VASUDHA FOUNDATION
Green ways for a good earth!

India's Power Outlook Series

Volume-6

A Compendium of the Latest Clean Energy Initiatives

June 2022

INTRODUCTION

India and the Promise of Net-Zero

The global average temperature is on a continuous rise. As per NASA's Goddard Institute of Space Studies (GISS), the average global temperature on Earth has increased by 1.1°C since 1880.[1] Moreover, the majority of warming has taken place since 1975 with around 0.15°C to 0.20 °C per decade as seen in Figure 1.
The year 2021 was the sixth warmest year on record.

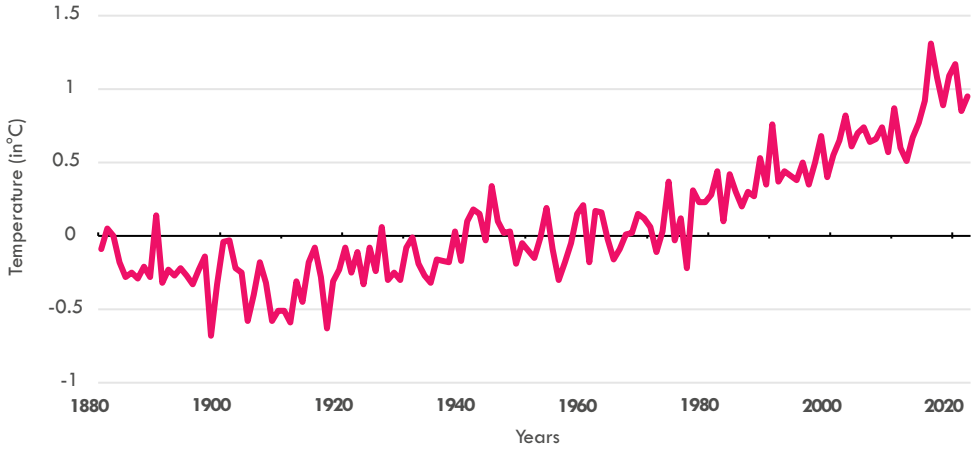


Figure 1 : Change in Global Surface Temperature Relative to 1951-1980 Average Temperatures

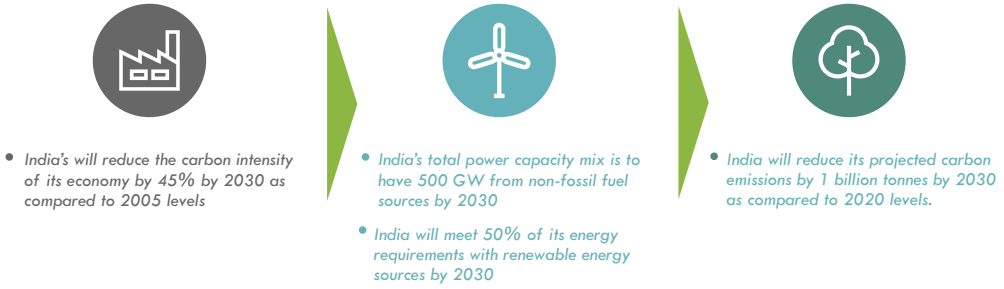


Figure 2 : India's Climate Targets for 2030

This exponential rise is an alarm bell and requires immediate global attention. At the Conference of Parties (COP26) held in Glasgow, Scotland in 2021, 195 countries came together with a common goal to limit anthropogenic emissions and avoid climate catastrophes in the future. This event also witnessed around 135 countries announcing their Net-Zero targets under different setups and institutional arrangements.
India belongs to this cohort and has pledged to meet the Net-Zero emissions target by 2070. Moreover, India has also released several short- to medium-term targets by 2030 as seen in Figure 2.

India's major share of emissions comes from the energy industry, accounting for 69 percent of overall GHG emissions in 2015. Within energy, electricity and transport industries remain the major contributors to GHG emissions as seen in Figure 3.

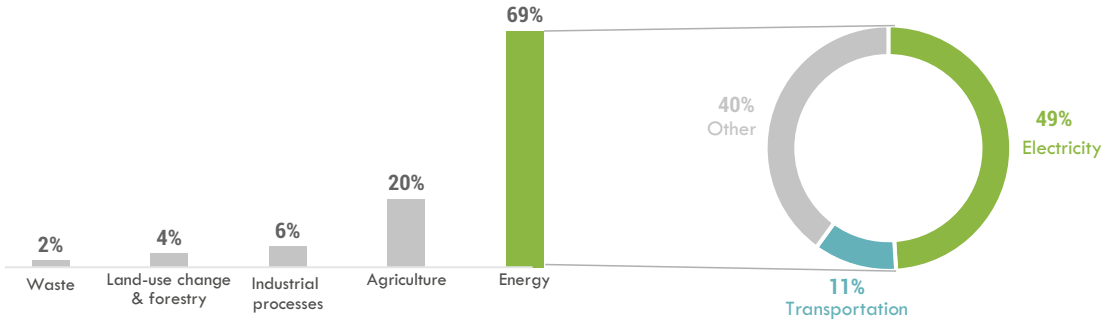


Figure 3 : Sector-Wise GHG Emissions in India

Thus, to meet India's global commitments, several policies, schemes, standards, and guidelines have been released by the Government of India (GoI). The next section delves deeper into the framework designed for this volume.

KEY INITIATIVES ASSESSMENT

This volume of the Power Outlook Series aims to provide a detailed analysis of a few key central-level policies, schemes, guidelines, and standards released in last two to three years that will have a big impact on how India meets it Net-Zero targets. As there are several initiatives at play, there is a possibility that certain key aspects may have been missed during formulation. Moreover, the progress of these initiatives is marred by a great degree of complexity, and thus actions on the ground are varied. In this context, an analysis of initiatives through a well-formulated framework may help in deriving the findings needed for their effective implementation.

The framework developed for this analysis uses a wide-ranging, theme-based approach. We then finalised the key parameters that will assist in the holistic assessment of these initiatives. Each initiative is then expounded under the selected parameters listed below.

A **NEED**

B **AIM**

C **DATE OF RELEASE**

D **OBJECTIVE**

E **SUMMARY**

F **KEY PROVISIONS**

G **CURRENT STATUS**

H **IMPACT**

I **KEY RECOMMENDATIONS**

To maximize the relevance of our recommendations, we have followed a thorough review process in the preparation of this volume. However, despite our best efforts, we have not been able to cover everything. There will certainly be many other key initiatives that we have not been able to consider, or that we may have missed out on. However, we did aim to do justice to the ones considered in this volume.

