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DEVELOPMENT AND
FUTURE OF ENERGY
TRANSITION:
ANALYZING THE
LEGAL LANDSCAPE

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EDITORIAL NOTE

With a staggering US\$4.3 billion earmarked for the nation's energy transition and achievement of its "net zero by 2070" goal, India's 2023–2024 budget is groundbreaking. India now stands committed to reducing the Emissions Intensity of its GDP by 45 per cent by 2030. This should establish India as "a leader in the global green energy market" if objectives are followed through.

In Volume 9, Issue 1 of the RSRR Journal, the Editorial Board has aimed to cover the niche aspects of the field of Energy law to have a broader perspective on the changes happening in this arena. An attempt has been made to examine and evaluate the Energy law framework considering the energy industry's untapped potential, recent developments, and the dearth of a strong legal framework surrounding it.

In furtherance of this objective and to generate novel legal literature marking this transition, contributions were invited from all stakeholders, including, NGOs, corporations, governments, and academic researchers, among others.

The article on urban energy transition examines India's energy outlook and concludes that interstate differences

and socioeconomic factors are strongly related to urban areas' energy consumption levels. It highlights the necessity of introducing Energy Efficiency Building Code programmes, as they have not been optimally introduced.

The article on the overview of energy legislation in the global society briefly covers the conflict between Russia and Ukraine, it also examines recent developments in international energy law. It examines energy law within the domestic legal framework and addresses the necessity and advantages of energy law's acknowledgement in India as a distinct academic discipline.

The article analysing the impact of Federalism on India's energy transition critiques the constitutional mandate over the governance of electricity. It further goes on to list the major historical factors that led the Union Government to take control of energy governance and the ramifications thereof, both in terms of distribution and production, from the State Governments.

The article on renewable energy banking highlights it as a burgeoning idea in the Indian energy Landscape. It is looked upon as an esoteric trump card that can be availed in order to save excess energy similar to the function of financial institutions. It also discusses potential implementation and regulatory challenges that may come up in the process of meeting climate obligations and

achieving ambitious energy security goals such as universal electrification.

The primary objective behind this theme is to provide a platform for legal analysis, insightful commentary, and in-depth analysis that can bridge the gap between pertinent legal developments in the energy sector and the likelihood of their actual implementation which, in turn, will improve the discourse about such contentious issues of the energy transition phase.

On behalf of the entire Editorial Board of the RGNUL Student Research Review Journal, I am glad to present Volume 9, Issue 1 of the journal.

Kavya Jha
Editor-in-Chief
RSRR

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ANALYSING URBAN ENERGY TRANSITION IN LIGHT OF THE ENERGY CONSERVATION ACT, 2001

** Dr. Madhubanti Sadhya*

1. SETTING THE CONTEXT

Urban areas play a pivotal role in the global discourse on energy consumption since they house a substantial portion of the global population and bear significant responsibility for a considerable share of worldwide energy usage. 55% of the global population resides in cities which is set to rise by nearly two-thirds by 2050.¹ Population projections presented by the Population Division of the United Nations Department of Economic and Social Affairs reflect that by 2050, half of Asia's countries will have levels of urbanization greater than 74%. India ranks relatively high in this list of Asian countries and has seen its level of urbanization nearly double between 1950 and 1980.² Presently India boasts of 5 megacities, which will increase to 7 by 2030.³ 34% of

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¹UNDESA (Population Division), 'World Urbanization Prospects: The 2018 Revision' (2019) ST/ESA/SER.A/420.

²ibid.

³ibid.

India's population currently resides in urban areas, which could rise to 46% by 2040, meaning that India's urban population is projected to rise by approximately 270 million people over the coming two decades, and India would add an equivalent of Los Angeles, each year to its urban population.⁴

A significant proportion of energy consumption is attributed to urban areas due to their role as hubs of economic activities and their heightened need for energy-intensive services. Cities make a substantial contribution to the growing energy demand accounting for two-thirds of global energy consumption, and are responsible for 70% of Global Greenhouse Gas ("GHG") emissions.⁵ Despite India's aggressive policies, introduced in the recent past towards the adoption of renewable energy alternatives, India continues to be reliant on coal, which is the mainstay to meet its energy requirements. India recorded a drop in CO₂ emissions for the first time since 1982, not only owing to the COVID-19 lockdown but also as a result of the reduced demand for coal.⁶ However, the International Energy Agency (IEA)

⁴International Energy Agency, 'India Energy Outlook 2021' (IEA 2021).

⁵United Nations Human Settlements Programme, 'World cities report 2020: The Value of Sustainable Urbanization' (2020) HS/045/20E, xviii.

⁶Lauri Myllyvirta & Sunil Dahiya, 'Analysis: India's CO₂ emissions fall for first time in four decades amid coronavirus' (*CarbonBrief*, 12 May 2020) <<https://www.carbonbrief.org/analysis-indias-co2-emissions-fall-for-first-time-in-four-decades-amid-coronavirus/>> accessed 21 January, 2023.

reported the highest-ever global increase in CO₂ emissions in absolute terms in 2021, accounting for a 6% increase driven by growth in coal use. India recorded a 13% jump in coal-based electricity generation compared to 2020, partly owing to the slow growth in the use of renewable energy.⁷

The figures reflect that India's energy needs have increased considerably post-recovery from the COVID-induced slump. A considerable share of India's energy use is being employed to fuel urban areas. Rapid urbanization has driven up India's energy use and GHG emissions. In 2018, India ranked 131st in per capita GHG emissions of 1.94 metric tonnes⁸ and has recorded an annual 6% increase over the past decade.⁹ Given the global expanse and importance of urban areas in energy consumption, it is important to address the energy needs of these areas sustainably and efficiently. Urban areas are extremely critical in overcoming future challenges of energy deficiencies; in facilitating a nation's transition to renewable energy alternatives and in mitigating climate change. In pursuance of the Glasgow Climate Pact

⁷International Energy Agency, 'Global Energy Review: CO₂ Emissions in 2021' (IEA 2021).

⁸M. Crippa et al., 'Fossil CO₂ & GHG emissions of all world countries' (EUR 28766 EN, Publications Office of the European Union, Luxembourg, European Commission, 2017).

⁹R. Andrew, 'Why India's CO₂ emissions grew strongly in 2017' (*CarbonBrief*, 2018) <<https://www.carbonbrief.org/guest-post-why-indiasco2-emissions-grew-strongly-in-2017>> accessed 21 January, 2023.

adopted by over 200 countries in COP26, mitigation measures have to be deployed across different governance levels to meet the global efforts of limiting warming to 1.5 degrees Celsius.¹⁰ Urban areas and cities play an instrumental role in limiting climate warming since they are bastions of human energy-intensive activities and have a direct impact on energy end-users in the field of urban transport, buildings and other key sectors that support urban infrastructure. While national contributions and progress in the race to mitigate climate change continue to struggle, cities assume an emerging role with efforts to the likes of C40, a network of mayors of nearly 100 world-leading cities collaborating in urgent action to meet the climate crisis¹¹ and global campaigns like Cities Race to Zero¹², as the nucleus of global climate change governance and mitigation efforts. Cities and Urban Local Governments are increasingly recognized as important components for fulfilling the avowed objectives of global climate policies. The rapid rate of India's urbanization, therefore, presents a crucial opportunity for its urban planners in curbing its energy demands and reducing carbon emissions thereby meeting

¹⁰United Nations Climate Action, 'COP26 Day 13: An Agreement to Build On' (UN) <<https://www.un.org/en/climatechange/cop26-day-13-agreement-build>> accessed 21 January, 2023.

¹¹'About C40' (C40 Cities) <<https://www.c40.org/about-c40/>> accessed 21 January, 2023.

¹²'Cities Race to Zero' (C40 Cities) <<https://www.c40.org/what-we-do/building-a-movement/cities-race-to-zero/>> accessed 21 January, 2023.

both its domestic and global commitments. This can be achieved through a combination of policies and technologies that promote energy efficiency, reduce energy waste, and increase the use of renewable energy sources. What is material at this juncture is to appreciate India's domestic and international commitments towards energy use transition and to identify the instrumentalities responsible for meeting these objectives.

The paper is divided into four parts. The introductory part of the paper has set the context and underscored the important role that Indian urban spaces can play in achieving the shift to efficient and renewable energy resources. Part II of the paper draws attention to the broad framework of the Indian policy landscape on urban energy transition. Part III highlights the objectives of the Energy Conservation Act, 2001 - the first legislation specifically targeting energy conservation efforts of the country and the institutional and structural mechanisms under it. Special attention is paid to examining the efforts undertaken by states to implement this legislation, locating urban areas as the focal point of action, and probing into the Centre-State convergence to meet the avowed objectives of this statute. In the concluding section of the paper, insights and conclusions drawn from the research presented in the preceding sections are provided.

2. ENERGY TRANSITION - POLICY LANDSCAPE

For every nation of the twenty-first century and the times to come, energy generation, use, import and consumption are germane for the discourse on their energy resilience and contribution to global climate change mitigation efforts. Today, nations across the globe confront interconnected challenges related to climate change, energy consumption, and energy security, all of which are deeply intertwined and cannot be effectively tackled in isolation. These phenomena no longer operate in silos and are difficult to decouple. This was not always the case. Energy and climate change began to be interlinked by policymakers only in the later decades of the twentieth century when the international community began to grasp the unalterable effects on the atmosphere and climate triggered by the enhanced use of fossil fuels to power the global economy.¹³ Although many nations, particularly those heavily dependent on fossil fuels, were initially hesitant to recognize the connection between these fuels and global warming during the early days of the Intergovernmental Panel on Climate Change, in the current decade it is now widely acknowledged that the

¹³Michael Stephenson, *Energy and Climate Change: An Introduction to Geological Controls, Interventions and Mitigations* (1st ed, Elsevier 2018) 175-178.

production and consumption of energy are deeply interconnected with climate change, and this fact requires no further proof. This is evidenced by the goals and targets set by different actors of the international community working in these spheres, which invariably require nation-states to commit to policy, and governance changes that involve aspects of both.

India has garnered significant global attention and scrutiny due to its status as the third-largest electricity producer, accompanied by concerns about elevated carbon emissions that necessitate both domestic and international focus. Its heavy reliance on coal and imported oil to meet its electricity needs has created formidable challenges in complying with the Sustainable Development Goals (SDGs) and in meeting climate mitigation goals.¹⁴ However, in line with its SDG commitments, particularly SDG7 - ensuring access to affordable, reliable, sustainable and modern energy for all; SDG 11 - sustainable cities and communities and SDG13 - taking urgent action to combat climate change and its impacts, India has directed its efforts towards economic growth in tandem with efforts to make its energy system

¹⁴Hanying Wang, 'How SDG 7 fosters hope for India's Energy Sector' (*The Borgen Project*, 7 October 2022) <<https://borgenproject.org/indias-energysector/#:~:text=With%20ambitions%20to%20achieve%20net,of%20infrastructure%20and%20technology%20improvements>> accessed 21 January, 2023.

sustainable and climate resilient. In the recent past, the focus of the government has been towards strengthening its renewable energy resources. This is evident from India's stance at United Nations Framework Convention on Climate Change (UNFCCC)'s COP26 where it has updated its Nationally Determined Contribution (NDC) and has pledged to achieve 500 GW of non-fossil fuel-based energy capacity by 2030 to meet 50% of its energy requirements from renewable sources by 2030. The country has further avowed to reduce total projected carbon emissions by one billion tonnes from the present till 2030, to reduce the carbon intensity of its economy by less than 45% by 2030 as compared to the 2005 levels and to achieve the target of Net Zero by 2070.¹⁵ The Indian Government has also put forward its ambitions of adopting a citizen-centric mass movement - LIFE-Lifestyle for Environment as a key initiative towards combating climate change where citizens play a central role in adopting a way of life that is conducive to the planet's well-being.¹⁶ The Indian Government's updated NDCs and other incentives seek to enhance green jobs in automobiles, electric vehicles, appliances etc.¹⁷

¹⁵Ministry of Environment, Forest and Climate Change, 'India's Stand at COP-26'(PIB, 03 February,2022)
<<https://pib.gov.in/PressReleasePage.aspx?PRID=1795071>> accessed 21 January, 2023.

¹⁶ibid.

¹⁷Ministry of Environment, Forest and Climate Change, 'Cabinet approves India's Updated Nationally Determined Contribution to be

However, the cabinet press release on the updated NDCs does not identify any specific Ministry or Department responsible for spearheading these amended targets. It enjoins this task of meeting them on ‘relevant’ Ministries/Departments with support from States and Union Territories. The press release unequivocally states that ‘India’s NDC does not bind it to any sector-specific mitigation obligation or action.’ It affirms the country’s objective of reducing overall emission intensity and improving the economy’s energy efficiency over time while protecting the vulnerable sectors of the economy.¹⁸

While the NDCs do not delineate the role of Ministries and Departments involved with the task of urban planning and development in meeting energy efficiency and climate change targets, the Central Government has floated several policies, schemes, and programmes primarily under the aegis of the Ministry of Housing and Urban Affairs (MoHUA) that have attempted to mainstream energy management in urban development and planning. Before delving into the urban development and infrastructure policies with energy use and climate change implications, it is important to delineate the

communicated to the United Nations Framework Convention on Climate Change’ (*PIB*, 03August 2022)<<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1847812>> accessed 19 January, 2023.

¹⁸ibid.

division of power between the Central and State Governments in governing the Indian urban spaces.

The Central Government's work in the sphere of urban affairs, development and housing is undertaken by the MoHUA which plans, monitors and coordinates activities and programmes of various Central Ministries, State Governments, and other nodal authorities in the country. However, the constitutional authority of the Central Government to legislate on matters of urban development and planning is restricted to Delhi, the Union Territories and any other subject that the State Legislatures may authorise the Union Parliament to legislate on.¹⁹ Vide the 74th Constitutional Amendment Act, 1992, which added Part IX A (Articles 243P - 243ZG) to the Constitution, the responsibility of urban development has been vested in the State Governments and the urban local bodies comprising, Municipal Corporations, Municipal Councils for urban areas and Nagar Panchayats for areas in transition from rural to urban. These bodies responsible for urban local governance have their jurisdictional limits over specified urban areas demarcated by the State Governments and are manned by elected representatives. 18 functions have been identified in the XII Schedule to the Constitution

¹⁹The Constitution of India, 1950, art 249.

which was added vide the amendment that includes *inter alia* subjects that are of direct relevance to energy use and climate change. Pertinent among these include urban planning including town planning; regulation of building construction; roads and bridges; water supply for domestic, industrial, and commercial purposes; public amenities including street lighting, parking lots, bus stops, and public conveniences; burials and burial grounds including electric crematoriums; urban amenities and facilities; sanitation and waste management; urban forestry, parks, playgrounds, and gardens. Most of these functions are discharged by the Municipal bodies in pursuance of laws drafted by the state legislature or Rules and By-Laws promulgated by the bodies. However, even before the 74th constitutional amendment, most states had drafted their town and country planning laws²⁰ between 1951 and 1990, which coincided with the Five-Year Plans spearheaded by the Planning Commission of India, which supported most of the urban planning and development programmes. It was also during this period

²⁰Bihar Town and Country Improvement Act 1951; Bombay Town Planning Act 1954; Delhi Development Authority Act 1957; Assam Town and Country Planning Act 1959; Jammu and Kashmir Town Planning Act 1963; The Maharashtra Regional and Town Planning Act 1966; The Pondicherry Town and Country Planning Act 1967; The Tamil Nadu Town and Country Planning Act 1971; The U.P. Urban Planning and Development Act 1973; Madhya Pradesh Town and Country Planning Act 1973; Tripura Town and Country Planning Act 1975; Gujarat Town Planning and Urban Development Act 1976; Bangalore Development Authority Act 1976; Himachal Pradesh Town and Country Planning Act 1977.

that Central Government's Public Sector Undertakings (PSUs), the likes of the Housing and Urban Development Corporation, and City and Industrial Development Corporation with a specific focus on urban development, were established.²¹ This reflects that urban planning efforts in the country have largely advanced in a fragmented manner, with states and the Central Government creating separate plans, thereby increasing the potential for conflicts or friction.

To underscore this point, we can reference initiatives introduced by the Central Government that pertain directly to climate change and are situated at the intersection of urban development and energy efficiency. The National Action Plan on Climate Change (NAPCC) was unveiled on June 30, 2008. This plan outlines a national strategy to help India adapt to climate change while simultaneously enhancing the country's ecological sustainability in its development endeavours. At the heart of the National Action Plan are eight "National Missions,"²² which serve as its fundamental components.

²¹NITI Aayog, 'Reforms in Urban Planning Capacity in India' (*NITI Aayog*, 2021) <<https://www.niti.gov.in/sites/default/files/2021-09/UrbanPlanningCapacity-in-India-Annexures-16092021.pdf>> accessed 21 January, 2023.

²² National Solar Mission; National Mission for Enhanced Energy Efficiency; National Mission on Sustainable Habitat; National Water Mission; National Mission for Sustaining the Himalayan Eco-system; National Mission for a Green India; National Mission for Sustainable

These missions are centred around advancing knowledge and awareness of climate change, addressing both adaptation and mitigation strategies, promoting energy efficiency, and conserving natural resources.²³ Among these eight missions, consider the National Mission on Sustainable Habitat (NMSH).

NMSH has two primary objectives: (i) Promoting environmentally friendly urban growth to reduce GHG emissions intensity, aligning with India's NDC commitments, and (ii) Enhancing cities' resilience to climate change impacts and bolstering their ability to recover effectively from climate-related extreme events and disaster risks. The initial version of NMSH, introduced in 2010, has undergone revisions in light of the NDCs stipulated by the Paris Agreement, SDGs, and the UN Habitat's New Urban Agenda. The updated NMSH has delineated five thematic domains, which include (i) Energy and Green Building, (ii) Urban Planning, Greenery, and Biodiversity, (iii) Mobility and Air Quality, (iv) Water Resource Management, and (v) Waste Management. Within each thematic area, essential

Agriculture and National Mission on Strategic Knowledge for Climate Change.

²³Ministry of Environment, Forest and Climate Change, 'National Action Plan on Climate Change (NAPCC) FAQs' (*PIB*, 1 December, 2021) <<https://static.pib.gov.in/WriteReadData/specificdocs/documents/2021/dec/doc202112101.pdf>> accessed 21 January, 2023.

strategies for both mitigation and adaptation to support the establishment of sustainable habitats have been proposed. The first thematic area, “Energy and Green Buildings,” centers around the reduction of energy consumption within India’s real estate sector, particularly for lighting, heating, cooling, and similar purposes. This involves transitioning towards cleaner and renewable energy sources by embracing green building technologies. Some of the crucial mitigation and adaptation strategies proposed in this domain encompass conducting yearly energy audits for all municipal services, including water supply, sewage, and stormwater management, as well as promoting renewable energy adoption and achieving 100% deployment of energy-efficient street lighting. The NMSH 2.0 is slated for execution from 2020-21 to 2030. The objectives of NMSH 2.0 are expected to be met through several other initiatives and programs within the MoHUA, launched by the Ministry in 2015 to integrate sustainable development and climate action into all urban investments and development activities. These urban missions and programs include the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Pradhan Mantri Awas Yojana -Urban (PMAY-U), Deendayal Upadhyay Antyoday Yojana - National Urban Livelihoods Mission (DAY-NULM), Swachh Bharat Mission - Urban (SBM-U), and the Smart Cities Mission (SCM). These missions aim to establish exemplary models

of sustainable urban development, serving as replicable examples to enhance the quality of life for urban citizens.²⁴

A closer look at the Mission document, particularly the key priorities under the first thematic thrust area- ‘Energy and Green Building’ reveals that most measures and strategies that could facilitate energy-efficient and sustainable urban habitats are in the form of recommendations from the Ministry. These include *inter alia* conducting annual energy audits of all municipal services, including water supply, sewage, and stormwater management; promoting 100% installation of energy-efficient streetlights and use of renewable energy-operated streetlights; promoting the installation of renewable energy systems in buildings (premises), including all municipal corporation buildings, to reduce the dependency on fossil fuels.²⁵

When these strategies are read together with other programmes launched by the Ministry of New and Renewable Energy such as Municipal Energy Efficiency Programme (MEEP), Street Lighting National

²⁴ Ministry of Housing and Urban Affairs, ‘National Mission on Sustainable Habitat 2021-2030’ (*MoHUA*, October, 2021) <<https://mohua.gov.in/upload/uploadfiles/files/NMSH-2021.pdf>> accessed 9 September, 2023.

²⁵ *ibid.*

Programme (SLNP), and Unnat Jeevan by Affordable LEDs and Appliances for All (UJALA), it becomes apparent that these schemes such as SLNP work in collaboration with Urban Local Bodies, Municipal Bodies, Gram Panchayats and State Governments and target transforming the market by lowering prices through demand consolidation and changing the preference for purchasing from Sodium Vapour/Fluorescent Lighting to LED-based State Lighting. When the Energy Service Company (ESCO) Model is opted for conventional street lights are replaced with LED lights without any need for municipalities to invest.²⁶ The core concept of the business model revolves around the idea that the facility owner does not need to provide upfront capital for energy efficiency projects. Instead, they are obligated to fund these investments solely from the actual savings they accrue through the implemented energy efficiency projects. ESCOs offer their services through the Energy Saving Performance Contracting (ESPC) model which has several variants. The Bureau of Energy Efficiency (BEE) has undertaken measures to develop the ESCO market.²⁷

²⁶ Ministry of Power, 'Salient features of UJALA and SLNP programmes' (PIB, 22 March, 2022) <<https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1808264>> accessed 2 September, 2023.

²⁷ Ministry of Power, 'Energy Saving Companies' (*Bureau of Energy Efficiency*) <<https://saath.eeeindia.gov.in/Common/BEEContent?MIID=2&SMID=31>> accessed 2 September, 2023.

Another key strategy identified under the first thematic thrust area recommends municipal corporations with a population exceeding 10 lakhs to establish a green building action cell responsible for various tasks, including knowledge dissemination, public awareness, accrediting green building vendors, designing green building initiatives and promoting them, conducting verifications, and expediting approvals for green constructions within the city. Additionally, it is recommended that such municipal corporations should form a high-level green building committee or its equivalent, comprising ex-officio members from the municipal corporation, smart city Special Purpose Vehicles (SPV), Urban Development Department, Public Works Department, green building certification agencies, and civil engineering/architectural associations to offer strategic guidance to encourage the adoption of energy-efficient and environmentally friendly buildings in the city.²⁸

Another recent initiative of the MoHUA under the Smart Cities Mission was the launch of the Climate Smart Cities Assessment Framework (CSCAF) in 2019. Currently, in its third phase of implementation, CSCAF serves as a

²⁸Ministry of Housing and Urban Affairs, 'National Mission on Sustainable Habitat 2021-2030' (MoHUA, October, 2021) <<https://mohua.gov.in/upload/uploadfiles/files/NMSH-2021.pdf>> accessed 2 September, 2023.

comprehensive monitoring framework to gauge the advancement made in alignment with NMSH guidelines. It offers cities 28 indicators (mapped with 5 thrust areas under NMSH) to evaluate their yearly performance and offers a step-by-step plan for integrating pertinent climate actions. The outcomes derived from CSCAF play a vital role in tracking progress and providing insights to inform NMSH.²⁹ In line with CSCAF, the Ministry has also spearheaded the Climate Centre for Cities (C-Cube) at the National Institute of Urban Affairs (NIUA),³⁰ to foster collaboration and coordination among diverse stakeholders engaged in climate initiatives within Indian cities, to enhance overall impact. Currently, 126 cities including the 100 Smart Cities, with a combined population exceeding 140 million individuals, are actively documenting their climate-related initiatives and are evaluated on six indicators under the Energy and Green Building component which include electricity consumption in the city, total electrical energy in the city derived from renewable sources, fossil fuel consumption,

²⁹Ministry of Housing & Urban Affairs, 'ClimateSmart Cities Assessment Framework 3.0: Technical Document', (*MoHUA*, 2022) <https://niua.in/ccube/sites/all/themes/zap/assets/pdf/CSCAF_3_0_Technical_document.pdf> accessed 2 September, 2023.

³⁰ An autonomous think tank on urban planning and development set up in 1976 under the aegis of the Ministry of Housing and Urban Affairs. NIUA, <https://niua.in/About_NIUA#aboutNiua> accessed 2 September, 2023.

energy efficient street lighting, promotion of green buildings and green building adoption.³¹

Therefore, a perusal of these schemes working in tandem with the NMSH's Energy and Green Building vertical reflects a significant dependence on Urban Local Bodies and State Governments and to a certain extent consumer awareness (especially in the case of LED lights under the UJALA scheme)³² to implement many of these schemes and initiatives. These entities play a crucial role in executing and overseeing various urban development and energy efficiency programs, including the adoption of LED lighting, green building initiatives, and other sustainability measures.

The decentralization of urban governance in India allows for flexibility, responsiveness, and adaptation to local needs. However, it also necessitates effective coordination and capacity-building efforts to ensure that the Central Government's objectives are met consistently across the country. States with more resources and administrative capacity may benefit more from these

³¹Climate Data Observatory, NIUA <<https://niu.in/cube/cdot/index.html>> accessed 2 September, 2023.

³² Radhika Khosla and Ankit Bhardwaj, 'Illuminating Affordable Homes', in Radhika Khosla and Aditya Chuneekar (Eds.) (2017). Plugging In: A Collection of Insights on Electricity Use in Indian Homes, <https://cprindia.org/wpcontent/uploads/2022/01/Plugging-In-Residential-Electricity-in-India_CPR-Prayas-2017.pdf> accessed 2 September, 2023.

schemes floated by the Union Government, while those with fewer resources may struggle to effectively implement initiatives. This claim finds credence from the fact that all cities that stood out as forerunners on the six indicators under the Energy and Green Building component in the Second Phase of CSCAF were a part of the Smart Cities Mission which enjoyed relative advantages over cities not part of the Mission in terms of resource allocation, utilization and urban planning.³³ Thus, although the Central Government has the authority to introduce schemes, plans, and model laws³⁴ related to urban governance, it lacks the power to enact legislation on this subject. These initiatives of the Central Government serve as persuasive nudges and are required to be accepted and adopted by the respective states and municipal bodies to ensure that their effects are felt across the country.

3. THE ENERGY CONSERVATION ACT, 2001

The Energy Conservation Act, of 2001 (ECA) was the first legislation to directly target the energy conservation

³³ Surat, Diu, Tirupati, Pune, Rajkot, Nagpur, Warangal, Chandigarh and Pimpri Chinchwad, 'Best Practices', (CSCAF 2.0) <<https://niu.a.in/c-cube/cdot/best-practices.html>> accessed 2 September, 2023.

