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National Electricity Policy 2021: Making India's Power Sector Future-Ready

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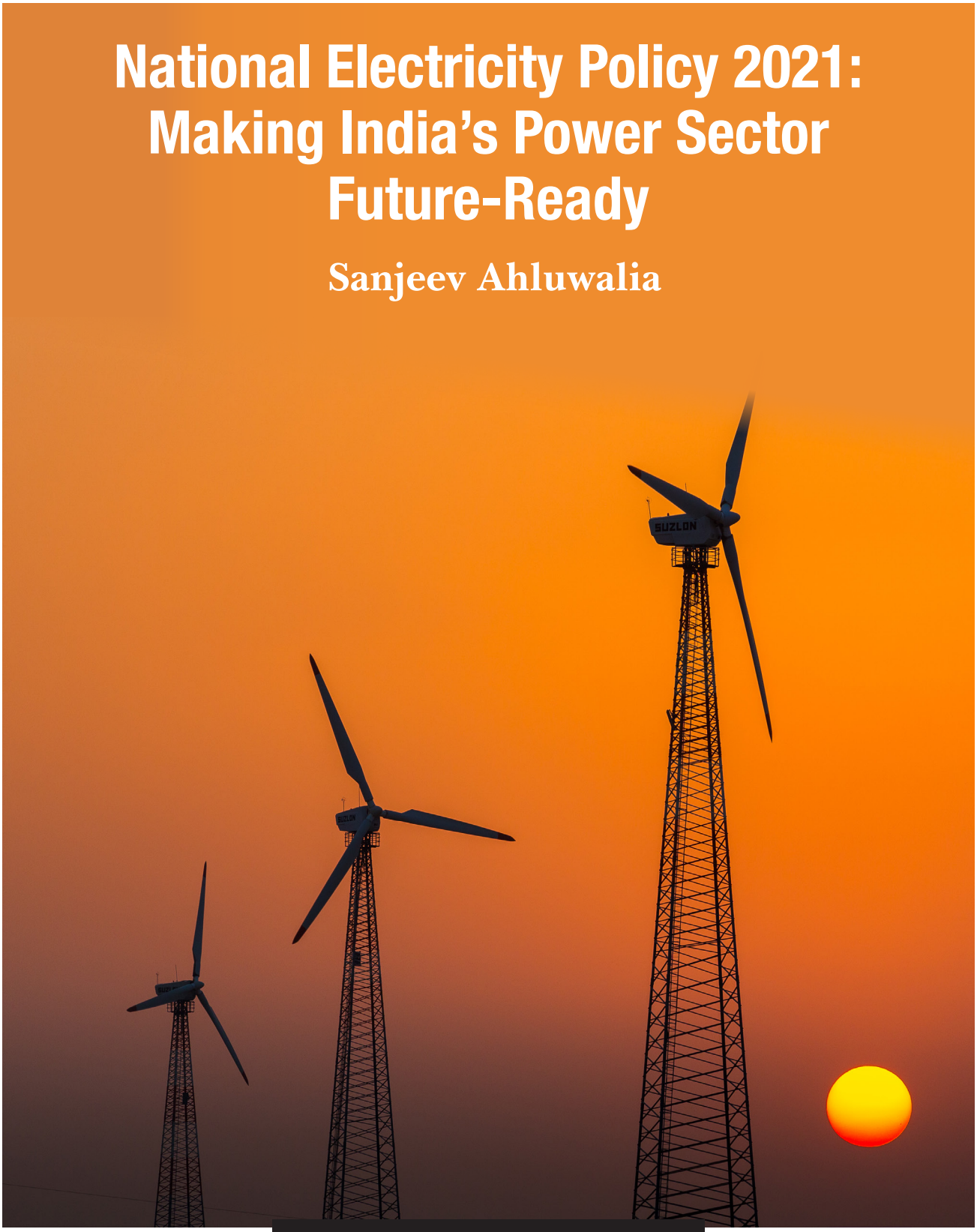

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Introduction

A policy is as much a statement of intention as it is an opportunity for participative planning. In the context of good governance, policy can act as effective guardrails that ensure the efficiency and quality of government services. In theory, legislation flows from the changes in law necessary to implement policy. But transformative legislation also needs policy support for efficient implementation.

