturing capabilities for low energy cooling technologies.
- Organize an innovation challenge to attract startups and innovators to develop innovative cooling solutions
- Develop technology incubation centers to support entrepreneurs and startups related to mentorship and the necessary infrastructure for technology development and commercialization.
- Design and implement cluster-level technical assistance programs for SMEs to improve the assembly of components.
- Provide exemptions to SMEs involved in the manufacturing of energy efficient appliances by waiving off appliance labelling fees, certification fees, and lab testing fees.
- Create dedicated programs targeting the expansion of the capacity of manufacturers and supply chain SMEs to produce super efficient appliances (fans, air conditioners, etc and their components).

ii. Enhancing appliance energy performance standards for super efficiency

- BEE to develop a program for super energy efficient room air conditioners – the highest level of EE that's technically possible while ensuring life-cycle-cost effectiveness.
- RAC labelling programs must also account for other energy performance factors beyond energy efficiency, like the potential for demand flexibility, smart and connected features, integrated renewable energy use, and low embodied carbon in manufacturing.

iv. Promoting an urban cooling centric approach for resilient cities

- Develop nature-based solutions through active collaboration between city authorities, the private sector, and civil society for a resilient and inclusive urban environment
- Implement district cooling solutions in new townships and urban development areas to achieve greater energy efficiency in delivering cooling services to the residents
- Enable Series A and B financing for moving technologies from the laboratory to the field

v. Scale low-cost cooling solutions and technologies to meet the thermal comfort needs of vulnerable communities.

- Prioritize achieving thermally efficient building envelope or shell for all buildings.
- Enable both ECBC and ENS to describe thermally efficient building envelope specifications for all building types



Scaling energy efficiency in MSMEs

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- i. **Setting targets for EE in the MSME sector:** The G20 Leaders' Declaration in September 2023 noted the voluntary adoption of doubling the rate of Energy Efficiency (EE) improvement by 2030. Suitable targets for 2035 and 2040 are required to ensure momentum.
 - ii. **Accelerate adoption through innovative implementation models:**
 - As soon as BEE's PAE is launched, a time bound pilot should be designed to assess its implementation modalities.
 - Recognize efforts taken on EE through appropriate branding.
 - Gol should develop a payment guarantee mechanism for the EE sector- to address the risk perceptions of stakeholders and pricing distortion, quick disbursements should happen.
 - iii. **Capacity building and training needs**
 - Capacity building for the financing community to understand and evaluate EE projects
 - Create a knowledge platform for:
 - Collection of important stakeholder feedback and peer sharing of case studies
 - Effective learning of new schemes, policies, and technologies



People-Positive Energy Transition

At COP26, India announced its target of achieving Net Zero by 2070 and subsequently submitted its Long-Term Low Emission Development Strategy (LT-LEDS) at COP27. While India has committed to achieving this transition from traditional fuels in a just, smooth, sustainable, and inclusive manner, the specific approaches to address the people-centric aspects of this energy shift have not been explicitly outlined. The urgency of this matter is underscored by estimations indicating that more than 21.5 million people, encompassing both formal and informal employment in the traditional fuel and allied sectors, will be directly affected. Moreover, a significantly higher number of people indirectly depend on these sectors for their livelihoods, amplifying the societal impact of the energy transition.

Regardless of the timeframe established to expedite the phasing down of traditional fuels, it is important to establish a clear, transparent, and consensus-driven approach for a people-centric energy transition—one that unequivocally "leaves no one behind". Recognizing the complexity of this endeavour, which demands extensive stakeholder engagement and consensus building, this communique underscores the need for immediate and decisive actions. This communique also highlights the urgency of bridging the existing gap between the overarching national energy transition strategy and the specific measures required to safeguard the well-being of individuals and communities directly impacted by this monumental shift in India's energy landscape.

1. Building a common understanding of "People-Positive Energy Transition"

To build a common understanding of "People-Positive Energy Transition", the group believes that it is crucial to -

- Recognise that people are pivotal to the energy transition process and adopt an approach that enables the active involvement of communities, including women, youth and marginalized sections of society.
- Establish a clear and contextual definition of "People-positive energy transition" in the Indian context, factoring in the regional diversities and socio-economic complexities.
- Adopt a set of high-level principles to ensure a more holistic and equitable approach, which acts as the cornerstone in guiding the planning and implementation of a people-centric energy transition. These principles must include -
 - a commitment to "Do no harm/leave no one behind (LNOB)", which prioritizes actions that avoid negative impacts and ensures that no individual or community is left behind while paying special attention to vulnerable groups such as women, youth, and marginalized sections of society.
 - integration of measures that create new job opportunities and enhance existing livelihoods, fostering economic resilience among communities affected by the transition.
 - emphasis on principles that result in positive transformations across social, environmental, and economic dimensions.

2. Establishing Anchor Institutions at the National & Sub-National Levels

The complexity of the energy transition necessitates a centralized institution to undertake research and coordinate actions across various ministries, addressing issues ranging from economic and industrial diversification to upskilling and reskilling the workforce. Collaboration on the repurposing of land, social protection, and environmental concerns, including climate and disaster risk, requires a centralized body to ensure streamlined efforts. The group believes that the institution at the national level best suited to undertake this responsibility is the NITI Aayog, given its policy expertise and engagement on issues pertaining to climate change and sustainable development.

