
Draft National Electricity Policy 2021 – Suggestions of TERI

The draft National Electricity Policy (NEP) 2021 was circulated by the Ministry of Power on 27 April 2021 inviting suggestions to the Expert Committee. As desired, a presentation was made by TERI to the Expert Committee on 15th May 2021 (copy attached as Annexure).

A. Generic Suggestions :

- 1) *The NEP 2021 may spell out vision and objectives stemming from current and emerging priorities including (a) climate change, (b) sustainability, (c) environmental pollution and (d) reliability, affordability and quality of supply.*
- 2) *The policy should envision a ‘Just Transition’ to a fossil-fuel free electricity system.*
- 3) *Estimation of demand and its projection of demand profiles should form the basis of sectoral planning across the value chain.*

A review of key initiatives and schemes which have been rolled out after framing of NEP 2005 would be extremely useful.

B. Para-wise comments/suggestions:

5.0 OPTIMAL GENERATION MIX

5.3 Differential tariffs between peak and off-peak hours for consumers and generating stations by CERC/ SERCs, as envisaged in the Tariff Policy, should be introduced expeditiously in order to appreciate the value of peaking power. SERCs need to frame a scheme whereby consumers willing for curtailment in their demand, part or full load, get the benefit of a lower tariff.

TERI’s Suggestion(s):

The State Electricity Regulatory Commissions notifying Regulation for Time-of-day tariffs may consider specifying large enough price differential in generation tariff as well as retail tariff as per grid requirements (demand profile) to send appropriate price signals for attracting investments and voluntary participation of consumers in demand side management.

5.4 A regulatory framework for determination of adequate (national, regional and state level) primary, secondary and tertiary reserves should be developed by CEA so that demand can be met at all times even with planned outage/ tripping of generating units, variability of generation and fluctuation of load so that the frequency is maintained at the nominal value of 50 Hz.

TERI’s Suggestion(s):

While developing a regulatory framework for determination of national, regional and state level primary, secondary and tertiary reserves, the need for ensuring requisite spatial distribution across the country be duly considered for safe and secure operation of grid.

THERMAL GENERATION

5.6 While India is committed to add more capacity through non-fossil sources of generation, coal-based generation capacity may still be required to be added in the country, as it continues to be the cheapest source of generation, though compliance to stricter environmental norms remain a challenge, particularly for the older stations. Therefore, endeavor should be to adopt the most efficient technology for coal-based power stations available at any point of time. All future coal-based plants should only be super critical/ ultra-super critical technology or other more efficient technology.

TERI's Suggestion(s):

India has set itself the ambitious targets of increasing renewable capacity to 175 GW by 2022 and 450 GW by 2030 and has also taken concrete steps towards reducing its emissions. The goal of the energy transition should be to have a fossil fuel free electricity system.

There is surplus thermal power generation capacity at present, and there are additional plants under construction. Hence, adding more coal-based capacity in future should be the last resort so as to enable transition towards a low-carbon pathway in power sector. In order to enable this, the Government should frame a strategy for ensuring Just Transition in electricity and its primary fuel i.e. coal.

5.7 Adequate coal should be made available to meet the requirements of power plants so that generation capacity is not stranded due to shortage of coal. At the same time, coal-based power plants should maintain adequate stocks in power stations to meet day to day and seasonal fluctuations of demand since coal cannot be transported instantaneously. In the past, there have been cases where shortages in coal supply and quality of indigenous coal have been constraints for generating plants. However, with the efforts made by the Government, coal shortages have been eliminated. To address concerns regarding quality of coal, third party sampling of coal has been started at loading as well as at receipt end. To reduce the margin of error in sampling, automated coal sampling and on-line quality measurements should be encouraged.

TERI's Suggestion(s):

Government of India may also consider addressing the shortage and quality of coal by way of rationalization of coal linkages and allocating higher grade coal for coal-based plants designed for imported coal. This will also help in reducing dependence on imported coal.

5.9 Use of natural gas as a fuel for power generation would depend upon its availability at reasonable prices. At present, about 6.74% of total installed capacity is through gas-based plants and the average PLF of such plants is about 22.15% only because of less availability of domestic gas and high landed cost of imported Regassified Liquefied Natural Gas. The possibility of utilizing the existing gas turbine/ combined cycle gas-based capacities for peaking or balancing may be made flexible with respect to time, depending on requirements, instead of constant flow. These gas stations should be compensated for reduction of efficiency and increased wear and tear due to fluctuations in generation.