KEY INITIATIVES

POLICY

1 Electricity (Timely Recovery of Costs Due to Change in Law) Rules, 2021

22 October 2021

2 Electricity (Promotion of Generation of Electricity from Must-run Power Plant) Rules, 2021

22 October 2021

NEED

The GoI has committed to 175 GW Renewable Energy (RE) capacity addition by 2022 and has set a target of 500 GW of non-fossil fuel capacity addition by 2030 in the recently concluded COP26 forum. High targets for renewable capacity addition must be backed by commensurate policy support to realise the scale of capacity addition at the desired pace. Wavering cost recovery of renewable energy projects has plagued the sector from its inception and continues to inhibit its growth by acting as a disincentive to emerging RE projects. Concurrently, the RE powerplants that were recognised with a 'must-run' status, often underwent curtailment due to the increased penetration of intermittent RE in the grid causing issues in grid balancing. This arbitrary curtailment has no remedy for the power producer, mentioned in the Grid code or Power Purchase Agreements (PPAs). Petitions to the concerned tribunals from the power producers brought no monetary relief and lacked securing an accountability mechanism for the power procurers.

Thus, to protect the interests of the RE investors and ensure timely recovery of their costs in the event of changes to the law, it's high time that the prevailing policy ambiguity is done away with for India to meet its climate targets.

AIM

To protect the interests of the investors and allied stakeholders in RE projects by introducing mechanisms to ensure their financial security and viability.

OBJECTIVE

Policy 1

In the event of a change in law, restore the economic position of the affected party (renewable power producer) to the previous position before implementation of the new law, through tariff adjustments.

Policy 2

Introduce monetary compensation mechanism to renewable power producers in instances of curtailment, unless for technical constraints or security concerns of the electricity grid, as provided by the Indian Electricity Grid Code.

KEY PROVISIONS

Policy 1

- The power producer has a three-week window to notify the procurer for compensation.
- Post three weeks of notice (or) 30 days post change in law, producer to submit computed tariff which is to be recovered from procurer.
- Recovery of proposed charges to commence in the subsequent billing cycle of tariff.
- Flexibility in the mode of recovery - one-time payment; monthly computed tariff; or a combination of both.
- Adjudicating Commission to verify and approve proposed charges within 60 days from the date of receipt of a relevant submission from the power producer.

Policy 2

- No curtailment or regulation of power generation or supply for 'must-run' deemed power plants by citing commercial considerations.
- Agreement for purchase or supply of electricity to specify compensation charges to be borne by procurer in event of arbitrary curtailment.
- In case of curtailment notified by the procurer in advance, power producers are permitted to sell electricity in power exchange.
- The deficit in the realisation of the amount through power exchange is to be borne by the procurer.
- In case of excess realisation, charges are to be adjusted in subsequent billing cycles.

CURRENT STATUS

The burden of revenue disparity caused due to a change in the law is borne by the renewable power producer. To have delay in timely payments results in financially stressed investors. With increased RE commitments, the sector needs to transform itself into an investor-friendly sector.

Concerning curtailment of 'must-run' power plants, the procurers were issued multiple directives to deter arbitrary curtailment without any monetary relief to the power producers. A recent judgment by the Appellate Tribunal of Electricity (APTEL) passed in *National Solar Energy Federation of India Vs. TNERC & Ors. (2021)*, was the first case in which the Tribunal provided monetary relief by directing the power procurers to compensate the power producers for unjustifiable curtailment with a ceiling of 75 percent of the PPA tariff on the loss of generation suffered.

IMPACT

Creating an investor-friendly environment for upcoming RE projects

Reduction in financial burden for renewable power producers and increased accountability of concerned stakeholders

KEY RECOMMENDATIONS

Policy 1

1. Incorporation of retrospective operation as there are several RE projects under litigation due to changes in laws that have occurred in the last two years.

Policy 2

1. Explore guidelines to provide system operators control over the output of variable RE plants. This will allow them to view RE power plants as assets in maintaining grid reliability.

2. Enhance transparency by providing a detailed report on the reasons for curtailment to the affected generators. This will allow them to plan their future projects better.


Li-ion
ENERGY STORAGE

MAKING VARIABLE RENEWABLE ENERGY MORE DISPATCHABLE

POLICY

1 Guidelines for Procurement and Utilization of Battery Energy Storage Systems as part of Generation, Transmission, and Distribution Assets, along with Ancillary Services

10 March 2022

NEED

The global push for decarbonisation has rendered RE the most affordable and clean source to meet energy requirements. Concomitantly, the Indian government has committed to 175 GW RE capacity addition by 2022 and has set a target of 500 GW of non-fossil fuel capacity addition by 2030 in the recently concluded COP26 forum. High penetration of RE in India's power portfolio is accompanied by variability and reliability challenges in supplying power to meet energy requirements. Recent studies have advocated for the integration of Energy Storage Systems (ESS) with RE generation as a pathway to ensuring the supply of reliable and clean power. ESS has critical applications across Generation, Transmission, and Distribution sectors in a majority-RE power mix scenario. Key ancillary services for a resilient grid are also derived from ESS. Among the commercially deployable storage solutions, a report by the Central Electricity Authority (CEA) has identified Battery Energy Storage Systems (BESS), and Pumped Hydro Energy Storage (PHES), as the front-runners. The report envisages 27,000 MW of BESS capacity in addition to 10,151 MW of PHES capacity to be installed by 2030 to support high RE penetration in the country's power portfolio. Thus, to foster an environment that supports the capacity addition of BESS, clear guidelines are necessary to encourage stakeholders. The roles and responsibilities of each actor should be unambiguously defined to avoid administrative roadblocks and regulatory barriers in emerging BESS projects.

OBJECTIVE AIM

These guidelines aim to facilitate BESS capacity addition by issuing guidelines that define the modalities associated with procurement and utilisation of BESS across Generation, Transmission, and Distribution assets, including ancillary services.

27,000 MW of BESS capacity by 2030.

SUMMARY

The document extensively defines procedures and processes surrounding the bidding process and award of projects, project implementation modalities, and other provisions surrounding dispute resolution. The policy recognises the following stakeholders –Battery Energy Storage System Developer (BESSD), authorised representative of the procurer (in case the Agreement is signed by a different entity from the one participating in the bidding process), intermediary procurer (trading licensee), and end procurer (distribution licensee).

Under the bidding process section, the policy details the process for inviting bids and lists the prerequisites to be upheld by each stakeholder. The policy also mentions financial safeguards to be furnished between the BESSD and the procurer, concerning the Request for Selection (RfS) document and the Battery Energy Storage Purchase Agreement (BESPA). The project implementation section provides for the various terms, performance parameters and considerations to be included as part of the BESPA. Details of project commissioning at various stages and associated requirements from the various stakeholders have been furnished in the policy. Mandates surrounding payment security mechanisms, and recommendations in event of *force majeure* have been established to pre-emptively divide risk among the stakeholders. Additional provisions surrounding dispute resolution have been established which go beyond the regular legal mechanisms. Additional forums to promptly address disputes can be formed at the behest of the Central/State government, by the relevant stakeholders.