Recognizing the unique challenges faced by states with differing dependence on traditional fuels, either from the supply and/or demand perspective, it is equally imperative to establish anchor institutions at the state level for effective planning, implementation, and monitoring of transition actions. These state-level institutions can act as conduits for tailoring national policies to meet state-specific needs, ensuring a more nuanced and effective transition. Few states have already initiated action in this regard by establishing a separate task force for undertaking such efforts (e.g., the Sustainable Just Transition Taskforce notified by the Government of Jharkhand). By establishing both central and state-level anchor institutions, India can create a robust framework for comprehensive planning and execution of the energy transition.

3. Identifying Key Priority Areas and Initiate Planning Process

When embarking on this disruptive journey towards a low-carbon and sustainable future, it becomes critical that a people-positive energy transition strategy be designed which aligns with the Long-Term Low Emission Development Strategies (LT-LEDS). This strategy will identify key priority areas for initiating the process of research and planning. Some of the key priority areas recommended by the group are -

- **Adequate and Fair Compensation Mechanism for Affected Regions:** Ensuring that regions undergoing economic shifts, especially the coal-dependent states in Eastern India, receive fair and adequate compensation is critical. This includes mechanisms to offset potential economic disruptions, support affected communities, and facilitate a smooth transition for individuals and businesses.
- **Social Protection:** Robust social protection measures, which go beyond existing schemes, are essential to safeguard vulnerable communities during the transition. This includes comprehensive social safety nets, healthcare provisions, and support systems that prevent any adverse impacts on the well-being of individuals and families.
- **Gender Equality:** A just transition demands gender equality as a core principle. Initiatives that empower women economically and socially contribute not only to equality but also to the overall success and sustainability of the transition.
- **Environmental Safeguards:** Embedding stringent environmental safeguards that balance economic development with ecological sustainability ensures a harmonious transition that doesn't compromise the health of ecosystems and biodiversity.
- **Economic Diversification:** Identifying and fostering emerging sectors, such as renewable energy, green technologies, and sustainable practices, becomes pivotal for long-term economic diversification and resilience.
- **Workforce Development:** Central to a successful transition will be workforce development - upskilling and reskilling programs to ensure that the workforce is equipped with the necessary skills for emerging industries.
- **Livelihood Promotion:** Promoting alternative climate-resilient livelihoods is of utmost importance, particularly for individuals in the informal sector whose means of living were traditionally tied to traditional fuels.

The group also believes that it is imperative to immediately initiate rigorous research and data collection on the identified priorities, which is fundamental for developing a nuanced understanding of the short-, medium-, and long-term actions required in each priority area. Informed decision-making, backed by robust data, is key to crafting effective policies and interventions.



4. Establish Stakeholder Dialogue/ Engagement Platforms

Extensive and inclusive stakeholder engagement is recognised as one of the key drivers of a successful people-positive energy transition. Engaging communities fosters a sense of ownership and empowerment, vital for building support and cooperation. Such engagement becomes a mechanism for addressing social inequalities, particularly by prioritizing vulnerable populations in the transition strategy. The group therefore believes that it is critical to –

- establish regular and structured dialogue platforms at the national, regional, state, district, and community levels for meaningful stakeholder engagement.
- establish similar platforms for sectoral stakeholder engagement -in particular, the representatives of trade unions/ associations in affected sectors.
- develop clear and relatable content for awareness creation to convey the objectives, benefits, and challenges of the energy transition to communities, the MSME sector, and other relevant stakeholders.

5. Earmarking Sources of Funding for People-Centric Action

The financing needs of supporting the energy transition are substantial. However, supporting the priorities identified above to ensure that such a transition is socially equitable and economically inclusive requires significant grant and patient capital. While there may be some international sources of funding in this regard, it is important to start planning and earmarking domestic sources of funding for the same. Some of the recommendations from the group in this regard are -

- Undertake a Detailed Assessment of Existing Government Schemes:** A meticulous examination of existing government schemes, particularly social protection programs, is vital in identifying opportunities for restructuring and optimizing these programs and channelling resources more efficiently towards supporting individuals and communities affected by the transition.
- Establish a People-Positive Energy Transition Fund:** A dedicated fund which recognises the unique financing needs of "hard to finance" people-positive aspects of the energy transition is required. This fund will serve as a financial catalyst, providing the necessary resources to drive impactful and inclusive changes. Possible sources of financing include an energy transition cess, contribution from future energy projects, percent share of CSR funds, development aid and climate funds
- Extended Industry Responsibility (for people):** Along the lines of the Extended Producer Responsibility (EPR) on materials, it is proposed to put the onus of managing the transition process of all people employed by industry, both formal and informal, on the industry itself. This will ensure that all the costs associated with such a transition are factored into the overall financial planning of the industry.

Anchor Partners



Investment Partners



Upstream Partners



TETD Partners





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