The National Electricity Policy (NEP), 2005[1] is an example of this, having been implemented after the adoption of the Electricity Act (EA), 2003. The EA, 2003 is an omnibus legislation that replaced three previous legislations,[a] defining the structure of the electricity generation and supply business in India and the regulatory arrangements to manage it efficiently. In light of the splintered constitutional mandate[b] for a "concurrent" subject such as electricity, the Act requires the Union government to prepare a

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a The Electricity Act 2003 replaced the Indian Electricity Act 1910, The Electricity (Supply) Act 1948, and the Electricity Regulatory Commissions Act 1998.

b The Constitution of India (Seventh Schedule) prescribes exclusive legislative mandates for the Union (Union List) and state governments (State List). It also lists mandates (Concurrent List) where both Union and state governments can legislate, but the Union legislation shall prevail. Electricity generation and distribution is one such "concurrent" mandate. The Constitution was amended in 1992 (Seventy Fourth Amendment) to provide exclusive mandates to local governments—village panchayats and cities—but the extent of powers delegated to them varies and depends on suitable legislation being enacted by the relevant state government. Usually, the management of public streetlights is the only function in the electricity supply chain delegated to them. The Union government has chosen to focus on ramping up generation through publicly owned capacity and private generators, extending the inter-state transmission system, instituting systems for grid management and security and international cooperation for enhancing cross-border trade of electricity. It has refrained from entering the distribution and retail supply segment beyond the determination of national technical standards of supply, the financing of distribution reform programs and legislating the structure of regulation. State governments have mimicked Union government initiatives by expanding generation and transmission capacity within their states and have exclusive control over the distribution and retail supply segment within their states subject, to the National Electricity Policy formulated by the Union government under the EA, 2003.

national electricity policy and a tariff policy (Section 3); national policies on standalone systems for rural areas and a policy for bulk supply and local distribution managed by panchayats, cooperatives, NGOs and franchisees (Sections 4 and 5). The NEP, 2005 provided a roadmap for implementation of the new legislation and the new unbundled, institutional arrangements to achieve the objectives of inclusion through electricity access; economic growth through the supply of quality power at reasonable prices; and private sector participation in ramping up capacity, whilst enhancing efficiency through competition.

The government is now revising the 2005 policy and preparation is underway for a draft National Electricity Policy, NEP 2021,[2] by a specially constituted expert committee. NEP 2021 will focus on optimum regulatory arrangements for the future, outline a template of some successful initiatives, set new medium-term objectives that build upon past achievements, and identify pathways to achieve these objectives.

> "The EA, 2003 defines the structure of the electricity generation and supply business in India and the regulatory arrangements to manage it efficiently."

The Electricity Landscape in India: An Overview

The Industrial Policy Statement, issued on 25 July 1991, liberalised industrial licensing and exempted power generation and distribution from the list of industries reserved for the public sector under the Industrial Policy Resolution 1956. Combined with the simplifying of the licensing process, this opened the door for private investments in India's power sector, facilitating the entry of private generators, introducing autonomous regulation via the central and state-level regulatory commissions, and unbundling of the electricity supply chain to promote competition under the Electricity Regulatory Commissions Act 1998. These changes, dating back almost three decades, can be credited with private generation now accounting for 46 percent of the utility generation capacity—a factor that explains the current power surplus, albeit with a marginal peaking shortage at less than one percent.

Generation

India's total electricity generation has grown at 5.85 percent per annum since 1990–91. However, the energy mix remains biased toward fossil fuels, the availability of efficient peaking power capacity is limited, and the availability of contracted generation capacity for ancillary services and demand response is unstructured. Gas-based capacity is limited by the availability of affordable domestic gas at administered prices. Moreover, stranded capacity in private projects based on imported gas and LNG remains a problem.

As of 31 March 2021, Renewable Energy (RE) generation capacity is at 21 percent (94.4 GW) of the total generation capacity. However, coal still accounts for 55 percent of the installed generation capacity. To increase RE further and reduce the dependence on coal-based power, significant changes are needed in the capacity mix, with distributed localised generation (gas or RE or hybrid) and contracted capacity—pumped storage or gas based—for ensuring grid stability.

Transmission

At present, inter-state transmission is the strongest link in the electricity supply chain.[c] One-third of the power generated can now be transferred across state boundaries and a minuscule two percent is traded internationally with Bhutan (imports), Nepal (export) and Bangladesh (export), with small volumes of trade possible with Myanmar.

Power transferability and grid security are critical. This became evident during the blackout of 30-31 July 2012 in India, when 22 states were deprived of electricity for two days due to grid instability. In February 2021, a cold weather-stress-induced power blackout in Texas, an islanded grid with no external linkages, left millions of homes in the dark for four days. The potential cost was above US$125 billion, even as generators earned billions with the traded price of power shooting up to US$ 9 (approximately INR 700) per kWh.[3]

In the context of RE, a strong grid is even more significant, since RE—the energy of the future—is clustered in specific locations. With a mere six out of 30 states accounting for 90 percent of the registered solar and wind projects, strong grid connectivity is essential to efficiently navigating future "green" energy pathways and achieving the target of 450 GW RE generation capacity (including hydro) by 2030. RE-intensive areas need to import power or set up fossil fuel generators to cover the intra-day and seasonal gaps in RE availability. This constraint will be less pronounced once battery-based storage systems become available; however, such a development is at least a decade away.

c The intra-state grid is the link between distribution and generation capacity with a state and with the inter-state transmission-system which transfers power across state borders. Capacity and the quality of management varies significantly across state states.

