



SDG Knowledge Forum

Proceedings of Energy Transition and Industrial development



By

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1. Background

A policy round table on '*Energy Transition and Industrial Development*' was held on December 6th, 2024 at the Anna Centenary Library, Chennai. The event was organized by MIDS in collaboration with UNDP and SDGCC of Tamil Nadu.



The round table focused on understanding India's need to implement creative and effective strategies to address the combined impact of economic growth, development and energy transition, particularly to achieve SDG 7 (ensuring access to affordable, reliable, sustainable, and modern energy for all.) & 9 (supporting R & D that promotes industrial diversification and value addition to commodities) with special focus on protecting livelihoods, offering alternative job opportunities, and ensuring that vulnerable communities are not adversely impacted. The event comprised of three panel discussions that featured several eminent academicians & personalities, entrepreneurs and PhD scholars who excelled in the above area of research.

The event started at 10.30 am with a welcome address given by Mr. Balasubramanian Munuswamy, Chief Development Goals Specialist (i/c), UNDP-SDGCC, TN where he emphasized the importance of the roundtable in shaping policies focused on energy transition and economic growth. The goal was to address the gap between the benefits of reduced energy production costs for manufacturing and the need for



worker reskilling and upskilling amid rapid energy and digital transitions. This was followed by the theme and overview address of round table which was given by Dr. A. Kalaiyaran, Assistant Professor, MIDS, Chennai where he highlighted key gaps in the global energy transition, including (1) differing priorities between countries: The Global North focuses on diversifying their energy mix, while the Global South prioritizes meeting global energy demands; and (2) a lack of coordination, or "strategic silos," among policymakers. He stressed the importance of addressing these issues and considering their impact on livelihoods. Then he gave a brief introduction on the three main areas that were to be covered in the panel discussions: Decarbonizing Industrialization; Greening Development & Skilling Workforce; and Energy Transition & Inequality.

Due to unforeseen last-minute commitments, two chief guests, Mr. Anshul Mishra (IAS) and Mr. Atul Anand (IAS), along with the Director of MIDS, Prof. M. Suresh Babu, were unable to attend and inaugurate the event.

2. Session I – Decarbonizing Industrialization

“What works in Curriculum, pedagogy and assessment for improved learning outcomes”

2.1. Prelude

This session had 4 discussants in total, each were allotted 15 minutes and the session was led by Mr. Alagappan Ramanathan, the Development Goals Specialist – UNDP-SDGCC, TN as its moderator. He set the context by stating that India, the world's fifth-largest economy, is grappling with the challenge of reducing industrial emissions, which constitute 23% of its greenhouse gases, primarily from sectors like cement, steel, and chemicals. Committed to achieving Net Zero by 2070 and reducing GDP carbon intensity by 45% by 2030, India aligns its efforts with the Paris Agreement and Sustainable Development Goals (SDGs). Setting the tone for sustainable growth, key decarbonization strategies include expanding renewable energy capacity to 500 GW by 2030 and integrating green hydrogen technologies. Additionally, the focus is on promoting sustainable industrial practices, such as producing low-carbon cement and green steel. Ensuring a just transition remains central, emphasizing worker reskilling and support mechanisms to adapt to the evolving green economy.



2.2. Speaker 1: Mr. Prakash Tiwari, Former Director, NTPC, Chhattisgarh.



He discussed both the technological and financial aspects of industrial decarbonization. On the technology front, he highlighted pre-combustion and post-combustion carbon capture methods. Pre-combustion, which is small-scale, cost-effective, and more feasible, receives less attention in India compared to post-combustion, which is widely practiced despite being energy and capital-intensive. Two NTPC carbon capture projects at the Vindhyachal Power Plant (Madhya Pradesh) and Simhadri Power Plant (Andhra Pradesh) are in their initial phases. Captured CO₂ from these projects is compressed and utilized in petroleum industries and for producing materials like polycarbonates, methanol, and fertilizers. On the financial side, he noted that while funding is accessible for petroleum industries, it remains a challenge for soil carbon sequestration efforts. Lack of public awareness is a critical barrier to India's decarbonization initiatives, particularly regarding the use of green hydrogen as a transportation fuel. Green hydrogen shows promise, especially in steel industries, but requires substantial investment to be scaled up, as grey hydrogen dominates current usage. He emphasized the importance of raising awareness about the cost of electricity produced through carbon capture and storage and called for government investment in capital expenditure. He also addressed negative perceptions about coal, advocating for efficient coal plants and increased domestic production to reduce imports. He concluded

with the thought that the solution to a problem changes the nature of the problem but does not eliminate it.

Policy recommendations:

- Promote pre-combustion technologies for carbon capture methods, which are more cost-effective and suitable for India's current economic situation, over the widely practiced post-combustion techniques.
- Boost funding for soil carbon sequestration by creating awareness to enhance public and private investment in this area.
- Expand green hydrogen usage particularly in the steel sector, by improving public awareness and providing financial incentives to reduce reliance on grey hydrogen.
- Increase public awareness on the cost implications of electricity produced through carbon capture and storage to garner support for sustainable energy transition efforts.
- Counter negative perceptions about coal by promoting efficient coal plants and increasing domestic coal production to reduce dependency on imports.
- Advocate for the government to take on a larger share of the capital expenditure needed for decarbonization technologies and energy transitions.