³⁴The Ministry of Housing and Urban Affairs has drafted several model laws to serve as guidance materials for the State Governments, Urban Local Bodies, Urban Development Authorities Model Municipal Law, 2003; Model Building Bye-Laws 2016; Model Tenancy Act 2021.

efforts of the country. Despite the close interlinkages between energy consumption and climate change, this Act predates the NAPCC which was launched in 2008. From the perspective of urban areas and their share in the country's energy consumption and conservation efforts, the application of the ECA could be very relevant. Three of the major thrust areas of the Act – carbon credit trading, the energy efficiency of buildings and the energy efficiency of appliances have a direct correlation with urban areas and could aid in achieving energy efficiency. Urban areas present unique challenges for implementing central laws for reasons already mentioned. The ECA which has direct implications for urban buildings and use of appliances functions under the aegis of the Ministry of Power. The energy sector in general falls under the ambit of the Central Government with certain aspects such as electricity, governed by states. Given this context, it is crucial to examine the strategies for implementing the Act and explore potential alignment between the Central and State Governments in its execution.

The ECA was drafted to ensure the efficient use of energy and its conservation and specified norms and standards for appliances, equipment, and construction of buildings. The latest amendment to the Act in 2022 seems to align the law to meet India's new energy targets

and seeks to support India's journey towards a Net-Zero economy by 2070. The Act is implemented by the BEE established in March 2002 under Section 3 as a Central statutory body comprising 31-37 members with representation from energy-intensive Central Ministries³⁵ and the recent addition of representation from the Ministries of Environment, Forest and Climate Change, Housing and Urban Affairs, Road Transport and Highways, Steel, Civil Aviation, Ports, Shipping and Waterways, Railway. The BEE, which works under the auspices of the Ministry of Power also has nominated representation from the energy or power department of five states from the five power regions and a maximum of seven experts or persons capable of representing industry, equipment and appliance manufacturers, architects, institutes and consumers nominated by the Central Government.³⁶ This appears to be a pertinent step in recognising the importance of adopting an economy-wide perspective to regulate energy consumption and enhance energy efficiency through inter-ministerial coordination. The Act largely applies to 'designated consumers' who include any user or class of users in energy-intensive industries and other establishments identified by the Central Government in

³⁵Central Ministries and Secretaries of the Government of India associated with Power, Petroleum and Natural Gas, Coal, Non-conventional Energy Sources, Atomic Energy.

³⁶Energy Conservation Act 2002, s 4.

cognizance of the intensity or quantity of energy consumed.³⁷ The list of designated consumers is enlisted in the Schedule appended to the Act and the BEE reserves the power to recommend the inclusion of any class of energy consumer as ‘designated’ under the Act.³⁸

The provisions of the Act that could impact urban areas in achieving energy efficiency are (i) the carbon credit trading scheme; (ii) the energy efficiency of appliances and (iii) the actual implementation of the Act in the states. The 2022 amendment to the ECA empowers the Central Government to enforce a carbon credit trading scheme and prescribe a minimum share of consumption of non-fossil sources, with penalties for non-compliance. The proposed carbon market aims to increase demand for renewable energy certificates and emissions reduction units, with the potential to extend to sectors beyond energy-intensive industries, such as commercial buildings, establishments, and the transport sector. In so far as energy efficiency of electronic appliances is concerned, BEE’s Standards and Labelling Programme aims to promote energy efficiency in India by mandating energy efficiency standards for popular home appliances. The Central Government has also floated some appliance and sector-specific initiatives to push towards energy

³⁷ibid, s 14 (e).

³⁸ibid, s 13(c).

efficiency. However, the ultimate success of this law lies in the country-wide implementation of its provisions and allied regulations that largely depend on municipal approval and state-by-state acceptance.

The following section has emphasized the importance of these three aspects of the ECA for achieving energy efficiency in urban areas.

Carbon Credit Trading Scheme

Powers of the Central Government under Section 14 to enforce efficient use of energy and its conservation have been expanded vide the 2022 amendment to include the issuance of a carbon credit trading scheme³⁹ and prescribing minimum share of consumption of non-fossil sources by designated consumers as energy or feedstock, who have registered for carbon credit trading schemes with different consumption benchmarks for different designated consumers.⁴⁰ Failure to comply with the requirement of meeting a minimum share of consumption of non-fossil sources could attract a penalty of up to 10 lakh rupees for each transgression. To establish a carbon market, the Central Government or any agency authorised by it may issue a carbon credit

³⁹ibid, s 14(w).

⁴⁰ibid, s 14(x).

certificate to registered entities that comply with the carbon credit trading scheme and allow the registered entity to trade in carbon credits.⁴¹ The Central Government or its authorised agency can also issue Energy Savings Certificates (ESCerts) to the designated consumers who have consumed energy lower than the prescribed norms and standards. The amendment further allows persons other than registered consumers to purchase energy-saving certificates or carbon credit certificates voluntarily.⁴²

The 2022 amendments to the ECA appear to tie in with the objectives of the Draft Blueprint of the National Carbon Market issued by the Ministry of Power and BEE published in October 2021. The draft clearly states that to facilitate the country in achieving 2030 NDC targets, the development of a domestic carbon market with adequate support mechanisms is crucial. The proposed voluntary carbon market could be instrumental in three ways - creating a market framework for wider energy saving with fair and transparent price discovery; increasing potential for those climate-conscious organizations and individuals who could voluntarily participate in reducing their emissions and offsetting remaining GHG emissions with

⁴¹ibid, s 14AA.

⁴²ibid, s 14A.

the use of carbon credits and incentivising a shift to renewable energy.⁴³

As per the draft blueprint, the primary target players of the carbon market would be voluntary entities whose active participation would aid in meeting India's NDC. The voluntary carbon market proposed to be carried out in three phases would focus on increasing demand for ESCerts and Renewable Energy Certificates (RECs) in the market in the first phase. This would involve converting ESCerts and RECs to tradable carbon credits to be traded with voluntary buyers, existing designated consumers, State Designated Agencies (SDAs)⁴⁴, DISCOMs – who have Renewable Purchase Obligations under the Electricity Act, 2003 and the airlines sector. In the second phase, project-level registration would generate a supply-side push, facilitated by the proper validation of projects by a third-party auditor, followed by verification and issuance of emission reduction units. The final phase would involve transitioning to a cap-and-trade system, modelled after the one currently in operation in

⁴³Ministry of Power & Bureau of Energy Efficiency, 'National Carbon's Market: Draft Blueprint on "National Carbon Market"' (*EQ International*) <<https://beeindia.gov.in/sites/default/files/NCM%20Final.pdf>> accessed 21 January, 2023.

⁴⁴Energy Conservation Act 2001, s 15 (d) (The Ministry of Power reports that SDAs have been established in 32 states and Union Territories and the role of the SDA is undertaken by different departments across states such as the Renewable Energy Development Agency; Electrical Inspectorate, Distribution Companies, Power Departments and others).

the European Union. This would involve allocating a specific number of emissions to individual sectors and companies.⁴⁵ This scheme, if introduced, would be administered by the BEE, with the Central Electricity Regulatory Commission acting as the market regulator for trading in carbon credits. The carbon credit trading scheme purported to be introduced by the 2022 amendment is not the first of its kind in India, since the Perform Achieve Trade (PAT) Scheme launched in 2011 under the National Mission for Enhanced Energy Efficiency is already in place which incentivises energy-intensive industries to save energy and procure tradable ESCerts from the authorities. However, the ECA could have a wider impact in so far as energy consumption in urban India is concerned since its application. Consequently, the carbon credit trading scheme could be extended to not only energy-intensive industries but also voluntary buyers, SDAs, commercial buildings and establishments and the transport sector which feature in the urban map.

Energy Efficiency of Appliances

India achieved near universal household connectivity to electricity in 2019, a historic achievement for over 900 million citizens who gained electric connections to their

⁴⁵MoP, *supra* note 43.

households. While there continue to be challenges in providing affordable and sustainable access to all potential consumers of the country, the past decade has witnessed electricity consumption by buildings outpacing the electricity consumption of the wider economy. This has been attributed to the increase in appliance use in Indian households. Most households with access to electricity use LED bulbs, ceiling fans and televisions. There is a stark divide in the categories of electrical appliances that are used in urban and rural households except televisions and smartphones which are owned by over 60% of households in rural areas. Energy consumption from energy-intensive appliances is largely due to urban households having a much greater likelihood of owning refrigerators, washing machines and air-conditioning units as compared to rural households.⁴⁶

Under the ECA, the Central Government reserves the power to prescribe norms and processes for energy consumption standards of appliances, industrial units, buildings, or establishments; and prohibit the manufacture or import of any equipment or appliance that does not conform to the standards prescribed. The scope of Section 14 has been expanded vide the 2022 Amendment to include ‘vehicles’ (as defined under

⁴⁶International Energy Agency, ‘Global Energy Review: CO2 Emissions in 2021’ (IEA 2021).

Section 2(28) of the Motor Vehicles Act, 1988) and vessels (including ships and boats).⁴⁷ The Government can also direct appliances and equipment to display particulars on labels that reflect energy consumption. The Central Government also has the power to prohibit the manufacture or import of equipment appliances vehicles or vessels and the closure of industrial units that do not comply with energy consumption regulations.⁴⁸ Both the BEE and the Central Government have the power to notify any user or class of users of energy as a designated consumer under the Act which would require them to comply with the requirements of the Act and directions issued by the Central or the State Government.⁴⁹

In pursuance of these provisions, the BEE has been operating the Standards and Labelling Programme since 2006 which allows consumers of electrical appliances to make an informed choice about energy saving and consumption. Energy-intensive electrical appliances and equipment recognised under the programme must bear energy performance labels and lay down minimum energy performance standards. Presently the programme covers a list of 30 appliances and equipment that all have been

⁴⁷Energy Conservation (Amendment) Act 2022, s 6.

⁴⁸Energy Conservation Act 2001, s 14.

⁴⁹ibid, s 13 (c) & 14 (e).

notified via gazette notifications.⁵⁰ The programme operates as a rating system that operates between 1 star being the least energy efficient and 5 stars being the most energy efficient given to appliances and equipment by BEE. Some appliances have to mandatorily⁵¹ carry these labels and cannot be sold till they meet the minimum 1-star rating. Appliances under the voluntary category do have prescribed energy efficiency levels but can be sold even without labels and with an efficiency of less than a 1-star rating. BEE revises its star rating system periodically to encourage more energy-efficient technologies, which implies that a 5-star appliance model rated today may become 3-star rated in the times to come. Amongst the list of appliances that need to mandatorily carry the BEE labels and bear star ratings, the humble ceiling fan which is ubiquitous in rural and urban areas has had a rather late entrance with notifications issued in May 2022.⁵²

Steps taken by the BEE in mandating energy efficiency standards for popular home appliances look promising. However, mandating tighter norms does not always translate into compliant consumer behaviour or large-

⁵⁰Bureau of Energy Efficiency, 'Standards and Labelling' (*BEE*) <<https://beeindia.gov.in/content/standards-labeling>> accessed 21 January, 2023.

⁵¹ibid.

⁵²Bureau of Energy Efficiency, 'Electric Type Ceiling Fan' (*BEE*) <https://www.beestarlabel.com/Content/Files/CFN_Notification.pdf> accessed 21 January, 2023.

scale adoption of such appliances. For instance, there has been a significant drop in 5-star-rated appliance production for frost-free refrigerators after energy efficiency requirements were made more stringent in 2014 and 2016. Consumer research has shown that buyers are more likely to choose an option that falls somewhere in between the best compliance standards possible and the least.⁵³ The Press release of the Ministry of Power in June 2021 has however reflected encouraging figures and hailed the performance of the BEE Standard and Labelling Programme. The release noted that the use of energy-efficient products by the citizens has resulted in an estimated electricity savings of 56 billion units during 2020-21, worth over Rs. 30,000 crore which was effective in reducing CO₂ emissions of approx. 46 million tonnes every year.⁵⁴ In addition to initiatives that directly target households, the Central Government has implemented UJALA, and SLNP, which target specific appliances or sectors. As of February 2022, 36.79 crore LED bulbs, 72.18 lakh LED tube lights and 23.59 lakh, energy-efficient fans have been distributed across the country

⁵³Aditya Chunekar & Mrudula Kelkar, 'The Efficiency Of Appliances' (CPR&Prayas(energygroup,24October2017) <<https://energy.prayasgroup.org/our-work/article-and-blog/the-efficiency-of-appliances>> accessed 21 January, 2023.

⁵⁴Ministry of Power, 'Standards and Labelling (S&L) Program results into estimated electricity savings of 56 Billion Units during 2020-21' (PIB,8June2021)<<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1725448>> accessed 16 January, 2023.

under the UJALA program.⁵⁵ Over 10 million LED smart street lights have been installed by Energy Efficiency Services Limited, a government-owned energy services company.⁵⁶

Implementation of ECA in States

Chapter VI of ECA delineates the role of State Governments. A perusal of the provisions reveals that the bulk of its power is restricted to energy use and energy efficiency of buildings. The State Government in consultation with the BEE can amend the energy conservation and sustainable building codes to suit the regional and local climatic conditions. Furthermore, states may specify and notify energy codes concerning the use of energy in the buildings and implement the same through building bylaws. It can direct designated consumers who are owners or occupiers of a building or building complex to comply with the provisions of the codes and direct such consumers if necessary to conduct energy audits by a certified auditor. The power of the states to vary the energy conservation and sustainable building codes has likely been granted by the Act to ensure alignment with the powers already vested in them

⁵⁵Ministry of Power, 'Status of Implementation of National Mission for Enhanced Energy Efficiency (NMEEE)' (*PIB 2022*).

⁵⁶International Energy Agency, 'Global Energy Review: CO2 Emissions in 2021' (*IEA 2021*).

under the XII Schedule of the Constitution. This division of power is particularly relevant from the perspective of energy consumption in urban areas which are populated by buildings, particularly commercial buildings that are the second-highest consumers of electricity.

The amended Act mandates an “Energy Conservation and Sustainable Building Code” to be prescribed by the BEE. Before the 2022 amendment, the Act required an energy conservation building code that focused on energy consumption expressed in terms of per square metre of the area occupied by the building. This has been altered to a code that focuses on sustainability and prescribes norms and standards for energy efficiency and its conservation, use of renewable energy and other green building requirements for a building.⁵⁷ The amended definition of ‘building’ has been expanded to include a building which has a minimum connected load of 100 Kilowatt (kW) or contract demand of 120 Kilovolt Ampere used or intended to be used for commercial purposes or as an office building or for residential purpose.⁵⁸ The earlier definition made no mention of residential complexes. Further, the amendment also allows State Governments to prescribe a lower threshold for connected load or contract demand which enhances

⁵⁷Energy Conservation Act 2001, s 2(j).

⁵⁸Energy Conservation Act 2001, s 2(c).

their power to direct smaller commercial and residential buildings to use renewable energy and sustainable materials for construction and comply with energy efficiency and conservation standards.⁵⁹

The Energy Conservation Building Code (ECBC) was released by the BEE in 2007 and revised in 2017 to incorporate advanced technologies and additional parameters of renewable energy integration, ease of compliance, the inclusion of passive building design strategies and flexibility for the designers.⁶⁰ Estimates show that by 2030, India is slated to add nearly one billion square metres of new commercial floor space—more than the land area of New York City and Washington D.C combined and the implementation of the ECBC across the country could avoid 1,065 metric tons of carbon dioxide emissions till 2030.⁶¹ The FAQs on the ECBC released by the BEE and the Ministry of Power note that the building construction boom in India which is yet to reach its full potential will pose grave challenges to energy efficiency. By setting minimum energy efficiency levels for commercial buildings, and

⁵⁹ibid.

⁶⁰ Ministry of Power & Bureau of Energy Efficiency, 'Energy Conservation Building Code 2017' (BEE) <https://beeindia.gov.in/sites/default/files/BEE_ECBC%202017.pdf> accessed 21 January, 2023.

⁶¹ Sameer Kwatra & Prima Madam, 'Constructing Change with Building Energy Codes in India' (*Natural Resources Defence Council*, 6 August 2021) <<https://www.nrdc.org/experts/sameer-kwatra/constructing-change-building-energy-codes-india>> accessed 18 January, 2023.

locking in energy savings for years to come, the ECBC seeks to ensure the comfort of the occupants while ensuring climate mitigation efforts. The ECBC has no application to residential buildings and complexes and is restricted to the hospitality sector, assembly (theatre, transport service facilities, multiplex), healthcare, business, education sector and shopping facilities.⁶²

The ECA and the ECBC had left residential buildings outside its scope, but the 2022 amendment has attempted to plug that gap. Even before this amendment, the BEE and the Ministry of Power introduced the Eco Niwas Samhita (ENS) in 2018 targeting the energy efficiency of the residential building sector taking cognizance of the fact that 70% of the electricity consumed by buildings is reportedly consumed by residential buildings. Part I: Building Envelope of ENS prescribed minimum building envelope performance requirements to limit heat gains (for cooling-dominated climates) and to limit heat loss (for heating-dominated climates), as well as for ensuring adequate natural ventilation and daylighting potential.⁶³ Part II of ENS launched in July 2021 titled Compliance

⁶²Ministry of Power & Bureau of Energy Efficiency, 'Energy Conservation Building Code FAQs' <https://beeindia.gov.in/sites/default/files/ECBC_FAQs_0.pdf> accessed 19 January, 2023.

⁶³Ministry of Power & Bureau of Energy Efficiency, 'Eco-Niwas Samhita 2021 (Code Compliance and Part-II: Electro-Mechanical and Renewable Energy Systems)' (July 2021) <<https://beeindia.gov.in/sites/default/files/ENS%202021.pdf>> accessed 20 January, 2023.

Code and Electro-Mechanical and Renewable Energy Systems prescribes minimum energy performance requirements for building services, indoor electrical end-use and renewable energy systems. The Code applies to residential buildings and residential parts of Mixed land-use building projects built on a plot area measuring more than or equal to 500 square metres. The Code also applies to additions to existing infrastructure in residential buildings that could result in the renovated or remodelled building surpassing the designated threshold. The electromechanical systems covered under the Code include building services such as common area and exterior lighting, elevators, pumps, basement ventilation, transformers, power distribution losses, power factor correction, electrical vehicle supply equipment etc. and indoor electrical end-use services such as indoor lighting, comfort systems, service hot water etc.⁶⁴

While the provisions of this Central Code that apply to residential buildings look promising and could positively impact urban areas in attaining energy efficiency, its implementation like most other codes in the domain of urban development largely depends on municipal approval and state-by-state acceptance and incorporation into law. Further, the document on the Code released by

⁶⁴ibid.

the BEE clearly states that in case of conflict between ENS 2021 and any other rules on safety, security, health, or environment by Central, State, or Local Government, the Code prescribed by the government would take precedence.⁶⁵ This leaves it to the discretion of the respective state and municipal authorities to adopt and implement the Code.

Other powers and responsibilities of the State Governments under the ECA include establishing SDAs to coordinate and enforce the provisions of the Act, encouraging the use of energy-efficient equipment or appliances, undertaking awareness drives and capacity-building exercises for personnel for efficient use of energy and its conservation and setting up of the State Energy Conservation Fund for promotion of efficient use of energy and its conservation within the State.⁶⁶ The provisions of the Act have been supplemented by several rules, the most material amongst them when viewed from the perspective of energy consumption of designated consumers being the Energy Conservation (PAT) Rules, 2012.⁶⁷ These Rules vest the responsibility of establishing

⁶⁵ibid.

⁶⁶Energy Conservation Act 2001, s 15 & 16.

⁶⁷Energy Conservation (Energy Consumption Norms and Standards for Designated Consumers, Form, Time within which, and Manner of Preparation and Implementation of Scheme, Procedure for Issue of Energy Savings Certificate and Value of Per Metric Tonne of Oil Equivalent of Energy Consumed) Rule 2012.

energy consumption norms and standards on the technical committee set up by the BEE.⁶⁸ Under these Rules, the SDAs are responsible for receiving the action plans submitted by designated consumers that detail their identified energy-saving measures. Further, they are also responsible for assessing the performance of the consumers.⁶⁹

Section 18 of the Act is broadly worded and gives power to the Central and State Governments to issue directions to any person, officer, authority, or any designated consumer for the efficient use of energy and its conservation. The section clarifies that the government's authority to issue directions encompasses the authority to issue regulations and norms for process and energy consumption standards in any industry; building or building complex. The government also has the authority to instruct the establishment of standards for regulating the energy consumption for equipment and appliances. This provision gives the sense that the State Government has also been empowered to issue norms and regulations on energy consumption standards for equipment and appliances. While the Energy Conservation (PAT) Rules, 2012 restrict the role of the State Government and its designated agencies to a supervisory capacity, Section 18

⁶⁸Energy Conservation (PAT) Rules 2012, Rule 4.

⁶⁹Energy Conservation (PAT) Rules 2012, Rule 5 & 6.

envisages a broader role of the state since it also empowers it to regulate energy consumption standards. Neither the Act nor the Rules clarify to what extent the powers of the State Governments under Section 18 can be stretched. However, operational guidelines issued by the BEE for strengthening the SDAs reflect that the ECA follows a two-tier structure for its implementation with the BEE at the Centre assisted by the notified SDAs acting as nodal agencies in the states and union territories.⁷⁰

SDAs have been established in 36 States and Union Territories.⁷¹ Kerala and Andhra Pradesh have established Stand-Alone SDAs. However, the remaining 34 States and UTs have assigned the additional responsibility of facilitation and enforcement of the provisions of the ECA at the State level to one of their existing agencies or departments, such as the Renewable Energy Development Agency, Electrical Inspectorate, Distribution Companies, and Power Departments. In states where SDAs are housed within pre-existing departments, the SDA shares key facilities, staff, and

⁷⁰MoP & Bureau of Energy Efficiency, 'Scheme for Strengthening SDAs, Operational Guidelines' <https://beeindia.gov.in/sites/default/files/Guidelines%20SDA%20Book%20PRINTED%20ONE_0.pdf> accessed 20 January, 2023.

⁷¹Bureau of Energy Efficiency, 'SDAs' <<https://beeindia.gov.in/content/sdas-0>> accessed 17 January, 2023.

budget with the parent department. ⁷²The following paragraphs examine some of the initiatives undertaken by SDA in a select few states to identify whether there is any parity in the measures and implementation strategies adopted by them in complying with the provisions of the ECA with specific reference to the ECBC (the Code).

In Karnataka, the body designated as the SDA is the Karnataka Renewable Energy Development Ltd (KREDL).⁷³ A perusal of the agency's website reflects that vide Section 18 of the ECA, the Government of Karnataka has issued several directions in the field of energy efficiency to comply with the provisions of the Act. The Karnataka Energy Conservation Building Code (ECBC) was introduced in 2014 and revised in 2018,⁷⁴ with the KREDL identified as the nodal agency responsible for the implementation of the Code. The enforcing authority for ensuring compliance of private and public buildings with the code is the Urban Development Department and the Directorate of

⁷²Bureau of Energy Efficiency, 'Scheme for Strengthening SDAs, Operational Guidelines' <https://beeindia.gov.in/sites/default/files/Guidelines%20SDA%20Book%20PRINTED%20ONE_0.pdf> accessed 18 January, 2023.

⁷³Energy Department, Government of Karnataka, 'Notification No. DE 22 PSR 2002/363' <<https://kredl.karnataka.gov.in/storage/pdf-files/EC/SDA%20-NOTIFICATION.pdf>> accessed 17 January, 2023.

⁷⁴Energy Department, Government of Karnataka, 'KECBC 2018 Notification No. EN 171 VSC 2018 dt 25-11-2019' <<https://kredl.karnataka.gov.in/storage/pdf>> accessed 18 January, 2023.

Municipal Administration. These departments have been directed to incorporate the code into their building bylaws. For government buildings, the enforcing authority is the Public Works Department (PWD) and Architecture Department. Since the Karnataka Code is read with the Karnataka Municipalities Model Building Bye-Laws 2017, its application extends to all categories of buildings⁷⁵ in urban areas. ⁷⁶The other initiatives undertaken by the Karnataka Government and SDA include awareness building and publicity about energy conservation and energy efficiency, the establishment of the Karnataka State Energy Conservation fund to promote, develop and implement pilot projects. The Government has mandated the use of solar water heating systems in industries, hospitals, govt. offices, hotels, residential buildings, and commercial buildings since 2007, use of LED lights in Govt. buildings since 2015. The use of energy-efficient BEE 4/5 star rated pump sets for drinking water supply in the city, town or gram panchayath under the Social Welfare Department and Rural Development and Panchayat Raj Department; and the use of BEE 5 Star rated electrical appliances in Government and Public undertaking Departments have also been mandated. Furthermore, as per the BEE guidelines, the operating temperature of air conditioners

⁷⁵Karnataka Municipalities Model Building Bye-Laws 2017, Cl. 3.2.

⁷⁶Karnataka Energy Conservation Building Code (ECBC) 2014.

has been set to 24° C - 25° C in all Government and Public Undertaking Departments in the state.⁷⁷

In Odisha, the Engineer-In-Chief (Electricity) – cum – Principal Chief Electrical Inspector of the Department of Energy is the SDA.⁷⁸ Odisha was one of the first states to adopt the ECBC and introduced the Odisha Energy Conservation Building Code in 2011 which was revised in 2018.⁷⁹ It is interesting to note that, unlike Karnataka, the Odisha Code does not apply to residential areas. The application of the code is restricted to buildings or building complexes that have a connected load of 100 kilowatts (kW) or greater or a contract demand of 120 kilo-Volt-Amperes kVA or greater and are intended to be used for commercial purposes.⁸⁰ Instead of the Model Building Bye Laws prescribed by the Central Government, the Housing and Urban Development Department of Odisha has adopted the Odisha Development Authorities (Planning and Building Standards) Rules 2020. These Rules apply to residential, commercial, and institutional buildings. These Rules

⁷⁷Karnataka Renewable Energy Development Limited, 'EC Related Orders issued by GOK' <<https://kredl.karnataka.gov.in/page/Energy+Conservation/Policies%20and%20Acts/EC+Related+Orders+Issued+by+GOK/en>> accessed 18 January, 2023.

⁷⁸'Odisha Energy Conservation Building Code', (*SDA, Odisha*) <<https://eielectricityodisha.nic.in/ECONS/ECBC.aspx>> accessed 20 January, 2023.