KEY PROVISIONS

The document has comprehensively addressed the modalities concerning BESS procurement and utilisation. It has highlighted the business cases that can emerge on the theme.

Business cases covered are -

- RE project with BESS where complete ownership lies with the generation entity
- BESS infrastructure integration with transmission assets for network decongestion
- BESS is used by System Operator for flexibility and load balancing services
- BESS integration with DISCOM for demand-side management
- Standalone BESS for arbitrage operation
- BESS owner engages in storage lending service to reap capacity charges
- BESS developer trades capacity in the power market
- Any other business cases as found suitable by Procurers/Intermediary procurers/beneficiaries/Generators

The mode of engagement between the stakeholders and their respective responsibilities has been clearly defined. Potential conflict areas in project commissioning, financial guarantees, and dispute resolution have been described with mechanisms for redressal.

CURRENT STATUS

BESS projects are at a nascent stage in India. The country's first grid-scale BESS was a 1 MW BESS set up in Puducherry in 2017. In 2019, a project jointly helmed by AES India, Fluence, and Mitsubishi Corporation deployed a 10 MW/10 MWh[2] system offering one hour of energy storage in Tata Power's distribution network in Delhi. In March 2021, Tata Power in collaboration with storage company Nexcharge installed a 150 KW /528 kWh[3] BESS offering six-hour storage to reduce the burden on their distribution transformers. The BESS was designed to charge during the off-peak hours and discharge the power during peak hours. This supported the distribution transformers to manage peak load, regulate voltage and frequency, manage reactive power, and defer CAPEX (capital expenditure) among other benefits. In a recent development, Tata Power Solar Systems was awarded a 100 MW solar project with a 120 MWh[4] BESS in Chhattisgarh. Additionally, the Solar Energy Corporation of India Limited (SECI) has initiated a tender to set up a standalone Inter-State Transmission System (ISTS) connected to BESS for an aggregate storage capacity of 1000 MWh (500 MW x 2 hrs). As shown in Figure4, about 322 MW of BESS projects are under construction, and projects amounting to 621 MW are in the tendering stage. Additionally, as observed in Figure 5, advancements in technology and economies of scale have seen prices of the Li-ion battery pack and cell decrease over the years. It is forecasted that Li-ion battery packs will decrease to USD 58/kWh by the year 2030. However, increasing demand for Lithium is bound to slow the fall in price in the medium term before the supply-demand is stabilised.

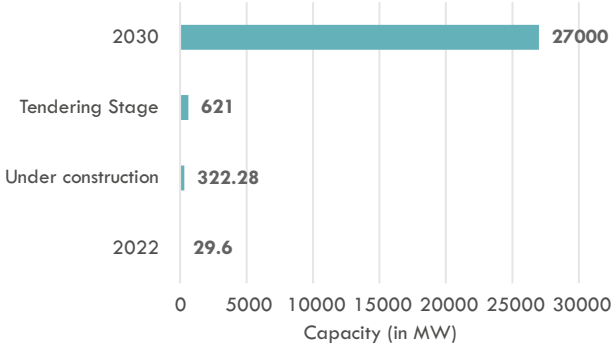


Figure 4 : BESS Capacity in India[5]

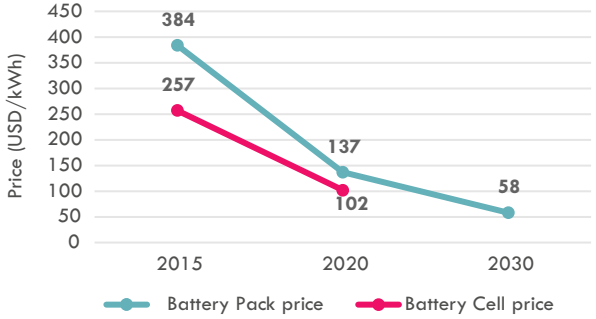


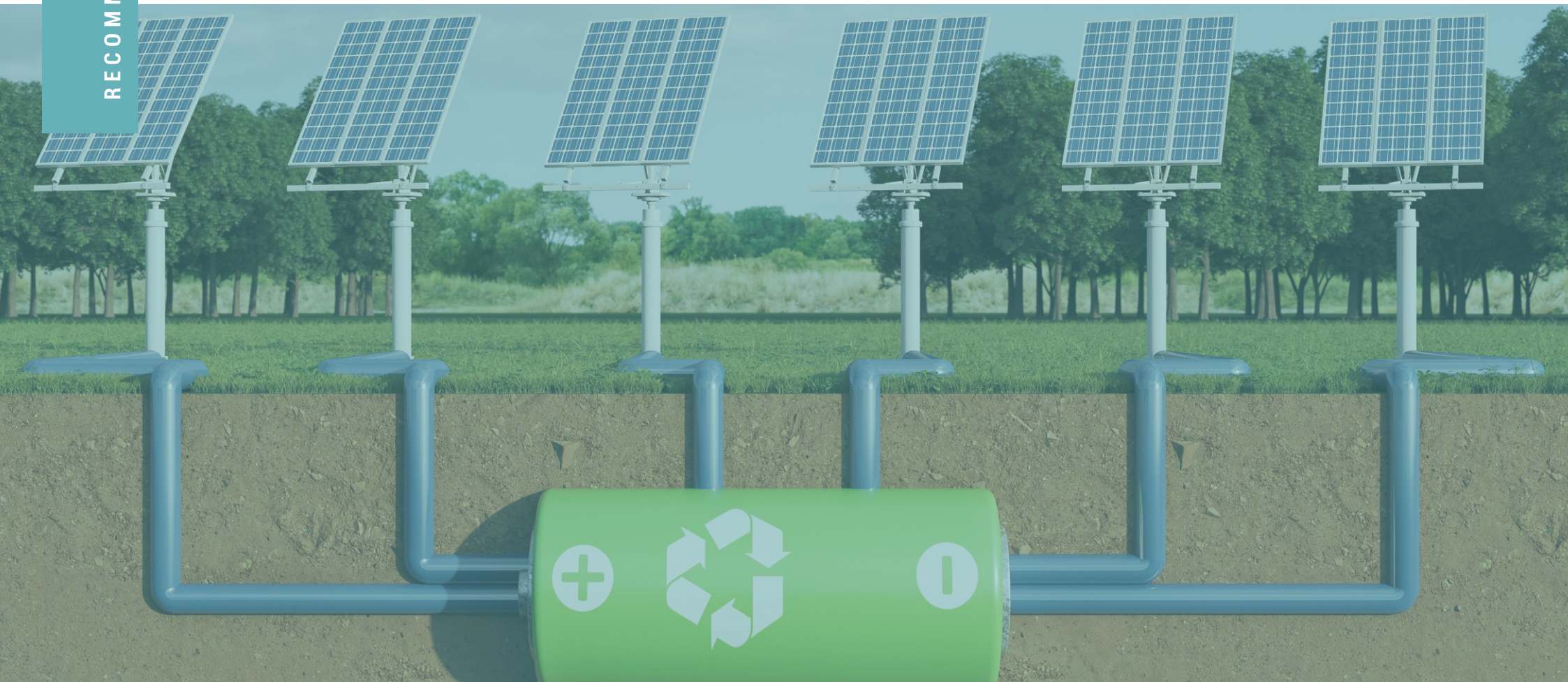
Figure 5: Price Trend of Li-ion Battery Pack and Cell[6]