Distribution

The state of electricity distribution (typically, voltage < 11KV) in India is dire, with massive aggregate financial losses of around INR 613.6 billion (2018–19) after accounting for receipt of government subsidy. During the same year, the average loss was INR 0.52 per kWh supplied, with Andhra Pradesh recording the highest loss in the country, at INR 2.64 per kWh and Gujarat the lowest at INR 0.02 per kWh. The accumulated financial loss in electricity distribution companies (DISCOMS) amounted to INR 4.8 trillion, financed by accumulated debt.[4] Consequently, DISCOMS' investments in maintaining and upgrading their assets fall short of requirements.

Across India, supply interruptions and voltage fluctuations are common, even in large cities. Those who can afford it maintain backup supply options, i.e. battery storage or fossil-fuel-powered home generators, at double the per kWh rate of the electricity tariff. Physical reading of meters and gaps in billing customers constitute a significant source of revenue loss which, in the absence of effective metering of supply, is often explained as hard to verify, technical line-loss.

Ownership

Central government-owned generators are listed and publicly traded companies, with a 24-percent share in total capacity, and maintain high standards. POWERGRID, India's Central Transmission Utility operating under the Ministry of Power, is a well-functioning Union government-listed and publicly traded company. On the other hand, the quality of state government-owned generators, with a 29-percent share in capacity, vary significantly. Private generation has grown impressively over the three decades since India's liberalisation, but is now afflicted by stranded capacity in gas generation and mega-power units linked to imported coal.

Additionally, distribution is dominated by state-government owned utilities (DISCOMS), which lack standardisation in terms of quality performance. Out of 41 public DISCOMS, 61 percent were rated on operational and financial parameters, as moderately risky or worse.[5] Compared to this, private DISCOMS in prosperous urban centres such as Kolkata, Mumbai, the National Capital Region, Ahmedabad, Surat; and private franchisee models in Kanpur, Agra and Bhiwandi are better managed, but they account for less than five percent of the retail supply. Odisha, for instance, privatised distribution in 1999 but reverted to state ownership in 2015 due to non-performance of the private licensees; it is now set to re-privatise its four DISCOMS.

Regulation

Electricity remains heavily regulated despite the entry of private generators. A forest of policies and regulations guide power development under the EA, 2003 (amended in 2007); Hydro Power Development Policy, 2006 (amended in 2009); Mega Power Policy, 2009; Rural Electrification Policy, 2006; Tariff Policy, 2006 (amended in 2009 and revised in January 2016); and National Electricity Policy, 2005. Further, the Central Electricity Authority specifies construction and safety standards for electricity installations and supply, and provides technical advice on power planning. Electricity regulators—Central Electricity Regulatory Commission and the State Electricity Regulatory Commissions—specify business regulations, which govern their functioning and prescribe the procedures for tariff determination, service standards, grievance redress and the code for grid management.

Currently, Coal India Limited, a government-owned company, is the largest supplier, making the coal price administered rather than a market price. Moreover, generation tariff is regulated selectively for government-owned companies and for the private generators that do not enter via the competitive bidding route. Similarly, transmission, distribution, and retail supply tariffs are regulated to balance a complex structure of cross-subsidy paid by larger customers to partly subsidise supply to small users and agriculture.

Competition

One of the central features of the ERC Act, 1998 and its successor, the EA 2003, is the promotion of competition as an instrument of economic efficiency. However, competition is only sparsely embedded in the electric power ecosystem and remains limited to "for the market." While private generators bid for establishing capacity in exchange for long-term purchase power agreements (PPAs), government-owned companies that do not enter through a bidding process get their tariff approved on a normative cost-plus basis from the relevant electricity regulator. The cost of public power provides a glass ceiling for private generators, although there have been instances of post-bid upward redetermination of the bid tariff.

Competition "in the market," too, is minimal, at less than nine percent of the electricity supplied. Most generation capacity is established using up to 70 percent of bank finance, which requires the assurance of long-term power purchase contracts, as a back stop for project viability.

> A central feature of the ERC Act, 1998 and its successor, the EA 2003, is the promotion of competition as an instrument of economic efficiency.