⁷⁹Odisha Energy Conservation Building Code 2018.

⁸⁰ibid, Cl. 2.

provide for the application of Green Building norms under Rule 51 which prescribe norms on water conservation and management, solar energy utilization, energy efficiency and waste management for both residential and non-residential buildings. Rule 51(2) of the 2020 Rules makes a mention of the 2011 Odisha Energy Conservation Building Code and not the recently updated 2018 Code. Further, it merely states that the development authorities shall ‘encourage’ adoption of the Odisha ECBC Code and Guidelines, 2011 for new and existing buildings but the incentive for the same would be based on applicable State Government policy as applicable from time to time. This appears to be a dichotomous situation since there is a lack of clarity under the Rules as to what should count as an incentive to adopt the Code adopted under the ECA.

Kerala prides itself as the first state to establish a standalone Energy Management Centre which functions as the SDA. The state adopted the Kerala State Energy Conservation Building Code Rules in 2017.⁸¹ While the Code does not apply to residential buildings, its clauses have been Kerala Municipal Building Rules and Kerala Panchayat Building Rules that apply to residential

⁸¹Kerala State Energy Conservation Building Code 2017.

buildings.⁸² In Tripura, the State Electricity Corporation Limited has been assigned the role of the SDA. The state adopted the Tripura Energy Conservation Building Code in 2020 which, like most other states, does not apply to residential building complexes. The Tripura Building Rules, 2017 last amended in 2019 has taken an approach like the Odisha Rules where it prescribes that the State Government may by Notification in the Official gazette prescribe a separate green rating system for buildings similar to the task performed by the energy conservation code by selectively combining or amending the provisions of the ECBC.⁸³

Similar to the other building standards like the Model Building Bye-Laws, 2016 issued by the Ministry of Housing and Urban Affairs, the ECBC has a persuasive value for states, since they enjoy the prerogative to adopt, notify, amend and implement such codes. However, the ECBC has been readily adopted by 18 States and 2 Union Territories with respective state amendments to suit the local requirements. Uttar Pradesh (UP) was the first among the states to adopt the updated 2017 Code. While notification of the updated code and its alignment with existing building codes is underway in some states like Gujarat and Maharashtra, other states like Telangana and

⁸²Kerala Municipality Building Rules 2019, Rule 17.

⁸³Tripura Building Rules 2017, Rule 105.

Andhra Pradesh are mobilizing personnel to ensure compliance. While adoption of these codes by the states is the first step to realising its full potential, timely and large-scale implementation and compliance with the Code across the country is pertinent.⁸⁴ On examining the ECBCs adopted by 4 states it became apparent that even under the ECA, the State Governments continue to exercise their discretion in deciding the extent to which they would incorporate or implement the Codes.

Under the 2022 amendment to the ECA which has revised the ECBC to introduce energy conservation and sustainable building codes and expanded the scope of 'buildings' to include those used for residential purposes, the 2017 version of the ECBC would require supplemental amendments to incorporate the use of renewable energy and other green building requirements. Sixteen years since the introduction of the ECBC, 20 states and Union Territories have adopted certain versions of the code. The 2022 amendment would require further compliances to be met by buildings and could further delay the country-wide implementation of the Code, subject to the extent that the states permit its application within their respective jurisdictions.

⁸⁴Sameer Kwatra & Prima Madam. 'Constructing Change with Building Energy Codes in India' (*Natural Resources Defence Council*, 6 August 2021) <<https://www.nrdc.org/experts/sameer-kwatra/constructing-change-building-energy-codes-india>> accessed 16 January, 2023.

4. CONCLUSION: CITY AS CENTRES FOR ENERGY TRANSITION - WHO DECIDES AND WHO IMPLEMENTS?

Division of legislative power and inter-ministerial convergence can do little to impact socio-economic factors that influence energy conservation across states. Analysis of India's Energy Outlook 2021 presented by the IEA reflects that energy consumption levels of urban areas are closely intertwined with socio-economic considerations and interstate variances amongst others. The wealthiest states in India have an average per capita income of almost twice as high as the poorest states. The wealthy states house 44% of the urban population of the country which is twice as urbanised as the lower income states and account for 40% higher energy consumption with a few outlier states like Jharkhand, Odisha in the energy-intensive industry belt.⁸⁵ Nearly 40% of Indians reside in states with both low per capita incomes and low per capita energy use.⁸⁶ These figures are further overlaid by other considerations of gender, rural-urban divide and caste.⁸⁷ The success of India's energy efficiency efforts targeting urban areas would require more than just

⁸⁵International Energy Agency, 'Global Energy Review: CO2 Emissions in 2021' (*IEA 2021*), 44.

⁸⁶*ibid.*

⁸⁷*ibid.*

support and participation from states. The lack of adequate data tools to map the energy use and transition in different sectors could act as an impediment to recording any success achieved. The use of data tools that collect energy use and efficiency across sectors and map it on a city, state and national scale would help the country identify and overcome barriers and track progress.

The division of legislative power on planning and development puts urban areas at the confluence of the Centre and state policies that envisage different goals and strategies. This division makes it further challenging to ensure the adoption of an urban planning and development policy that is uniformly implemented across the country since a lot is contingent on the laws and initiatives independently launched by State Governments and their propensity to espouse the central schemes. A similar challenge is likely to be faced by urban policies that impact energy transition and climate change mitigation. In this backdrop of fragmented regulatory and governance framework for the urban areas in India, it is trite to raise apprehension about the contribution that urban areas can make to meet the avowed energy transition targets. Three decades of experience in electricity reform indicate that solutions that aim to fit all

situations have not proven effective.⁸⁸ The situation would not be very different for the overall energy sector. Political and economic frameworks within the energy sector vary from one state to another, and the sector operates within diverse political and economic contexts at the state level. These variations underscore the importance of tailoring energy approaches to the specific needs of each state.

Most efforts in the field of energy have come as broad goals laid down by the Central Government to be achieved by the respective states. The ECA is a little different from earlier policies and guidelines since it has put in place certain concrete mechanisms with the establishment of the BEE and SDAs in states. Efforts of BEE to introduce energy efficiency standards for electronic appliances have not faced much resistance from states, since there is little scope for conflict. However, schemes on Energy Efficiency Building Codes that directly come within the states' jurisdiction on urban development and planning have not been optimally introduced. Thus, this legislation is not very different from other urban development initiatives launched by the

⁸⁸ Ashwini K Swain, Navroz K Dubash, et al, 'Comments on Budget Proposal for Electricity Reforms' (*Centre for Policy Research, 15 March 2021*) <<https://cprindia.org/wp-content/uploads/2021/12/Comments-on-Budget-Proposal-for-Electricity-Reforms-1.pdf>>accessed September, 2023.

Central Ministries that require active participation from the State Governments for their adoption and implementation. Despite efforts made by the BEE to seek the active involvement of SDAs, states suffer from constraints that go beyond the provisions of the ECA to address. India has set its energy objectives primarily on a national scale, however, as with most policies, the rate of progress towards an energy transition will vary across various states. To achieve uniform energy efficiency across states, the focus should be directed at improving inter-ministerial and center-state convergence to ensure that national goals translate into local realities.

ENERGY LAW AS AN AREA OF LAW IN INDIA

** Mr. Badrinath Srinivasan*

1. INTRODUCTION

Energy law as an area of law has emerged in the last three decades.⁸⁹ Law firms have been specialising in energy law practice.⁹⁰ Universities world over have been conducting undergraduate and postgraduate degrees with specialisation in energy law.⁹¹ Given the importance of energy and the focus on energy security in India, it is important to examine the state of energy law as a distinct area of law in India.

The criticality of energy is highlighted by recent developments in Europe in terms of the Russia-Ukraine war. The issue has acquired international legal dimensions with the apprehension in Europe over access to the Russian gas. There has been a dramatic shift in focus of Europe, in particular, and the international community, in general, from prioritising environment/climate

⁸⁹* Mr. Badrinath Srinivasan, Senior Manager (Legal) at Directorate General of Hydrocarbons (DGH). Adrian Bradbrook, 'Energy Law as an Academic Discipline' (1996) 14 *Journal of Energy & Natural Resources Law* 193 (hereafter "*Bradbrook*").

⁹⁰ See, for instance, US News, Best Law Firms, 'Energy Law' <<https://law.usnews.com/law-firms/practice-area/energy>> accessed 26 November, 2022; First Hand, '2023 Best Law Firms for Energy, Oil, & Gas Law' accessed 26 November, 2022. <<https://firsthand.co/best-companies-to-work-for/law/best-law-firms-in-each-practice-area/energy-oil-and-gas>> accessed 26 November, 2022.

⁹¹ See, section 3 of the paper.

changeover energy to ensuring energy security.⁹² It is in this background that this paper aims to explore the development of energy law as an independent legal discipline in India.

Towards this end, this paper proceeds as follows: The second section of this paper discusses what it means to be an area of law. It draws upon the recent work of Tarunabh Khaitan and Sandy Steel regarding areas of law⁹³ and provides context to the next Section. Section 3 briefly discusses the overview of energy law in the international community. Section 4 analyses a recent development in international Energy law in the context of the Russia Ukraine War. It highlights how the increasing focus on renewables in Europe has led to the failure to secure energy security. This has resulted in a crisis-like situation for Europe, especially Germany. Sections 5 analyses energy law in the domestic context. It argues that energy law as a distinct field of study is at a nascent stage in India considering that the Indian legal industry is yet to possess a shared acceptance of the same. Section 6 concludes by noting the importance and the benefits of recognition in India of energy law as a separate academic discipline.

⁹² See, section 6 of the paper.

⁹³Tarunabh Khaitan and Sandy Steel, 'Areas of Law: Three Questions in Special Jurisprudence' (2022) Oxford Journal of Legal Studies (forthcoming), <<https://ssrn.com/abstract=4192900>> accessed 29 October, 2022 (hereafter "*Areas of Law*").

2. AREAS OF LAW

The recent work of Tarunabh Khaitan and Sandy Steel⁹⁴ addresses three broad questions regarding what is commonly regarded as ‘areas of law’:

- What is an area of law?
- What are the consequences of designating laws into distinct areas of law?
- What are the foundations of an area of law?

Khaitan and Steel argue that the search for the normative foundations of an area of law are nothing but a search for their functions or aims.⁹⁵ Areas of law may be delineated or designated as such owing to numerous factors such as requirements of law practice, “analytical elegance”⁹⁶, ease of teaching and learning the law, etc.⁹⁷ There are examples of areas of law having emerged from academia as opposed to legal practice: the law of unjust enrichment is a typical example.⁹⁸

But the mere existence with these factors is not determinative of the recognition of a subject as a distinct area of law: recognition as such by the legal industry, that

⁹⁴*Areas of Law*, p. 2.

⁹⁵*Areas of Law*, p. 3.

⁹⁶Analytical elegance generally refers to the coherence and clarity of a doctrine or a set of doctrines being in sync with each other without contradictions.

⁹⁷*Areas of Law*, p. 5.

⁹⁸*ibid.*

is, advocates, judges, academicians, policy-makers, law publishers, journal editors, legal associations, etc. is important.⁹⁹ Although individual actors – be it a jurist or an institution – can quicken the process but “shared acceptance” by the legal industry is necessary for the distinct subject to evolve into an area of law.¹⁰⁰

Such recognition or shared acceptance may be owing to the one or a combination of more than one of the following factors¹⁰¹:

- Object of the area of law;
- Purpose of the area of law; and
- Procedure encompassing the area of law

However, there is no requirement for a consensus from among the actors of the legal industry regarding the basis for such recognition.¹⁰² At the same time there is convergence on the contents of the area of law being recognised.¹⁰³

There are implications on classifying a subject as an area of law¹⁰⁴:

⁹⁹Khaitan and Steel call them the “legal complex” but they have been known for a long time as the legal industry, which is the terminology used in this paper.

¹⁰⁰*Areas of Law*, p. 7.

¹⁰¹*ibid*, 8.

¹⁰²*ibid*, 9.

¹⁰³*ibid*.

¹⁰⁴ See, for instance, Paul H. Rubin, ‘Courts and the Tort-Contract Boundary in Product Liability’ (1999), <<https://ssrn.com/abstract=157359>> accessed 30 October, 2022.

- Sometimes, the classification results in legal outcomes¹⁰⁵ and at times the area of law that a cause of action is allocated has implications on the applicable legal regime and the outcome thereof.¹⁰⁶ For instance, classifying an assistant consultant in the information technology industry into the rubric of industrial disputes law instead of contract law has considerable implications on the termination of such an employee.¹⁰⁷

Another significant implication of classifying a subject as an area of law is that the legal industry begins to bring internal coherence¹⁰⁸ into that area of law.¹⁰⁹

- Not only does the legal industry move towards internal coherence of that area of law, there is also an attempt to identify the “foundational coherence”, that is, the normative foundation or

¹⁰⁵*Areas of Law*, p. 13.

¹⁰⁶*ibid*, 14.

¹⁰⁷ See, for instance, *Thirumalai Selvan Shanmugam vs. Tata Consultancy Service Limited*, MANU/OT/0064/2022, I.D. No. 34/2016 & CNR No. TNCH0E0000492016 dt. 08.06.2022 decided by the Principal Labour Court, Chennai.

¹⁰⁸Internal coherence refers to normative coherence in law where the principles, policies, and objectives that justify the law to form a coherent set such that they refer to common value(s) and that conflicts within the law are “resolved in a principled, reasonable and non-arbitrary fashion.” See J.M. Balkin, ‘Understanding Legal Understanding: The Legal Subject and the Problem of Legal Coherence’ (1993) 103 *Yale Law Journal* 105, 116; Julie Dickson, ‘Interpretation and Coherence in Legal Reasoning’ (2016), *The Stanford Encyclopedia of Philosophy* (Winter 2016 Edition), Edward N. Zalta (ed.)

<<https://plato.stanford.edu/archives/win2016/entries/legal-reas-interpret/>> accessed 14 January, 2023.

¹⁰⁹*Areas of Law*, p. 14.

aims of such area of law.¹¹⁰ Foundational coherence helps in moving towards internal coherence of that area of law.¹¹¹

- Once the legal industry agrees with the aims of that area of law, such foundational aims interact with the ideological underpinnings of the legal system.¹¹² There need not be a perfect agreement on the foundational aims of the particular area of law and a critical mass in the legal industry projecting that view is sufficient.
- As the area of law matures in the sense that the doctrinal contours become settled and are in broad consonance with the aims of that area of law, hard cases are settled through analytical reasoning without reference to policy.¹¹³ On the other hand, in areas of law that have recently been carved out or those with unsettled doctrinal contours, judges would have to make frequent reference to the foundational aims to

¹¹⁰Ibid, 15.

¹¹¹ibid.

¹¹²*Areas of Law*, p. 15.

¹¹³ibid.

settle hard cases.¹¹⁴ “Ideological stability” gives the area of law legitimacy.¹¹⁵

- Areas of law in a particular jurisdiction may have distinct features such as convergence with prevailing standards at an international level, level of enforcement by the enforcing authorities, compliance level, and so on.¹¹⁶

3. ENERGY LAW AS AN AREA OF LAW

Energy law has been defined by Adrian Bradbrook to mean the law dealing with "*the allocation of rights and duties concerning the exploitation of all energy resources between individuals, between individuals and the government, between governments and between states*".¹¹⁷ Energy resources have been stated to include petroleum (crude oil, natural gas, etc.), coal, uranium (and related nuclear elements), solar energy, wind energy, geothermal energy, tidal and wave energy, hydroelectricity, biomass, hydrogen, generation, transmission and consumption of electricity.

Coal, uranium, solar energy, wind energy, petroleum, etc. are regarded as primary sources of energy, which are

¹¹⁴Ibid, 16.

¹¹⁵ibid.

¹¹⁶Ibid, 17.

¹¹⁷Bradbrook, p. 194.

available naturally. Energy subjected to human-made transformation is regarded as secondary energy.¹¹⁸ Energy law not only covers primary sources of energy but also secondary sources.¹¹⁹ This definition is not comprehensive in that it ignores the triumvirate in any form of energy: production, transmission and consumption.¹²⁰ Hence, energy law as such would cover energy generated through primary and secondary sources as well as the entire chain from production up to consumption.

An important area in energy law is energy conservation which is as important as energy generation.¹²¹ Energy generation, transformation, storage, distribution and consumption create considerable costs, both direct and indirect, and also leads to wastage. Energy resources by itself, are scarce. Therefore, energy conservation plays a significant role.

Energy law has important international law dimensions.¹²² The production, transportation and consumption of energy has underpinning of several international

¹¹⁸Sara Øvergaard, 'Issue paper: Definition of Primary and Secondary Energy' (September 2008), available at <https://unstats.un.org/unsd/envaccounging/londongroup/meeting13/lg13_12a.pdf> accessed 24 November, 2022.

¹¹⁹Bradbrook, p. 194-195.

¹²⁰Bradbrook however considers production (including exploration) of energy resources in several other context in the paper. See, for instance, Bradbrook, p. 198-199.

¹²¹Bradbrook, p. 195.

¹²²Raphael J. Heffron, *Energy Law: An Introduction* (2nd ed. 2021) 16ff.

obligations. Conventional energy sources such as oil, gas, coal, etc. are often imported across countries and even continents. With energy resources becoming scarce, there is a move to explore and produce from sea beds in the territorial waters, exclusive economic zones and even from high seas. Hence, international energy law is also an important dimension of energy law.

The production of energy sources and generation, transportation and consumption of energy create considerable impact on the environment and surroundings. For instance, energy generated by coal-based power plants have effects on the economy across several activities including the mining of coal, transportation of coal, burning of coal, ash and other waste produced from coal-based plants, air pollutants such as sulphur-based compounds released in the process of burning coal, etc. Hence, these laws have a significant role to address the environmental concerns emanating owing to the energy industry. Similarly, the concerns of climate change law are also addressed in the context of energy resources which are one of the major factors responsible for climate change. Hence, climate change law and environmental law have continued to play an important part in the evolution of energy law.

In the first two decades of this century, there has been a considerable shift in the international community towards

prioritising the environment and climate change over conventional energy sources such as oil, gas and coal.¹²³ In this context, it is important to note that the oil and gas sector alone contributes to 42% of the global emissions (as of 2015).¹²⁴

Energy law has gained political prominence because of the environmental impact and economic consequences.¹²⁵ This shift is apparent in the United Nations Resolution on 2030 Agenda for Sustainable Development: while recognising universal access to affordable energy, the Agenda states:

*“7.a By 2030, enhance international cooperation to facilitate access to **clean energy research and technology**, including **renewable energy**, energy efficiency and advanced and **cleaner***

¹²³See, for instance, David M. Ong, ‘From Stakeholders to Actors? The Progressive Integration of Environmental, Social and Cultural Considerations Within International Energy Law’, in Tina Soliman Hunter *et al.*, *Routledge Handbook of Energy Law* (2020) 8-9, 14-41; Rosemary Lyster, ‘Renewable Energy in the Context of Climate Change and Global Energy Resources’, in *Law As Change: Engaging With The Life & Scholarship Of Adrian Bradbrook* (2014) 83 <<https://library.oapen.org/bitstream/handle/20.500.12657/33168/560243.pdf?sequence=1&isAllowed=y>> accessed 23 November, 2022; Adrian J. Bradbrook and Richard L. Ottinge (Ed.), ‘Energy Law and Sustainable Development’ (2003), p. vii-viii <<https://lib.icimod.org/record/11388/files/5342.pdf>> accessed 25 November, 2022.

¹²⁴Chantal Beck *et al.*, ‘The Future is Now: How Oil and Gas Companies can Decarbonize’ (McKinsey, 07 January 2020), <<https://www.mckinsey.com/industries/oil-and-gas/our-insights/the-future-is-now-how-oil-and-gas-companies-can-decarbonize>> accessed 26 November, 2022.

¹²⁵ Raphael J. Heffron, Anita Rønne, Joseph P. Tomain, Adrian Bradbrook & Kim Talus, ‘A Treatise for Energy Law’ (2018) 11 *Journal of World Energy Law and Business* 34-48, 34.

fossil-fuel technology**, and promote investment in energy infrastructure and **clean energy technology

*7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support”.*¹²⁶

Since the definition provided by Bradbrook discussed earlier in this section, energy law has become more multidimensional, especially within the international sphere in the context of international investment law.¹²⁷ Energy law in the West has acquired distinct priorities at various points of time in history. Prior to the 1990s, the West was keen in establishing an international economic order with protection of foreign investments and enforcement of rights of foreign investors emanating out of the its investments in oil rich third world countries.¹²⁸ After successfully establishing an international economic order for protection of foreign investments in the energy sector and thereby securing continuous access to energy,

¹²⁶ United Nations General Assembly, ‘Transforming our world: the 2030 Agenda for Sustainable Development’, A/RES/70/1 (2015), <<https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf> > accessed 26 November, 2022

¹²⁷Bradbrook, p. 205.

¹²⁸ Kate Miles, *The Origins Of International Investment Law* (2013) 79-119; Antony Anghie, *Imperialism, Sovereignty & The Making Of International Law* (2004) 223ff.

the developed countries shifted to focussing on protection of environment and lessening the impact of energy industries on the environment.¹²⁹ The problems that the developed countries sought to address in terms of reducing the impact of energy industries on the environment are different from the problems of the third world, which has been grappling with problems of energy security and access to energy.¹³⁰

As the search for energy resources has increased, it has pushed countries not only to their territorial waters but also to areas beyond their territorial waters and into the high seas. This has led to attempts to regulate exploration and production of energy sources through international law. These developments have contributed to increasing

¹²⁹ See, for instance, David M. Ong, 'From Stakeholders to Actors? The Progressive Integration of Environmental, Social and Cultural Considerations Within International Energy Law' in Tina Soliman Hunter *et al.*, *Routledge Handbook of Energy Law* (2020) 8-9, 14-41; Rosemary Lyster, 'Renewable Energy in the Context of Climate Change and Global Energy Resources' in *Law As Change: Engaging With The Life & Scholarship Of Adrian Bradbrook* (2014) 83 <<https://library.oapen.org/bitstream/handle/20.500.12657/33168/560243.pdf?sequence=1&isAllowed=y>> accessed at 23 November, 2022; Adrian J. Bradbrook and Richard L. Ottinge (Ed.), *Energy Law and Sustainable Development*(2003),p.vii-viii <<https://lib.icimod.org/record/11388/files/5342.pdf>> accessed 25 November, 2022.

¹³⁰Hojjat Salimi Turkamani, 'International Energy Law and the Development Dilemma of Developing Countries' (2022) 19 Manchester Journal of International Economic Law 211-227, 212; D R Pendse, 'The energy crisis and Third World options' (1979) 1 Third World Quarterly 69-88.

efforts at codifying various facets of international energy law.¹³¹

As internal and international norms have increased, so has a shared acceptance from the industry as to energy law becoming a separate discipline. Energy law has acquired the status of an academic discipline.¹³² Although there have been suggestions in the past which described energy law as a nascent or an emergent field,¹³³ energy

¹³¹See, for instance, the United Nations Convention on the Laws of the Sea, 1982, <https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf> accessed 26 November, 2022; United Nations General Assembly, Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond Limits of National Jurisdiction (1970) <<https://digitallibrary.un.org/record/201718?ln=en>> accessed 26 November, 2022.

¹³² See, for instance, Kaisa Huhta, 'The Contribution of Energy Law to the Energy Transition and Energy Research' (2022) 73 *Global Environmental Change* 102454 <<https://doi.org/10.1016/j.gloenvcha.2021.102454>> accessed 22 November, 2022 (hereafter "*Energy Law & Energy Transition*"); Kaisa Huhta, 'The Coming of Age of Energy Jurisprudence' (2021) 39 *Journal of Energy & Natural Resources Law* 199-212; Raphael J Heffron *et al*, 'A Treatise for Energy Law' (2018) 11 *Journal of World Energy Law and Business* 34; Raphael J Heffron and Kim Talus, 'The Development of Energy Law in the 21st Century: A Paradigm Shift?' (2016) 9 *Journal of World Energy Law and Business* 189; Alexandra Wawryk, 'International Energy Law: An Emerging Academic Discipline', in Paul Babie & Paul Leadbeter (Eds.), *Law As Change: Engaging With The Life & Scholarship Of Adrian Bradbrook* (2014) 223-255 <<https://library.oapen.org/bitstream/handle/20.500.12657/33168/560243.pdf?sequence=1&isAllowed=y>> accessed 23 November, 2022; Raphael J Heffron and Kim Talus, 'The Evolution of Energy Law and Energy Jurisprudence: Insights for Energy Analysts and Researchers' (2016) 19 *Energy Research & Social Science* 1; Adrian Bradbrook, 'Energy Law as an Academic Discipline' (1996) 14 *Journal of Energy & Natural Resources Law* 193.

¹³³ See, for instance, Raphael J Heffron *et al*, 'A Treatise for Energy Law' (2018) 11 *Journal of World Energy Law and Business* 34; Raphael J Heffron and Kim Talus, 'The Development of Energy Law in the 21st

law has come to be recognised as a distinct practice and academic sphere in the West.¹³⁴ Universities world over have energy law papers and some universities even offer masters degrees with specialisation in energy laws.¹³⁵

As noted in this paper, recognition of energy law as an academic discipline has led to attempts at convergence at regional and international level.

4. PRIORITISATION OF ENERGY SECURITY

The foundational aims of energy law in a jurisdiction will and should depend on the jurisdiction's priorities vis-à-vis

Century: A Paradigm Shift?' (2016) 9 Journal of World Energy Law and Business 189;

¹³⁴ See, for instance, *Energy Law & Energy Transition*; Kaisa Huhta, 'The Coming of Age of Energy Jurisprudence' (2021) 39 Journal of Energy & Natural Resources Law 199-212; Raphael J. Heffron, *Energy Law: An Introduction* (2nd ed. 2021).