IMPACT

- BESS projects will help in managing high RE integration in the grid
- Dependence on thermal power generation can be reduced
- New business avenues for power sector stakeholders to improve their financial standing
- Job creation through upcoming energy entrepreneurs

KEY RECOMMENDATIONS

1. Inclusion of standards around the health and safety of the personnel and equipment deployed at the site.
2. Methodology to consider battery degradation during financial analysis is important and must be specified for each battery technology.
3. Detailed follow-up guidelines on the performance monitoring criteria for the BESS plants should be released. Along with this, there must be provisions in place for penalties to be levied in case the desired performance and safety standards are not followed by the developer.



POLICY

2 Guidelines for Procurement of Round the Clock Power from Grid-connected RE Power Projects

22 July 2022

NEED

The Government of India has undertaken numerous measures to facilitate large-scale renewable energy and hence pave the way towards achieving its renewable energy targets. Some of them include easy land acquisitions, evacuation through solar parks, dedicated transmission corridors, PPAs for 25 years, etc. All these measures coupled with improved technology and economies of scale have resulted in record low tariffs and rapid deployment of wind and solar energy projects across the country. However, time and again the intermittency of renewable energy has resulted in its low capacity utilisation and has not been a favorite with DISCOMs due to its limited availability. The 22 percent renewable energy generation vis-a-vis a 40 percent RE capacity share showcases the inability of RE sources to meet variable electricity demand. With the common goal of 'greening the grid', there is a need to make RE more accessible and available 24x7, resulting in increased generation and dispatch.

AIM

With this background, the Ministry of New and Renewable Energy (MNRE) set forth guidelines for procurement of round-the-clock(RTC) power by DISCOMs from grid-connected RE. This could be done either by bundling RE with coal-based thermal power projects or with power from any other forms of storage, through competitive bidding (as per the amendment in November 2020).

OBJECTIVE

450 GW of RE by 2030

SUMMARY

The guidelines aim to integrate variable renewable energy with stable power sources such as thermal or energy storage to provide a 24x7 power supply. It further incentivises DISCOMs to fulfill their renewable energy purchase obligations by procuring RTC power. The guidelines further look at providing a transparent and fair platform based on open competitive bidding in two stages – technical and financial. Finally, it looks at defining the role of an intermediary, i.e., trader to aggregate the power purchased from different RTC power generators.

KEY PROVISIONS

Direct Incentives:

- A higher percentage of RE generation in the power mix.
- Building DISCOMs confidence to procure RE during peak hours - A Power generator will be required to operate and maintain 85 percent capacity utilisation annually, along with 85 percent of the power availability during peak hours (four out of 24 hours)
- Firming Renewable Energy - The Government is slowly transitioning from solar or wind-only projects to hybrid to assured peak power to finally RTC projects. The idea is to move in the direction of reliable RE integration and load following.

Indirect Incentives:

- Accelerating the transition to clean energy - RTC tenders will overcome the natural limitations of variability and intermittency and would lead to rapid RE deployment and higher RE generation.
- Boost to energy storage - Practically, it is impossible to achieve RTC power supply without introducing batteries. While energy storage technologies are still expensive, these guidelines will act as a push for RE developers to move beyond the 18-30 percent Capacity Utilisation Factor (CUF) for solar and wind.

CURRENT STATUS

It is not the first time that the bundling of RE projects with conventional fuels, particularly coal, has been introduced. Phase 1 of the National Solar Mission (NSM) saw the bundling of the then cheaper NTPC's coal-based power plants with expensive solar power. The situation has now reversed, with cheaper solar being complemented with expensive coal.

Solar Energy Corporation of India (SECI) Round-the-Clock Bid details

Bidding Scheme/Project Brief	States/Pan India	Technology	Date			
			Start Date/Notification Date	End Date/Due Date/Bid Submission Date	Auction Result Date (Applicable only for auctioned/Allocated	Anticipated Date of Commissioning
2500 MW of Round-the-Clock (RTC-II)	Pan India	Thermal + RE	17-03-2020	03-09-2021	Oct-21	Mar-24
400 MW Round-the-Clock (RTC-I)	NDMC (200 MW) Dadra & Nagar Haveli – Daman & Diu (200 MW)	Solar-Wind Hybrid	18-10-2019	23-03-2020	May-20	Nov-22

Source: Vasudha Foundation Analysis

In October 2019, the Solar Energy Corporation of India (SECI) issued the first tranche of RE RTC tender of 400 MW (RTC 1). This was then followed by another tender announcement in March 2020 for RE plus thermal where the initial capacity of 5,000 MW was revised to 2,500 MW in December 2020. It was the RTC- 1 auction results in May 2020 that led to the formation of guidelines for the tariff-based competitive bidding process for RTC power projects.

While the RTC auctions were ought to be a potential game-changer to ensure dispatchability of RE plants, the amendments made under both the tenders leave little room for these tenders to qualify as an RTC in real terms. The critical amendment that was introduced but later removed in these tenders was that the power is available when the DISCOMs demand it and not when the RE developer schedules it.[7]

IMPACT

The RTC auctions followed by the guidelines have been instrumental in bringing major renewable energy companies to participate in auctions requiring 80-85 percent CUF on an annual basis and also during peak hours. This necessitates either of the two things – increased capacity deployment or integration of energy storage technologies.