2.3. **Speaker 2: Dr. Naveen J Thomas, Associate Professor, Jindal School of Government and Public Policy.**



Here the speaker highlighted the crucial connection between economic growth and human development, stressing that addressing vulnerabilities such as poor living conditions is key to advancing decarbonization and carbon capture efforts. One significant issue identified was the stagnation in the manufacturing sector's contribution to GDP, which leads to low employment rates. As a result, excess labor from agriculture is absorbed by the unorganized non-agriculture sector, especially in countries like India and Sub-Saharan Africa. In India, out of 6.5 crore establishments, 5.5 crores are Own Account Enterprises (OAEs), which are primarily micro-establishments. A majority (99%) of these enterprises are micro, with 63% being unregistered, and they struggle to grow beyond survival mechanisms, providing employment to about 11 crore people.

The speaker pointed out that vulnerabilities in the OAE sector are compounded when marginalized groups, such as women and socially disadvantaged communities (SCs/STs), are involved. These businesses face numerous challenges, including a lack of demand, limited credit access, non-payment of dues, and unreliable electricity, which hinder their growth potential. For India to address these vulnerabilities, there is a pressing need to transition micro-enterprises to macro-enterprises, providing them with better support systems. Additionally, expanding the formal manufacturing sector is crucial to absorbing the labor from the informal sector. This would require a significant increase in the size of the formal sector, specifically six times its current size, which can only be achieved

through energy transition. Energy transition is also vital for labor-intensive industries such as textiles, which are both high-energy-consuming and highly polluting. The Tamil Nadu power loom sector, for instance, faces energy shortages that restrict the use of auto looms, demonstrating the need for improved energy technology. The manufacturing sector currently meets only 11% of its energy requirements independently, which underlines the importance of adopting green energy solutions to address sector-specific energy demands.

The speaker proposed several solutions to bridge these gaps: First, micro-enterprises, especially OAEs, should be supported in their transition to greener sectors, although the low value-added nature of these sectors poses challenges. Second, there should be an emphasis on skill development to help workers move to more sustainable sectors. Third, creating industry clusters with shared facilities for pollution control—such as common treatment plants and coordinated hazardous waste disposal—would help mitigate environmental impact. Finally, ensuring energy security by increasing the share of renewable energy, coupled with solutions like rooftop solar plants to supplement the grid, is essential for long-term sustainability. These strategies are crucial for addressing the vulnerabilities in labor markets and fostering both economic and energy transitions.

Policy recommendations:

- Support for Micro-Enterprises transition, especially Own Account Enterprises (OAEs), grow into more sustainable (green) sectors, while acknowledging the challenges posed by low-value-added industries.
- Implement skill development programs to facilitate labor shifts from the informal sector to more formal and sustainable manufacturing sectors.
- Focus on developing industry clusters with common facilities to address pollution control, such as shared treatment plants and coordinated disposal of hazardous waste.
- Ensure energy security by increasing the share of renewable energy in the industrial sector, addressing energy shortages, and promoting the use of green energy sources.
- Encourage the installation of rooftop solar plants to complement grid energy and reduce reliance on conventional energy sources.

2.4. Speaker 3: Mr. Praveen Chandrasekaran, Engagement Lead, Council on Energy, Environment and Water (CEEW).



to TN's lower industrial emissions.

The speaker highlighted a study by CEEW on Tamil Nadu's (TN) industrial energy transition. The study considered factors like population growth, urbanization, and future GSDP growth to outline TN's energy transformation pathways. From 2005-2019, TN's CO₂ emissions rose by 84%. However, despite being the third-highest contributor to economic value in India, TN's emissions are relatively low compared to states like Gujarat and Maharashtra. This is due

By 2070, TN is expected to urbanize rapidly in the next three decades, with population growth stabilizing and then declining, significantly impacting energy transition. Economic growth will drive per capita income, with GSDP rising but at a slower growth rate. Urban-rural inequality is expected to decrease as rural incomes grow faster, and future industrial growth will likely emerge from rural areas.

Key insights for TN's net-zero transition include aligning state and public aspirations for net-zero goals; choosing the right emission peaking year alongside the net-zero target year; mass electrification of energy consumption; a significant reduction in final energy consumption; decarbonizing the power sector as a priority and finally utilizing the Green TN Mission's carbon sequestration potential of 19-25 MtCO₂ annually to achieve net-zero by 2070. To conclude, TN must balance energy security with affordable energy transition for its people.