¹³⁵ See, for instance, Queen Mary University of London (LLM in Energy&ClimateChangeLaw) <<https://www.qmul.ac.uk/postgraduate/taught/coursefinder/courses/energy-and-climate-change-law-llm/>> accessed 26 November, 2022; University of Birmingham (LLM in Energy&EnvironmentalLaw) <<https://www.birmingham.ac.uk/postgraduate/courses/distance/law/llm-energy-environmental-law.aspx>> accessed 26 November, 2022; New York University (LLM in Environmental&EnergyLaw), <<https://www.law.nyu.edu/llmjsd/environmental>> accessed 26 November, 2022; University of Dundee (LLBwithEnergyLawSpecialisation), <<https://www.dundee.ac.uk/undergraduate/law-english-northern-irish-energy-law>> accessed 26 November, 2022; University of Aberdeen (LLM in energy law & LLM with energy law Professional Skills) <<https://www.abdn.ac.uk/law/courses/master-degree-87.php>> accessed 26 November, 2022; University of Houston (LL.M. in Energy, EnvironmentandNaturalResourcesLaw) <<https://www.law.uh.edu/llm/eenr.asp#:~:text=The%20UH%20Law%20Center's%20LL,natural%20resources%20exploitation%20and%20conservation>> accessed 26 November, 2022.

energy and resources. A blind convergence with other jurisdictions may prove disastrous. A typical example of this trend is the focus of energy law on energy transition, that is, the transition from fossil fuels to renewables.¹³⁶ The Western world is focussed on energy transition to renewables in the immediate context. In an ideal scenario, the third world, typically characterised by a huge population with hardly any discernible access to scarce resources, should also be as focussed as the West in energy transition. However, given the human rights issues associated with the lack of access to energy resources, the problems of the third world are considerably different: they relate more to energy security, access to energy resources and the environment. Untrammelled efforts of convergence with dominant jurisdictions are likely to therefore result in serious problems.

Given the continuous access in the developed countries to energy sources, energy law in such countries prioritised environment and climate change law in the past decade or

¹³⁶ See, for instance, Ankita Dutta, 'Europe's Energy Security in the Aftermath of Ukrainian Crisis' (Indian Council of World Affairs, 13 June 2022) <https://www.icwa.in/show_content.php?lang=1&level=3&ls_id=7471&lid=5009> accessed 23 November, 2022; Sebastian Lutz-Bachmann, 'The Security-Oriented Turn in Energy Law' (*Verfassungsblog*, 12 April 2022) <<https://verfassungsblog.de/the-security-oriented-turn-in-energy-law/>> accessed 23 November, 2022; Raphael J. Heffron, *Energy Law: An Introduction* (2nd ed. 2021) 37ff; Penelope Crossley and Gloria M. Alvarez, 'Concluding Thoughts on the global energy Transition', in Tina Soliman Hunter *et al.*, *Routledge Handbook of Energy Law* (2020) 598;

so.¹³⁷ There has been an increasing focus on climate change so much that investment into the traditional primary sources of energy have lessened with increasing investments in the renewable energy sector.¹³⁸ The International Energy Agency in fact called for a stoppage in investment in oil and gas exploration in order for reaching the target of net zero emissions by 2050: “*The trajectory of oil demand in the NZE means that no exploration for new resources is required and, other than fields already approved for development, no new oil fields are necessary.*”¹³⁹ Insofar as gas is concerned, the *2050 Roadmap*

¹³⁷ See, for instance, Ankita Dutta, ‘Europe’s Energy Security in the Aftermath of Ukrainian Crisis’ (Indian Council of World Affairs, 13 June 2022)

<https://www.icwa.in/show_content.php?lang=1&level=3&ls_id=7471&lid=5009> accessed 23 November, 2022; Sebastian Lutz-Bachmann, ‘The Security-Oriented Turn in Energy Law’ (*Verfassungs*, 12 April 2022), <<https://verfassungsblog.de/the-security-oriented-turn-in-energy-law/>> accessed 23 November, 2022.

¹³⁸ See, for instance, Bob Ward, ‘An End to UK Oil and Gas Exploration’ (*LSE*, 19 May 2021), <<https://www.lse.ac.uk/granthaminstitute/news/an-end-to-uk-oil-and-gas-exploration/>> accessed 26 November, 2022.

¹³⁹ International Energy Agency, ‘Net Zero by 2050: A Roadmap for the Global Energy Sector’ (2021) 101 <https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroBy2050-ARoadmapfortheGlobalEnergySector_CORR.pdf> accessed 26 November, 2022 (hereafter “*2050 Roadmap*”); Nina Chestney, ‘End New Oil, Gas and Coal Funding to Reach Net Zero, says IEA’ (*Reuters*, 18 May 2021) <<https://www.reuters.com/business/environment/radical-change-needed-reach-net-zero-emissions-iea-2021-05-18/>> accessed 27 November, 2022; Catherine Clifford, ‘These are the World’s Largest Banks that are Increasing and Decreasing their Fossil Fuel Financing’ (*CNBC*, 22 April 2021), <<https://www.cnbc.com/2021/04/22/which-banks-are-increasing-decreasing-fossil-fuel-financing-.html>> accessed 27 November, 2022; United Nations Environment Programme, ‘World’s Governments must Wind Down Fossil Fuel Production by 6% per Year to Limit Catastrophic Warming’ (2 December 2020)

stated: “*No new oil and natural gas fields are needed in our pathway, and oil and natural gas supplies become increasingly concentrated in a small number of low-cost producers.*”¹⁴⁰ As regards the use of fossil fuels, the *2050 Roadmap* suggests that for net zero to be achieved there would be a huge decline in the use of fossil fuels to about one fifth of the total energy supply by 2050 and that even the one fifth energy supply through fossil fuels would be in goods where carbon is used in the form of plastics.¹⁴¹

However, this trend changed after the Russia Ukraine War leading to considerable changes in geopolitics. The Ukrainian side has been supported by the West leading to fears that Russia would cut gas fuel supply to Western Europe. Gas is one of the main fuels used for heating and other purposes in Europe, especially during winters. With the Russia Ukraine War, there has been considerable issues raised regarding energy security, leading the West to turn back their clock as regards energy priorities. A recent news article argued:

“Say what you will about Vladimir Putin, but his war on Ukraine did open European eyes to some long-underrated truths... Another

<<https://www.unep.org/news-and-stories/press-release/worlds-governments-must-wind-down-fossil-fuel-production-6-year>> accessed 27 November, 2022; France24, ‘World Bank to stop funding oil, gas projects from 2019’ (12 December 2007) <<https://www.france24.com/en/20171212-world-bank-stop-funding-oil-gas-projects-2019-climate>> accessed 27 November, 2022.

¹⁴⁰ibid, 23.

¹⁴¹ibid, 18.

*is that the “green dream” of modern economies powered exclusively by renewable energies remains out of reach – and reliable access to cheap energy supplies remains essential.”*¹⁴²

The price of oil also increased from around US\$ 70 per barrel in 2021-2022 to about US\$ 140 per barrel in 2022 during the war. The prices have once again dipped to around US\$ 70 in March 2023 owing to bank crises.¹⁴³

In order to tackle energy scarcity scenario post-Russia-Ukraine war, strategies now suggested include enhanced investment in greenfield oil and gas projects and increase in production from brownfield petroleum fields.¹⁴⁴ These are in addition to suggestions to invest more in clean energy.¹⁴⁵

Now, energy security has once again become the dominant theme in the West.¹⁴⁶ The trend is visible in

¹⁴²Hans-Werner Sinn, ‘Will Germany’s Energy Policy Lead to Economic Failure?’ (*The Guardian*, 25 November 2022) <<https://www.theguardian.com/business/2022/nov/25/germany-energy-policy-economic-failure-green-russian-gas>> accessed 26 November, 2022

¹⁴³ Sanjeev Choudhary, ‘Crude oil tanks to \$70, but cut in pump prices unlikely soon’ (*The Economic Times*, 21 March 2023) <<https://economictimes.indiatimes.com/markets/commodities/news/crude-oil-tanks-to-70-but-cut-in-pump-prices-unlikely-soon/printarticle/98845419.cms>> accessed 16 May, 2023.

¹⁴⁴ Muqsuit Ashraf *et al.*, ‘The war in Ukraine: A moment of reckoning for the oil and gas industry’ (*Accenture*, 10 May 2022), <<https://www.accenture.com/us-en/insights/energy/ukraine-oil-gas>> accessed 16 May, 2023.

¹⁴⁵ *ibid.*

¹⁴⁶ See, for instance, Ankita Dutta, ‘Europe’s Energy Security in the Aftermath of Ukrainian Crisis’ (*Indian Council of World Affairs*, 13 June 2022)

the case of Germany, which decided to phase out coal and nuclear power based plants and shifted its focus to gas, particularly, Russian gas.¹⁴⁷ Some European countries such as Austria, Finland, Poland, Slovakia and Hungary are dependent on Russian gas to the extent of 50% to 100%.¹⁴⁸ This dependence on Russian gas has now proved to be having strategic security implications.¹⁴⁹ The immediate reaction to the Russia-Ukraine war and the security concerns regarding fuel in Germany has been to bring about legislations to accelerate renewable energy projects but the view there seems to be that such sources may be inadequate to meet the energy demands.¹⁵⁰

The call, therefore, more than before, is to integrate the security policy concerns with energy law. Suggested measures under energy law include expansion of energy grids, regulation of energy storage facilities, etc., while

<https://www.icwa.in/show_content.php?lang=1&level=3&ls_id=7471&lid=5009> accessed 23 November, 2022; Sebastian Lutz-Bachmann, 'The Security-Oriented Turn in Energy Law' (*Verfassungs*, 12 April 2022) <<https://verfassungsblog.de/the-security-oriented-turn-in-energy-law/>> accessed 23 November, 2022.

¹⁴⁷ Sebastian Lutz-Bachmann, 'The Security-Oriented Turn in Energy Law' (*Verfassungs*, 12 April 2022) <<https://verfassungsblog.de/the-security-oriented-turn-in-energy-law/>> accessed 23 November, 2022.

¹⁴⁸ Muqsit Ashraf *et al.*, 'The war in Ukraine: A moment of reckoning for the oil and gas industry' (*Accenture*, 10 May 2022), <<https://www.accenture.com/us-en/insights/energy/ukraine-oil-gas>> accessed 16 May, 2023.

¹⁴⁹ *ibid.*

¹⁵⁰ *ibid.*

keeping in mind the security concerns without losing sight of competition and market-based freedom.¹⁵¹

It appears that unlike Western Europe, Eastern European countries having been at the receiving end of increased Russian gas prices after their accession to the European Union in 2004, have cautioned the European Union regarding the security implications of energy. This led, it is argued, to the European Union designating security policy dimension as the core component of energy policy of the European Union.¹⁵²

Another notable example of the shift in energy is Japan's reversal in prioritising nuclear energy. Earlier, after the earthquake in 2011 and the resultant Fukushima disaster, Japan decided to phase out nuclear energy by 2030.¹⁵³ But in a drastic reversal, Japan brought out a new Policy in December 2022 whereby it decided to adopt a policy to extend the lifespan of old nuclear reactors, replace old reactors and also build new nuclear reactors.¹⁵⁴ It has been

¹⁵¹ibid.

¹⁵² European Parliament, 'Energy Policy: General Principles' available at <<https://www.europarl.europa.eu/factsheets/en/sheet/68/energy-policy-general-principles>> accessed 24 November, 2022; European Council for an Energy Efficient Economy, 'Energy Union' <<https://www.ecee.org/policy-areas/energy-union/>> accessed 24 November, 2022.

¹⁵³The Associated Press, 'After the Fukushima Disaster, Japan Swore to Phase out Nuclear Power. But not Anymore' (NPR, 22 November 2022) <<https://www.npr.org/2022/12/22/1144990722/japan-nuclear-power-change-fukushima>> accessed 14 January, 2023.

¹⁵⁴ World Nuclear News, 'Japan Adopts Plan to Maximise Use of Nuclear Energy' (23 December 2022), <<https://www.world-nuclear->

stated that the policy shift in Japan is owing to the increase in energy prices in the midst of the Russia-Ukraine war and power shortages.¹⁵⁵ It also appears that similar moves have been made by European and Asian countries, such as UK, Philippines, and South Korea.¹⁵⁶ In fact, about two-thirds of the nuclear reactors under construction are in Asia, which are led by China and India.¹⁵⁷ Another reason that has been attribute to the policy shift is the pressure to reduce carbon emissions.¹⁵⁸

The energy outcomes of the Russia-Ukraine war are a matter beyond the scope of the present paper. The short point is that only after the Russia-Ukraine war, when energy shortage has become an issue for Europe and

[news.org/articles/Japan-adopts-plan-to-maximise-use-of-nuclear-energ](https://www.reuters.com/news/articles/Japan-adopts-plan-to-maximise-use-of-nuclear-energ)> accessed 14 January, 2023.

¹⁵⁵Reuters, Japan Turns Back to Nuclear Power to Tackle Energy Crisis (16 December 2022) <<https://www.reuters.com/world/asia-pacific/japan-turns-back-nuclear-power-tackle-energy-crisis-2022-12-16/>> accessed 14 January, 2023.

¹⁵⁶Enrico Dela Cruz, Florence Tan, and Timothy Gardner, 'Analysis: Global Energy Crisis Drives Rethink of Nuclear Power Projects' (*Reuters*,05August,2022)

<<https://www.reuters.com/business/energy/global-energy-crisis-drives-rethink-nuclear-power-projects-2022-08-04/>> accessed 14 January, 2023; Reuters, 'Energy Crisis Revives Nuclear Power Plans Globally'(05August,2022)

<<https://www.reuters.com/business/energy/energy-crisis-revives-nuclear-power-plans-globally-2022-08-04/>> accessed 14 January, 2023.

¹⁵⁷ World Nuclear Association, Asia's Nuclear Energy Growth (April 2023), <<https://world-nuclear.org/information-library/country-profiles/others/asias-nuclear-energy-growth.aspx>> accessed 16 May, 2023.

¹⁵⁸Mari Yamaguchi, 'Japan Adopts Plan to Maximize Nuclear Energy, in Major Shift' (*The Associated Press*, 22 December 2022) <<https://apnews.com/article/russia-ukraine-business-japan-climate-and-environment-02d0b9dfec8cdc197d217b3029c5898>> accessed 14 January, 2023.

developed countries like Japan, is the issue of energy security raised and there is a policy reversal. On the other hand, concerns of energy scarcity and security to third world countries such as India are continuous problems which such economies have sought to address. Therefore, the priorities accorded to the core principles of energy law vary on spatial and temporal considerations.

5. ENERGY LAW IN INDIA

As has been seen in section 2 of this paper, recognition of areas of law by the legal industry enables debates on foundational aims and internal coherence. Another important aspect of a shared acceptance of a distinct area of law is the interaction in that jurisdiction with prevailing international standards to examine if the jurisdiction's laws in that area of law are required to be converged, in the first place.¹⁵⁹ This section looks at whether energy law in India is recognised as a legal discipline.

Energy law in Indian legal education

A word search of the terms “energy law” and “energy laws” in the websites of the National Law Schools and other prominent law schools through Google’s Advanced Search (https://www.google.co.in/advanced_search)

¹⁵⁹*Areas of Law*, p. 17.

revealed nearly zero search results in most law schools. Details thereof are listed as Appendix A to this paper.

In addition to National Law Universities, there are universities offering professional courses from the energy law perspective. For instance, the school of law of the UPES University offers an undergraduate programme in law with specialisation in energy law.¹⁶⁰ TERI University offers an LLM programme in Environmental and Natural Resources law, with a specific paper on energy law.¹⁶¹ The Tamil Nadu National Law University offers an LLM programme on Natural Resources Law, with a specific paper titled “Energy Law and Regulation”.¹⁶² Several Universities and organisations offer post graduate diploma and certificate programmes on energy laws.¹⁶³

¹⁶⁰"Postgraduate Course" National Law University Nagpur, <https://www.nlunagpur.ac.in/academics_postgraduate_course.php/> accessed 17 November, 2022.

¹⁶¹"LLM Programme with Specialisation in Environment and Natural Resources Law and Infrastructure and Business Law" TERI School of Advanced Studies, <<https://www.terisas.ac.in/llm-programme-with-specialisation-in-environment-and-natural-resources-law-and-infrastructure-and-business-law.php>> accessed 17 November, 2022.

¹⁶²"Post Graduate" Tamil Nadu National Law University, <https://tnnlun.ac.in/Post_Graduate.php> accessed 17 November, 2022.

¹⁶³ See, for instance, "Online Certificate Course on Energy Law and Policy in India" CUTS Institute for Regulation and Competition (CUTS), < <https://circ.in/online-courses.php> > accessed 16 November, 2022; “Certificate Course in Energy Laws” ILS Law College, <> accessed 16 May 2023; “Certificate Course in Energy Law” Parul University, <<https://cep.paruluniversity.ac.in/course/cel>> accessed 16 May, 2023. <https://ilslaw.edu/wp-content/uploads/2017/02/Certificate-Course-Energy-Laws-in-India.pdf>> accessed 16 May 2023; “Certificate Course in Energy Law”

At the undergraduate level, prominent law schools do not seem to have dedicated papers on energy laws, although they seem to have papers on components of energy laws such as downstream oil and gas¹⁶⁴, nuclear energy¹⁶⁵, etc.

Some law schools offer electives or specific papers on energy laws. For instance, the Hidayatullah National Law University offers “energy law” as an optional paper in its five year BA, LLB course.¹⁶⁶ The Gujarat National Law University, Gandhinagar has a chair on energy law (by Gujarat Urja Vikas Nigam Limited) and offers a paper in the 9th semester on energy laws.¹⁶⁷ The Rajiv Gandhi National Law University, Patiala has a dedicated Centre for Advanced Studies In Energy Laws (CASEL)¹⁶⁸ and offers an optional paper on “Real Estate and Energy

Parul University, <<https://cep.paruluniversity.ac.in/course/cel>> accessed 16 May, 2023.

¹⁶⁴"Downstream Oil and Gas Elective Course 2021-22" National Law School of India University, <<https://www.nls.ac.in/course/downstream-oil-and-gas-elective-course-2021-22/>> accessed 16 November, 2022.; "Certificate Course: Energy Laws in India" ILS Law College, Pune, <<https://ilslaw.edu/wp-content/uploads/2017/02/Certificate-Course-Energy-Laws-in-India.pdf>> accessed 26 November, 2022.

¹⁶⁵"8th Certificate Course on Nuclear Energy and Law (Online)" Hidayatullah National Law University, <<https://hnlulaw.ac.in/invites/8th-certificate-course-on-nuclear-energy-and-law-online/>> accessed 16 November, 2022.

¹⁶⁶"B.A. LL.B (Hons)" Hidayatullah National Law University, <<https://hnlulaw.ac.in/hnlulaw/programs/b-a-ll-b-hons/>> accessed 21 November, 2022.

¹⁶⁷"Undergraduate Programme" Gujarat National Law University, <<https://www.gnlulaw.ac.in/GNLU/Under-Graduate-Programme>> accessed 21 November, 2022.

¹⁶⁸"Certificate Course in Advanced Studies in Energy Laws (CASEL)" Rajiv Gandhi National University of Law, <<https://www.rgnul.ac.in/118/CASEL>> accessed 14 January, 2023.

Law” in the 8th semester of the BA LLB course.¹⁶⁹ The National University of Advanced Legal Studies, Kochi conducts an add on course on energy law.¹⁷⁰ The Damodaram Sanjivayya National Law University, Vishakhapatnam offers an elective paper in the 7th semester of the BA LLB course on International Trade Law / Natural Resources and Energy Laws.¹⁷¹ The Himachal Pradesh National Law University, Shimla offers a paper on Energy law in the 10th semester for its business law specialisation.¹⁷² Symbiosis Law School, Pune offers an elective paper on energy law in the 7th semester.¹⁷³ Except for the above, information on energy law programmes in law schools remain scarce.

It is seen from the aforesaid survey that law schools need to focus better on energy law courses, at all levels. The undergraduate programmes could include seminar/ credit courses on critical areas such as electricity laws,

¹⁶⁹"B.A. LL.B (Hons)" Rajiv Gandhi National University of Law, <<https://www.rgnul.ac.in/64/ballb-hons-course-description>> accessed 14 January, 2023.

¹⁷⁰"5 Year Integrated B.A. LL.B (Hons)" National University of Advanced Legal Studies, <<https://www.nuals.ac.in/5-year-SCHEME-OF-COURSES.aspx>> accessed 14 January, 2023.; "Common Law Admission Test Brochure 2014" National Academy of Legal Studies and Research, <https://www.nalsar.ac.in/sites/default/files/final-clat-brochure_1.pdf> accessed 16 November, 2022.

¹⁷¹"Damodaram Sanjivayya National Law University" <<https://dsnlu.ac.in/>> accessed 15 November, 2022.

¹⁷²"Himachal Pradesh National Law University" <<http://www.hpnlul.ac.in/>> accessed 15 November, 2022.

¹⁷³"Symbiosis Law School" <<https://www.symlaw.ac.in/>> accessed 15 November, 2022.

petroleum laws, nuclear energy laws, etc. These areas are ripe for legal analysis and critique, both from public law and private law perspectives. In addition, these areas also constitute lucrative practice areas in the transactional as well as the dispute resolution spaces.

These areas are practice-oriented and given the traditional focus of Indian legal academics on public law, research in energy laws has not attained a critical mass. Focus seems to be on specific facets of energy law such as the interface between energy law and environmental law, etc. Research in energy law needs to move from the traditional topics and focus on the problems. While there are writings on energy law in India¹⁷⁴, the key is to address problematic areas in energy law and policy through research.

It is also surprising that barring a few law schools listed below, many prominent universities do not offer specialised post graduate (LLM) programmes in energy laws.

S. No.	University/ Law School	Description

¹⁷⁴ See, for instance, Mohammad Naseem and Saman Naseem, *Energy Law In India* (4th. ed. 2021); Manish Yadav, *Energy Laws* (2021); Usha Tandon (Ed.), *Energy Law and Policy* (2018); Sanjay Kumar Kar and Piyush Kumar Sinha, 'Ensuring Sustainable Energy Security: Challenges and Opportunities (2014) 4 India, Oil, Gas & Energy Law.

1.	TERI University	One Year LLM in Environment & National Resources Law ¹⁷⁵
2.	Tamil Nadu National Law University	One Year LLM in National Resources Laws ¹⁷⁶
3.	UPES, Dehradun	One Year LLM with specialisation in Energy Law ¹⁷⁷
4.	Jindal Global Law School, Sonipat	One Year LLM in Environmental Law, Energy & Climate Change ¹⁷⁸
5.	Maharashtra National Law University,	One Year LLM with specialisation in Energy Law &

¹⁷⁵Teri University, New Delhi. "LLM Programme with Specialisation in Environment and Natural Resources Law and Infrastructure and Business Law" <<https://www.terisas.ac.in/llm-programme-with-specialisation-in-environment-and-natural-resources-law-and-infrastructure-and-business-law.php>> accessed November 17, 2022.

¹⁷⁶Tamil Nadu National Law University. "Post Graduate" <https://tnnl.u.ac.in/Post_Graduate.php> accessed November 17, 2022.

¹⁷⁷University of Petroleum and Energy Studies. "LLM with Specialization in Energy Law/ Business Law/ International Economic Law/ Law & Technology" <<https://www.upes.ac.in/school-of-law/llm/environmental-and-energy-law>> accessed November 17, 2022.

¹⁷⁸"JindalGlobalUniversity"(JGU)<<https://jgu.edu.in/cpgls/courses/llm-in-environmental-law-energy-climate-change/>> accessed November 17, 2022.

	Nagpur	Telecommunications Law. ¹⁷⁹
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It would be apparent from the aforesaid table that LLM programmes on energy laws are offered in combination with other areas of law. For instance, the Maharashtra National Law University, Nagpur offers the LLM in telecommunications law, in addition to energy law. Similarly, the focus of the LLM offered by the Jindal Global Law School is on environmental law and climate change, in addition to energy law. The TERI University and the Tamil Nadu National Law University focus on natural resources law, which is a facet of energy law. However, it is rare to offer a comprehensive energy law specialisation programme in India.

It would do well to offer a specialisation on energy laws, considerable the importance of energy laws as an academic discipline as well as a practice area, for reasons of significance as well as for lucrativeness. A possible structure for an LLM programme with specialisation on energy laws to this paper as Appendix B.

Energy law in India in practice

¹⁷⁹"National Law University Nagpur, Postgraduate Course" (NLU Nagpur) <https://www.nlunagpur.ac.in/academics_postgraduate_courses.php> accessed November 17, 2022.

One of the reasons for energy laws not being taken up as a separate area of law is the absence of an umbrella regulator on energy. While there are regulators for various facets of the energy industry such as the Central and State Electricity Regulatory Commissions, Petroleum and Natural Gas Regulatory Board, Atomic Energy Regulatory Board, etc., there is no umbrella regulator on the energy sector. Such a regulator for the energy industry would enable a macro view on energy needs of India and linking demand with supply. There is a shifting trend towards electricity as the source of energy¹⁸⁰ may provide fillip to having such an overarching regulator in future.

In 2017, the Government tasked NITI Aayog to frame a national energy policy in order to reflect the priorities of the Government vis-à-vis energy and for addressing the future of energy in India, replacing the Integrated Energy Policy, 2006.¹⁸¹ This policy was aimed at developing a roadmap for the future of energy development in India, which was to provide clarity to stakeholders regarding the

¹⁸⁰ See, for instance, Andy Extance and Abigail Pinchbeck, 'Energy Boost' (*Education in Chemistry*, 6 June 2022) <<https://edu.rsc.org/feature/moving-from-fossil-fuels-to-renewable-energy/4015752.article>> accessed 21 November, 2022; Lawrence M. Fisher, 'Bridging the Gap Between Oil and Electricity' (*Milken Institute Review*, 22 December 2021) <<https://www.milkenreview.org/articles/bridging-the-gap-from-oil-to-electricity>> accessed 21 November, 2022; Tomas Kåberger, 'Progress of Renewable Electricity Replacing Fossil Fuels' (2018) 1 *Global Energy Interconnection* 48-52.

¹⁸¹ See, Draft Energy Policy (2017) <https://smartnet.niua.org/sites/default/files/resources/NEP-ID_27.06.2017.pdf> accessed 16 May, 2023.

long term strategy of the Government.¹⁸² One of the aims of the draft policy was that an omnibus policy would further the goal of energy security through better coordination between various Ministries handling different energy sectors.¹⁸³ Important aspects in the draft National Energy Policy regarding law are summarised below¹⁸⁴:

- There is a need to develop a comprehensive energy efficiency policy covering all sectors, whether energy producing or energy consuming.
- There is a need to empower the Bureau of Energy Efficiency (BEE) to better implement the salutary objectives of the Energy (Conservation) Act, 2001, and across all energy sectors.
- There is a need to prioritise energy efficient measures through the drawing up of effective instruments and to provide fiscal incentives therefor.

However, the draft Energy Policy, 2017 has not been made final.

From an individual's perspective, access to energy has been recognised as an important right. Recently, in *Ashish*

¹⁸² *ibid.* para 1.3.