TERI's Suggestion(s):

In view of the limited availability of cheap domestic gas and the high cost of imported LNG, the power sector may be provided gas at a pooled market determined price. The take or pay contracts may be dispensed with, and gas prices should be market determined. With time-of-day tariffs, gas based power plants could provide supply during peak demand hours and also increase system flexibility.

HYDRO GENERATION

5.11 Delay in the construction of hydro projects is primarily due to the reasons like delays in environment and forest clearances, settlement of rehabilitation & resettlement issues, resolutions of inter-state issues, land acquisition, inadequate infrastructural facilities at hydro potential sites, law & order/ local issues, funds constraint and contractual issues etc. causing significant time and cost overruns thereby impacting their commercial viability. Geological surprises are major contributors for delay in implementation of hydro projects. Efforts should be made to reduce geological surprise through advanced technological tools. Proper implementation of the National Policy on Rehabilitation and Resettlement (R&R) would be essential so as to ensure that concerns of project affected families are addressed adequately. For faster resolution of disputes with contractors, thereby reducing time and cost overruns, there is need to develop model contract document for award of work in hydro projects.

TERI's Suggestion(s):

- i) Hydro potential has value beyond electricity generation (grid support and flexibility, peaking power), and the multipurpose hydro projects also serve for irrigation. .*
- ii) Pumped storage projects (PSP) can help facilitate integration of greater shares of variable RE into the power system. However, as high investment cost and long gestation periods pose additional challenges in promoting this storage technology, there is a need for greater policy interventions, for example by bundling PSP with RE for round the clock (RTC)/flexible supply, consideration of PSPs as regulatory asset as a grid supporting measure, and a common asset under ancillary services, etc. Policies should consider the additional services PSPs offer, and frame incentives to encourage investment accordingly. Small head PSPs need to be considered from capital cost and implementation time considerations.*
- iii) There is a need for developing technologies which are uniquely suited to the Himalayan terrain, necessitating commitments to investment for suitable R&D and capacity expansion.*

RENEWABLE ENERGY SOURCES AND COGENERATION

5.19 There is an urgent need to promote generation of electricity based on renewable energy sources due to its environmental benefits coupled with energy security. Hybrid renewable energy generation like wind-solar, solar-biomass, solar-mini hydel, etc. with or without energy storage system should also be encouraged. Further, hybrid operation of variable renewable sources like solar and wind with conventional generation sources and energy storage systems would facilitate self-balanced portfolio with Round-the-clock power supply of acceptable profile.

TERI's Suggestion(s):

i) India's reservoirs have 18,000 sq.km. of area with the potential to generate 280 GW of solar power through floating solar photovoltaic (PV) plants. The Policy should encourage the States to maximize utilization of this available potential in developing floating solar PV plants in the respective States. This will also help the States in fulfilling their RPO requirement.

ii) India's geothermal potential is over 10,000 MW, however, presently there are no geothermal plants in India. There is an urgent need for further exploration and study of identified geothermal locations in India so that geothermal energy could be promoted for electricity generation and thermal applications.

RENEWABLE ENERGY SOURCES AND COGENERATION

5.23 'Long term growth trajectory of RPOs' for non-solar as well as solar sources has been issued by the Ministry of Power uniformly for all States/ UTs up to year 2021-22. Trajectory beyond this period, if required, shall be notified by the Ministry of Power in consultation with MNRE from time to time. Large hydropower projects (with capacity) more than 25 MW) shall also be treated as renewable sources of energy. The Ministry of Power shall also notify a trajectory for Hydropower Purchase Obligation for a period up to 2029-30 and may extend it further, if required.

TERI's Suggestion(s):

Considering falling tariff of solar power due to decline in Solar PV module cost, the need to give emphasis for procurement of solar power may not be necessary and RPO targets need not distinguish between solar and non-solar targets separately.

5.26 There are a number of advantages of distributed generation, as most of the energy generated is used at the point of consumption and, therefore, it reduces the requirement of transmission and distribution infrastructure. It also helps to reduce congestion and transmission & distribution losses. Therefore, renewable distributed generation such as solar rooftop need to be promoted. Central Government is promoting off-grid solar PV applications through various schemes for use in home lighting systems, street lighting systems, solar power plants, solar pumps etc. One way of promoting solar PV systems, particularly in household applications and small industries is through net metering. The Electricity (Rights of Consumers) Rules, 2020 provide such metering for loads up to 10 kW. State Governments should consider installing solar PV system in office & school building, panchayats and other public service institutions.

TERI's Suggestion(s):

There is a need for incentivizing Rooftop solar and other emerging RE technologies (biomass energy, etc.) using gross metering (with feed-in tariffs) for increasing pace of development in these sectors.