Policy recommendations:

- ◉ Align State and Public Aspirations: Ensure that Tamil Nadu's goals for net-zero emissions are in sync with the aspirations of its people to foster collaboration and inclusivity.
- ◉ Carefully plan the year of emission peaking alongside the net-zero target year to optimize the transition.
- ◉ Prioritize mass electrification of energy consumption across sectors to drive the energy transition.
- ◉ Make the power sector the first priority for decarbonization, as it is critical to achieving emissions reduction targets.
- ◉ Leverage the Green TN Mission to harness its annual carbon sequestration potential of 19-25 MtCO₂, aiding in meeting the state's net-zero targets.
- ◉ Focus on fostering industrial growth in rural regions, reducing urban-rural inequality while supporting economic development.
- ◉ Ensure that the energy transition is economically accessible for people while maintaining energy security for the state.
- ◉ Implement measures to significantly reduce energy demand across sectors, improving efficiency.

2.5. Speaker 4: Ms. Sree Harica Devagudi, PhD scholar, IIT-Delhi



The speaker discussed the regional disparities in energy transition and the challenges posed by phasing out coal in India. Eastern and Central India, heavily reliant on coal, are seeing a decline in coal-related employment. The workforce includes:

- ❖ Informal workers contracted by middlemen, with no social security.
- ❖ Illegal workers collecting coal from abandoned mines for local sale.
- ❖ Captive mine workers employed by private companies for in-house operations.

- ❖ Non-legal workers in regions like Assam and Meghalaya under the VIth schedule.
- ❖ Formal workers, who are the smallest group.

Around 10 million people are directly employed in coal mining, with significant fiscal dependence on coal in states like Chhattisgarh and Jharkhand, where coal contributes 10-60% of district GDP. Coal also accounts for 40% of railway revenues and supports about 25 million people living near coal regions, highlighting its large economic multiplier effect. Women, however, are often excluded from coal mining and work in agriculture, which is adversely impacted by mining activities.

Most coal mines are public sector-operated, providing developmental services traditionally handled by state governments. In contrast, Southern and Western states are better suited for wind and solar energy, creating a double disadvantage for coal-dependent regions that must reduce mining and lack the resources for renewable energy. Private renewable energy companies are concentrated in the South and West, exacerbating the regional imbalance. Green hydrogen production also depends on coal, limiting its potential in Chhattisgarh and Jharkhand.

The speaker suggested solutions like place-based industrial strategies to reduce regional disparities and involving trade unions in energy transition discussions. Trade unions and social movements could play significant roles in addressing these challenges. Key questions raised for further research included the role of trade unions and PSUs in renewable energy and whether energy transition should be privately or state-led.

Policy recommendations:

- Support Coal-dependent Regions such as development of targeted strategies for Eastern and Central India, heavily reliant on coal and reduced dependence on coal while addressing the economic challenges faced by communities in coal-rich states like Chhattisgarh and Jharkhand.
- Promote Place-based Industrial Strategies where localized approaches are implemented for industrial development tailored to the strengths and needs of coal-dependent regions to diversify their economies.
- Encourage Trade Union Involvement i.e., include trade unions in energy transition dialogues to leverage their influence and ensure fair treatment for workers in the coal and renewable energy sectors.
- Leverage Public Sector Undertakings (PSUs) where it can strengthen the role of PSUs in leading the energy transition by investing in renewable energy projects and supporting communities' dependent on coal mining.
- Balance Energy Transition Leadership i.e., determine whether energy transition should primarily be private-led or state-led, with a focus on equitable and inclusive development.
- Support Renewable Energy in Coal Regions i.e., increase investments in renewable energy projects in coal-dependent regions, ensuring these areas are not left behind in the transition.
- Research Key Questions: Investigate the potential roles of trade unions and PSUs in renewable energy development; Explore models for integrating coal-dependent economies into the renewable energy landscape effectively.



The session concluded with an engaging Q&A segment where the audience actively participated. Questions included why policies and projects couldn't be short-term instead of long-term, examples of successful public-private partnerships for carbon capture, and the role of hazardous pollution in emission reduction efforts. The speakers addressed these queries thoroughly, sharing their expertise and providing insightful responses.

3. Session II: Greening Development and Skilling Workforce

3.1. Prelude

The session had four panelists and was moderated by Mr Balasubramanian Munuswamy Chief Development Goals, Specialist (i/c), SDGCC, TN. He set the context by stating that the previous session largely focussed on the technical aspects related to decarbonisation while also hinting at the need for skilling, reskilling, upskilling in the Indian context. While there is a huge opportunity for job creation, one needs to be cautious of job losses that may occur in the energy transition scenario. He also pointed to the commitment to triple the renewable energy capacity and double the energy efficiency by 2030 and to also unlock 1 trillion dollar value by then. India's Skill Council for Green Jobs, established sector-wise, could be an enabler in better preparedness for the energy transition.



3.2. Speaker 1: Mr Arpit Sharma, CEO, Skill Council for Green Jobs spoke on the 'potential of Green jobs and policy measures to boost green jobs in TN'.