¹⁸³ *ibid.* para 1.2.

¹⁸⁴ *ibid.* para 3.8.

*Gupta vs. Tata Power Delhi Distribution Limited*¹⁸⁵, the Delhi High Court recognised the settled law in India that the right to electricity access is a facet of the right to life protected under Article 21 of the Constitution of India.

Indian law practice in energy sector is characterised by specialisation. Even where the legal industry purports to deal with the energy sector, it ends up focussing on certain energy sectors.¹⁸⁶

From India's perspective, energy security and access to energy form the core concerns that energy law should address. This view is echoed by lawyers from similarly placed jurisdictions.¹⁸⁷ Again, this is not a development versus environment debate. It is rather complicated. Environment friendly policies could lead to better compliance with human rights.¹⁸⁸

¹⁸⁵W.P.(C) 890/2022 (Judgment dt. 14.01.2022), <https://www.livelaw.in/pdf_upload/sas14012022cw8902022121650-409895.pdf> accessed 26 November, 2022. See also, KN Raveendranadhan v. Kerala State Electricity Board, Judgment dt. 15.03.2021, in WP(C).No.34061 Of 2014(G) (Kerala High Court). See also, Sanjit Kumar Chakraborty, 'The 'Fundamental' Right to Access Energy: Issues, Opportunities and Challenges in India' in Sairam Bhat (Ed.), *Energy Law And Policy In India* (2016) 3-22.

¹⁸⁶ See, for instance, Economic Laws Practice, 'Legal Issues in India's Energy Sector' (2018) <<https://elplaw.in/wp-content/uploads/2019/05/ELPs-Energy-Sector-Book.pdf>> accessed 26 November, 2022 (but focussing on the power sector).

¹⁸⁷ Hojjat Salimi Turkamani, 'International Energy Law and the Development Dilemma of Developing Countries' (2022) 19 *Manchester Journal of International Economic Law* 211-227, 216-217.

¹⁸⁸ Thierry Ngosso, 'The Right to Development of Developing Countries: An Argument Against Environmental Protection?' (2013) 5 *Public Reason* 3-20, 19.

The recent shift in energy policies of the West post the Russia- Ukraine war are important lessons for India. India's foreign policy during the said war is an important marker, which is a prelude to the recognition of prioritisation of energy security. Despite tremendous pressure from the Western nations, India has been purchasing petroleum from Russia. This is evidenced by the Government's Press Statement in May 2022, wherein the Government's Press Release noted the "false narrative" being created as regards energy purchases by India from Russia ("Press Release").¹⁸⁹ The Government's purchases are to be seen in light of the increase in crude oil prices due to the Russia-Ukraine war¹⁹⁰, leading to weakening of the Indian rupee against the US dollar.¹⁹¹

The Press Release notes the demand for energy in India, where the daily consumption of oil is around 5 million barrels. The Press Release takes note of the increasing prices of oil, fuel inflation and India's energy needs and

¹⁸⁹ Ministry of Petroleum & Natural Gas, Press Statement (04 May 2022) <<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1822665>> accessed 16 May, 2023.

¹⁹⁰ Tiya Singh, 'The Russia-Ukraine War and the Unfolding Global Disorder, Economic and Political Weekly' (Engage) <https://www.epw.in/sites/default/files/engage_pdf/2022/10/31/16_1187.pdf> accessed 16 May, 2023.

¹⁹¹ Ministry of Finance, 'Russia-Ukraine conflict, soaring crude oil prices and tightening of global financial conditions are major reasons for weakening of Indian Rupee against the US Dollar' (26 July 2022), <<https://www.pib.gov.in/PressReleaseDetail.aspx?PRID=1845054>> accessed 16 May, 2023.

condemns attempts at sensationalisation of crude oil purchases from Russia, which had been going on for several years. The Press Release also brings to attention major purchases of petroleum by other countries¹⁹² including the West.

The concern for energy security is at the macro-level and access to energy is at the individual level. Foundational coherence in energy law would be not achieved without considering these core aspects. As Khaitan and Steel argue, foundational coherence leads to internal coherence within an area of law. So is the case with energy law: internal contradictions and hard cases in energy law can be resolved through reference to its foundational aims.

In the landmark case of *Reliance Natural Resources Ltd. v. Reliance Industries Ltd.*¹⁹³, Justice Sudharshan Reddy analysed the energy sector broadly and listed out six issues that each jurisdiction faced¹⁹⁴:

- Addressing supply constraints to meet the overall energy and industrial demands;
- equitable access to all sectors where demand for energy exists as such access has implications on the quality of life;

¹⁹² Ministry of Petroleum & Natural Gas, 'Press Statement' (04 May.2022) <<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1822665>> accessed 16 May, 2023.

¹⁹³ [2010] 5 S.C.R. 704: MANU/SC/0341/2010.

¹⁹⁴ [2010] 5 S.C.R. 704, 876-877.

- Equitable energy pricing;
- Nation's energy security;
- Links between energy security and the nation's defence;
- Inter-generational equity.

This constituted one of the comprehensive attempts are laying down the normative framework of energy law in the Indian legal discourse.

The decision of Justice Sudharshan Reddy is also notable for the *obiter* that the Government should consider framing a comprehensive law/ policy on energy security of India.¹⁹⁵ But such attempts have been rare and have not been taken forward to the next level by the legal industry.

Interestingly, this observation by Justice Reddy formed the subject-matter of the petition filed by the Independent Gas based Power Producers' Association in the High Court at Hyderabad.¹⁹⁶ The Single Judge hearing the matter held that the aforesaid observations of Justice Reddy could not be taken to be a direction to the Central

¹⁹⁵ [2010] 5 S.C.R. 704, 923.

¹⁹⁶ Independent Gas based Power Producers' Association v Union of India and Ors. (28.01.2015 - HYHC): MANU/AP/0022/2015.

Government to enact a law or frame a policy¹⁹⁷ in view of the settled law.¹⁹⁸

To summarise India's position, energy law as a separate discipline is still in its nascent stages. Legal education and law practice have to do more if India seeks to reap the benefits that the international community did recognising energy law as a distinct area of law. Such Recognising energy law as a separate discipline in India would lead to coherence in its foundational aims.

6. CONCLUSION

This paper analysed what it meant to be a distinct area of law. It drew upon the work of Khaitan and Steel to state that classifying energy law as a distinct area of law could act as a catalyst in the legal industry acting towards bringing internal coherence into that area of law.¹⁹⁹ This would result in debates on aims of energy law and regulation and thereby lead to foundational coherence. The paper analysed the state of energy law as a distinct discipline internationally. It highlighted that in the West energy law has been recognised as a distinct area of law.

¹⁹⁷ *ibid*, para 66.

¹⁹⁸ Some of the decisions cited by the Single Judge in support of this proposition include *AK Roy v. Union of India*, MANU/SC/0051/1981 and *V.K. Naswa v. Union of India*, MANU/SC/0050/2012.

¹⁹⁹ *Areas of Law*, p. 14.

The paper then went on to discuss the shift in the foundational aims of the energy law and the lack of prioritisation of energy security. This led to a crisis-like situation for Europe, especially Germany. The paper also discussed the impact of the Russia-Ukraine crisis on countries like Japan which led to a reversal in policy as regards nuclear energy.²⁰⁰ The Western and the Japanese experience as regards the shift in foundational norms from environment, safety and climate change to energy security is an important lesson for India. It is important to have clarity as to the foundational aims of energy law based on the needs of India as a country. While foundational norms keep getting re-looked at, there should be a shared acceptance in the industry on such norms. Clarity on these foundational norms would enable resolution of conflicting claims and hard cases in a coherent manner.

Another important concern for India is that energy has is yet to have a shared acceptance, as noted by Khaitan & Steel, as a distinct area of law. Such recognition would enable settlement of the doctrinal contours of energy law and provides ideological stability, and consequently, legitimacy, to energy law.²⁰¹

²⁰⁰ See, Section 4 of this paper.

²⁰¹ *ibid*, 16.

But for this to happen, several steps are required to be taken: Law schools should recognise that offering energy law papers in the undergraduate course could prepare students not only to prepare for a practice in energy law, be it transactional lawyering or advocacy, but also enable them understand different facets of interplay between energy and law. Law schools should also consider offering specialisation in energy law at the post-graduate level, which could act as a fillip for research in energy law.²⁰² Law schools can augment research in energy law through establishing centres or departments on energy law.

At a macro-level, energy security is important for the survival of India and its economy. India's economic growth would have to be fuelled by energy and the way energy (being a scarce commodity) is produced, distributed and consumed is through energy law and regulation. Likewise, at a micro-level, individual's access to energy and addressing competing claims over energy is also through the vehicle of energy law. Hence, the shared acceptance on the importance of recognition of energy law as a distinct area of law is important.

²⁰² See, Appendix B, which provides a possible course structure for an LLM programme on energy law.

Appendix A

Results on “energy law” & “energy laws” in Websites of
Prominent Indian law schools²⁰³

S. No.	Law School ²⁰⁴	Search Result
1.	National Law School of India University, Bengaluru ²⁰⁵	0 results
2.	National Law Institute University, Bhopal ²⁰⁶	0 results
3.	NALSAR University of Law, Hyderabad ²⁰⁷	1 result
4.	The West Bengal National University of Juridical Sciences, Kolkata ²⁰⁸	0 results
5.	National Law University, Jodhpur, ²⁰⁹	0 results

²⁰³ Website search conducted through Google’s Advanced Search <site search: https://www.google.co.in/advanced_search>. Search results are as on 21.11.2022.

²⁰⁴ The list of universities/ law schools is more or less based on the rankings of the National Institutional Ranking Framework <<https://www.nirfindia.org/2022/LawRanking.html>> and other rankings available in the public domain. The arrangement of the law schools here is not reflective of their rankings.

²⁰⁵ “National Law School of India University” (NLSIU) <<https://www.nls.ac.in/>> accessed December 17, 2022.

²⁰⁶ “National Law Institute University” (NLIU) <<https://nliu.ac.in/>> accessed December 17, 2022.

²⁰⁷ “National Academy of Legal Studies and Research” (NALSAR) <<https://www.nalsar.ac.in/>> accessed December 17, 2022.

²⁰⁸ “West Bengal National University of Juridical Sciences” (WBNUJS) <<https://www.nujs.edu/>> accessed December 17, 2022.

6.	Hidayatullah National Law University, Raipur ²¹⁰	0 results
7.	Gujarat National Law University, Gandhinagar ²¹¹	0 results
8.	Dr. Ram Manohar Lohia National Law University, Lucknow ²¹²	0 results
9.	Rajiv Gandhi National University of Law, Patiala ²¹³	7 results
10.	Chanakya National Law University, Patna ²¹⁴	0 results
11.	National University of Advanced Legal Studies, Kochi ²¹⁵	0 results
12.	National Law University Odisha, Cuttack ²¹⁶	1 result
13.	National University of Study and	0 results

²⁰⁹“National Law University, Jodhpur” (NLUJ) <<http://www.nlujodhpur.ac.in/index-main.php>> accessed December 17, 2022.

²¹⁰“Hidayatullah National Law University” (HNLU) <<https://hnl.u.ac.in/>> accessed December 17, 2022.

²¹¹“Gujarat National Law University” (GNLU) <<https://www.gnl.u.ac.in/>> accessed December 17, 2022.

²¹²“Dr. Ram Manohar Lohiya National Law University” (RMLNLU) <<http://www.rmlnl.u.ac.in/>> accessed December 17, 2022.

²¹³“Rajiv Gandhi National University of Law” (RGNUL) <<https://www.rgnul.ac.in/>> accessed December 17, 2022.

²¹⁴“Chanakya National Law University” (CNLU) <<https://cnlu.ac.in>> accessed December 17, 2022.

²¹⁵“National University of Advanced Legal Studies” (NUALS) <<https://www.nuals.ac.in/>> accessed December 17, 2022.

²¹⁶“National Law University Odisha” (NLUO) <<https://www.nluo.ac.in/>> accessed December 17, 2022.

	Research in Law, Ranchi ²¹⁷	
14	National Law University and Judicial Academy, Assam, Guwahati ²¹⁸	0 results
15	Damodaram Sanjivayya National Law University, Vishakhapatnam ²¹⁹	1 result
16	Tamil Nadu National Law University, Trichy ²²⁰	0 results
17	Maharashtra National Law University, Mumbai ²²¹	0 results
18	Maharashtra National Law University, Nagpur ²²²	2 results
19	Maharashtra National Law University, Aurangabad ²²³	0 results
20	Himachal Pradesh National Law University, Shimla ²²⁴	1 result

²¹⁷“National University of Study and Research in Law” (NUSRL) <<http://www.nusrlranchi.ac.in/>> accessed December 17, 2022.

²¹⁸“National Law University and Judicial Academy” (NLUJAA) <<http://www.nluassam.ac.in/>> accessed December 17, 2022.

²¹⁹“Damodaram Sanjivayya National Law University” (DSNLU) <<https://dsnlu.ac.in/>> accessed December 17, 2022.

²²⁰“Tamil Nadu National Law University” (TNNLU) <<https://tnnlu.ac.in/>> accessed December 17, 2022.

²²¹“Maharashtra National Law University, Mumbai” (MNLU) <<https://mnlumumbai.edu.in/>> accessed December 17, 2022.

²²²“National Law University and Judicial Academy, Nagpur” (NLUJAA Nagpur) <<https://www.nluagpur.ac.in/>> accessed December 17, 2022

²²³“Maharashtra National Law University, Aurangabad” (MNLU Aurangabad) <<https://mnlua.ac.in/>> accessed December 17, 2022.

²²⁴“Himachal Pradesh National Law University” (HPNLU) <<http://www.hpnlua.ac.in/>> accessed December 17, 2022.

ENERGY LAW AS AN AREA OF LAW IN INDIA

21	Dharmashastra National Law University, Jabalpur ²²⁵	0 results
22	Dr. B.R. Ambedkar National Law University, Sonapat ²²⁶	0 results
23	National law university, Sikkim	–
24	National Law University, Tripura ²²⁷	0 results
25	National law University, Meghalaya	–
26	Symbiosis Law School, Pune ²²⁸	1 result
27	IIT Kharagpur School of Law ²²⁹	0 results
28	Jamia Millia Islamia, New Delhi ²³⁰	0 results
29	ILS Law School, Pune ²³¹	5 results
30	Siksha 'O' Anusandhan, Bhubaneswar ²³²	0 results

²²⁵“Madhya Pradesh National Law University” (MPDNLU) <<https://www.mpdnlu.ac.in/>> accessed December 17, 2022.

²²⁶“Dr. B.R. Ambedkar National Law University” (DBRANLU) <<https://old.dbranlu.ac.in/>> accessed December 17, 2022.

²²⁷“National Law University, Tripura” (NLU Tripura) <<https://nlutripura.ac.in/>> accessed December 17, 2022.

²²⁸“Symbiosis Law School, Pune” (SLS) <<https://www.symlaw.ac.in/>> accessed December 17, 2022.

²²⁹“Indian Institute of Technology, Kharagpur” (IITKGP) <<http://www.iitkgp.ac.in/>> accessed

²³⁰“Jamia Milia Islamia” (JMI) ,<<https://www.jmi.ac.in/>> accessed December 17, 2022.

²³¹“ILS Law College, Pune” (ILS) <<https://ilslaw.edu/>> accessed December 17, 2022.

Appendix B

One Year LLM Programme

(Specialisation in energy laws)

(Semester Pattern)

Semester I

1. Mandatory Paper: Law and Justice in Globalizing world
2. Mandatory Paper: Research Methods and Legal Writing
3. Specialisation Paper 1
4. Specialisation Paper 2
5. Specialisation Paper 3

Semester II

1. Mandatory Paper: Comparative Public Law and Systems of Governance
2. Specialisation Paper 4
3. Specialisation Paper 5
4. Specialisation Paper 6
5. Specialisation Paper 7/ Dissertation

²³²“Siksha'o'Anusandhan”(SOA)<<https://www.soa.ac.in/>> accessed December 17, 2022.

Specialisation Papers²³³:

1. International Energy Law
2. Energy Regulation
3. Oil & Gas Law
4. Nuclear Energy Law
5. Electricity Law (excluding renewable energy)
6. Renewable Energy, Alternative Energy & Energy Conservation Law
7. Energy & Constitutional Law (including Access to Energy)
8. Energy & Competition Law
9. Energy & Environment
10. Energy & Climate Change
11. Energy & International Trade Law
12. Energy & International Investment Law
13. Energy & Taxation
14. Energy, Human Rights & Indigenous Peoples
15. Energy & Dispute Resolution
16. Investment Treaty Arbitration
17. International Commercial Arbitration

²³³The courses are based on Alexandra Wawryk, 'International Energy Law: An Emerging Academic Discipline' in Paul Babie and Paul Leadbeter (Eds.), *Law As Change: Engaging With The Life & Scholarship Of Adrian Bradbrook* (2014) 223-255 <<https://library.oapen.org/bitstream/handle/20.500.12657/33168/560243.pdf?sequence=1&isAllowed=y>> accessed 23 November 2022.

FEDERALISM AND ITS IMPACT ON INDIA'S ENERGY TRANSITION: THE CASE OF THE ELECTRICITY SECTOR

**Ms. Lydia Powell*

1. INTRODUCTION

The Indian federal structure is seen by scholars as being asymmetric in the distribution of powers. The structure is described as an “indestructible Union of destructible states” as power is concentrated in the Union Government.²³⁴ In contrast, the United States, a federal country is seen as an “indestructible Union of indestructible States”.²³⁵

The concentration of power has so far not helped the Union Government in India to consolidate power over energy policy.²³⁶ The case of reform of the electricity distribution sector is illustrative of the same. Electricity is a subject in the concurrent list under the Indian Constitution and power over decision-making for the

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²³⁴ Mahendra P. Singh, and Douglas V. Verney, ‘Challenges to India’s Centralized Parliamentary Federalism’ (*Jstor*, 2003) 33 *Publius* 1 <<http://www.jstor.org/stable/3331193>> .

²³⁵ Thomas Apolte, ‘American Federalism and Emerging Federal Structures in Europe: A Comparative View’ (1996) 47 *ORDO — Jahrbuch für die Ordnung von Wirtschaft und Gesellschaft* 279-292 <<http://www.jstor.org/stable/23743145>>.

²³⁶ International Energy Agency, *India 2020*, (IEA 2020), <<https://www.iea.org/reports/india-2020>>.

same is shared equally between the Union and State Governments.²³⁷ Many policies initiated by the Union Government have not succeeded to the extent expected, on account of little or no State level ownership and dissonance with State interests, powers and capabilities.²³⁸ Though several reform initiatives have been proposed by the Union Government over the last five decades, electricity distribution companies that are under State Governments have carried out reforms half-heartedly and often only to avoid financial penalties.²³⁹ The draft Electricity Amendment Bill, 2022 initiated in 2014, continues to face stiff opposition from several State Governments over clauses that undermine State Government authority over electricity distribution.²⁴⁰

Oil & gas come under the Union Government as per the constitution but State Governments undermine federal

²³⁷ Government of India, Legislative Department, The Constitution of India, Seventh Schedule, List III, Concurrent List (1950), <https://legislative.gov.in/sites/default/files/COI_English.pdf>.

²³⁸ “Banerjee, Sudeshna Ghosh; Barnes, Douglas; Singh, Bipul; Mayer, Kristy; Samad, Hussain, *Power for All: Electricity Access Challenge in India*, (World Bank Study; Washington, DC: World Bank 2015), <<https://openknowledge.worldbank.org/handle/10986/20525>> License: CC BY 3.0 IGO.”

²³⁹ Mandhir Kumar Verma, V. Mukherjee, Vinod Kumar Yadav, and Santosh Ghosh, ‘Indian Power Distribution Sector Reforms: A Critical Review’ (2020) 144 *Energy Policy* 1-12 <<https://doi.org/10.1016/j.enpol.2020.111672>> .

²⁴⁰ Jasleen Bedi, Concerns over the Electricity (Amendment) Bill, 2022, *The Leaflet: Constitution First*, (17 October 2022), <<https://theleaflet.in/concerns-over-the-electricity-amendment-bill-2022/>>.

policy through State level taxes and subsidies.²⁴¹ Devolved federalism which puts authority in the State and Local Governments in the context of land use, slows down energy infrastructure projects in all such sectors, including nuclear and renewable energy sectors.

In the early years after independence, the Union Government played a large role in influencing the governance of the electricity sector as it was an important component in nation-building. This changed in the late 1960s when political power diffused to regional parties which in turn led to State Governments gaining control over electricity distribution.²⁴² In the 1990s the development funding agencies such as the World Bank strongly influenced the Union Government and advised it to take charge of the electricity sector, arrest the financial deterioration of State Electricity Boards (SEBs) and put it on a course of deregulation and liberalization.²⁴³ In the 2000s the Union Government introduced radical legislation²⁴⁴ that centralised electricity policy thus putting the sector on a course that will lead to market-oriented

²⁴¹ S Kalyanasundaram, Should Taxes on Petro-products be Reduced? *The Hindu*, (1 June, 2021), <<https://www.thehindubusinessline.com/opinion/should-taxes-on-petro-products-be-reduced/article34701363.ece>> .

²⁴² Navroz K. Dubash, and Sudhir Chella Rajan. "Power Politics: Process of Power Sector Reform in India." *Economic and Political Weekly* 36, no. 35 (2001): 3367–90. <<http://www.jstor.org/stable/4411059>> .

²⁴³ Kale, Sunila S. "Current Reforms: The Politics of Policy Change in India's Electricity Sector." *Pacific Affairs* 77, no. 3 (2004): 467–91. <<https://www.jstor.org/stable/4411059>> .

²⁴⁴ Electricity Act 2003.

reform, a process that is currently making progress. Since 2010, the Union Government has been consolidating power over electricity sector governance partly driven by international climate-related obligations that require India to decarbonise the electricity sector and partly driven by private interests that dominate traditional fossil-fuel-based power generation and almost completely control renewable energy (“**RE**”) based generation. Among the three most important segments of the electricity value chain i.e., generation, transmission and distribution: generation is now dominated by the private sector while transmission being a natural monopoly of the Union Government. The only segment over which States have some control is electricity distribution. This too is likely to change in the coming decade with a new legislation that is under discussion.

This article traces these developments in greater detail to gain insights into how wealthy private interests in today’s India will influence electricity governance and shape its energy transition. Electricity is chosen because it is the vector or the main carrier of renewable energy and its share in final energy consumption is likely to grow in the future. Electricity is expected to replace oil in transportation including shipping which was once thought to be impossible. Even in heavy industries such

as cement and steel manufacture, electricity is expected to replace coal for generating high-temperature process heat.

The first section gives a brief overview of the Indian energy sector and the short and long-term goals for India's energy transition. This is followed by an outline of the constitutional mandate over governance of electricity. The chapter then proceeds to identify key historic influences that shifted authority over electricity governance from the State Governments to the Union Government in the generation of electricity and in the Distribution of electricity. The insights gained are used to make concluding observations on the course of the transition in the electricity sector towards low carbon fuels.

2. INDIA'S ENERGY BASKET: A BRIEF OVERVIEW

India's primary energy basket is dominated by fossil fuels (coal, oil and natural gas). About 47 percent of primary energy consumption in 2021 was derived from coal and about 22 percent from oil.²⁴⁵ Biomass (burnt directly as

²⁴⁵ Calculated from International Energy Agency, *World Energy Outlook 2022*, (2022) <<https://www.iea.org/reports/world-energy-outlook-2022>> & Statistical Review of World Energy, Energy Institute, <<https://www.energyinst.org/statistical-review/resources-and-data-downloads>> .

fuel for cooking) contributed about 18 percent and natural gas about 5 percent of primary energy consumption.²⁴⁶ Among non-fossil fuels, nuclear energy contributed just under 1 percent, hydropower about 3 percent and renewable energy that includes solar, wind and other forms of new energies about 4 percent.²⁴⁷ Overall fossil fuels and biomass accounted for over 91 percent of primary energy consumption and non-fossil fuels accounted for the remaining 9 percent of primary energy consumption in 2021.²⁴⁸

Unlike primary fuels whose relative shares are outlined above, electricity is a secondary source of energy. Electricity must be generated using primary fuels such as coal, natural gas, nuclear power and RE. As of 31 October 2022, installed electricity generation capacity was over 408 gigawatts (GW) with coal contributing 52 percent, hydropower contributing 11 percent, natural gas contributing just over 6 percent and nuclear energy accounting for 1.6 percent of total power generation capacity. RE accounted for over 29 percent of capacity making it the second largest after coal.²⁴⁹ In terms of actual electricity generation, coal and natural gas lead with

²⁴⁶ *ibid.*

²⁴⁷ *ibid.*

²⁴⁸ *ibid.*

²⁴⁹ Calculated from Central Electricity Authority (CEA), Government of India, *Installed Capacity Report*, (October 2022) <<https://cea.nic.in/installed-capacity-report/?lang=en>> .

a share of 74 percent in 2021-22 followed by RE that contributed about 12 percent of power generation. Hydropower contributed about 10 percent of power generation while nuclear energy contributed 3 percent of power generation.²⁵⁰ To make the transition towards net zero, India would have to replace coal and generate most of the electricity using RE.

3. CONSTITUTIONAL MANDATE OVER GOVERNANCE OF THE ENERGY SECTOR

The seventh schedule of the Indian Constitution read with Article 246 allocates responsibility for energy under Union, State and Concurrent lists. Atomic energy and minerals required for its production are unambiguously placed in the Union list (list I, entry 6).²⁵¹ Regulation and development of oil fields and mineral oil resources, petroleum and petroleum products, other liquids and substances declared by Parliament by law to be dangerously inflammable is also in the Union list (list I, entry 53). The provision under the Union list for the

²⁵⁰ *ibid.*

²⁵¹ Government of India, Legislative Department, The Constitution of India, Seventh Schedule, List I, Union List (1950), <https://legislative.gov.in/sites/default/files/COI_English.pdf> The Indian Constitution (1950).

regulation of mines and minerals covers coal mining (list I, entry 54).²⁵²

The power to impose duties of excise on petroleum crude, high-speed diesel, motor spirit (commonly known as petrol), natural gas, aviation turbine fuel (list I, entry 84), substituted by the one hundred and first amendment act of 2016 [17 (a) (i)] has opened the opportunity to increase Central levies on petroleum products.²⁵³ List II or the State list covers the power to tax the sale of petroleum crude, high-speed diesel, motor spirit, natural gas, and aviation turbine fuel but not including sale in the course of inter-state trade or commerce or sale in the course of International trade or commerce of such goods (list II, entry 54) substituted by the sixth amendment act of the constitution (1956) and further substituted by the one hundred and first amendment of the constitution in 2016 [17(b) (ii)].²⁵⁴ List II also allows State Governments

²⁵² Government of India, Legislative Department, The Constitution of India, Seventh Schedule, List I, Union List (1950), <https://legislative.gov.in/sites/default/files/COI_English.pdf> The Indian Constitution (1950).