- a. Gross metering would be more equitable between large and small consumers, and would also be more sustainable for DISCOMs. Net metering allows consumers who would otherwise have paid higher (subsidizing) tariffs to show low overall consumption, which not only impacts the DISCOM's ability to collect cross-subsidy, but also allows those consumers to become 'subsidized instead of subsidizing'.*

- b. *Feed-in-tariffs would provide a simpler mechanism for investment in decentralized generation, which will be advantageous to India's renewable ambitions, which have so far been realized through large utility scale solar projects. Developing decentralized solar plants would reduce transmission investments. Separate feed-in tariffs for roof-top solar in kW range in rural areas and bio-mass energy would be required to encourage technology specific innovations and maximal realization of their respective potential.*

MICROGRIDS

5.28 The Discoms, in areas prone to natural disasters, should explore possibility of automatic islanding of the distribution system into multiple micro grids with own distributed generation during storms/ cyclones etc.

TERI's Suggestion(s):

i) Given the extension of the grid to every willing household, microgrids, with their high tariffs and operation and maintenance issues, may not be cost effective. Having extended connections, the obligation of universal supply and reliable power should be with the DISCOM, and the focus should be on providing reliable supply for households. Local generation and consumption should be encouraged to reduce transmission losses, but the tariffs should be regulated by SERCs.

ii) While Demand Side Management (DSM) and local generation can help; it is unclear how microgrids can help in disaster resilience. In disaster prone areas, the focus should be on disaster resilient infrastructure, emergency capacity [maintaining backups and redundancy (portable DG sets, etc)]; and restoring grid operations.

RENOVATION & MODERNISATION (R&M)

5.32 R&M of old wind power plants by replacing them with modern and more efficient wind generating units, results in flexibility of generation power across a higher range of wind speed and thereby generating more power at the same location with high-Capacity Utilization factor. The Ministry of New and Renewable Energy, in August 2016 released a Policy for repowering of Wind Power Projects with an objective to promote optimum utilization of wind energy resources by creating a facilitative framework for repowering.

TERI's Suggestion(s):

While the MNRE policy advocates replacement of old wind power plants with newer more efficient plants, this clause may not be appropriate under R&M.

6.0 TRANSMISSION

6.11 India is centrally placed in South Asian region and with cross border interconnections with neighbouring countries, can play a major role in effective utilization of regional resources. India is also a member of BIMSTEC countries.

Presently, India is connected and transacts electricity with Nepal, Bhutan, Bangladesh and Myanmar with transmission capacity of about 4000 MW. In the year 2019-20, India imported a total of 6310 MU of electricity and exported 9369 MU. Further, to facilitate import/ export of electricity between India and neighbouring countries, Ministry of Power, Govt. of India have issued the “Guidelines for Import/ Export (Cross Border) of Electricity – 2018”. On 18th December, 2018. Import/ export of power with neighbouring countries should be promoted for mutual benefit, which ultimately will lead to optimum utilization of regional resources.

TERI's Suggestion(s):

Cross-border electricity trade should be considered in overall power system planning, and the Policy should take due note of the recent initiative of MNRE, namely “One Sun One World One Grid” (OSOWOG) project which aims to promote cross border energy trade of all forms of clean energy.

7.0 DISTRIBUTION

TERI's Suggestion(s):

There is a need for a review and study of past reform initiatives and its impact towards developments in power sector. This would help in understanding the gaps and the initiatives which are required for subsequent developments in power sector (increasing RE, prosumers, universal supply, etc.) to achieve reform objectives.

7.7 For the progressive growth of the electricity distribution sector, it is essential that the sector becomes sustainable. Public Private Partnership (PPP) in electricity distribution sector is one of the effective ways to improve the efficiency, enhancing consumer satisfaction and reduce financial losses of the distribution companies. Franchisee model being one of the PPP model, has emerged as the preferred route for introduction of privatization in the distribution sector by delegating some distributing related responsibilities in an area to a third party on a contract basis and many states have already taken action in this direction. Another variant of the PPP model could be in the form of sub-licensee to be appointed with the approval of the State Commission. Thus, there is a need to create right environment for public private partnership in the distribution sector in the country. An element of competition can also be brought in the distribution sector by separation of the carriage (lines) and content (supply) business. To introduce the system of sub-licensee as well for separation of carriage and content, the Electricity Act 2003 will have to be suitably amended.