He started his talk by stating that his organisation is actively engaged in projects in Tamil Nadu which include solar, wind, small hydro, bio fuels along with solid and municipal waste management, waste water treatment and bio waste. By 2030 India aims to achieve 500 gigawatts of installed capacity from non-fossil fuel sources amounting to 50% share in total energy requirements. Given that India is aiming for net-zero emission by 2070, they are huge prospects of new jobs in the renewable energy sector. He pointed out that, while Tamil Nadu is at the forefront of renewable energy production, the installed capacity is only 10,000 Megawatt. Yet TN is very promising with prospects for creation of new jobs. Moreover, India's first Green Hydrogen project which will be set up in Tuticorin in Tamil Nadu will be an important lever in the energy transition aspirations of India. He also noted that the Government of Denmark is planning to have a policy dialogue with the Government of Tamil Nadu for a technology transfer. Towards rooftop solar plants installation, the scheme PM Surya Ghar Yojna aims to electrify 1 crore households which will have the dual benefits of adopting clean energy sources as well creating entrepreneurship opportunities. The scheme will unleash an entire eco system of suppliers, vendors, helpers with a potential for increased participation from women. He said that his organisation has created certification programmes and is in the process of implementing courses in academic institutions in collaboration with industry partners.

Policy recommendations:

- More courses to be introduced in academic institutions such as ITIs, colleges and even schools through industry-academic partnerships.
- More initiatives to be taken up for technology transfer from other countries which have developed expertise.
- Tamil Nadu has more roof top potential which needs to be unleashed.
- PM Surya Ghar Yojana has the potential for increased participation of women as micro entrepreneurs in the solar plants eco systems.

3.3. **Speaker 2: Mr Thiru Srinivasan Lead, EV Task Force TN FaMe on 'EV transition skilling landscape in Tamil Nadu (Fresh skilling, reskilling and upskilling) '.**



His talk focused on how Tamil Nadu plans to harness the potential of the renewable energy sector through skilling its workforce. He sees Electric Vehicle technology, a disruptor in Auto Industry, as an opportunity for levelling the field where India can now compete with other auto majors such as Germany or Japan. He suggested that India can learn from China's spectacular strides in EV production. EV is a priority sector for Tamil Nadu given that TN it is a major auto manufacturing hub with a growing auto component sector. The aim of the EV taskforce, that he heads, is to augment EV policy and to accelerate EV growth in Tamil Nadu with the big dream to be the world's largest EV manufacturer and exporter. Apart from land and capital related issues, the focus of the task force is the development of human resources. They undertake Research and Development through collaborations with training support providers. A notable aspect of the taskforce is that it has membership from multiple government departments and that it is centred in the MSME department. The target is to create 34 lakh skilled resources in manufacturing and 35000 in R&D apart from sales and services. They have also conducted several training programmes but the bottleneck is limited skilled resources exist for training the trainers.

He emphasised the need for a 'just' transition of the workforce along with the energy transition. The strength of TN is the large aspiring educated workforce who are looking for high value jobs. The twin challenges are the reduction in working age population and the supply of workers for entry level manufacturing jobs. The move towards EV manufacturing would entail a reduction in the number of jobs as EV vehicles require lesser number of components than Internal Combustion Engines, yet the value of jobs created would be high. The challenge then is enabling those working in exhaust component manufacturing and machining to make a shift towards EV component manufacturing. Another skill gap that needs to be filled is training in electronics and embedded software. His organisation engages with the industries to understand and quantify the skill needs and resources needed in the near future. They also work on revising the curriculum for polytechnic institutes to include more content on EV. New courses have been introduced at Anna University and IIT including certification and Masters courses. Another important endeavour of the task force is focused on setting up of common facility centres for testing EV vehicles.

Policy recommendations:

- Government should focus on 'just transition' of the workforce given that EV vehicle manufacturing would create lesser jobs than conventional auto manufacturing though the value of jobs created would be higher.
- Workforce qualified in electronics and embedded software is the need of the hour for the EV industry.
- TN government should facilitate internal migration of skilled workforce from other states to work in entry level jobs in Tamil Nadu as the aspiration levels of the TN workforce is higher.
- Training the trainers is an important need to ensure the supply of enough trainers throughout the country.
- Common facility centres need to be set up for EV Vehicles testing as well as for sharing resources on other aspects.

3.4. Speaker 3: Dr Raguram Arjunan, President, Sustainability & Energy Practitioners Association on 'Industry academia collaboration strategies for Greening Development'



He represents an organisation called SEPA (Sustainability and Energy practitioners' association). He brought to the discussion the perspective of entrepreneurs based on their experiences in finding their feet in the burgeoning green energy sector in India. After many years of struggle, SEPA decided to start an accreditation program to streamline the activities in the sector. With membership currently numbering 130, SEPA focuses on translating the vision of governments through institutions and MSMEs. Focus areas

are solar, energy storage, carbon capture and green hydrogen. They work with the chambers of commerce of different states and conduct programmes and workshops in institutions with the aspiration to churn out more entrepreneurs. He pointed out that the academic curriculum is found wanting in its inclusion of courses on green energy such as solar plants, green hydrogen, carbon capture technologies etc. His organisation has been at the forefront of addressing this lacuna by working with educational institutions.