A formal power exchange market has been functioning since 2008 where surplus power can be forward traded on up to hour ahead basis in packets of 15 minute each.[6] Power trading got a fillip with the introduction of the innovative Availability Based Tariff (ABT), in 1999.[7] The ABT was a frequency-based grid tariff, which encouraged generators to maintain discipline in grid despatch and DISCOMs in energy off-take per their day-ahead forecast schedules. Deviation from the schedule was penalised, based on the extent of frequency variation at the time of deviation. This mechanism incentivised bilateral trade within DISCOMs, trade through licensed traders and since 2008, through a regulated power-exchange market, where surplus power (contracted under long-term contract but not used) can be forward traded on an hour-ahead basis in packets of 15 minutes each. In a first for cross-border trade, the Nepal Electricity Authority will now trade electricity in Indian power exchanges.[8]

In 2003, the introduction of open access for users with a load of more than 1 MW opened the door for merchant generators and retail suppliers. However, this opportunity has remained on paper and largely unutilised, since DISCOMS fear the exit of their best customers, i.e. industry, commercial, and large households that pay significantly more than the maximum of 20 percent above average cost of supply to cross-subsidise smaller users as specified in the Tariff Policy, 2016. State governments further undermine the credibility of open access through administrative actions restricting such transfer during energy shortages. State electricity regulators tend to fix the surcharge and wheeling charge to be paid by the open-access customer, at levels that make direct purchase uneconomical compared to buying from the distribution utility.[9]

Future Directions in Electricity Policy

There are five broad areas where greater clarity on the available options could help achieve the objectives of equity and efficiency in the electric power sector.

1. How Much Electricity Is Enough?

The Electricity Policy, 2005 had set a target of per capita consumption of 1000 kWh, which was achieved by 2016-17, although the COVID-19 pandemic has impacted average per capita consumption adversely since 2019-20. Nevertheless, the share of electricity in total energy services is likely to continue growing, given that per capita electricity use in India is minimal—less than one-fourth of the level in China (an oft used compactor for development results) and less than one-fifth the level in Denmark.[10] Technology trends, too, predict an increasing share for electricity in total energy use in transportation, communication, and industrial applications. India must produce or import the incremental electricity required for economic growth and to meet the consumption needs of its growing population, which is expected to increase from 1.36 billion in May 2021 to 1.7 billion by 2040.

The existing target of 450 GW of RE capacity (including hydropower) by 2030 must be complemented by sufficient fossil-fuel generation capacity. A near quadrupling of total generation capacity by 2040 can be envisaged. An annual increase in installed capacity of six percent can meet the physical targets of energy supply. Over the last 29 years, between 1990–91 and 2019–20, India's electricity generation has increased by 5.85 percent per annum. The challenge now is to align power development plans with the country's Nationally Determined Contributions of reducing carbon emission by 33–35 percent below the 2005 levels, by 2030. Consequently, the NEP 2021 draft must provide some clarity on the minutiae of power development trajectory till 2040. This medium-term vision is necessary as guidance for investors and to determine milestone tasks.

2. A New Ownership Profile

Currently, India is at the cusp of system maturity. Going forward, investments must be optimised across generation, transmission and distribution, with the dual objective of containing carbon emissions and providing incremental electricity at reduced cost. To facilitate this, a new class of owners and investors are required, who have the right blend of public purpose under environment, social and governance (ESG) metrics, and the requisite financial depth and innovative zeal for contextually appropriate investments.

As of now, transmission and distribution assets are concentrated in the public sector. The NEP, 2021 must assess whether a quadrupling of capacity is conceivable without significantly changing their ownership profile. The draft policy must review whether restructuring government-owned electricity assets can incentivise private investment, retaining only a residual, core investment in areas where market-based solutions are premature or where the active participation of government is necessary.[d]

3. The Limits of Competition

Enhancing competition to increase efficiency is a reasonable general proposition. However, political economy constraints impeding competition cannot be ignored. The "Atmanirbhar" programme is an example of geopolitics dictating a "closed" domestic policy. The shift away from "open economy" principles to the active use of industrial policy to protect domestic producers is a growing constraint on competition in the global supply of goods and services.

The draft NEP, 2021 should define the sequencing, nature and extent of competition necessary for optimising the cost of supply and incentivising efficiency enhancement, such that it does not impede integrated investment across the supply chain.

d For example, funding electricity supply to remote areas and the border regions, high-value security areas, R&D initiatives, and capacity-building of human resources.

The preliminary draft policy appears optimistic on the near-term potential benefits of retail supply competition, i.e. licensing more than one distributor in an area,[e] the possibility of appointing a sub-licensee, the systemic benefits of franchising local supply to panchayats and local governments. These could be contextually appropriate options. However, each intervention needs safeguards to ensure that it does not splinter the grid but enhances the uniformity of supply standards and the quality of customer servicing.

4. Fixing The Basics

Prepaid Meters

Paragraph 7.17 of the draft policy states that all new connections should come with pre-paid meters and all existing meters should be changed to the pre-paid mode within three years.