TERI's Suggestion(s):

There is a need to encourage private sector participation, especially in areas where performance has been consistently inadequate. However, the proposed separation of carriage and content will create multiple challenges, including:

- *Given past experience of competition for consumers (Open Access, delicensing in Mumbai), legislative reforms may not achieve intended benefits*
- *International experience also shows retail competition:*
 - *Does not guarantee lower electricity prices (In UK, US: retail prices fluctuated with gas prices)*
 - *Can increase volatility in average prices (In US, states with retail competition experience greater volatility)*
 - *Gains were dependent on consumer participation (with benefits greater for wholesale than retail)*
 - *Does not guarantee against market concentration*
- *Thus, delicensing distribution risks diverting scarce leadership resources away from:*
 - *Resolving the severe financial crisis of DISCOMs*
 - *Lack of cost reflective tariffs*
 - *High technical and commercial losses*
 - *Irregular regulatory true ups*
 - *Billing and collection efficacy challenges-*
 - *theft*
 - *non-payment of dues (...even by state government departments)*
 - *Universal Service Obligation: Achieving and maintaining 24x7 power*
 - *Transition away from fossil fuels*
 - *Sustaining sufficient surplus in generation capacity (preventing capacity shortages)*
- *Separation also raises additional challenges on:*
 - *Allocation of legacy PPAs*
 - *Treatment of existing losses and regulatory assets*
 - *Settlement of accounts, consumer migration, redressal mechanisms (supply decision like load shedding taken at the feeder level)*
 - *Sharing of investment in infrastructure charges between incumbent and emerging players*
 - *Introduces greater uncertainty in demand projections by DISCOMs*
- *Moreover, while choice alone may not lower prices for consumers (especially since cost of power in India nearly 80% of total expenses of DISCOMs), delicensing may introduce costs of implementation (in restructuring institutional frameworks, building consumer awareness, new metering and billing procedures) on DISCOMs, regulators, consumers etc., as well as other costs (e.g. Marketing costs to retain/expand customer base)*

7.8 The Regulatory Commissions should ensure that all the reasonable and legitimate costs are accounted for in the tariff without taking recourse to regulatory assets. Tariff determined by Regulatory Commissions should be able to finance necessary CAPEX to be undertaken by Discoms for improving the quality of supply. The Regulatory Commissions should ensure that tariff petitions are filed in time and processed expeditiously so that new tariffs could be made applicable w.e.f. the very first day of the following financial year, enabling the utilities to recover full revenue during each financial year. Trueing up of accounts of the utilities should be done at the earliest possible to ensure that unnecessary carrying costs are not allowed to inflate tariffs.

TERI's Suggestion(s):

i) The Policy should prescribe a fixed timeline so that the Regulatory Commissions reduce and eliminate regulatory assets and the same needs to be provided in their regulations.

ii) The Policy should require (a) the Regulatory Commissions to calculate the actual cost of supply for each consumer category at different voltage levels in order to rationalize tariffs and reduce cross-subsidies and (b) rationalization of categories of retail tariff.

7.10 Special emphasis should be placed on consumer indexing and asset mapping in a time bound manner. The Government of India is providing support for the same to the States through information technology-based systems under the IPDS program

TERI's Suggestion(s):

The Policy should require the Regulatory Commissions to fix timelines for GIS mapping and linking of all assets of distribution licensees and also implementation of Enterprise Resource Planning (ERP) system.

7.17 The use of automation and smart metering can play a pivotal role in bringing the positive transformation in the distribution sector. Smart meters have advantages of remote metering and billing, implementation of peak and off-peak tariff and demand side management through demand response. The shift to the pre-paid system will do away with all the problems associated with meter reading, billing, collection and disconnection in the case of non-payment. All new electricity connections should be released with smart pre-paid meters/ simple pre-paid meters. Further, existing meters should also be replaced with pre-paid meters in a phased manner so as to achieve 100% pre-paid metering within 3 years from the date of issuance of this policy. The State Commissions should also put in a place an independent third-party meter testing arrangement.

7.20 Use of Smart meters along with the energy audit systems is helpful to detect theft of electricity. The Electricity Act, 2003 has provided for stringent measures against theft of electricity. The States and distribution utilities should ensure effective implementation of these provisions.

TERI's Suggestion(s):

There is a need to have a differentiated metering approach, for maximizing utilization of cheaper conventional technologies such as pre-paid meters for low end consumers; and 2-way meters for solar rooftops, which can match improvements in billing efficiencies at lower costs, instead of emphasis on smart metering for all consumers.