From his experience of building and installing solar plants, he finds that lack of sub-stations is a bottleneck for expansion of grid connectivity for green sources. Existing solar plants needs to be retrofitted for implementing Agrivoltaics for which Italy and Netherlands serve as exemplars. Next important step is to set up a consortium for the farmers to enable them to obtain credit for green energy uptake. He said his organisation is working for MSME- Academic Institutions collaboration for promoting real time research. Another issue that needs to be addressed in order to expand solar installation is the quality of roofing.

Policy recommendations:

- Need for centres of excellence in Green Energy.

- Need for restructuring academic courses to include green energy technologies not only in premier institutions but also in all other colleges.
- Industry and academia should come together to tap resources that are made available by the government.
- Real time research should be taken up through collaboration between MSMEs and Academic Institution.
- Improving the structural quality of roofing is important for robust solar installations capable of handling extreme climatic events.
- Need to setup / upgrade sub-stations to expand grid connectivity.
- Need technological and financial support for upgradation to Agrivoltaics.
- Need to set up a financial institution for providing credit to farmers on the lines of NABARD.

3.5. **Speaker 4: Ms. Chaitanya Kanuri, Associate Director WRI India on 'Strategies to enable MSMEs in the auto sector to diversify into EV and EV-component manufacturing'**



She is part of a non-profit organisation WRI where she leads various research and project initiatives on electric mobility at the national and state levels. In her talk, she focused on the vulnerabilities of the MSME sector which include the very small scale of operation and lack of resources. Given that India is a growing auto market, it will have a longer transition arc where the demand for ICT vehicles will continue to grow along with EV. Hence in the case of India it is more pertinent to talk about diversification to EV rather than a transition. The

challenges to EV transition include – lack of awareness of the opportunities that exist in EV manufacturing; major skills mismatch as the workforce in the auto industry are trained in mechanical casting and forging rather than electronics; ambiguity on the prospects of EV as potential for higher value business exists even though business volumes may come down; Industry- Academic collaboration is found wanting.

She emphasized the need for a dedicated channel for supporting MSMEs and component manufacturing to understand the EV market opportunity. She also pointed out that there are data gaps and there was a need for national level data on employment trends in the automotive sector. She presented the findings from a research study conducted on major MSME clusters where it was found that there was a demand-supply gap in the skill required for the industry both in the low and high skill jobs. She seconded the other speakers in the panel regarding the need for more quantification of the skill gap. She also suggested that MSMEs could tap into opportunities for diversification towards auto and non-auto manufacturing through process innovation. This would require support in terms of technology transfer, financing, skilling and infrastructural support.

Policy recommendations:

- Need to create awareness for MSMEs on the opportunities available in the Electric Vehicle sector both for auto and non-auto MSMEs.
- Government should step in for providing subsidies based on capital/ turn over based and subsidies on land cost.
- Support for Infrastructure through initiatives such as MSME parks.
- Common facility centres for effluent treatment, battery testing equipment , production and process equipment, prototype new products and more.
- Upskilling, reskilling the workforce to match the need of the EV sector.
- MSME certification programs to develop trust worthy MSMEs which will improve global competitiveness.
- Market Development Support for MSME are required as they are risk averse and lack enough resources to plan in advance.

3.6. Concluding remarks

The moderator concluded the session by noting that systematic skill gap assessment is being done across all sectors by various agencies in India. Nonetheless, a comprehensive effort needs to be undertaken exclusively for the EV sector to quantify the skill needs. He requested his fellow panelists who happen to be important stakeholders in the EV eco system to come together for this initiative.

3.7. Major Policy Insights from Panel Discussion - 2:

Mr Thiru Srinivasan of the EV Task Force, asked **SDGCC,GoTN** to undertake a study to quantify the skill gap in the EV sector including green hydrogen technologies in Tamil Nadu as most of the speakers pointed to the existence of data gaps in assessing the needs and potential of the EV sector. SDGCC expressed his willingness to undertake this study along with Skill Council for Green Jobs & WRI India. Green Skill Council emphasized that real time data collection is the most challenging part of this exercise and that they are willing to share the reports of the skill gap studies conducted so far. The moderator concluded the session with appreciation for the initiative.



4. Session III: Energy Transition & Inequality

4.1. Prelude

This session had 3 panelists and was led by Prof. L.Venkatachalam, RBI Chair Professor, MIDS.

4.2. Speaker 1: Prof. Kavikumar, Professor, MSE.



The speaker discussed the need for methodological innovations to address the inequalities and job losses caused by energy transition. Three types of inequalities were highlighted:

1. **Existing Inequalities:** Inequities in energy access, reliability, quality, and environmental impacts like morbidity and mortality.
2. **Potential Inequalities:** Those arising from energy transitions, policy shifts, climate change, and other factors.
3. **Inequalities Across Groups:** Geographic regions, income levels, social groups, rural-urban divides, and gender disparities.

The speaker noted disparities in energy access and health impacts, such as PM 2.5-induced mortality, which is lower in northeastern states due to the absence of power plants but higher in southern states. Poorer states experience sharper economic declines with rising temperatures compared to wealthier states.