Such a transparent billing and payment mechanism can be efficient and is already widely used for mobile phone services by cost-conscious users. Thus, the same multi-option digital-plus physical pre-payment system can be replicated for electricity, with the additional advantage of generating decentralised, informal top-up card vendor livelihoods and to the detriment of expensive company employees or BPO agencies in urban areas.

In South Africa, the widespread use of pre-paid electricity meters resulted in the reduction of electricity consumption by 13 percent due to better household budget management by customers. Lower outstanding utility receivables from unpaid bills benefited the utility. However, the benefits vary between larger customers and small customers. Most importantly, the associated welfare impact on poorer customers must be ascertained. Backup programmes must be in place to support poorer customers, to prevent them from dropping out of the electricity access safety net due to the hard, cash-budget constraint imposed by pre-paid metering.[11]

Revised Subsidy Delivery Mechanism

Paragraph 7.21 of the draft policy proposes a radical departure from how the subsidy is currently delivered. The EA 2003 requires that state governments must deposit subsidy in advance for identified beneficiaries, to enable the regulatory commissions to suitably adjust the tariff downwards. However, this is rarely implemented in practice. Moreover, the guidance hitherto has been that not more than 50 percent of the average cost should be given as a subsidy to any user, and it must be further limited to 30 kWh consumption per month per customer.

e Although the Tariff Policy, 2016 explicitly ruled it out.

The draft policy does away with this guidance, leaving it to the state governments to determine the quantum of subsidy per customer, with the caveat that the subsidy will be provided directly by the state government to the customer and not via reduced tariff. Thus, electricity tariff will now reflect the average cost of supply, thereby encouraging customers to be economical in using energy, which will, in turn, drive the sale of energy-efficient end-use equipment and help reduce carbon emissions.

At the same time, welfare and efficiency concerns must be assessed and managed. Most electricity connections in India are in the name of the house owner, not the tenant—a problem also encountered whilst transferring cash subsidy to unregistered tenant farmers.[f] To this end, a mechanism could be introduced for the compulsory registration of tenants for electricity billing. This will also help boost the revenue from property tax, since rented properties are charged at higher rates than self-occupied properties.

These "smart" options, however, cannot easily be applied to the mass of informal rent-in arrangements, sans rental deeds in urban villages, resettlement colonies, and the "affordable housing" segment. While the direct transfer of electricity subsidy is a good idea, it is tough to implement fairly. Any change in policy must consider the welfare consequences carefully, to avoid enhancing the existing financial stress on those at the bottom of the income pyramid.

Allocation of the Actual Costs of Supply to Tariff

The parent legislation, EA 2003, and the Tariff Policy, 2006 prescribed that tariff must reflect the normative cost of supply. However, two decades on, neither is the actual (as opposed to the average) cost of supply for a customer category accounted for nor do tariffs increasingly reflect these differential costs. There are no solutions proposed in the draft policy for this regulatory lapse that arises from the lazy allocation of differential costs to the appropriate customer.[g] For industrial and commercial tariff to become competitive, it is crucial to account for the actual cost of supplying electricity and strip away the load of "cross-subsidy."

f To address this issue, the new farm legislation seeks to formalise the leasing-in of land.

g The actual cost of supply varies with the volume of demand, the voltage of supply, the time of supply and the distance of the customer from the grid. An "average tariff" pools customers into a group and applies a single average common cost of supply to all. This encourages "free riding" by customers who might impose a much higher cost than the average and penalises others whose costs are lower than the average.

A subset of such rational cost allocation is "time of use tariff," which is unevenly implemented for retail users and not at all for bulk grid supply, where it can easily be metered and priced differentially. Further, the draft must consider a significantly higher penalty under the "availability-based tariff" regime for short supply by a generator at peak times rather than at off-peak times, to reflect the time-dependent market price of power in the exchange. Similarly, the transmission tariff should incentivise capacity upgrade to meet the changing needs of the load flow while ensuring minimal line loss.

Metered Supply

Paragraph 7.19 of the draft policy highlights the urgency for better metering, which is a critical requirement. Whilst most feeder lines are metered, only 70 percent are linked to the national portal to automatically record data; amongst distribution transformers, only 37 percent are metered. A three-year period has been proposed for the full metering of the grid and the sub-grid.

The metering of supply is a core responsibility of all licensees, and failure to comply should be severely penalised by the relevant commission by holding back the pass-through of the full cost of supply, including what should have been spent on effective metering and monitoring. More of the same micro-focused central assistance is not the answer, and state governments must step up and take responsibility.