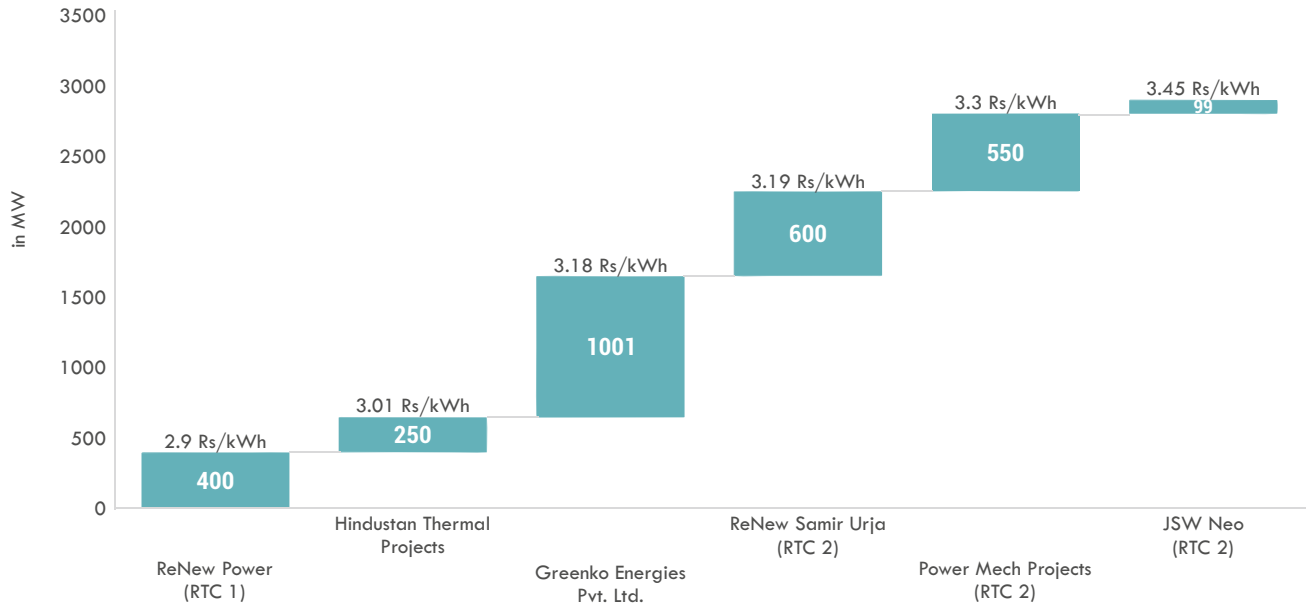


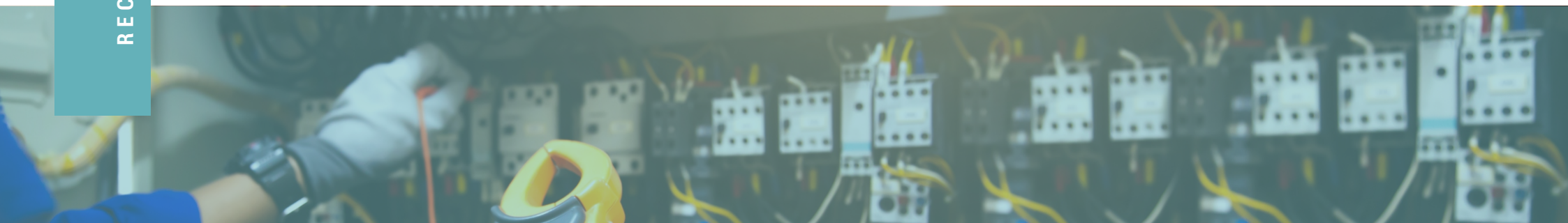
Figure 6: SECI Round-the-clock Bid Results

KEY RECOMMENDATIONS

1. There is a need for DISCOMs and system operators to facilitate effective integration at the system level given the diversity and scale of load and supply options they manage.[8]

2. To ensure RTC supply, developers may oversize their RE capacity which may result in an excess generation. Hence, there is a need to couple this with storage, but that may be expensive for the next few years. It is worth mentioning that the success of a real sense RTC contract lies in choosing the right mix of generation sources such as RE + hydro or RE+coal, till the time battery costs remains high.

3. To make it RTC in the true sense, the tenders should be precise regarding the power supply terms on a daily rather than monthly basis. If a specific duration of the power supply is set, the storage component will enter the picture.




H2

POLICY

1 Green Hydrogen Policy

17 February 2022

NEED

As India's GDP continues to register steady growth, the demand for energy and natural resources will see a significant concomitant rise. As per International Energy Agency (IEA), India is expected to face a massive energy demand, making the country the highest contributor to the growth in primary energy demand in the world. This highlights that India needs to make an informed set of decisions to propel its development through a long-term balanced approach. At COP26, India has already committed to Net-Zero emissions by 2070. Therefore, enhancing resource efficiency and exploring new clean technologies to meet future energy demand are some of the key imperatives for ensuring that the trade-offs between environmental goals and growth can be minimised.

In the search for an abundant fuel that can meet both these needs of growing energy demand and interest in reducing carbon emissions, certain options like Hydrogen are turning out to be promising in becoming the fuel of the future. Moreover, India's heavy reliance on imported oil and gas could leave the country vulnerable to price volatility and potential disruptions in the supply chain. Therefore, hydrogen posits itself as a promising solution. Hydrogen as a fuel has multiple uses since it has direct industrial applications and can be an effective way to make fuel cell-based batteries. Therefore, it is believed that hydrogen has the potential to play a transformational role, especially when produced using RE.

AIM

The Indian government aims to achieve Net-Zero emissions by facilitating the transition from fossil fuel/fossil fuel-based feedstocks to Green Hydrogen/Green Ammonia both as energy carriers as well as chemical feedstock for different sectors.

SUMMARY OBJECTIVE

5 MMT of Green Hydrogen by 2030.

The policy indicates that the hydrogen/ammonia produced by way of electrolysis of water using RE or produced from biomass will be considered Green Hydrogen/Green Ammonia. It also aims to facilitate the flow of renewable power across states for its production. There is also support for setting up green hydrogen/green ammonia manufacturing units across the country. This appears to be the first phase of the policy transition that will encourage key users of hydrogen and ammonia such as the fertiliser industry, oil & gas refineries, etc., to produce green hydrogen for captive use.

KEY PROVISIONS

Direct Incentives:

- Waiver of Inter-State Transmission Charges for 25 years for the projects commissioned before 30 June 2025.
- Banking for RE for 30 days is allowed.
- Land in RE parks can be allotted for Green Hydrogen/Green Ammonia.
- Green Hydrogen/Green Ammonia plants can be set up in any manufacturing zone.
- Green Hydrogen/Green Ammonia manufacturers shall be allowed to set up bunkers near ports for storage and subsequent export/use by shipping.

Indirect Incentives:

- Grant of open access to the projects within 15 days of receipt of application.
- Connectivity to the Inter-State Transmission System to be provided on a priority basis.
- RE consumed for the production of Green Hydrogen/Green Ammonia shall count for the Renewable Purchase Obligations (RPO) target of the consuming entity.
- MNRE to create a single portal for all statutory clearances and permissions required for the manufacture, transportation, storage, and distribution of Green Hydrogen/Green Ammonia.
- MNRE can aggregate demand for several sectors and have a consolidated bid conducted for procurement of Green Hydrogen/Green Ammonia.