9.0 POWER MARKETS

9.2 Government is committed to introduce suitable market mechanisms and also to deepen the spot markets by enhancing its percentage share to about 25% during the year 2023-24. These mechanisms may include capacity markets/ auction mechanisms that help do away with the rigidity of the present

long term PPA driven arrangements while catering to the need for reliable capacity. The government is also working proactively to usher in the next level of reforms in the power markets by introduction of longer duration forward contracts and derivatives on power exchanges. CERC has already approved a term-ahead product for renewable energy in power exchanges. There is need to take measures for encouraging trade of renewable energy in day-ahead markets as well. Further, the emphasis has to be on broadening the scope of ancillary services and to move towards market-based procurement of such services and to move towards market based procurement of such services. One important measures to maintain fairness and to minimize possibility of collusion and gaming in power markets is to put in place a strong regulatory framework and infrastructure for market monitoring and surveillance.

TERI's Suggestion(s):

The Policy should recognize that need based evolution of spot market is important, instead of prescribing a percentage in definite time frames. Study of international experience is recommended before introducing forward contracts and derivatives.

9.4 A new entity called aggregators may be created to aggregate demand, renewable power generation, demand response, micro-storage etc. to help small consumers, prosumers and producers reach the market. This would also help in promotion of open access which is presently allowed for consumers with a load of only 1 MW and above.

TERI's Suggestion(s):

There is a need for greater clarity on characterization and functioning of aggregator in the Policy.

14.0 ENVIRONMENTAL ISSUES

14.5 Stringent emission norms have been notified by MoEFCC for SO₂, NO_x, mercury and water which are required to be achieved in accordance with a notified time schedule and have cost implications on the operation/ design of coal based plants. In addition to the equipment cost to be incurred to meet the revised norms, there will be auxiliary power consumption. Efforts must be made to meet the compliance norms in the most cost effective way in order to minimize cost to consumers. These impacts should be captured by Regulators in the tariff determined under Section 62 of the Electricity Act. In case of tariff determined through tariff based competitive bidding under Section 63 of the Electricity Act 2003, these impacts should be allowed under "Change of Law" provision. Additionally, the use of biomass pellets (agro residue based) in co-firing with coal for power generation should be encouraged in order to curtail environmental pollution due to burning of crop residues.

TERI's Suggestion(s):

To reduce the emission intensity of the electricity sector, polluting and inefficient old coal-based plants should be either decommissioned or run only for meeting seasonal peaks so that their operation is minimized. Given the high costs of R&M retrofitting, and the reduced lifespan of these plants, it would be preferable to address environmental norms by limiting usage to only serving seasonal peaks when required, and not investing in R&M for old plants.

The modifications for meeting stringent emissions norms can thus be avoided, and absolute pollution levels reduced by limited usage, which will more cost-effectively reduce absolute pollution

14.6 Disposal of electronic waste is one of the major concerns for solar photovoltaic power projects. The State Governments (Central Government) should formulate a disposal policy so that the developer can easily dispose of the waste materials in line with policy. With reduction in prices of batteries, usage of batteries is likely to increase in future. Recycling/ disposal policy for the batteries also need to be formulated.

TERI's Suggestion(s):

The Policy should prescribe timeline for notifying of SOPs for disposal of electronic waste, especially for solar panels and grid storage batteries. Early action will allow identified disposal costs and mechanism to be factored into tariffs and contracts.

17.0 CREATION OF ELECTRIC VEHICLE CHARGING INFRASTRUCTURE

17.4 Distribution Licensee should be proactive in identifying part of distribution network that needs strengthening due to EV charging. SERCs may need to come out with special provision for early approval of the augmentation proposed by Distribution Licensee to facilitate EV charging.

TERI's Suggestion(s):

The Policy should require the Regulatory Commissions to enable setting up of EV charging infrastructure by DISCOMs by making such investments a part of normal investments in distribution.

18.0 MAKE IN INDIA INITIATIVE AND AATMANIRBHAR BHARAT ABHYAN

18.1 The primary goal of Make in India initiative is to establish India as a global manufacturing hub, by encouraging both multinational as well domestic companies to manufacture their products within the country. 'Aatmanirbhar Bharat Abhiyan' aims towards becoming a self-reliant economy.

TERI's Suggestion(s):

The Policy should propose that all future bids for solar with storage projects to have a condition in the bid document to manufacture the solar and associated components with full value addition in India. Inviting bids for solar power with-storage for the next 10 years with the condition that manufacturing with full value addition would be done in India would result in self-reliance in this critical area. Improving ease of manufacture through access to cheaper electricity, developed land with ready availability of infrastructure facilities, prior environmental clearances and special dispensation for duty-free imports of plant, equipment and spares would help develop domestic industry, which would increase equipment supply security and also create employment opportunities.