²⁵³ Government of India, Legislative Department, The Constitution of India, Seventh Schedule, List I, Union List (1950), <https://legislative.gov.in/sites/default/files/COI_English.pdf> The Indian Constitution (1950).

²⁵⁴ Government of India, Legislative Department, The Constitution of India, Seventh Schedule, List II, State List (1950), <https://legislative.gov.in/sites/default/files/COI_English.pdf> .

to tax the consumption or sale of electricity (list II, entry 53).²⁵⁵

List III or the concurrent list covers the items over which both the Union and State Governments can legislate and it also contains “electricity” (list III, entry 38).²⁵⁶ The Union Government which had more or less left governance of electricity production, transmission and distribution to State Governments since independence, started intervening in the sector in the late 1990s following electricity sector reform initiatives promoted by development funding agencies such as the World Bank.²⁵⁷ The entry of electricity in the concurrent list legitimised the involvement of the Union Government in the governance of the electricity sector.

Entry 56 under the Union list that provides for regulation and development of inter-state rivers and river valleys has proved to be contentious as it infringes on State authority to use water flow for generation of hydropower (list 1, entry 56).²⁵⁸

²⁵⁵ Government of India, Legislative Department, The Constitution of India, Seventh Schedule, List II, State List (1950), <https://legislative.gov.in/sites/default/files/COI_English.pdf> .

²⁵⁶ Government of India, Legislative Department, The Constitution of India, Seventh Schedule, List III, Concurrent List (1950), <https://legislative.gov.in/sites/default/files/COI_English.pdf> .

²⁵⁷ S. Karkia, M. D. Mannb, H. Salehfarc and R. Hill, *Electricity Sector Reform in India: Environmental and Technical Challenges* (Asian J. Energy Environ., Vol. 6, Issue 1, 2005): 71 – 102.

²⁵⁸ Government of India, Legislative Department, The Constitution of India, Seventh Schedule, List I, Union List (1950),

4. GOALS FOR ENERGY TRANSITION

India has communicated obligatory near-term goals for its energy transition as well as long-term goals to achieve ‘net-zero’ emission of greenhouse gas (“**GHG**”) emissions, to the multilateral climate platforms of the United Nations. Among key near-term goals are the nationally determined contributions (“**NDCs**”) that are mandated by the Paris Agreement (“**PA**”) on climate change. The energy-related quantitative targets in India’s initial NDCs were to reduce the emission intensity of its gross domestic product (“**GDP**”) by 33 to 35 percent by 2030 from its 2005 level and to achieve about 40 percent cumulative installed capacity for electric power generation from non-fossil fuel-based energy resources by 2030 with the help of the transfer of technology and low-cost international finance including from green climate fund (“**GCF**”). GCF, the world’s largest climate fund is a critical element of the Paris Agreement mandated to support developing countries raise and realize their NDC ambitions towards low-emissions, climate-resilient pathways. As required by the PA, India updated its NDCs in 2022 to reduce the emissions intensity of its GDP to 45 percent by 2030 from its 2005 level and to achieve 50 percent cumulative installed capacity for electric power

<https://legislative.gov.in/sites/default/files/COI_English.pdf> The Indian Constitution (1950).

generation from non-fossil fuel-based energy sources by 2030 under the same conditions.²⁵⁹ These are not necessarily ambitious goals and India is on target to meet both goals even under the “business as usual” growth scenario.

In 2014, the new government that came to power increased the voluntary domestic target for RE power generation capacity to 175 GW with solar contributing 100 GW, wind 60 GW, biomass 10 GW small hydropower (“**SHP**”) 5 GW.²⁶⁰ At the Conference of Parties 26 (“**COP26**”) at Glasgow in 2021, India also committed its long-term goal to achieve “net zero” by 2070.²⁶¹ “Net-zero” emissions refer to achieving an overall balance between GHG emissions produced and GHG emissions taken out of the atmosphere.²⁶² India’s “net-zero” target by 2070 does not mean it will achieve “zero carbon” emissions, as that will require zero carbon

²⁵⁹ Government of India, 'India's Updated First Nationally Determined Commitment under the Paris Agreement (2021-2030)' (2022, UNFCCC) <<https://unfccc.int/sites/default/files/NDC/2022-08/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>> .

²⁶⁰ Press Information Bureau, Government of India, Ministry of New and Renewable Energy, *A target of installing 175 GW of renewable energy capacity by the year 2022 has been set* (19 July 2018) <<https://pib.gov.in/Pressreleaseshare.aspx?PRID=1539238>> .

²⁶¹ Ministry of Environment, Forest and Climate Change, *India's Stand at COP-26*, (3 February 2022) <<https://pib.gov.in/PressReleasePage.aspx?PRID=1795071>> .

²⁶² Oxford University, Energy & Climate Intelligence Unit, *Taking Stock, A Global Assessment of Net Zero Targets*, (March 2021) <https://ca1-eci.edcdn.com/reports/ECIU-Oxford_Taking_Stock.pdf?mtime=20210323005817&focal=none> .

emissions by 2070. India (as well as other countries) should achieve “net-zero” through a rapid reduction in carbon emissions, but where zero carbon cannot be achieved, offset emissions through carbon credits or sequester emissions through rewilding (increasing tree cover to absorb carbon) or through the use of technologies such as carbon capture utilization and storage (CCUS).

In 2021, the Prime Minister articulated five goals that would potentially contribute to India’s energy transition in his speech at COP26.²⁶³ One of these ambitious goals is to achieve 500 GW of RE capacity by 2030 and this has been adopted as a voluntary domestic target by the draft National Electricity Plan (NEP) released for consultation in 2022.²⁶⁴

5. ELECTRICITY GENERATION

Erosion of State Government Control

Electricity is an energy carrier or secondary source of

²⁶³ Down to Earth, *CoP26: Modi Offers ‘Panchamrita’ Concoction for Climate Conundrum at Glasgow* (2 November, 2021) <<https://www.downtoearth.org.in/news/climate-change/cop26-modi-offers-panchamrita-concoction-for-climate-conundrum-at-glasgow-80001>> .

²⁶⁴ Central Electricity Authority, Ministry of Power, Government of India, *Draft National Electricity Plan 2021* (2021) <https://cea.nic.in/wp-content/uploads/irp/2022/09/DRAFT_NATIONAL_ELECTRICITY_PLAN_9_SEP_2022_2-1.pdf> .

energy that needs to be generated from primary sources of energy such as coal, natural gas, oil, nuclear energy, hydropower, solar energy, wind energy and other forms of renewable energy. In coal, natural gas, oil and nuclear power generation, heat energy is converted to electricity. In solar photovoltaic generation, light energy is converted to electricity and in hydro and wind-based generators, the kinetic energy of water and wind is converted into electricity. The Electricity (Supply) Act of 1948 (“**EA 1948**”)²⁶⁵ provided for generation and distribution by the State and Union Governments and also the private sector but the Union Government's 1956 policy resolution promoted a system whereby SEBs built power stations and produced, priced, and distributed electricity.²⁶⁶ The Central Electricity Authority (“**CEA**”) set up under EA 1948, served as the central planner promoting electricity generation and providing financial and technical resources to the State Governments.²⁶⁷ SEBs did not quite meet expectations in addressing the growing electricity demand partly because the more electricity they supplied the more money they lost. Electricity tariff in rupees per kilowatt hour (unit) was set below the rate

²⁶⁵ Government of India, Central Electricity Regulatory Commission, ElectricitySupplyAct1948, <<https://cercind.gov.in/electsupplyact1948.pdf>> .

²⁶⁶ Navroz K. Dubash, Sudhir Chella Rajan, *Power Politics: Process of Power Sector Reform in India*(Economic and Political Weekly, Vol. 36, No. 35, Sep.1-7, 2001): 3367-3390 <<https://www.jstor.org/stable/4411059>> .

²⁶⁷ Central Electricity Authority (CEA), Government of India, *Functions*, (2022) <<https://cea.nic.in/functions/?lang=en>> .

required for full cost recovery for political and social reasons. This meant that SEBs lost money for each unit of electricity supplied reducing the incentive to supply electricity. The plant load factor (PLF, or the ratio of average power generated by the plant to the maximum power that could have been generated for a given time period) of existing plants was as low as 40-45 percent and power supply met only 65 percent of demand.²⁶⁸ To address the challenge, the Ministry of Energy was created in 1974 to centrally plan and execute the setting up of large coal and hydropower-based power generating plants and improve SEB finances.²⁶⁹ Until then the power sector was administered by the Ministry of Irrigation & Power, as hydropower generation that dominated power generation had the twin objectives of irrigation and meeting energy needs.²⁷⁰

In 1975, the newly set up Ministry of Energy and the CEA decided that the Union Government must step into power generation and initiated the idea of setting up the National Thermal Power Corporation (“**NTPC**”) and National Hydro Power Corporation (“**NHPC**”) to establish large power generating stations that would

²⁶⁸ Government of India, Planning Commission, *Fourth Five Year Plan-1969-74* (1968).

²⁶⁹ D.V. Kapur, *The Bloom in the Desert: The Making of NTPC* (Harper Collins India 2015).

²⁷⁰ Planning Commission, Government of India, *Sixth Five Year Plan - 1979-84* (1978).

supply to SEBs.²⁷¹ The idea was resisted by both the PC and the Ministry of Finance which eventually yielded on condition that the World Bank should fund the projects.²⁷² World Bank funding was secured and NTPC was set up in 1976 and administratively located in the Ministry of Power. As political interference continued, the founding Chairman of NTPC observed that he was forced to use the WB as a shield.²⁷³ As the planned NTPC plants were completed, the share of the Central sector in power generation grew to about a third of total power generation capacity by the 2000s.²⁷⁴

In 2001-02, the States dominated ownership of generating assets (62 percent) and electricity generation (56 percent). In 2020-21, the private sector dominated ownership of generating assets (56 percent) with State Government ownership falling to 27 percent.²⁷⁵ Though the Central sector (Union Government) dominated electricity generation, the private sector was a close second (33 percent) with the State sector accounting for only 28 percent.²⁷⁶ Factors that influenced the change are the

²⁷¹ *ibid*, 269.

²⁷² *ibid*.

²⁷³ *ibid*.

²⁷⁴ Central Electricity Authority, Ministry of Power, Government of India, *Growth of Electricity Sector in India from 1947-2021* (April 2021) <https://cea.nic.in/wpcontent/uploads/pdm/2021/12/Growth_Book_2021.pdf> .

²⁷⁵ *ibid*.

²⁷⁶ *ibid*.

legislation namely the Electricity Act 2003²⁷⁷ which in turn was motivated by the dominant global economic narrative conveyed by development funding institutions such as the WB that emphasised the role of markets and private initiative in improving efficiency in electricity generation, transmission and distribution and the Union Government's decision to offer a key role to private players in the sector.

Though the share of power generation capacity under Central control was only about 25 percent in 2020-21, compared to 47 percent for the private sector, Central sector plants contribute over 38 percent of total power generation, the largest share, indicating technical and economic efficiency of centrally owned plants.²⁷⁸ Many of the centrally owned plants are pit head plants (located near coal mines) which substantially reduces the cost of power generation.²⁷⁹ State Government-controlled power plants were located in the State often far away from the coal mines which substantially increased the

²⁷⁷ Government of India, Legislative Department, The Electricity Act, 2003, <<https://legislative.gov.in/actsofparliamentfromtheyear/electricity-act-2003>>.

²⁷⁸ Central Electricity Authority, Ministry of Power, Government of India, Growth of Electricity Sector in India from 1947-2021 (April 2021) <https://cea.nic.in/wpcontent/uploads/pdm/2021/12/Growth_Book_2021.pdf>.

²⁷⁹ PNS, NTPC Strives towards Being Cost Cognizant Organization, *TheDailyPioneer* (17March2022) <<https://www.dailypioneer.com/2022/state-editions/ntpcc-strives-towards-being-cost-cognizant-organization.html>> .

cost of power generation as the cost of transport of coal by rail is often more than the cost of coal.²⁸⁰ However, States preferred plants located in the State as it gave them control over the plant and control over pricing electricity generated by the plant and more importantly increased employment opportunities directly and indirectly.

6. THE CASE OF SEB FINANCES

Role of the Union Government

One of the key barriers to replacing fossil fuel-based electricity generation with that of RE is the poor financial health of electricity distribution companies, earlier state departments known as SEBs but now detached as independent commercial entities in most States and labelled “Discoms”.²⁸¹ Though most of the analysis on the financial status of Discoms assigns blame on administrative inefficiency of SEBs and politicization of electricity tariff at the State level, the Union Government inadvertently initiated their financial deterioration.

²⁸⁰ Rahul Tongia and Samantha Gross, *Coal in India: Adjusting to Transition*, (Brookings Institution, 8 March 2019).

²⁸¹ Prasanth Regy, Rakesh Sarwal, Clay Stranger, Garrett Fitzgerald, Jagabanta Ningthoujam, Arjun Gupta, Nuvodita Singh, *Turning Around the Power Distribution Sector: Learnings and Best Practices from Reforms* (NITI Aayog, RMI, and RMI India, 2021) <https://www.niti.gov.in/sites/default/files/2021-08/Electricity-Distribution-Report_030821.pdf> .

At the time of independence (1947) electricity generation, transmission and distribution were primarily in the hands of the private sector.²⁸² Private companies and their franchisees focussed on urban and industrial electricity demand that offered a reasonable return on investment. Rural and agricultural sectors were ignored as they were unprofitable.²⁸³ Following the enactment of the Electricity Act 1948, SEBs were set up as departments of State Governments that took over governance of their respective electricity sectors.²⁸⁴ One of the key mandates of SEBs was to increase access to electricity. As per the original plan, SEBs were expected to earn a return of 3 percent on their net fixed assets in services after meeting other financial obligations and depreciation.²⁸⁵ SEBs did manage to work under these conditions initially but they began to falter financially in the late 1960s. Under the Union mandate to “energize pump sets” (provide electricity connections) for agricultural irrigation to increase food production, SEBs were expected to focus

²⁸² S. Madan, S. Manimuthu and S. Thiruvengadam, *History of Electric Power in India (1890 – 1990)* (IEEE Conference on the History of Electric Power, Newark, NJ, USA, 2007): 152-165 <<http://ieeexplore.ieee.org/document/4510263/>> .

²⁸³ Ronojoy Sen, ‘India’s Changing Political Fortunes’ (2014) 113(762) *Current History* 131-136 <<http://www.jstor.org/stable/45388182>> .

²⁸⁴ Anoop Singh, ‘Power Sector Reform in India: Current Issues and Prospects’ (2006) 34(16) *Energy Policy* 2480-2490 <<https://www.sciencedirect.com/science/article/pii/S030142150400254X>> .

²⁸⁵ Thomas B. Smith, ‘India’s Electric Power Crisis: Why Do the Lights Go Out?’ (1993) 33(4) *Asian Survey* 376-392 <<http://www.jstor.org/stable/2645104>> .

on increasing the number of pump sets “energised” rather than on financial performance.

The Planning Commission (“**PC**”), an extra-constitutional body set up in 1950 to ensure that the constitutional right to adequate means of livelihood and the right to a decent quality of life to all citizens strongly influenced governance of sectors such as electricity that were under State purview.²⁸⁶ State Governments were required to send all proposals with economic or financial significance such as plans for electricity generation and distribution to the PC. Chief Ministers (CMs) of certain States resented this procedure as they were consulted only nominally at a late stage over the economic governance of their respective States.²⁸⁷ The National Development Council (“**NDC**”) set up in 1952 with State CMs as members and the PM as Chair to address the issue only strengthened the role of the PC as the most important arbiter of economic policy in India. The Central grants-in-aid were allocated to States through the PC which

²⁸⁶ Medha Kudaisya, *A Mighty Adventure: Institutionalising the Idea of Planning in Post-Colonial India, 1947-60*(Modern Asian Studies, Vol. 43, No. 4, Cambridge University Press, July 2009): 939-978 <<http://www.jstor.org/stable/40284916>> .

²⁸⁷ *ibid.*

increased the power of the Union Government over key subjects such as electricity.²⁸⁸

The famine in the 1960s led the Union Government and the PC to direct SEBs to focus on the national strategic goal of providing access to electricity for irrigation to promote agriculture.²⁸⁹ As cost recovery for the supply of electricity was not emphasised as strongly as energising pump sets were emphasised for irrigation to boost food production, the financial status of SEBs started deteriorating.²⁹⁰ At that time SEBs were departments of the State Government whose nature was influenced by the PC to pursue national objectives such as attaining self-sufficiency in food production and increasing access to electricity for poor households that compromised the financial performance of SEBs. ²⁹¹ SEBs managed to achieve not only a reasonable level of village electrification driven by the electrification of groundwater pumping for irrigation but also facilitated development in agriculture through the green revolution.²⁹² The upside of this strategic outcome, the achievement of self-sufficiency

²⁸⁸ V Bhaskar Rao, 'Planning and Centre-State Relations in India' (1986) 47(2) *The Indian Journal of Political Science* 214-228 <<http://www.jstor.org/stable/41855846>> .

²⁸⁹ Government of India, Planning Commission, Second Plan Document 1956-61 (1955) & Third Plan Document 1961-66 (1960).

²⁹⁰ Government of India, Planning Commission, Third Plan Document 1961-66 (1960) & Fourth Plan Document 1969-1974 (1968).

²⁹¹ Joel Ruet, *Privatising Power Cuts? Ownership and Reform of State Electricity Boards in India*, (India, Academic Foundation, 2005).

²⁹² *ibid.*

in food production was appropriated by the Union Government while the downside, the deterioration of SEB finances was left behind as a problem for State Governments. The gap between revenue and costs of SEBs persisted despite the amendment to the Electricity Act that mandated positive return from SEBs.²⁹³ A number of analytical reports from national and global development funding agencies took it upon themselves to reform SEBs after India was forced to approach these agencies for financial assistance following a balance of payments crisis in 1991.²⁹⁴ They framed the problem as one of administrative or managerial inefficiency of SEBs and proposed “reform” of SEBs through unbundling of generation, transmission and distribution segments that would push SEBs under the efficient “market” logic.²⁹⁵ The PC adopted the narrative and instructed SEBs to “accept reforms” and “pay their dues” to generating

²⁹³ Navroz K. Dubash & Sudhir Chella Rajan, *The Politics of Power Sector Reform in India* (World Resources Institute, April 2001) <https://r.search.yahoo.com/_ylt=AwrPpQd_579jfQsLS567HAX.;_ylu=Y29sbwNzZzMEcG9zAzEEdnRpZAMEc2VjA3Ny/RV=2/RE=1673549824/RO=10/RU=http%3a%2f%2fpdf.wri.org%2fpower_politics%2findia.pdf/RK=2/RS=avq8.QP5ctG2BeRBeA2F41rAkys->> .

²⁹⁴ N.K. Singh & Jessica S. Wallack, *Some Light at the End of the Tunnel: Ingredients of Power Sector Reforms in India* (Working Paper Number 235, Stanford Centre for International Development, December 2004) <https://kingcenter.stanford.edu/sites/g/files/sbiybj16611/files/media/file/235wp_0.pdf> .

²⁹⁵ Banerjee, Sudeshna Ghosh; Pargal, Sheoli, *More power to India: The Challenge of Electricity Distribution* (Directions in development, Energy and Mining, World Bank Group 2014) <<http://documents.worldbank.org/curated/en/815021468042283537/More-power-to-India-the-challenge-of-electricity-distribution>> .

companies failing which “they will face graded reduction in power supply”.²⁹⁶ The threat did not stop State Governments from exploiting electricity tariffs as a political tool to further erode SEB finances.

Role of State Governments

Federalism in India was designed to diffuse potential conflicts arising out of heterogeneity and more importantly to manage the pace and direction of social change in the interests of regional elites and caste-based voting blocks that they controlled. Electricity in the hands of State Governments played a significant role in appealing to these groups. Though electricity was a concurrent subject as per the Constitution, the establishment of SEBs as vertically integrated monopolies gave State Governments greater control of electricity generation, transmission, and distribution.²⁹⁷ Amendments to the Electricity Act in 1949 and 1951 allowed State Governments to influence the appointment of senior staff in SEBs and required SEBs to accept ‘policy directives’ from State Governments.²⁹⁸ In the

²⁹⁶ Government of India, Planning Commission, *Tenth Plan Document 2002-2007* (2001).

²⁹⁷ Kelli L. Joseph, ‘The Politics of Power: Electricity Reform in India’ (2010)38(1)*EnergyPolicy*503-511
<<https://www.sciencedirect.com/science/article/pii/S0301421509007241>> .

²⁹⁸ Santosh Ghosh, Vinod Kumar Yadav, Vivekananda Mukherjee, and Shubham Gupta, ‘Three Decades of Indian Power-Sector Reform: A CriticalAssessment’(2021)68*UtilitiesPolicy*1-12

1960s and 70s, external political developments allowed State Governments to further consolidate their power over SEBs.²⁹⁹

Electoral loss of the dominant congress party in certain key States in 1967 allowed regional parties to become major actors in political and economic negotiations.³⁰⁰

Though facilitating the accumulation of physical capital by land owning castes and groups remained the central model for political intermediation at the Federal and State level, compromises in the form of social capital had to be offered to emerging interest groups such as a sizeable middle class in urban areas and farmers empowered by the green revolution in rural areas.³⁰¹ The best way to appease both groups was to continue provision of subsidised electricity to farmers and extend similar subsidies to households in urban areas. The offer of clean and convenient lighting replacing smoky oil lamps in households and pumped water for irrigating agricultural land guaranteed political returns from the two

<<https://www.sciencedirect.com/science/article/pii/S0957178720301508>> .

²⁹⁹ Brian Min, Miriam Golden, *Electoral Cycles in Electricity Losses in India* (EnergyPolicy, Volume65,2014):619-625,

<<https://www.sciencedirect.com/science/article/pii/S0301421513009841>> .

³⁰⁰ Mridula Mukherjee, Aditya Mukherjee and Bipan Chandra, *India Since Independence* (Penguin Books India, 2008).

³⁰¹ Shashank Kela, *Federalism and its Discontents: The Doctrine of States' Rights in India* (TheCaravan, February, 2019) <<https://caravanmagazine.in/literature/doctrine-state-rights-india>> .

large groups.³⁰² The electoral success of this model led many States to replicate subsidising electricity tariff for households and farmers. The widespread use of electricity as a tool to control resource allocation for political gains by State Governments accelerated the financial deterioration of SEBs.³⁰³ A number of reform initiatives by the Union Government designed to improve the finances of SEBs in the 1990s and 2000s have not had a significant impact. In 2021-22, the consolidated financial debt of State Discoms was estimated at ₹6 trillion.³⁰⁴

The dire financial status of Discoms hinders their ability to accommodate electricity generated by RE. Though the electricity from RE sources may be cheaper than fossil fuel-based electricity at the plant level (for example when electricity is being generated by a solar plant when the sun is shining and is used as it is generated), it is costlier at the

³⁰² Reena Badiani-Magnusson & Katrina Jessoe, *Electricity Prices, Groundwater, and Agriculture: The Environmental and Agricultural Impacts of Electricity Subsidies in India* in Wolfram Schlenker (ed) *Agricultural Productivity and Producer Behaviour* (November 2019, University of Chicago Press): 157-183 <<https://www.nber.org/books-and-chapters/agricultural-productivity-and-producer-behavior/electricity-prices-groundwater-and-agriculture-environmental-and-agricultural-impacts-electricity>> .

³⁰³ Rahul Tongia, *Delhi's Household Electricity Subsidies: Highly Generous but Inefficient?* (Brookings India IMPACT Series No. 042017, April 2017) <<https://www.brookings.edu/articles/delhis-household-electricity-subsidies-highly-generous-but-inefficient/>> .

³⁰⁴ ICRA, *Reforms implementation critical for state-owned Discoms amid rising debt levels and dues towards Gencos/PPs* (8 March, 2021) <<https://www.icra.in/Rating/DownloadResearchSummaryReport?id=4475>> .

system level (that is providing electricity to the grid day and night across summer, winter and monsoon) as it requires investment in expensive storage batteries or in backup generation.

7. REFORMS IN ELECTRICITY SECTOR GOVERNANCE: ELECTRICITY ACT 2003

The poor financial health of SEBs and perennial power outages led to the passing of the Electricity Regulatory Commissions Act 1998 Act under which the Central Electricity Regulatory Commission (“**CERC**”) and State Electricity Regulatory Commissions (SERCs).³⁰⁵ CERC and SERCs proved that the Union Government can create apolitical regulatory spheres simply by legislating one. But these institutions have so far had only moderate success in restricting political interventions in investment and tariff-setting decisions in the electricity sector at both the Federal and State levels. Retired bureaucrats who have served under the Union Government and State Governments are appointed to lead CERC and SERCs

³⁰⁵ Nair, S. K. N. *Electricity Regulation in India: Recent Reforms and their Impact* (Margin, The Journal of Applied Economic Research, 2(1), 2008): 87–144, <<https://journals.sagepub.com/doi/pdf/10.1177/097380100700200103>> .

thereby allowing for informal political influence in shaping key decisions.

In 2000, the Union Government conceived a radical new piece of legislation to completely change the paradigm for the electricity sector. Though the initial draft of the legislation was prepared by an Indian research institution, the WB was involved in shaping the final draft.³⁰⁶ Passed in 2003, the Electricity Act 2003 (“**EA 2003**”) provided a roadmap for initiating a market-based electricity sector through the progressive introduction of competition and choice with provisions for liberalization of captive generation, entry of the private sector in generation, introduction of open access in transmission and subsequently in distribution and issuing multiple distribution licenses in a given area. A critically important change that the Act sought to encourage was replacing the present single-buyer (i.e., SEBs) model with a multi-buyer model. This was expected to lead to a paradigm change in the sector where the monopoly of the SEBs for buying and selling power would cease, thus leading to a market determined tariff structure. Towards harmonization of regulation, the Act specified that the principles laid out by the CERC in generation and transmission should guide SERCs. The Act wrote the

³⁰⁶ “World Bank, *Post-2003 Electricity Act, Power Sector Challenges and Options* (World Bank, India: Long-term Energy Issues, 2006) <<https://openknowledge.worldbank.org/handle/10986/12998>> .

code for the sector from a national perspective with regard to grid discipline and rationalised dispatch of power. It also contained provisions that would potentially favour the incorporation of RE in the electricity grid. Overall, the EA 2003 and amendments to it are likely to preside over not just the transition of the electricity sector to low-carbon fuels but also the transition of governance of the electricity distribution segment from State Governments to the Union Government.