CURRENT STATUS

The demand for hydrogen in India is around 6 MMT per year and is primarily met via grey hydrogen produced from fossil fuels. The demand is mainly from the fertilizer and refinery industries. As observed in Figure 7, the demand is projected to grow to 7.3 MMT by 2025 and almost double by 2030. It is also observed that adequate support for green hydrogen can contribute to upwards of 40 percent of the total hydrogen requirement. Figure 8 illustrates the rising demand for hydrogen globally by 2030.

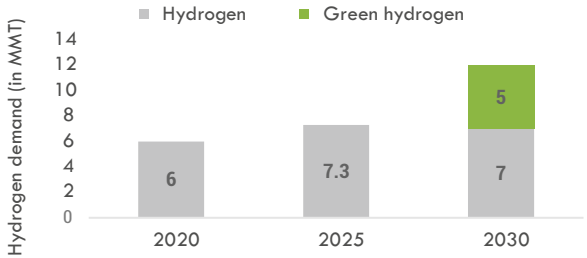


Figure 7: Hydrogen Growth Projections for India

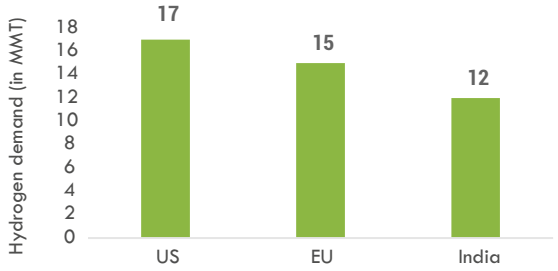


Figure 8: 2030 Global Hydrogen Demand Comparison

1. Pilot Projects:

- National Thermal Power Corporation (NTPC) awards India's first green hydrogen microgrid project at Simhadri, Andhra Pradesh.[9] Bloom Energy is assisting NTPC by providing a 240 kW Solid-Oxide Electrolyzer and Fuel Cell. Deploying Hydrogen Infrastructure for NTPC,[10] this unique project aims to decarbonise far-off regions of the country that are dependent on diesel generators.
- Indian Oil Corporation Limited (IOCL) to set up the Hydrogen plant at Mathura and Panipat Oil refineries by 2024.[11] IOCL aims to produce 70,000 tonnes of Green Hydrogen by 2030, accounting for 10 percent of its overall consumption by that time.
- Request for Selection (RFS) for the 25 kW Green Hydrogen pilot project in Ladakh has been released.[12]

CURRENT STATUS (Contd.)

2. Collaboration & Partnerships:

- India and Australia sign Letter of Intent to cooperate on scaling up the manufacture and deployment of clean Hydrogen.[13]
- L&T, IOC, and Renew Power announce a partnership to focus on green hydrogen in India.[14] Under this agreement, the entities will jointly develop, own, execute and operate green hydrogen projects in India.

3. Plan & Roadmaps:

- NTPC to make a hydrogen roadmap for Ladakh to attract foreign funding in the domain.[15]

4. End-use products:

- India's first Fuel Cell Electric vehicle (FCEV) powered by hydrogen, Mirai, has been launched in India by Toyota.[16]

IMPACT

- Creating an enabling environment for a stronger green hydrogen ecosystem to emerge by 2030.
- This policy will assist in slashing the cost of producing green hydrogen from USD 4/kg to USD 1/kg by 2030.

KEY RECOMMENDATIONS

Solar and wind are considered to be the most powerful tools to build India's energy independence. However, there are persistent bottlenecks that are slowing their progress. The GOI is cognizant of these issues and intends to develop holistic policies to establish robust supply chains around green hydrogen while it is still in its infancy. It has expressed its willingness to release a National Hydrogen Mission that will help in implementing the Green Hydrogen Policy.[17] The following recommendations, if incorporated into the mission, will embolden these efforts:

1 Supply-side Interventions:

a. Set up Green Hydrogen Infrastructure Investment Fund and provide funding for early-stage hydrogen technologies.
b. Explore blending capabilities of natural gas pipelines with green hydrogen to decipher a safe percentage.
c. Conduct studies to map suitable geological sites to store hydrogen as that is the most lucrative storage option in current times.
d. Focus on the program for skill development on the Hydrogen Value Chain similar to Suryamitra.[18]
e. Focus on Waste-to-Hydrogen

2 Demand-side Interventions:

a. Create policy measures for green hydrogen demand creation like setting up large-scale demonstration projects across multiple use-cases and sectors, purchase obligations, and more.
b. Presence of PLI scheme for green hydrogen and allied industries like FCEV manufacturing, hydrogen fuelling stations, etc.
c. Release RTC RE tenders along with hydrogen for storage.

3 Other Interventions:

a. Develop standards for hydrogen use-cases across the ecosystem. For example, transporting hydrogen from hubs where it is produced to service stations where it is used involves movements through urban areas, so safety is important.[19]
b. Creation of a task force to ensure effective implementation of the policy and the roadmap.

POLICY

2 Policy for Biomass Utilisation for Power Generation through Co-firing in Coal-based Power Plants

08 October 2021

NEED

India's coal production climbed from 639 million tonnes in 2015–16 to 716 million tonnes in 2021-22. CO_2 emissions have also increased concurrently from 2.37 gigatonnes in 2015-16 to 2.88 gigatonnes in 2021-22.[20] As per CEA, the coal-fired power plants will continue to play an important part in India's energy security with capacity estimated to expand from 205 GW in 2020 to 266 GW in 2029-30.[21] Thus, there is a need for multiple interventions to reduce emissions from these plants. One of the best solutions is co-firing of biomass pellets. Co-firing is a low-cost, near-term option for converting biomass to electricity efficiently and cleanly by using biomass as a partial substitute fuel in high-efficiency coal boilers.

AIM

The GoI aims to promote the use of biomass pellets in coal-based Thermal Power Plants (TPPs) to address rampant air pollution caused by the burning of farm stubble and reduce the carbon footprint in thermal power generation.

OBJECTIVE

Five to 10 percent blend of biomass pellets in coal-based thermal power plants.

SUMMARY

With around 750 Million Metric Tonnes (MMT) of biomass available every year in India, there is a huge opportunity to utilise biomass in generating necessary energy forms. This policy emphasises the use of biomass pellets in coal-based thermal power plants by blending the pellets with coal, which will help in the reduction in stubble burning in north Indian states and create an economic agro residue. It is a holistic policy that has set targets for blending biomass with coal in TPPs. There have been provisions in place to file for an exemption from blending on a case-to-case basis. Furthermore, the facets around tariff determination and scheduling are well articulated.

KEY PROVISIONS

- Mandatory for coal-based thermal power plant with bowl mill or ball & rice mill to blend five percent of biomass pellets with coal. After two years from this policy release, it will be increased to seven percent.
- Mandatory for coal-based thermal power plant with ball & tube mill to blend five percent of torrefied biomass pellets with volatile content below 22 percent.
- The policy would be in force for 25 years or till the useful life of the thermal power plant, whichever is earlier.
- The minimum contract for procurement of biomass pellets should be seven years.
- Obligated Entities like DISCOMs can meet their RPO targets by procuring power from such plants.