Key divergent views include:

- ◉ Energy access as either a basic need or a luxury.
- ◉ Energy costs being cheap versus expensive.
- ◉ Climate agreements seen as tools for global collaboration or as threats to national sovereignty.
- ◉ Energy policy driven by public interest versus private interests.

Decarbonization is often viewed as a way to mitigate GHGs and lower energy costs. However, issues like land acquisition, marginalization, and externalities need attention. Solar parks, for instance, currently bypass Environmental and Social Impact Assessments (EIA/SIA), which inadequately address the concerns of marginalized groups.

State governments' focus on renewable energy contracts, in addition to existing obligations, could increase fiscal deficits. The speaker emphasized the need to view energy transition as an opportunity for low-cost, clean energy to break cycles of poverty. A GST-like council for energy transition was proposed to ensure equitable policy development and implementation.

Policy recommendations:

- ◉ Address Inequalities by incorporating energy access, reliability, and quality improvements, with special attention to marginalized communities, to reduce existing and potential inequalities caused by energy transitions.

- ◉ Implement Comprehensive Assessments by extending Environmental Impact Assessments (EIA) to include Social Impact Assessments (SIA) for renewable energy projects and focus on understanding the broader impacts on vulnerable populations.
- ◉ Reform Energy Governance by establishing a GST-like council for energy transition to ensure equitable policymaking and address disparities across regions and sectors.
- ◉ Promote Decarbonization by leveraging low-cost, clean renewable energy as an opportunity to break cycles of poverty and improve human development.
- ◉ Revisit State Obligations by balancing states' power purchase obligations with their fiscal capacity to avoid significant financial strain from renewable energy commitments.
- ◉ Tackle Social Externalities by addressing land acquisition, marginalization, and other social externalities to ensure fair implementation of renewable energy projects.

4.3. **Speaker 2: Dr Sarada Prasanna Das on 'Sustainable Futures Collaborative on Politics and Institutions for Just Transition in India'.**



He started his presentation by stating that the 'Just Transition' discourse in India is emergent and consisted of many narratives. He signaled that global pressure for accelerated coal phasedown should be balanced with India's future energy needs. A understanding of the dependency on coal resources is needed in order to plan for transition. For instance, states like Madhya Pradesh and Jharkhand would lose out a substantial portion of revenue in the phasing out of coal. Moreover, as coal companies directly engage in provision of social services like health and education, the social costs associated with phasing out should also be considered. The ripple effect on the broader Indian economy needs to be studied as there is significant dependence on fossil fuels in the tax revenue basket of central and state governments.

Apart from these fiscal challenges, demand-supply issues also need to be rectified as the demand side issues do not get the attention it deserves. Reskilling initiatives need to be undertaken in tandem with regional economic development. As coal regions are also home to export oriented manufacturing sector, they would face increased competitive pressure due to global benchmarking for carbon content. The next important aspect of energy transition is the role of the institutions, while an array of them is being set up at different levels, their objectives and roles are yet unclear. Another crucial infrastructure from the consumers' perspective are the distribution utilities. He also pointed out the low preparedness among state and local governments based on inferences from his own research study. Moreover, the articulation of 'Just Transition' framework which includes job losses and environment impact assessment is missing from the policy documents. Capacity building of frontline workers is crucial as they are at the forefront of implementing policies. He concluded his talk by stating that inclusion of marginalised communities and removing barriers to participation should be a priority.

Policy recommendations:

- Actively seek inclusion of marginalised communities in the march towards ‘Just transition’.
- Building state capacity especially at the local government level should be a priority.
- The social cost of energy transition needs to be accounted for in the plan programs especially for the coal rich states.
- There should be more focus on labour demand side that encompasses regional economic development in conjunction with supply side initiatives such as upskilling/ reskilling.
- The role of institutions involved in the energy transition, such as the green energy task force, need to be made clear.

4.4. Speaker 3: Prof Jayaraman Professor, MSSR on ‘Global south’s approach to addressing inequalities



Through his evocative talk, he raised questions on the very purport of the usage of the term ‘energy transition’. He argued that the seemingly neutral term masked global inequalities. Hence, countries in the Global South should exercise caution and not fall into trap of setting unrealistic targets that don’t take into account the socio- economic realities. He said that he does not see a contestation between the centre and state with respect to net-zero target setting as the states have been competitively announcing the targets themselves. He expressed his scepticism of the net-zero policies as they are mired in ambiguity.

Energy transition should be considered alongside many of the other parallel transitions that are taking place in the country namely urbanisation, demographic transition, industrialisation led labour transition and finally modernisation or social transition. Given India’s low per capita energy consumption and modest levels of urbanisation, the idea of energy transition should be juxtaposed with the needs of development. He stated that it would be reductive to fit all these dynamic transformations into an emission centric framework.