Amendments to the Electricity Act 2003

There were two minor amendments to the EA 2003 in 2003 and 2007. The amendment proposing major changes, the Electricity (Amendment) Bill 2014 that amends the EA 2003 was introduced in the lower house of the Parliament in December 2014.³⁰⁷ It was referred to the Parliamentary Standing Committee on Energy following which it was reintroduced several times but was not passed. Revised and labelled as the Electricity (Amendment) Bill, 2022 (“**EA 2022**”) was introduced in lower house of the Parliament in August 2022.³⁰⁸ EA

³⁰⁷ PRS Legislative Research, *The Electricity (Amendment) Bill, 2022*, <[https://prsindia.org/billtrack/the-electricity-amendment-bill-2022#:~:text=The%20Electricity%20\(Amendment\)%20Bill%2C%202022%20was%20introduced%20in%20Lok,the%20electricity%20sector%20in%20India](https://prsindia.org/billtrack/the-electricity-amendment-bill-2022#:~:text=The%20Electricity%20(Amendment)%20Bill%2C%202022%20was%20introduced%20in%20Lok,the%20electricity%20sector%20in%20India)> .

³⁰⁸ Business Today, Electricity (Amendment) Bill, 2022 Sent to Standing Committee on Energy Examination, *Business Today* (8 August

2022 was once again referred to the Parliamentary Standing Committee on Energy after members of several opposition parties opposed its introduction on the grounds that it violated the Federal principles of the Constitution.³⁰⁹ EA 2022 is also opposed by farmers³¹⁰ as they fear that it will eliminate subsidised access to electricity and by some trade unions who fear job losses after the take-over of Discoms by private enterprise with tacit support from the Union Government.³¹¹

The concern expressed by opposition parties is that EA 2022 seeks to amend the Constitution through a statute that will allow the Union Government to appropriate the powers of State Governments. EA 2022 seeks to amend Section 42 of EA 2003 to facilitate non-discriminatory open access to the distribution network of a distribution licensee. In theory, open access would allow the entry of multiple companies to supply electricity to consumers as

2022) <<https://www.businesstoday.in/latest/economy/story/electricity-amendment-bill-2022-sent-to-standing-committee-on-energy-examination-344040-2022-08-08>> .

³⁰⁹ The Wire, Continuing Assault on India's Federal Structure!: People's Commission on Electricity Bill, *The Wire* (29 July 2022) <<https://thewire.in/government/continuing-assault-on-indias-federal-structure-peoples-commission-on-electricity-bill>> .

³¹⁰ A M Jigneesh, Why is there uproar over the Electricity (Amendment) Bill, 2022, *The Hindu* (10 August 2022) <<https://www.thehindu.com/news/national/explained-why-is-there-uproar-over-the-electricity-amendment-bill-2022/article65755167.ece>> .

³¹¹ NewsClick, Why is there Opposition to the Electricity Amendment Bill 2022? *NewsClick* (15 August 2022) <<https://www.newsclick.in/why-there-opposition-electricity-amendment-bill-2022>> .

in the case of mobile telephone services.³¹² This amendment is favoured by the middle and affluent classes eager to replace State Discoms with efficient private suppliers.³¹³ The concern over this provision from State Governments is that it will allow the Union Government to grant multi-state entry of favoured corporates into the electricity distribution segment.³¹⁴ The EA 2022 achieves this by blurring the distinction between the distribution licensee and distribution company.³¹⁵ This means that any company will only be required to register to trade in electricity to enter the distribution segment. In contrast, a distribution licensee will have to go through due diligence by the SERC to distribute electricity in a particular area. Multiple operators in areas where there are several categories of consumers with different tariff

³¹² The Hindu, Business Line, Electricity (Amendment) Bill 2022 Would Lead to Healthy and Ethical Competition, *The Hindu Business Line* (18 August 2022) <<https://www.thehindubusinessline.com/news/national/electricity-amendment-bill-2022-would-lead-to-healthy-and-ethical-competition/article65784324.ece>> .

³¹³ Shreya Jai, Power Hurdles: Consumers Need to Wait Before They Can Choose Supplier, *Business Standard* (21 July 2022) <https://www.business-standard.com/article/economy-policy/long-way-to-go-before-consumers-can-get-to-choose-their-power-retailer-121072100801_1.html> .

³¹⁴ The Wire, After Opposition's Concerns, Electricity Amendment Bill Sent to Parliament Standing Committee, *The Wire* (8 August 2022) <<https://thewire.in/government/electricity-amendment-bill-parliament-select-committee>> .

³¹⁵ Gursimran Kaur Bakshi, Electricity (Amendment) Bill, 2022 is an Assault on The Federal Structure of The Constitution: People's Commission on Public Sector and Services, *The Leaflet, Constitution First* (5 July 2022) <<https://theleaflet.in/electricity-amendment-bill-2022-is-an-assault-on-the-federal-structure-of-the-constitution-peoples-commission-on-public-sector-and-services/>> .

slabs are likely to create complex administrative and economic challenges.³¹⁶

EA 2022 offers open access at the low-tension consumer level. In theory, this could mean that a distribution company can choose to supply electricity to urban areas concentrated with affluent households marginalising rural areas with poor and low-income households. This would effectively create two different market segments, one, high-cost good quality commercial power for the cities supplied by private companies and another, low-cost, poor-quality social electricity for rural areas supplied by Discoms. This was the case in the early years after independence when the private sector dominated the electricity supply. Harsh penalties are imposed by the EA 2022 on Discoms for non-compliance with Renewable purchase obligations (RPOs) as prescribed by the Central Government.³¹⁷ EA 2022 provides for CERCs to effectively carry out policies of the Union Government which can compromise the autonomous functioning of the regulatory body. It can also effectively make SERCs redundant.³¹⁸

³¹⁶ *ibid.*

³¹⁷ *ibid.*

³¹⁸ V K Gupta, Electricity (Amendment) Bill, 2022: Pitfalls of Power Privatisation, *NewsClick* (15 July 2022) <<https://www.newsclick.in/Electricity-Amendment-Bill-2022-Pitfalls-Power-Privatisation>> .

In addition, the government passed the Energy Conservation (Amendment) Act, 2022 by the parliament in December 2022.³¹⁹ The Act is designed to amend the Energy Conservation Act, 2001 enabling the Union Government to impose the use of non-fossil fuels on energy consumers as an important provision that will help India meet its climate goals.³²⁰ The Act also allows the Union Government to implement a carbon trading scheme but it empowers the SERCs to adjudge penalties and to make regulations for discharging their functions offering some comfort to the concern that the Union is appropriating powers of State Governments over regulations on electricity.³²¹ The governing council of the Bureau of Energy Efficiency (BEE) has been expanded under the Act to include members from six ministries, departments, regulatory institutions as well as members

³¹⁹ Maitreyi Karthik, All You Need to Know About the Energy Conservation Bill, *Down to Earth* (17 August 2022), <<https://www.downtoearth.org.in/news/energy/all-you-need-to-know-about-the-energy-conservation-bill-84362#:~:text=The%20Lok%20Sabha%20passed%20Energy,energy%20sources%20and%20green%20hydrogen>> .

³²⁰ Sangita Shetty, Energy Conservation Bill Amendments to Help Usher in Energy Transition: ICRA, *Solar Quarter* (18 August 2022) <<https://solarquarter.com/2022/08/18/energy-conservation-bill-amendments-to-help-usher-in-energy-transition-icra/>> .

³²¹ Money Control, Energy Conservation (Amendment) Bill 2022 introduced in Lok Sabha, *Money Control* (3 August 2022) <<https://www.moneycontrol.com/news/business/economy/energy-conservation-amendment-bill-2022-introduced-in-lok-sabha-8945861.html>> .

from industries and consumer groups.³²² While the provisions of the new Amendments on the Electricity Act and the Energy Conservation Act may be welcome from the Climate perspective, these provisions are likely to orchestrate the slow erosion of State Government power over the governance of electricity distribution.

Decarbonising the Electricity Sector

The EA 2003, contained a number of provisions to promote RE which was probably premature in the early 2000s but very relevant after the Paris Agreement on climate change in 2015 and the declaration by India that it will achieve net zero by 2070 at COP 27 in Glasgow in 2021.³²³ EA 2003 provided for adequate grid connectivity for RE project developers and mandated minimum purchase of RE power by Discoms through renewable purchase obligation (RPO) to be enforced by the SERCs. The National Electricity Policy 2005, emphasized the need for specific power purchase agreements and tariff mechanisms to promote RE.³²⁴ The National Tariff Policy of 2006 introduced

³²² Rituraj Baruah, Lok Sabha Clears Amendments to EC Act, *LiveMint* (9 Aug 2022) <<https://www.livemint.com/politics/policy/lok-sabha-passes-bill-to-mandate-use-of-clean-energy-11659966783012.html>> .

³²³ Ministry of Environment, Forest and Climate Change, Government of India, India's Stand at COP-26 *Press Information Bureau* (3 February 2022) <<https://pib.gov.in/PressReleasePage.aspx?PRID=1795071>> .

³²⁴ Ministry of Law & Justice, Government of India, *Electricity Act 2003*, (ActNo36of2003) <<https://cercind.gov.in/Act-with-amendment.pdf>> .

preferential feed-in tariffs to promote RE.³²⁵ Without EA 2003 and policies that were derived from the Act, many of the financial incentives offered to RE project developers include but not limited to: access to low-cost finance, capital subsidies, viability gap funding, attractive generation-based incentives and “must-run” status that are behind the substantial RE capacity addition would not have been justified.³²⁶

Most of the provisions are centrally decided and implemented with little or no participation from State Governments.³²⁷ This is not necessarily the case of federal countries around the World. In the United States, ideological differences in the desired level of climate protection (between Republican and Democrat governed States) and disagreements over where authority should lie underpin the divergence between the Union and Regional Governments over climate action.³²⁸ For example, the

³²⁵ Ministry of Power, Government of India, *National Tariff Policy, 2006*, (2006) <https://cea.nic.in/wpcontent/uploads/legal_affairs/2020/09/Tariff%20policy.pdf> .

³²⁶ Ministry of New & Renewable Energy, Government of India, Schemes, <<https://www.bing.com/ck/a?!&&p=ed260d4dfdf94c13JmltdHM9MTY3MzY1NDQwMCZpZ3VpZD0yZGNkZWE0NS05MDgwLTlTYyMTItMWEwYS1mODI2OTFkMjYzNjYmaW5zaWQ9NTE4Nw&xptn=3&hsh=3&fclid=2dcdea45-9080-6212-1a0af82691d26366&psq=mnre+schemes&u=a1aHR0cHM6Ly93d3cubW5yZS5nb3YuaW4vc29sYXlvc2NoZW1lcy8&ntb=1>> .

³²⁷ IRENA, *Renewable Energy Prospects for India*, Working paper, The International Renewable Energy Agency (IRENA, 2017) <<https://www.irena.org/Publications/2017/May/Renewable-Energy-Prospects-for-India>> .

³²⁸ Cary Funk, *Key Findings: How Americans' Attitudes About Climate Change Differ by Generation, Party and Other Factors*, (Pew Research Centre

State of California has set itself the target of producing all energy from carbon free sources by 2045 and has mandated phase out of fossil fuels in all segment especially electricity generation.³²⁹ This has resulted in California having one of the highest electricity prices in the USA.³³⁰ Other federal countries in the American continent and in Europe have constitutionally mandated diffusion of power over energy policy.³³¹ Even when the Federal Government sets climate targets as required by multilateral climate agreements, State consultation and cooperation are solicited.³³²

Role of state governments in decarbonising the electricity sector

26,May,2021)<<https://www.pewresearch.org/facttank/2021/05/26/key-findings-how-americans-attitudes-about-climate-change-differ-by-generation-party-and-other-factors/>> .

³²⁹ Hannah Findling, *A Regional Energy Market to Achieve California's Renewable Energy Goals*, (Consilience: The Journal of Sustainable Development, Iss.24,2021)<<https://journals.library.columbia.edu/index.php/consilience/article/view/7411>> .

³³⁰ Kumar, R., Rachunok, B., Maia-Silva, D. et al. *Asymmetrical Response of California Electricity Demand to Summer-Time Temperature Variation* (Sci Rep 10, 10904, 2020) <<https://doi.org/10.1038/s41598-020-67695-y>> .

³³¹ International Energy Agency, *Germany 2020: Energy Policy Review*, (IEA,February2020)<https://www.bmwk.de/Redaktion/DE/Downloads/G/germany-2020-energy-policy-review.pdf?__blob=publicationFile&v=4> .

³³² David L Schwartz (ed), *Energy Regulation and Markets Review* (Tenth Edition, LawReviews, Law Business Research Ltd, 2021) <[https://scholar.google.co.in/scholar?q=David+L+Schwartz+\(ed\),+Energy+Regulation+and+Markets+Review&hl=en&as_sdt=0&as_vis=1&oi=scholar](https://scholar.google.co.in/scholar?q=David+L+Schwartz+(ed),+Energy+Regulation+and+Markets+Review&hl=en&as_sdt=0&as_vis=1&oi=scholar)> .

In India, there is no strong ideological difference over the need for Climate protection between the State and Union Governments. So far, most State Governments have been eager to implement policies that address climate change and also eager to attract investment in RE.³³³ Investment in RE capacity has a significant upside in terms of employment generation and elevation in the rankings of States that are active in addressing climate change which in turn attracts more investment. However, there are downsides to climate action that accrue mostly to State Governments. Many State Governments whose Discoms are in dire straits financially are concerned with the consumption of RE mandated by centrally determined RPOs.³³⁴ The Discoms on whom RPOs are imposed are financially constrained and RPOs increase their financial liabilities.

The increase in targets for RE in 2014 has meant a large degree of Centralization of the initiatives and programmes to increase RE capacity. Though many State Governments had their own incentive schemes for promoting solar and wind project development prior to

³³³ Niti Aayog, Government of India, *State Renewable Energy Capacity Addition Roadmap, Action Plan 2022 and Vision 2030: Summary of findings*, <<http://www.indiaenvironmentportal.org.in/content/446589/state-renewable-energy-capacity-addition-roadmap-action-plan-2022-and-vision-2030-summary-of-findings/>> .

³³⁴ Shakti Sustainable Energy Foundation, *Analysis of Financial Health of DISCOMs and its Link with End-use Efficiency Implementation*, July 2018, <<https://shaktifoundation.in/wpcontent/uploads/2018/10/Analysis-of-Financial-Health-of-DISCOMs-16Oct18.pdf>> .

2014, the scale of targets and scope of incentives announced by the Centre substantially reduced interest in State schemes.³³⁵ Centralization of policymaking and implementation on RE has produced mixed results. On the one hand, it has dramatically improved the visibility of India's effort to decarbonize the power sector. This has attracted large overseas players and foreign investment in the RE sector.³³⁶ On the other hand, Centralization has oversimplified and generalized RE projects offered on an auction or tender basis which has affected their technical and economic viability. While the involvement of technologically competent international players in the RE sector has introduced advanced technology, it has also driven out small players with domestic roots promoted by State Government policies, especially in the wind sector. Most importantly the constant pressure to drive down tariffs of RE projects has favoured large international players with access to low-cost finance at the expense of smaller domestic players. In addition, the overemphasis on lower tariffs has meant that tariff caps set for centrally auctioned projects are often too low to make the projects bankable or

³³⁵ Kumar. J, C.R., Majid, M.A. Renewable Energy for Sustainable Development in India: Current Status, Future Prospects, Challenges, Employment, And Investment Opportunities (Energ Sustain Soc 10, 2, 2020). <<https://energysustainsoc.biomedcentral.com/articles/10.1186/s13705-019-0232-1>> .

³³⁶ International Energy Agency, *Renewables Integration in India* (IEA 2021), <<https://www.iea.org/reports/renewables-integration-in-india>>.

economically viable.³³⁷ While solar is generally location agnostic, wind favours specific locations and this has become a major problem when tariff caps are set at low levels. Under a ‘one tariff fits all’ approach that centralized efforts pursue, wind projects crowd around a few favourable locations around the country. This has limited capacity creation. Continued emphasis on low tariffs pushed projects towards cheaper components that compromised the efficiency and life of wind and solar energy systems.

Prior to the involvement of the Union Government, proactive State Government initiatives in the wind energy sector in the early 2000s not only facilitated the development of a competitive domestic wind energy manufacturing industry employing thousands of people but also put India ahead of China in wind energy generation.³³⁸ Early State Government initiatives in the solar sector enabled India to briefly become a net exporter of solar modules.³³⁹ Today aggressive targets set for RE electricity capacity development by the Union

³³⁷ Ankita Chauhan, Low renewable auction prices in India – Aggressive bids or unrealistic expectations? (S&P Global, 30 August 2019), <<https://www.spglobal.com/commodityinsights/en/ci/research-analysis/low-renewable-auction-prices-in-india.html>> .

³³⁸ Deepak Sangroya et al., *Development of Wind Energy in India* (International Journal of Renewable Energy Research, Vol.5, No.1, 2015), <https://www.ijrer.org/ijrer/index.php/ijrer/article/download/1626/pdf_7> .

³³⁹ Reuters, Moser Baer Gets Export Orders Worth \$500 Mn, *Livemint* (1 October 2008) <<https://www.livemint.com/Industry/vsHAQbGExoS cuT2MGZvkdO/Moser-Baer-gets-export-orders-worth-500-mn.html>> .

Government along with the centrally decided low tariff for RE electricity has gained international prestige but necessitated the import of cheap solar panels from China inadvertently creating jobs in China.

The share of solar and wind in India's ten renewables-rich states (Tamil Nadu, Karnataka, Gujarat, Rajasthan, Andhra Pradesh, Maharashtra, Madhya Pradesh, Telangana, Punjab and Kerala) is significantly higher than the national average. This is partly because of natural factors such as the State being windy most of the time or having excellent solar insolation. States that are not favourable to solar and wind projects cannot install RE capacity on the same scale as the RE-rich States. Even if they do, they will not be able to accommodate the low tariff set by centrally administered auctions because of unfavourable terrain and other natural challenges. These States may be required to purchase RE from other RE-rich states to meet their RPO obligations even if they are self-sufficient in meeting their electricity requirement. This could be an additional burden on poorer States with Discoms that carry huge financial liabilities.

8. CONCLUSIONS

The key question in this context is whether Centralization is working for the energy transition or the energy

transition is working for Centralization. The answer is possibly the latter as electricity is only one of the many subjects that are placed under the State by the Constitution that the Centre is appropriating through legislation, policy promotion and through allocation and control of financial resources. The decision to Centralize electricity sector governance in India predates the commitment towards making an energy transition and is partly influenced by development funding agencies for whom Centralization and harmonization of electricity policies across nations and regions has been on the agenda for over four decades.

The fact that India's federal institutions place relatively weak checks on the power of a Union Government with a Parliamentary majority has accelerated the pace of Centralization.³⁴⁰ 'Placing this kind of flexibility in the hands of the Central Government was deliberate and designed to enable decisive Central action to protect national integrity in the aftermath of Partition' according to Loise Tillin.³⁴¹ The architect of the Constitution, B.R. Ambedkar concurred with the view as he observed that the difference between the 'tight mould' of other federal

³⁴⁰ Aswini K. Ray *India's Federal Polity: Some Questions*, (Economic and Political Weekly 14, no. 34, 1979): 1471–75, <<http://www.jstor.org/stable/4367879>> .

³⁴¹ Louise Tillin, *The Fragility of India's Federalism*, The Hindu, (8 August 2019) <<https://www.thehindu.com/opinion/lead/the-fragility-of-indias-federalism/article28872165.ece>> .

systems and the flexibility hard-wired into India's which would enable it to be both 'unitary as well as federal' according to the requirements of time and circumstances.³⁴² Time and circumstances, in the form of the commitment to multilateral institutions to decarbonize the energy sector has provided the Union Government the opportunity and justification to take back control of the electricity sector.

³⁴²ibid .

RENEWABLE ENERGY BANKING- THE ESOTERIC TRUMP CARD IN QUEST FOR ENERGY SECURITY GOALS

**Ms. Divya Singh Rathore*

ABSTRACT

Energy is the one aspect in today's era that is both desired and indispensable. It is the one factor that is most required to develop and grow, keeping pace with emerging scientific and technological advancements. Both renewable and non-renewable sources of energy are exhaustively used in order to generate a sufficient amount of energy that serves the needs of society. The well-known fact that pertains to the usage of energy is that there is only a limited amount of energy that can be produced and used, hence, the need to conserve energy arises. Renewable Energy Banking is a silver line among the clouds that can be availed in order to save the excess energy that can be withdrawn at the time of need which is similar to the function of financial institutions that bank money and give loans when demanded. However, this system to conserve energy exists at a nascent stage today and also faces a plethora of obstacles to function smoothly. The energy banking mechanism has to be brought to the larger public domain in order to increase the platitude of its usage.

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KEY WORDS: Renewable Energy, Energy Banking,
Sustainable Development Goals

1. INTRODUCTION

The Energy Sector and its contribution to the growth of a nation and its economy is something which doesn't require any introduction. From a domestic household to an industry, all depend on energy; without energy, there can't be any growth. While on one hand as per IMF, India's Projected Real GDP (% Change) is expected to be 6.1% in the year 2023 and 6.3% in the year 2024,³⁴⁴ on the other hand, India is proactively participating in reducing the carbon footprint as a compliance of its obligation to various climate change treaties and the Nationally Determined Contributions (NDCs) and Sustainable Development Goals (SDGs), the challenges like environmental challenges, rising carbon footprint, possible exhaustion of non-renewable resources, and climate change, to name a few in the field of Renewable energy sector needs to be addressed in light of the issues pertaining to Awareness, Availability, Accessibility and Affordability. India's Updated First Nationally

³⁴⁴ International Monetary Fund, *The global recovery is slowing amid widening divergences among economic sectors and regions*, <<https://www.imf.org/en/Publications/WEO/Issues/2023/07/10/world-economic-outlook-update-july-2023>> accessed 24 August, 2023.

Determined Contribution under the Paris Agreement is mentioned herein under³⁴⁵:-

1. “To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a mass movement for ‘LIFE’– ‘Lifestyle for Environment’ as a key to combating climate change [UPDATED].
2. To adopt a climate friendly and a cleaner path than the one followed hitherto by others at corresponding level of economic development.
3. To reduce Emissions Intensity of its GDP by 45 percent by 2030, from 2005 level [UPDATED].
4. To achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030, with the help of transfer of technology and low-cost international

³⁴⁵ United Nations Climate Change, *India’s Updated First Nationally Determined Contribution Under Paris Agreement*, <<https://unfccc.int/sites/default/files/NDC/202208/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>> accessed 1 November, 2022.

finance including from Green Climate Fund (GCF) [UPDATED].

5. To create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030.
6. To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, Himalayan region, coastal regions, health and disaster management.
7. To mobilize domestic and new and additional funds from developed countries to implement the above mitigation and adaptation actions in view of the resource required and the resource gap.
8. To build capacities, create domestic framework and international architecture for quick diffusion of cutting-edge climate technology in India and for joint collaborative Research and Development (R&D) for such future technologies."

In light of India's ambitious NDCs, towards achieving the goals of the Paris Agreement, it's essential that environmentally sustainable and low carbon initiatives are underpinned in all key sectors of the Indian economy. Considering India's quest for featuring in top economies of the world along with attaining the Sustainable Development Goals, it's the need of the hour that the energy sources are also sustainable in the form of Renewable Sources.³⁴⁶ The relevance of renewable energy can be understood from the famous statement by Barack Obama - *"To truly transform our economy, protect our security, and save our planet from the ravages of climate change, we need to ultimately make clean, renewable energy the profitable kind of energy."*

While the whole world has begun to look towards a future based on renewable energy, every nation has its challenges and one probable and feasible solution appears to be in the form of Renewable Energy Banking which can aid in meeting their unique clean energy targets and Sustainable Development Goals. 'Banking of Energy,'³⁴⁷ as the name implies, is analogous to depositing money in a bank and retrieving

³⁴⁶ 'Reasons For Increase in Demand for Energy', (BBC) <<https://www.bbc.co.uk/bitesize/guides/zpmmmp3/revision/1>> accessed 11 October, 2022.

³⁴⁷ *Tamil Nadu State Electricity Board v Tamil Nadu Electricity Regulatory Commission & Others* [2007], Appellate Tribunal of Electricity, Appeal No.98of2010, <https://aptel.gov.in/old_website/judgements/98%20of%2010.pdf>.

it on a need basis, works for both renewable as well as non-renewable energy, however, the scope of the paper is limited to Renewable Energy Banking.

2. RENEWABLE ENERGY BANKING

The energy banking concept works on an “*exchange of electricity for electricity*” basis, wherein as per the arrangement, surplus or unused power generated in a particular period is fed into the grid. This surplus or unused energy, known as banked energy, is then supplied back during periods of low Renewable Energy Generation.

To illustrate:

Unit A has produced Surplus energy or the energy production has been much more than the consumption during a particular period. This surplus or unused energy can be provided to Unit B and will be known as “Banked Energy”. When the needs arise e.g., Unit A's energy supply is depleted, etc., and then the same amount of energy has to be returned by Unit B that it received from Unit A.

This transaction can occur between two or more states or two or more countries. Recently, Nepal and India have agreed to establish an energy banking framework

and have begun implementing it.³⁴⁸ According to the various energy laws and policies, the concept of banking may vary from country to country.³⁴⁹

The energy exchange can work on various mechanisms. Some entities work on an accounting method for the energy exchange, while others, instead of accounting for energy exchange; agree to a banking arrangement in which one system works as a bank and the other acts as a depositor. When the depositor has excess energy, it would deposit it with the other system, and when it requires energy, it would simply withdraw it up to the Mega Watt Hour (MWH) it had placed with the other system.³⁵⁰

³⁴⁸ Bibek Subedi, 'Nepal and India agree on energy banking' (*The Kathmandu Post*, 27 December 2018) <<https://kathmandupost.com/national/2018/12/27/nepal-india-agree-on-energy-banking-deal>> accessed 20 October, 2022.