CURRENT STATUS

As of January 19, 2022, India's coal-fired power stations had co-fired 59,000 tonnes of biomass. Contracts for the acquisition of 1.1 million tonnes of biomass pellets have been awarded, with tenders for another 5.5 million tonnes being floated.

- The GoI has taken various measures to promote the policy by launching portals like SAMARTH (Sustainable Agrarian Mission on use of Agro Residue in Thermal Power Plants) that mandate that coal-fired plants use biomass pellets as a minimum of five percent fuel mix with coal for power generation.
- A total of 13 Power stations of NTPC have been modified with the technology.[22]
- NTPC completed the cofiring with a seven percent blend of Biomass pellets in the Dadri Plant.[23]
- Haryana State Genco was able to cofire 550 MT of biomass in two of its power plants and float tenders worth 11 lakh metric tonnes.[24]
- Training programs organised in Haryana and Punjab to sensitise and train stakeholders for participation in the value chain of biomass co-firing in TPPs.[25]

IMPACT

1. Reduces air pollution and creates an economic value for agro residue.

2. Encourages the establishment of decentralised pellet manufacturing units and generates employment.

3. Creates an additional income source for the farmers.

KEY RECOMMENDATIONS

1. Heavy industry is the second-largest source of carbon emissions after the power sector, accounting for 27 percent of CO_2 emissions. Provisions must be made in the policy to include heavy industries using coal in captive thermal power plants.

2. The overall cost of Biomass pellets is more in comparison to coal. Government should come up with a supporting economic plan for biomass pellets manufacturers to encourage the industry.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IEC62053-23 Cl.2
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POLICY

1 Revamped Distribution Sector Scheme (RDSS): A Reforms-based and Results-linked Scheme

20 July 2021

NEED

The electricity distribution sector has remained the weakest link in the entire power sector value chain. The Indian government has designed various bail-out schemes for the distribution sector but its plight remains unchanged. A series of schemes have been launched by the government to support a sustainable turnaround of the DISCOMs. Steps have also been taken for the automation and use of Information Technology (IT) in the Distribution sector under the Accelerated Power Development and Reforms Programme (APDRP), Restructured Accelerated Power Development and Reforms Programme (R-APDRP), and Integrated Power Development Scheme (IPDS). This includes a range of measures from consumer and asset mapping to installing Advanced Metering Infrastructure (AMI) meters on feeders and distribution transformers. Rural electricity access and supply have increased tremendously under the Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) and Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGYA) schemes. The more recent Ujjwal DISCOM Assurance Yojana (UDAY) scheme has played a significant role in improving the accountability and performance of DISCOMs.

Despite these periodic bailouts, the sector still faces significant challenges. The DISCOMs continue to grapple with a large number of operational and financial losses and have not been able to ensure a sustainable turnaround of the sector.

AIM

The scheme is designed to improve the quality and reliability of power supply to consumers through a financially sustainable and operationally efficient distribution sector.

OBJECTIVE

- Reduce Aggregate Technical & Commercial (AT&C) losses to pan-India levels of 12-15 percent by 2024-25.
- Reduce Average Cost of Supply (ACS) - the Average Revenue Realised (ARR) gap to zero by 2024-25.
- Develop institutional capabilities for the modernisation of DISCOMs.
- State-wise target will be defined based on current levels within various DISCOMs.[26]

SUMMARY[27]

Scheme Description :

Part A
This component included providing financial aid to the DISCOMs for metering, distribution infrastructure, and project management support.

Part B
This component essentially looks at augmenting the human resource requirement that shall include training, capacity building, and other enabling support.

SUMMARY

Financing: The total allocated funds under the scheme is ₹ 3.03 lakh crores with an estimated ₹ 97,631 crores as grant budgetary support from the Central government. For Part B, an estimated ₹ 200 crores will be spent by State governments for supporting technical assistance. Counterpart funding will be provided to DISCOMs by PFC/REC and/or Banks/other FIs. Funding can also be leveraged from bilateral/multilateral institutions for which the GoI would extend benefits of reduced Government Guarantee Fee.[28]

Eligibility: All State-owned distribution companies and State /UT Power departments, excluding private sector power companies, will be eligible for financial assistance under the revamped scheme.

Implementation Period: The scheme is for five years –from FY 2021-22 to FY 2025-26.

Implementation Agency: Renewable Energy Corporation and Power Finance Corporation.

Conditional Financial Assistance: The scheme aims to improve the operational efficiencies and financial sustainability of all DISCOMs/Power departments, excluding private sector DISCOMs, by providing conditional financial assistance for supply infrastructure strengthening. The aid is granted to the DISCOM, provided it meets pre-qualifying criteria and meets basic minimum benchmarks as determined by an agreed-upon evaluation mechanism linked to financial improvements.

KEY PROVISIONS

Direct Incentives:

- Adoption of the carrot and stick approach will help expedite working at the DISCOM level: The scheme mentions that there shall be no sanctions after May 31, 2023. Hence, all applicable DISCOMs/power departments will have to submit their detailed action plan within the stipulated period. This will ensure timely action and implementation. Accordingly, to incentivise the States/UTs to fast-track installation of prepaid Smart Meters by December 2023, an additional incentive of 7.5 percent of the cost per consumer meter or ₹450 (whichever is lower) shall be available.
- Enabling key reforms will improve the financial viability of the distribution sector - The scheme puts a lot of focus on facilitating operational reforms and infrastructure improvement at the DISCOM level. It further stresses the need to reduce AT&C loss levels to reasonable limits.
- The scheme provides adequate financial support to overcome the key stumbling blocks of a DISCOM in achieving viability such as Metering and Billing, Electricity supply to the agriculture sector, and distribution system inefficiency. It will also provide targeted funding for feeder segregation in unsegregated feeders which would further enable solarisation under the KUSUM (Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan) scheme, installation of prepaid smart meters, and system metering and system up-gradation measures.

Indirect Incentives:

- Discoms could leverage new technology up-gradation under the scheme to undertake informed decisions regarding loss-making pockets, demand forecasting, Time of Day tariff, etc.
- Further, smart meter implementation will lead to consumer awareness of usage patterns, and hence better demand-side management programs could be designed to help meet India' Net-Zero targets.
- In the light of Revamped Distribution Sector Scheme (RDSS) smart metering targets, there will be a top-down mandate and guidelines that would ensure metering and Advanced Metering Infrastructure (AMI) technology compatibility as well as policy certainty. Hence, it could limit the flexibility in metering system design. This would help the retailer minimise its choices and will, therefore, result in easier implementation.