The inequities that arise from international commitments needs to be made clear. The developed countries’ agenda to fully decarbonise is being thrust on the developing countries. The resistance from developing nations has been registered vociferously in the UNFCCC. There are costs to be incurred for the energy transitions and these costs are reflected in the utility payments made by the citizens and tariffs paid by the industries to the State.

He said that one cannot leapfrog into the net-zero debates without addressing the energy needs of the population. The story of energy, like that all other technologies, requires ladders to propel progress stage by stage. The role of the State and public investment cannot be discounted in the push towards private led initiatives. The idea of completely phasing out coal in the near term would be unrealistic and even undesirable for an energy deprived population. He categorically stated that fossil fuels will continue to play a part in the just transition process. Carbon emissions budget is a ‘global commons’ which must be equitably shared. He expressed disagreement with the notion of looking at the State’s dependence on revenue from coal extraction as a bottleneck to energy transition. There

is a real demand for energy in the country as more people need to be provided with reliable grid connectivity. Moreover, there has not been much discussion on the issue of energy poverty given that India's per capita energy consumption is very low. His concluding remarks were that a 'just transition' policy must have a comprehensive picture of socio-economic development that is not reduced to emissions and carbon sequestration.

Policy recommendations:

- ◉ The costs incurred in the process of energy transition must be adequately accounted for in the 'Just Transition' frameworks.
- ◉ Just Transition encompasses pathways that include energy, socio-economic, workforce and other dimensions based on nationally defined development priorities and include social protection.
- ◉ More analytical work should be undertaken at the state government level to underpin the policy making process instead of jumping to net-zero plans for cities.
- ◉ Adaptation should be a key element of transition.
- ◉ The notion of stranded assets is a production of policy.
- ◉ Carbon emissions budget is a 'global commons' which must be equitably shared.
- ◉ The role of the State and public investment cannot be discounted in the push towards private led initiatives.
- ◉ The political aspect of the discourse should not be missed amidst the sloganeering.

4.5. Concluding Remarks:

The moderator remarked that the session had raised some important and fundamental issues with respect to energy transition. One among the audience pointed out that the term 'energy augmentation' would be a more appropriate term than 'energy transition' as the aspirations of India cannot be met just that energy transition. Another question related to whether subsidies provided by states to electricity undermine the green energy efforts. The speaker responded by stating sometimes the requirement of the economy are contradictory in that ease of doing business could be at logger heads with incentives towards green energy uptake. He also remarked that a solid analytical understanding of issues both qualitatively and quantitatively is needed before rushing to announce new programs. To improve data availability, Dr Kalai suggested adding more questions in the PLFS questionnaire to better capture the employment status of the population in the energy transition scenario. He also raised a question regarding centre-state relations in fulfilment of international commitment where the centre makes the decisions, but the burden has to be taken on by the state governments. Prof Kavi Kumar emphasized that NSS data collection should be resumed. Prof Jayaram responded by saying that the inputs to the State on emerging technology related expertise could come from academic institutions rather than consultants. Moreover, what is perceived as lack of state capacity could be deliberate evasion by the State.

The formal vote of thanks was proposed, and all the speakers were presented with a memento.

5. Key Takeaways for Tamil Nadu

S.No	Key Takeaways	Responsible Departments of GoTN
1	Data Gaps in EV Sector: Stakeholders at the roundtable emphasized that Tamil Nadu faces significant data gaps in understanding the needs, challenges, and growth potential of the electric vehicle (EV) sector. These gaps hinder comprehensive planning and targeted interventions. SDGCC will partner with the MSME department to address these gaps, ensuring a coordinated effort in gathering relevant data and insights for the EV and green hydrogen sectors.	<ul style="list-style-type: none"> • MSME Department
2	Skill Gap Assessment: A core objective of the study is to identify and quantify the skill gaps required to support Tamil Nadu's evolving EV ecosystem, including the emerging domain of green hydrogen technologies. This involves assessing workforce readiness and identifying areas for skill enhancement.	<ul style="list-style-type: none"> • MSME Department • Energy Department
3	Focus on Green Hydrogen Technologies: With green hydrogen playing a pivotal role in the clean energy transition, the study will include an evaluation of opportunities and workforce requirements in this cutting-edge sector, positioning Tamil Nadu as a leader in sustainable energy solutions.	<ul style="list-style-type: none"> • MSME Department • Energy Department • Industries, Investment Promotion & Commerce Department
4	Strategic Policy Framework: The outcomes of this study will aid in designing evidence-based policies and training programs tailored to the state's unique industrial and workforce needs, boosting Tamil Nadu's competitiveness in the EV and green energy markets.	<ul style="list-style-type: none"> • MSME Department • Energy Department • Industries, Investment Promotion & Commerce Department
5	Economic and Environmental Impact: Addressing skill gaps and improving data availability will enable Tamil Nadu to maximize economic opportunities in the EV sector, reduce environmental impact, and contribute to India's clean energy goals.	<ul style="list-style-type: none"> • MSME Department • Energy Department • Industries, Investment Promotion & Commerce Department