India's poor state of metering is not an outcome of financial stringency. Bulk purchase through a global tender, on the pattern of what Energy Efficiency Services Limited (EESL)[h] did for LED bulbs, is being implemented as a Union government initiative. So far, approximately 1.5 million smart meters have been installed at a zero up-front cost to utilities in five out of 30 states, under the classic, energy services model, where the incremental revenues defray the capital costs. This top-down "win-win" techno-fix has yielded significant results. Billing from 1.1 million smart meters improved by 21 percent, with an increase in utility revenue of INR 2.6 billion and a reduction in ATC loss by 10–36 percent. The target of 250 million smart meters, however, is a difficult task and the implementation is likely to be stretched out significantly.[12]

h EESL is an energy services company that specialises in carbon emissions abatement through energy efficiency. It is a joint venture of four Union government-owned public sector undertakings: National Thermal Power Corporation Ltd, Power Finance Corporation, Rural Electrification Corporation Ltd and POWERGRID.

State-Level Ownership of Reform

The EESL experience demonstrates that a "managerial" as opposed to a political economy driven "soft budget" approach can improve governance within DISCOMs. Top-down rescue by Union government "white knights" is helpful but breeds "aid-dependency."

State governments must start owning the problem of poor local governance and face the consequences via the instruments of democratic accountability. Bankrupt state-owned DISCOMs result in poor power supply and consequential lower growth prospects for the states themselves. At the national level, the World Bank assessed an annual loss of 4.1 percent of GDP (2016) on account of poor access and quality of power, environmental damage due to coal generation, overuse of cheap power for ground water extraction, uncompetitive power tariff for industry and energy shortages.[13]

RE Incentives

Paragraph 5.24 of the draft policy calls for a review of the scheme formalised in 2010 for the determination of Renewable Purchase Obligation (RPO) as an administrative measure to force captive generators, bulk open access consumers, and DISCOMs to purchase RE from the then nascent, high-cost RE generators.

The RPO scheme is administratively complex. Against the compulsory purchase of RE at negotiated or bid rates, consumers get a Renewable Energy Certificate (REC) equal to a defined volume of MWh for every MWh of RE purchased. The REC is tradable at the Indian Energy Exchange (IEXL) or the Power Exchange of India Limited (PXIL). CERC periodically determines the minimum and maximum tradable price. The traded prices tend to lean towards the minimum price, since enforcement of the compulsory purchase obligation has been lax, dampening the demand for RECs.

In March 2010, against a four-percent share of RE in the total electricity generation, the Ministry of Power had prescribed compulsory purchase equivalent to 11.5 percent of the total purchase of power at the retail level by 2016–17.[14] The achievement was six percent. By March 2019, the share of RE had increased to around 10 percent but remained considerably below the target of 19 percent.[15] The primary purpose of the REC mechanism was to artificially reduce the purchase price of RE for DISCOMs by socialising

its uncompetitive cost across the pool of generated power from all sources. This was an implicit tax on fossil fuel and hydro generation, in addition to the existing explicit indirect tax on fossil fuel. The RPO/REC incentive scheme did increase RE capacity from 16 GW in March 2010 to 36 GW by March 2014, even as the minimum purchase price for solar REC decreased from INR 12,000 in 2010 to INR 9,300 in 2014. Under the Modi government, even though the minimum REC price reduced to INR 3,500 in 2017 and then further to INR 1,000 in 2018, scaling up of the level of ambition and mainstreaming of solar PV technology as a primary tool for abating carbon emissions resulted in capacity reaching 94.4 GW by 31 March 2021.[16]

In the future, as technological improvements are made in battery storage, RE will quickly become competitive on its own, without additional implicit subsidies. A detailed review of the type of incentives required to achieve RE targets and the cost effectiveness of the RPO/REC mechanism is advisable.

Hydro Power Incentives

Paragraph 5.23 of the draft policy proposes to initiate a hydro RPO/REC for large hydro projects, to defray the high cost of project delays and cost overruns. The cost effectiveness of this non-transparent, socialised, off-the-public budget subsidy mechanism must be critically examined before it is extended.

Far more significant will be to introduce "time-of-use" pricing in bulk power purchase and generator availability, to ensure that RE and hydro revenues reflect their crucial role in meeting peaking power requirement, where they compete with gas-fired generation, and, in future, with MW-sized battery support services.

5. Indexing Change

Shun Tired Templates

Some of the provisions in the draft policy proposals fail to align with the *principles of efficiency and equity*. For instance, Paragraph 7.7 suggests that the franchisee model is a "preferred route" for achieving something close to privatisation of distribution. However, the franchisee model, while possibly superior to an inefficient public utility, confers only limited potential benefits compared to outright privatisation, which outsources both the financial and the managerial risk from the public budget and encourages innovation in energy services.

Broadband Customer Tariff Categories

Paragraph 17.5 of the draft policy proposes liberalising the mechanisms for the supply of electricity to EV public charging station (PCS), e.g. via a new class of licensees called "energy aggregators." While this is commendable, Paragraph 17.2, by proposing a differential tariff for the PCS, departs from the principle that *customers with similar characteristics should have a similar tariff*. Thus, a PCS should be subject to the same tariff regime as any other commercial consumer with similar voltage and demand characteristics.