³⁴⁹ Ramesh Lamsal, 'Nepal Practices Energy Banking; Sends 200 MW Electricity to India' (*Nepal 24 Hours*, 16 July 2019) <<https://www.nepal24hours.com/nepal-practices-energy-banking-sends-200-mw-electricity-to-india/>> accessed 21 October, 2022.

³⁵⁰ Allen J. Wood, Bruce F. Wollenberg, Gerald B Shelbé, 'Power Generation, Operation and Control' (2013) John Wiley & Sons, 3rd Edition <[https://books.google.co.in/books?hl=en&lr=&id=JDVmA gAAQBAJ&oi=fnd&pg=PA17&dq=%E2%80%98Power+Generation,+Operation+and+Control%E2%80%99+\(John+Wiley+%26+Sons,+3rd+Edition\)&ots=CSPZiOkbh4&sig=rOJ0fHC78c0G_Ha- oaBLbVieLGg#v=onepage&q=%E2%80%98Power%20Generation%2C%20Operation%20and%20Control%E2%80%99%20\(John%20Wiley%20%26%20Sons%2C%203rd%20Edition\)&f=false](https://books.google.co.in/books?hl=en&lr=&id=JDVmA gAAQBAJ&oi=fnd&pg=PA17&dq=%E2%80%98Power+Generation,+Operation+and+Control%E2%80%99+(John+Wiley+%26+Sons,+3rd+Edition)&ots=CSPZiOkbh4&sig=rOJ0fHC78c0G_Ha- oaBLbVieLGg#v=onepage&q=%E2%80%98Power%20Generation%2C%20Operation%20and%20Control%E2%80%99%20(John%20Wiley%20%26%20Sons%2C%203rd%20Edition)&f=false)> accessed 29 October, 2022.

The concept of Renewable Energy banking has started gaining much prominence in light of India's proactive approach to shifting to the renewable sources of energy.

3. INDIAN SCENARIO

The electricity sector in India is primarily governed by the Electricity Act, 2003.³⁵¹ Although, the concept of "Energy Banking" is not defined in the Act, the State Regulatory Commissions have been conferred with the authority to create their own rules and regulations.³⁵² States like Tamil Nadu have implemented energy banking, which allows cooperatives to provide energy to the grid during periods of excess generation in exchange for free supply during periods of low generation.³⁵³ Banking as a concept was introduced by the Tamil Nadu Electricity Board in 1986 to encourage the generation of wind energy. The banking charge was fixed at 2% in 1986 and raised to 5% in 2001.³⁵⁴

³⁵¹ The Electricity Act 2003.

³⁵² The Electricity Act 2003, s 181.

³⁵³ DTE Staff, 'Renewable Energy in India: Tamil Nadu One of The World's Top 9 Green Power Markets' (*Down to Earth*, 20 January 2019) <<https://www.downtoearth.org.in/news/energy/renewable-energy-in-india-tamil-nadu-one-of-the-world-stop-9-green-power-markets-62887>> accessed 26 October, 2022.

³⁵⁴ *ibid.*

Further, Uttar Pradesh Electricity Regulatory Commission in its proposed Captive and Renewable Energy Generating Plants) Regulations, 2019 (hereinafter referred to as CRE Regulations, 2019) has defined the concept of Banking of Energy as: -

Power banking is the procedure by which a Generating Plant sends power to the grid with the goal of exercising its eligibility to drawback this power from the grid for its own use as per the requirements set for thin these Regulations, rather than selling it to a third party or a Licensee.³⁵⁵

Recognizing the importance of Energy Banking in sustainable development, Indian Courts have time and again stressed the need for Energy banking. The Appellate Tribunal in *Tamil Nadu State Electricity Board v Tamil Nadu Electricity Regulatory Commission & Others*³⁵⁶ elaborated upon the concept and importance of energy banking by comparing it with the general concept of banking in Financial Institutions. According to the Tribunal, energy banking is analogous

³⁵⁵ UPERC Draft CRE Regulation 2019, s 6 (1) (c).

³⁵⁶ *Tamil Nadu State Electricity Board v Tamil Nadu Electricity Regulatory Commission & Others* [2007], Appellate Tribunal of Electricity, Appeal No.98of2010availableat<http://aptel.gov.in/old_website/judgements/98%20of%2010.pdf>.

to saving money in a financial bank where money can be deposited and withdrawn as per need. Interest is also earned and hence both the account holders and bank are benefited from this procedure. However, electricity being a commodity which cannot be stored, has to be consumed instantly. For instance, wind energy is periodical in nature and is usually produced in instances when it is not required. In such a case, generator banks supply the energy to a licensee who returns the energy by procuring it from other sources. The Licensee, the banker of electrical energy, earns interest on this banked energy. Thus, the banking rate of electrical energy should be nominal.

In *Beta Wind Farm (P) Limited v Tamil Nadu Electricity Regulatory Commission & Others*,³⁵⁷ the Appellate Tribunal while adjudicating upon the issue of an unusual increase in banking charges held that while the State Commission has the authority to set banking charges, there must be a rationale for its decision to drastically alter the banking charge and the banking period. Shortening the banking period from a year to a month may render the entire financial system ineffective.

³⁵⁷*Beta Wind Farm (P) Ltd v Tamil Nadu Electricity Regulatory Commission, etc.*, Appellate Tribunal of Electricity, Appeal No. 197 of 2012 available at <https://aptel.gov.in/old_website/judgements/Judgements%20Appeal%20No.%2045%20of%202012_31012013.pdf>

With respect to the banking of Renewable energy, the Appellate Tribunal in *Maharashtra State Electricity Distribution Company Limited v Maharashtra Electricity Regulatory Commission & Others*³⁵⁸ stated that banking of wind energy is a necessary feature for a wind energy generator supplying power to a consumer through open access to be commercially viable. Varied State Commissions provide different financial facilities to wind energy companies in order to fulfill their role of supporting renewable energy under the Electricity Act of 2003. The Tribunal further found that the State Commission's decision to continue the banking facility for wind energy providers is not illegal, and that such a banking facility should not be at the expense of the Licensee's other customers.

Further, with respect to the concessions, the Appellate Tribunal in *Madhya Gujarat Vij Company Limited v Ankur Scientific Energy Technologies Private Limited & Others*³⁵⁹ held that the Renewable Energy Certificate (REC) Regulations, 2010 provide that a renewable energy-based independent power plant (IPP) that supplies power to a third party through open access is entitled to concessionary benefits such as

³⁵⁸*Maharashtra State Electricity Distribution Company Limited v Maharashtra Electricity Regulatory Commission & Others* [2014] SCC Online APTEL 166.

³⁵⁹*Gujarat Energy Transmission Corporation Limited v Gujarat Electricity Regulatory Commission* [2015] SCC OnLine APTEL 8.

transmission/wheeling charges, among other things. If the competent State Commission allows it, such an IPP can also benefit from REC at the same time.

Time and again, courts have ruled in favor of banking of the energy, specifically the renewable energy and endeavored to discipline the whole process of energy banking.

4. ESSENTIALS OF ENERGY BANKING

i. BANKING AGREEMENT

The energy generator must enter into a banking agreement with a distribution/transmission licensee in order to use the banking facilities supplied by a particular State. This type of agreement lays out the entire framework that the parties must adhere to. It may include provisions such as how much energy can be banked, who can bank the energy, and when surplus energy can be injected or withdrawn, among other things.

ii. GRID DISCIPLINE

Maintaining grid discipline amongst the entities is of utmost maintenance. Energy generators are typically provided with a banking facility to allow them to inject

surplus energy into the grid. Without the consent of the appropriate authority, the energy generator cannot inject such surplus.

In the case of *Renew Wind Energy (AP) Private Limited v Karnataka Electricity Regulatory Commission & Others*³⁶⁰ wherein electricity was injected without the consent of State Load Dispatch Centre, the Tribunal determined that such behavior amounted to grid indiscipline and could jeopardize grid security. Tribunal held that “Whether the energy pumped is renewable or non-renewable, grid indiscipline cannot be accepted.” The Tribunal also held that the energy injected cannot be stored and must be spent immediately.

iii. BANKING PERIOD

The time period during which energy is banked is referred to as the banking period. It is commonly done on a monthly basis, i.e. energy banking is done on a monthly basis.

³⁶⁰*Renew Wind Energy (AP) Private Limited v Karnataka Electricity Regulatory Commission & Others* [2017] SCC OnLine APTEL 59.

iv. BANKING CHARGES

Banking costs are fees charged on energy generators for using the energy banking process. It is a type of tariff that must be paid when electricity is sent from a generator to a distribution licensee. The State Regulatory Commissions are in responsibility of determining and computing banking charges in accordance with the rules of their individual tariff. The charges for renewable and non-renewable energy are different.

v. UNUTILISED BANKED ENERGY

It is not required that surplus supplied into the grid be fully used. Ideally, the fate of such unutilized energy is decided at the conclusion of each Financial Year based on the terms and circumstances of the banking arrangement. The unutilized surplus energy is not carried over to the next year as a general rule.

5. NEED FOR ENERGY BANKING

i. CLEAN ENERGY GOALS

India has always been an advocate of clean energy at the international forum and is the world's third largest producer of renewable energy, with 40% of its installed

electricity capacity coming from non-fossil fuel sources.³⁶¹ However, there are certain challenges in the transitional path from non-renewable energy to renewable energy. Out of the 3As, that are: Availability, Accessibility and Affordability, when it comes to renewable energy in India, the first challenge comes with the Availability. To elaborate, most of the states in India, receive abundant Sunlight throughout the year except for few winter months, still the solar energy accounts only for 14.9% of total share in energy production.

Table 1

Source-<https://powermin.gov.in/en/content/power-sector-glance-all-india>

INSTALLED GENERATION CAPACITY (FUELWISE) AS ON 30.09.2022		
CATEGORY	INSTALLED GENERATION CAPACITY(MW)	% of SHARE IN TOTAL
Fossil Fuel		
Coal	204.079	50.0%

³⁶¹Ministry of New and Renewable Energy, *Renewable Energy in India* (FeaturesID:151141) <<https://pib.gov.in/FeaturesDeatils.aspx?NoteId=151141&ModuleId%20=%202>>.

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Lignite	6.620	1.6%
Gas	24,824	6.1%
Diesel	562	0.1%
Total Fossil Fuel	2,36,086	57.9%
Non-Fossil Fuel		
RES (Incl. Hydro)	164.930	40.4%
Hydro	46,850	11.5 %
Wind, Solar & Other RE	118.080	29.0 %
Wind	41.666	10.2 %
Solar	60,814	14.9 %
BM Power/Cogen	10,206	2.5 %
Waste to Energy	495	0.1 %
Small Hydro Power	4,899	1.2 %
Nuclear	6,780	1.7%
Total Non-	171,710	42.1%

Fossil Fuel		
Total Installed Capacity (Fossil Fuel & Non-Fossil Fuel)	407,797	

One of the reasons for less contribution from the most promising source of energy is the issue of availability. Solar energy maybe available in the state of Rajasthan throughout the year but for a couple of winter months, but is not abundantly available in the state of Himachal Pradesh (HP) in abundance. So, for the state of HP, despite being available, it's not a favorable source of energy due to irregular sun exposure. If energy banking is used widely, the interstate as well as intrastate energy exchange can be facilitated which has the potential of increasing the dependency on renewable energy like solar energy. So, for the part of the year when solar energy is not available, it can be arranged through the Energy banking mechanism solving the major energy crisis. Same arrangement can be done for hydroelectricity.

If Energy Banking is used in its true spirit, then India's aim of Universal electrification which is the

Electrification of 99.99%³⁶² of the households in India, a major milestone towards attaining the Sustainable Development Goal target 7.1 of providing universal access to affordable, reliable, and modern energy services by 2030, can also be achieved.

ii. CLIMATE CHANGE OBLIGATIONS

India has always shown its willingness to emerge as a leader in order to fight climate change. The country's vision is to achieve Net Zero Emissions by 2070, in addition to attaining the short-term targets which include³⁶³:

- Increasing renewables capacity to 500 GW by 2030,
- Meeting 50% of energy requirements from renewables,
- Reducing cumulative emissions by one billion tonnes by 2030, and
- Reducing emissions intensity of India's gross domestic product (GDP) by 45% by 2030.

³⁶²Household Electrification Status available at <<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1989801#:~:text=2021%20all%20the%20States%20have,2021>>.

³⁶³Ministry of New and Renewable Energy, *Renewable Energy in India* (FeaturesID:151141) <<https://pib.gov.in/FeaturesDeatils.aspx?NoteId=151141&ModuleId%20=%202>>.

The only sustainable way of attaining these goals is a switch from non-renewable to renewable sources of energy. However, considering the issues of 3As, (Availability, Accessibility and Affordability) associated with the renewable source of energy makes it essential that Energy banking model is implemented.

iii. MEETING VARIED ENERGY DEMANDS

Renewable sources are inherently intermittent and variable in nature leading to a lack of sync in the demand cycles, which can be understood from the Table 2 and Table 3 mentioned below. One of the technological solutions to this intermittency is the physical storage of energy, and thus, storage technologies are critical to a transition to Renewable Energy. Until physical storage options are cost-competitive and scalable, which as of date is not, banking of energy works as the best alternative to promote RE generation. Since, the mechanism works similarly to the general Banking, it's easier to adopt as compared to the technological advances which require long years of research, development and finances.

Total Generation and growth over previous year in the country during 2009-10 to 2022-23:-

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Table 2-

Source: <https://powermin.gov.in/en/content/power-sector-glance-all-india>

Year	Total Generation (Including Renewable Sources) (BU)	% of Growth
2009-10	808.498	7.56
2010-11	850.387	5.59
2011-12	928.113	9.14
2012-13	969.506	4.46
2013-14	1,020.200	5.23
2014-15	1,110.392	8.84
2015-16	1,173.603	5.69
2016-17	1,241.689	5.80
2017-18	1,308.146	5.35
2018-19	1,376.095	5.19
2019-20	1,389.102	0.95
2020-21	1,381.855	-0.52
2021-22	1.491.859	7.96

Year	Total Generation	
	(Including Renewable Sources) (BU)	% of Growth
2022-23*	846.180	10.67

* Up to September 2022 (Provisional), Source: CEA

Power Supply Position

The power supply position in the country during 2009-10 to 2022-23:

Table 3-

Source: <https://powermin.gov.in/en/content/power-sector-glance-all-india>

	Energy				Peak			
	Requi remen t	Avail abilit y	Surplus(+)/ Deficits(-)		Peak Dema nd	Peak Met	Surplus(+) / Deficits(-)	
	(MU)	(MU)	(MU)	(%)	(MW)	(MW)	(MW)	(%)
2009	8,30,59	7,46,6	-	-10.1	1,19,1	1,04,00	-	-

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	Energy				Peak			
-10	4	44	83,950		66	9	15,157	12.7
2010	8,61,59	7,88,3	-		1,22,2	1,10,25	-	-
-11	1	55	73,236	-8.5	87	6	12,031	9.8
2011	9,37,19	8,57,8	-		1,30,0	1,16,19	-	-
-12	9	86	79,313	-8.5	06	1	13,815	10.6
2012	9,95,55	9,08,6	-		1,35,4	1,23,29	-	-
-13	7	52	86,905	-8.7	53	4	12,159	9.0
2013	10,02,2	9,59,8	-		1,35,9	1,29,81	-	-
-14	57	29	42,428	-4.2	18	5	6,103	4.5
2014	10,68,9	10,30,	-		1,48,1	1,41,16	-	-
-15	23	785	38,138	-3.6	66	0	7,006	4.7
2015	11,14,4	10,90,	-		1,53,3	1,48,46	-	-
-16	08	850	23,558	-2.1	66	3	4,903	3.2

	Energy				Peak			
2016 -17	11,42,9 29	11,35, 334	- 7,595	-0.7	1,59,5 42	1,56,93 4	- 2,608	- 1. 6
2017 -18	12,13,3 26	12,04, 697	- 8,629	-0.7	1,64,0 66	1,60,75 2	- 3,314	- 2. 0
2018 -19	12,74,5 95	12,67, 526	- 7,070	-0.6	1,77,0 22	1,75,52 8	- 1,494	- 0. 8
2019 -20	12,91,0 10	12,84, 444	- 6,566	-0.5	1,83,8 04	1,82,53 3	- 1,271	- 0. 7
2020 -21	12,75,5 34	12,70, 663	- 4,871	-0.4	1,90,1 98	1,89,39 5	-802	- 0. 4
2021 -22	13,79,8 12	13,74, 024	- 5,787	-0.4	2,03,0 14	2,00,53 9	- 2,475	- 1. 2
2022 -23*	7,91,05 3	7,85,7 22	- 5,331	-0.7	2,15,8 88	2,07,23 1	- 8,657	- 4. 0

* Up to September 2022 (Provisional), Source: CEA

6. CHALLENGES

i. IMPLEMENTATION ISSUES

Undoubtedly, in order to realize the SDGs and NDCs, currently, Renewable Energy Banking is the best solution available. However, the mechanism suffers from implementation issues. For instance, in the past few years, several states have placed different kinds of restrictions on banking of RE, jeopardizing the purpose of Renewable energy Banking (see Table 4) e.g., Gujarat and Maharashtra, have moved from annual to monthly banking, and that banking provisions are likely to be restricted further to time of day or daylong across most states. In some states such as Andhra Pradesh and Tamil Nadu, banking facilities have been withdrawn altogether. However, Tamil Nadu's decision to completely withdraw Banking facility has been held as "extremely radical" by APTEL, in January 2021³⁶⁴. It held that the preferential treatment of RE is a stated policy of the Government of India towards its commitments to climate action under the Paris Agreement, and SERCs must consider the same while taking decisions.

³⁶⁴*Tamil Nadu Spinning Mills Association v Tamil Nadu Electricity Regulatory Commission*[2018], Appellate Tribunal of Electricity, Appeal No. 191 of 2018.

Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022 [RE OA Rules] were notified by the Union Government in June 2022. The aim was to provide the users with a consistent approach to energy. However, the structure of the rules neglects the discretion of states that leads to failure of the whole energy exchange mechanism.

In March 2019, APTEL, while reviewing a petition against Karnataka ERC'S order to reduce banking period to six months, held that banking is a physical support to RE generation. In Karnataka, peak wind generation is in the months of May- September and if banking is not allowed throughout the year then surplus energy will not be available for consumption during peak demand months (January- March).

Table 4-

Source- [IEEFA/JMK India: New restrictions on banking of power risk curbing renewable energy growth / IEEFA](#)

Renewable-rich states that allow Banking	% Allowed	Settlement	Charges
BIHAR	100%	MONT HLY	2 %
GUJARAT	100%	VARIE	V

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		S	A R I E S
HARYANA	100%	ANNU AL	Rs. 1.5 0/ k W h
CHATTISGARH	100%	ANNUAL	2%
KARNATAKA	100%	ANNUAL	2%
MAHARASHTRA	100%	MONT HLY	2%
RAJASTHAN	25%	ANNUAL	10 %
UTTAR PRADESH	100%	ANNUAL	6 %
MADHYA PRADESH	100%	ANNUAL	5 %

ii. DISCOMFORT AMONGST THE DISCOMS

Discoms or the Distribution Companies, act as an interface between electricity generators and end consumers by purchasing energy from generators and

supplying it to the end users like agricultural, industrial, commercial, and residential users. Role of a healthy Discom is indispensable in the Power market. However, due to cost factors³⁶⁵i.e., variable cost of power at the time of injection and withdrawal of the banked energy, Discoms are resisting the concept of Energy Banking.

To illustrate:

In monsoon season, owing to regular winds, wind generation is at its peak whereas agricultural demand is low at this time of the year. Surplus wind energy is absorbed by Discoms by backing down low-cost thermal generation. The saved or the banked energy is utilized during summer when discoms have to supply expensive power to supply the banked energy. Discoms suffer financial plight due to unit-to-unit adjustment as banking facilities are used by RE developers who seek permission for higher capacity which is higher than their stated drawl requirement.³⁶⁶

Discoms's discomfort with the Energy Banking has been dealt with by APTEL in the *Roha Dychem Private Limited*

³⁶⁵Rishabh Sethi, Balaji Raparathi, Ashish Kumar Sharma, 'Open Access: Stakeholders' Perspective' (TERI, 2020) <[Open-Access.pdf \(teriin.org\)](#)> accessed 1 November, 2022.

³⁶⁶ibid.

and MERC and Ors.,³⁶⁷ where banking was used as a reason to impose restrictions on Open Access (OA) beyond contracted demand.

iii. COST FACTOR

Be it the discom discomfort or resistance for energy banking or less use of energy banking, the root cause lies in the fact that the cost of banking facilities has not been ascertained or fully understood. To date, discoms have not been successful in making a case before the APTEL proving that the banking increases the cost, however considering the gravity of the matter APTEL has criticized State Electricity Regulatory Commissions (SERCs) for failing to analyse the impact of banking which has led to the current state of ad hoc regulations and has suggested that CEA conduct the study on the financial health of Discoms due to Energy Banking. The outcome of the study is awaited, however, a study (Jain & Jain, 2020)³⁶⁸ based on the topic ‘Cost of Electricity banking under open-access arrangement: A case of solar electricity in India’ claims that banking service provided by discoms to an open-access customer buying solar energy from an independent power producer can increase

³⁶⁷*Roha Dyechem Private Limited and MERC and Ors.* [2021], Appellate Tribunal of Electricity, Appeal No. 319 of 2018.

³⁶⁸Sourabh Jain, Nikunj Kumar Jain, ‘Cost of electricity banking under open-access arrangement: A case of solar electricity in India’ [2020] 146, 776- 778.

the cost of solar electricity by 20-30%, which is still cheaper than storage.

The situation warrants a better awareness and understanding of the energy banking mechanism by Discoms which can be achieved only when there is clarity and uniformity in the regulations governing Energy banking.

iv. LACK OF UNIFORM REGULATION

As discussed earlier the RE OA Rules recognise the importance of banking, however there are ambiguous provisions which is watering down the whole purpose of energy banking.

For instance,:

Rule 8³⁶⁹ which provides about the mechanism of Banking states that

8. Banking. – (1) Banking shall be permitted at least on a monthly basis on payment of charges to compensate additional costs, if any, to the distribution licensee by the Banking and the Appropriate Commission shall fix the applicable charges.

(2) The permitted quantum of banked energy by the

³⁶⁹ Renewable Energy Open Access Rules 2003, Rule 8.

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Green Energy Open Access consumers shall be at least thirty percent of the total monthly consumption of electricity from the distribution licensee by the consumers.

Explanation: For the purposes of this rule, the expression—Banking means the surplus green energy injected in the grid and credited with the distribution licensee energy by the Green Energy Open Access consumers and that shall be drawn along with charges to compensate additional costs if any:

Provided that the credit for banked energy shall not be permitted to be carried forward to subsequent months and the credit of energy banked during the month shall be adjusted during the same month.

As per the first provision, SERCs can notify a longer banking duration which can be bi- annually or annually also, which would allow consideration of state-specific context. However, in the explanation to the clause, the RE OA Rules clarify that “the credit for banked energy shall not be permitted to be carried forward to subsequent months and the credit of energy banked during the month shall be adjusted during the same month.” This seems to be inconsistent with the first provision. If the explanation is taken into consideration, then the banking duration is limited only on monthly basis due to which the renewable sources of energy like

Solar and Wind energy will severely suffer.

Further, Rule 9 of the Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022³⁷⁰, provides all the charges that are to be levied, say

- (a) Transmission charges;
- (b) Wheeling charges;
- (c) Cross subsidy Surcharge;
- (d) Standby charges wherever applicable

Besides these charges, no other charge is to be levied. The rule states that the Cross-subsidy surcharge shall be as per the provisions of tariff policy notified by the Central Government under the Act and the standby charges, wherever applicable, shall be specified by the State Commission.

The rule is silent with respect to the parameters of charge determination and has not addressed Transmission charges and Wheeling charges leading to the exercise of discretion by the Central Government as well as the State Commission.

Lack of clarity and ambiguous provisions in the latest rules of 2022 is leading to a docket explosion before the

³⁷⁰ Renewable Energy Open Access Rules 2003, Rule 9.

courts and tribunals which is going to do no good to the Energy security goals.

7. SUGGESTIONS AND RECOMMENDATIONS

Attaining the Energy Security goals along with the compliance of the Climate Obligations can be viable only when more and more avenues of renewable energy are explored. One of the viable and sustainable means to shift from a non-renewable source of energy to a renewable source of energy organically is Energy banking mechanism. However, as discussed earlier, the banking mechanism is facing various challenges at the implementation as well as regulatory levels. In order to promote Renewable Energy mechanisms, the following measures are recommended

Establishment of uniform, clear and binding regulatory framework providing

- i. Rights, duties and Powers of various stakeholders
- ii. Pricing mechanism
- iii. Penalties for violation
- iv. Adjudicating Authority different from the existing Tribunals and Courts

Considering the concept of Energy Banking is

analogous to the concept of Financial Banking, its need of the hour that a watchdog (similar to RBI) is established which can exercise both monitoring as well as regulatory control over the stakeholders.

Secondly, the involvement of the private sector and PPP (Public-Private Partnership) Models also needs to be explored at a much wider level to promote orderly growth and healthy competition in the field of Energy Banking.

Since, the concept of energy banking is still evolving and facing discomfort from stakeholders like Discoms, research and study need to be conducted which can address the issues and challenges and provide viable solutions.

8. CONCLUSION

Despite being the forerunner in Energy Security Goals and rich and diverse in renewable sources of energy, India is lagging behind Europe and China in renewable energy deployment³⁷¹ because of various impediments in the effective use and implementation of the

³⁷¹ S Dinakar, 'Here's why Indian renewable energy plan pales in front of Europe and China' (*Business Standard*, 19 December 2022) <https://www.business-standard.com/article/specials/here-s-why-indian-renewable-energy-plan-pales-in-front-of-europe-and-china-122121900936_1.html>.

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renewable sources of energy. Considering the need of the hour in order to fulfil the Energy Security goals, banking of renewable energy appears as the best mechanism. Though many authors consider “Energy Banking” as a short-term solution and attaining technical advancement in the field of Storage of Renewable energy as the long-term solution, it’s beyond any iota of doubt that “Energy Banking” works on Banking mechanism just like a financial transaction so it’s clean and effective and less hazardous to the environment and any technical advancement can’t come without compromising the environment. If proper studies and research are conducted and the regulatory as well as implementation issues are addressed than Renewable Energy Banking can be used as an esoteric trump card not only in attaining Energy Security Goals but also in attaining Climate Obligations as well as Universal Electrification which will be Available, Accessible and Affordable for all.