Annexure



POLICY ROUND TABLE

on

ENERGY TRANSITION AND INDUSTRIAL DEVELOPMENT



06 December 2024,
09.30 AM to 4.00 PM



2nd Floor, Anna Centenary
Library, Kotturpuram, Chennai

Time	Agenda	Speakers
9:30-10:00 AM	Registration	
10:00-10:05 AM	Welcome Address	Mr. Balasubramanian Munuswamy Chief Development Goals Specialist (I/c), UNDP-SDGCC, TN
10:05-10:10 AM	Introduction	Professor M.Suresh Babu Director, MIDS
10:10-10:20 AM	Guest of Honour – Keynote address	Mr. Anshul Mishra IAS Member Secretary, CMDA, Chennai
10:20-10:25 AM	Chief Guest Address	Mr. Atul Anand, IAS Principal Secretary, MSME Department, Government of Tamil Nadu
10:25-10:30 AM	Theme Address and Overview of Round Table	Dr A Kalayarasan Assistant Professor, MIDS

Panel Discussion - 1: Decarbonizing Industrialization

Expected Outcomes: Strategies for Greening Development, Just transition and sustainable growth in India

Time	Agenda	Speakers
10:30-10:35 AM	Context Setting/Moderator	Mr. Alagappan Ramanthan Development Goals Specialist UNDP-SDGCC, TN
10:35-10:50 AM	<ul style="list-style-type: none"> • Current of technology in Decarbonization • Approaches to generate funds needed for renewable energy and carbon capture • Strategies to be adopted for addressing revenue loss from Decarbonization. 	Mr. Prakash Tiwari Former Director, NTPC, Chhattisgarh
10:50-11:05 AM	<ul style="list-style-type: none"> • Combining growth with greening industries • MSMEs and Decarbonization 	Dr Naveen J Thomas Associate Professor, Jindal School of Government and Public Policy
11:05-11:20 AM	<ul style="list-style-type: none"> • Pathways for Net Zero Emission 	Mr. Praveen Chandrasekaran Engagement Lead, Council on Energy, Environment and Water (CEEW)
11:20-11:35 AM	<ul style="list-style-type: none"> • Regional divide in Energy Transition • Impact of Phasing out Coal 	Ms. Sree Harica Devagudi IIT- Delhi
11:35-11:40 AM	Concluding Remarks	Mr. Alagappan Ramanthan Development Goals Specialist UNDP-SDGCC, TN
11:40-11:50 AM	TEA BREAK	

Panel Discussion-2: Greening Development & Skilling Workforce

Expected Outcomes : Recommendations to Tamil Nadu to accelerate green transition, develop a future-ready workforce, and create a sustainable, inclusive economy as well as supporting MSMEs in adopting sustainable production aligned with ESG frameworks and SDG 12.

Time	Agenda	Speakers
11:50-11:55 AM	Context Setting/Moderator	Mr. Balasubramanian Munuswamy Chief Development Goals Specialist (I/C), UNDP-SDGCC, TN
11:55 AM-12:10 PM	• Potential of Green jobs and policy measures to boost green jobs in TN.	Mr. Arpit Sharma CEO, Skill Council for Green Jobs
12:10-12:25 PM	• EV transition skilling landscape in Tamil Nadu (Fresh skilling, Reskilling & Upskilling)	Mr. Thiru Srinivasan Lead, EV Task Force, TN Fame
12:25-12:40 PM	• Industry academia collaboration strategies for Greening Development	Dr. Raguram Arjunan President Sustainability & Energy Practitioners Association
12:40-12:55 PM	• Strategies to incentivize firms in the mobility sector for adopting sustainable energy solutions.	Ms. Chaitanya Kanuri Executive Director, WRI India
12:55-1:00 PM	Concluding Remarks	Mr. Balasubramanian Munuswamy Chief Development Goals Specialist (I/C), UNDP-SDGCC, TN
1:00-2:00 PM	Networking Lunch	

Panel Discussion- 3: Energy Transition and Inequality

Expected Outcomes : Bridging silos and developing methodologies to address multi-dimensional inequalities.

Time	Agenda	Speakers
2:00-2:05 PM	Context Setting/Moderator	Prof L. Venkatachalam RBI Chair Professor, MIDS
2:05-2:20 PM	• What are the methodological questions and innovations needed to address the impact of energy transition on inequality and job losses?	Professor Kavikumar Professor, MSE
2:20-2:35 PM	• Politics and Institutions for Just Transition in India	Dr Sarada Prasanna Da Sustainable Futures Collaborative
2:35-2:50 PM	• Bridging silos: combining social science scholarship and technocratic policy-making	Professor Sudhir Chella Rajan Professor, IIT Madras
2:50-3:05 PM	• Global south's approach to addressing inequalities	Professor Jayaraman Professor, MSSRF
3:05-3:10 PM	Concluding Remarks	Prof L. Venkatachalam RBI Chair Professor, MIDS
3:10-3:15 PM	Vote of Thanks	Mr. Jeya Chandran Regional Head-Southern India, UNDP
3:15-4:00 PM	High Tea and Networking Session	