Establishing City-centric Distribution Utilities

The draft policy fails to explore the potential of institutionally expanding the managerial role of the 18 metropolitan regions/areas, the 54 one million+ cities, and the larger cities under the "smart cities programme," beyond their constitutional mandate of street lighting. The NEP 2021 must examine the ways in which these urban entities can take on full ownership of a dedicated electricity utility to meet the urgent needs of high-quality energy services in dense urban areas, where the EV programme is to be incubated.

Cross-border Electricity Trade

The draft policy should emphasise the opportunities available for diversifying the energy mix in South Asia. India has the capacity to be a regional hub for transparent and efficient trade in electricity, for the mutual benefit of all countries in the SAARC[i] and BIMSTEC[j] regional groupings. With the International Solar Alliance located in India, harmonising regional product and supply standards and converging business regulations present an opportunity to enhance the free flow of electricity across borders. India's potential for 748 GW of solar power and its additional untapped potential of 100 GW of hydropower should be used as a regional resource for a common "green" energy future.

> "India can be a regional hub for transparent and efficient electricity trade, to create a "green" energy future for the SAARC and BIMSTEC nations."

i SAARC is the South Asian Association of Regional Cooperation created in 1985, with eight member countries including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

j BIMSTEC is the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation constituted in 1990 and includes Bangladesh, Bhutan, India, Nepal, Sri Lanka and Thailand.

Conclusion

The expert committee faces an onerous task of drafting the NEP 2021. The committee must bind the fragmented structure of the draft electricity policy into a strategic framework for the next two decades, with tangible targets for the high-level objectives and defined milestones for the web of downstream activities.

India is close to achieving full access to electricity for all. The unfinished tasks now relate to the following: (a) identifying the mid-term investment planning milestones for following a cost-effective, low-carbon path to net-zero and dealing with the issue of stranded assets as in gas generation, thermal projects based on imported coal or older RE generators with lower efficiencies, which face technological obsolescence; (b) broadly indicating the respective roles for the public and the private sector; (c) assessing the cost benefits of competition "for the market" and "in the market" for the electricity supply chain; (d) weeding out the administrative and regulatory inefficiencies that keep supply costs higher than norms, constrain utility finances and burden customers with inflated bills; and (e) rationalising the functional allocation of mandates for electricity generation, transmission and distribution across the Union government, state governments, and large cities on the principles of network efficiency, scale effect, and financial and managerial capacity.

To this end, the expert committee must be prescient in anticipating technological changes, compassionate in ensuring that no one is left behind during the transition, and ruthless with embedded interests that seek to preserve traditional privileges. Finally, adopting the private-sector lens to assess the economic and financial viability of options will be indispensable in marrying theory with pragmatism.

Endnotes

1 Government of India, Ministry of Power, "National Electricity Policy," February 12, 2005.

2 Government of India, Ministry of Power, "Draft National Electricity Policy 2021," Draft National Electricity Policy 2021.

3 Mitchell Ferman, "Winter storm could cost Texas more money than any disaster in state history," *The Texas Tribune*, February 25, 2021, https://www.texastribune.org/2021/02/25/texas-winter-storm-cost-budget/.

4 Power Finance Corporation, "Report on performance of state power utilities 2018-19," https://pfcindia.com/DocumentRepository/.

5 Ministry of Power, Government of India, "State Distribution Utilities Seventh Annual Integrated Ratings," October 2019, https://www.pfcindia.com/DocumentRepository/ckfinder/files/GoI_Initiatives/Annual_Integrated_Ratings_of_State_DISCOMs/7th_Rating_Booklet_Final_13-10-2019.pdf.

6 Central Electricity Regulatory Commission, Economics Division, "Report on short term power market in India 2014-15," 2016, http://www.cercind.gov.in/2015/MMC/AnnualReport14-15.pdf.

7 Central Electricity Regulatory Commission, "Availability Based Tariff- Order no 2/99 dated July 29, 1999," http://www.cercind.gov.in/Neworder2000.html

8 Khabarhub.com "NEA gets permission to procure power from Indian market: NEA MD Shakya," April 16, 2021, Nepal India Power Trade.

9 Daljit Singh "Newer challenges for open access in electricity," Brookings India, April 28, 2017, https://csep.org/impact-paper/newer-challenges-for-open-access-in-electricity/.

10 International Energy Agency, Key Energy Statistics, 2018, https://www.iea.org/countries/.

11 B. Kelsey Jack and Grant Smith, "Charging ahead: Prepaid electricity metering in South Africa," December 2016, Working Paper 22895, NBER, http://www.nber.org/papers/w22895.

12 https://eeslindia.org/en/smart-meters/, May 31, 2021.

13 Fan Zhang, "In the Dark- How much do power sector distortions cost South Asia?" 2019, South Asia Development Forum, Washington, DC: World Bank.

14 Power System Operation Corporation Ltd, National Load Despatch Centre, "Renewable Energy Certificate Mechanism in India: Key Learnings, Data Analysis and Way Forward," July 2018.

15 Government of India, Ministry of Statistics and Program Implementation, Central Statistics Office, "Energy Statistics, 2019, Twenty Sixth Issue," http://mospi.nic.in/sites/default/files/publication_reports/Energy%20Statistics%202019-finall.pdf.

16 CEA, CEEW, "India Renewables Dashboard," https://www.renewablesindia.in/,

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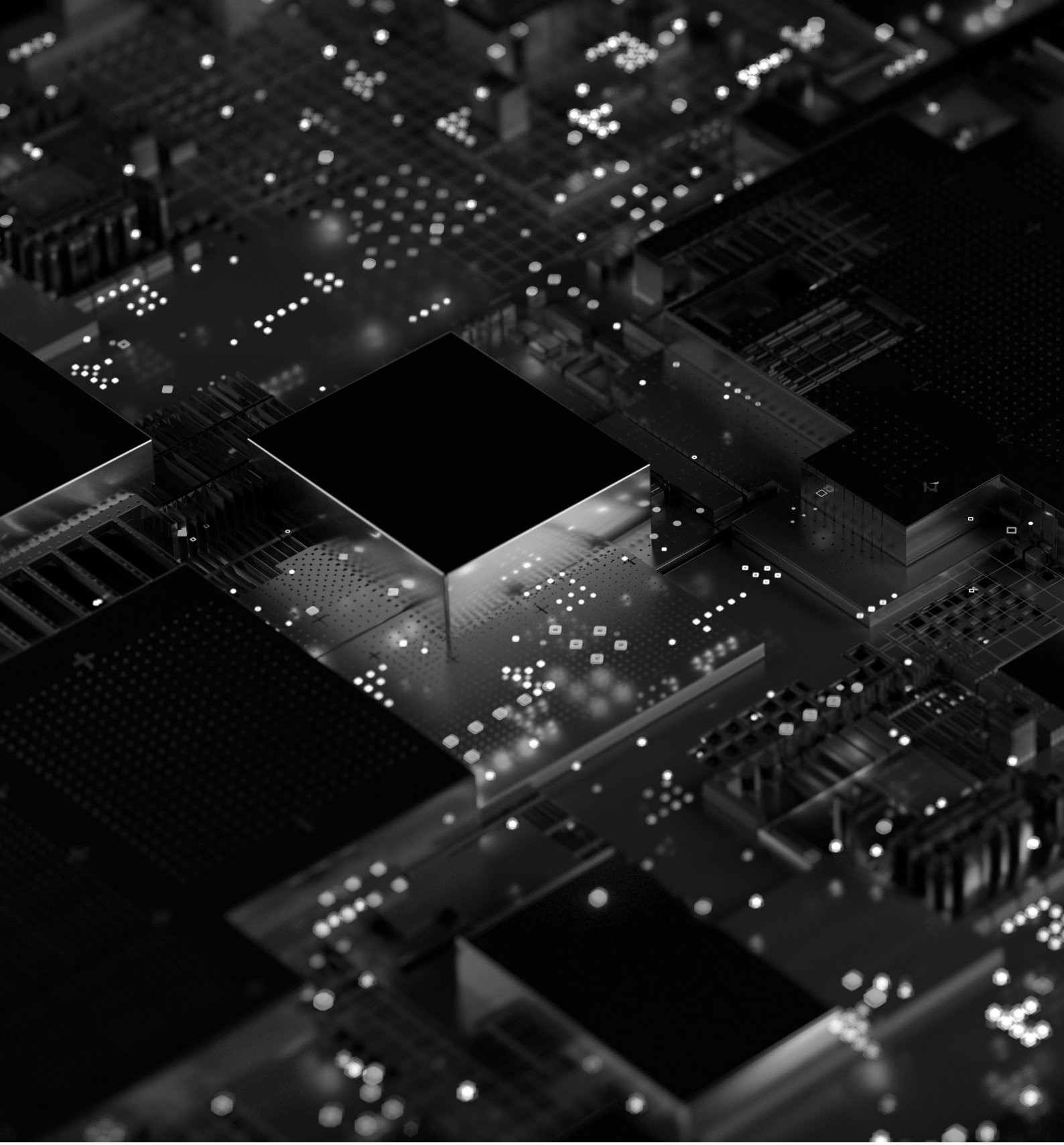

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