CURRENT STATUS

- The DISCOMs in most States and Union Territories (UTs) have submitted their action plans. Likewise, 39 out of 55 beneficiary DISCOMs have already submitted their draft proposals and are in active discussions with nodal agencies for their finalisation. Other DISCOMs are also expected to send their proposals shortly.[29]
- Uttar Pradesh, Andhra Pradesh, Himachal Pradesh, Kerala, Assam, Meghalaya, and Uttarakhand have been proactive in preparing plans for operational and financial improvements under the scheme.

IMPACT

Under the scheme, 10 crore prepaid meters are to be installed in the first phase by December 2023. The following shall be the priority order for smart meter installation

- All-Union Territories
- All Electricity Divisions of 500 Atal Mission for Rejuvenation and Urban Transformation (AMRUT) cities, with AT&C Losses > 15 percent in the base year;
- Industrial and Commercial consumers;
- All Government offices at the block level and above;
- Other areas with high losses, which shall mandatorily include electricity
- Divisions having more than 50 percent consumers in urban areas and with AT&C losses of more than 15 percent and other electricity divisions with AT&C losses of more than 25 percent, in the base year.

The final target is to install 250 million meters by the sunset time of the scheme.

KEY RECOMMENDATIONS

1. Time and again the Central government has provided financial assistance to the distribution sector. While the schemes can provide some temporary relief towards reducing the losses, there is a need for revamp in the overall functioning of the DISCOMs. New initiatives like separation of carriage and content, increased private sector participation, tariff reforms that reflect the real cost of supply, etc., need to be realised to ensure the real viability of the distribution sector.

2. The distribution sector is huge, complex, and diverse.[30] Several factors like consumer mix, political environment, geography, etc., have a huge bearing on electricity demand, DISCOM functioning, and its viability. Hence, there is a need the understand that there is no umbrella policy or scheme that could put an end to the current situation of DISCOMs.


EESL
ENERGY EFFICIENCY SERVICES LIMITED
A JV of PSUs under the Ministry of Power
EESL AND NDMC PUBLIC ELECTRIC VEHICLE CHARGING PLAZA
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EXICOM
DL 10CP3585
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POLICY

1 Charging Infrastructure for Electric Vehicles (EV)- The Revised Consolidated Guidelines & Standards

14 January 2022

NEED

Over the last few years, the central and state governments have undertaken a plethora of initiatives to mainstream electric vehicle (EV) adoption. These initiatives include the Faster Adoption and Manufacturing of (Hybrid) Electric (FAME) Vehicles scheme, Performance Linked Incentive (PLI) scheme for auto manufacturers, and state-level EV policies, among others. Remarkably, these initiatives have started reaping benefits already. The EV sales are ratcheting up, albeit on a low base. With the increasing uptake of EVs, the classic 'chicken and egg' conundrum is unfolding. The EV sector presents immense business potential to multiple stakeholders, most prominently through the deployment of charging stations. However, there remain certain unanswered questions such as: how many chargers to install? What should be the capacity of the chargers? Where should these chargers be installed? What must be the tariff for charging stations and EV owners? Therefore, the need of the hour is an all-encompassing document with guidelines for all of these pressing questions

AIM

These guidelines aim to enable faster adoption of EVs in India by ensuring safe, reliable, accessible, and affordable charging infrastructure for all.

OBJECTIVE

To generate employment opportunities for small entrepreneurs while keeping the tariff for charging station operators and EV owners under check. Also, these guidelines will assist the Electric Utilities in ensuring the preparedness of the distribution infrastructure for larger EV load uptake, going forward.

SUMMARY

Under these guidelines, all entities are allowed to set up charging stations provided all the necessary technical and safety protocols are followed. Timelines associated with the provision of a connection to Public Charging Stations (PCS) by Electric Utilities are explicitly mentioned in the guidelines. At the same time, the requirements for the PCS are holistically covered in the guidelines ranging from switchgear to be used to the combination of charger types, and more. For land, the owner of PCS can enter into an agreement with the government entities for public land for a minimum period of 10 years. Since data associated with PCS is of paramount importance, it is required that the State Nodal Agencies (SNAs) share the data with the Bureau of Energy Efficiency (BEE) regularly. The owner of PCS is also free to source electricity from the utilities or via open access after paying the necessary charges highlighted in the document. In addition to sizing, the requirements regarding siting of PCS are also well captured. Regarding tariffs for the supply of electricity to PCS, these are capped at the Average Cost of Supply (ACoS) till March 31, 2025. Another novel aspect is the assistance to the utilities to revamp their distribution infrastructure under the ambit of the RDSS. The guidelines also highlight the priority for the rollout of PCS in two phases wherein the first phase focuses on megacities and the connecting highways and expressways. The second phase focuses on state capitals and the headquarters of UTs.

KEY PROVISIONS

- Connection to a PCS must be provided within seven days for Metro cities, 15 days in other municipal areas, and 30 days in other rural areas.
- PCS may obtain electricity from any generator under open access provided within 15 days from the receipt of the application.
- Electric Vehicle Supply Equipment (EVSE) must be type tested by a lab accredited by National Accreditation Board for Testing and Calibration (NABL) from time to time.
- Regarding siting of PCS, in urban areas, a grid of 3 km X 3 km must be followed. And for the highways/expressways, the PCS must be installed every 25 km on both sides. However, for long-range EVs, the distance is increased to 100 km with a provision of having charging facilities in Transport Nagars, bus depots, and more.
- BEE has been designated as the central nodal agency for this and is instituted with the responsibility to manage a national database.

CURRENT STATUS

According to the response provided by the Minister of Power and New & Renewable Energy, R K Singh in Lok Sabha, there were 1,028 installed public charging stations in India at the end of December 2021.[31] This is equivalent to 0.04 chargers per EV. As per the Alternative Fuels Infrastructure Directive (AFID), the ideal EVSE/EV ratio is 0.1. Furthermore, a recent study by Grant Thornton and The Federation of Indian Chambers of Commerce & Industry (FICCI) recommends that India must have 4,00,000 EV chargers by 2026 to meet the requirements of two million EVs. Following are some of the key initiatives undertaken to increase charging station deployment in India.

Pilot Projects:

- A fully solar-powered EV charging station has been deployed in Mumbai.[32]
- India' first EV charging station powered by food waste launched in Mumbai.[33]

Collaboration & Partnerships:

- Hero Electric has partnered with Bolt to set up 50,000 EV charging stations in India.[34]
- MG Motor India has partnered with Bharat Petroleum Corporation Limited (BPCL) to bolster EV charging infrastructure in the country.[35]

Plan & Roadmaps:

- EV charging stations to be installed in the Parliament premises in New Delhi soon.[36]
- The Ministry of Heavy Industries (MHI) has sanctioned 2,877 charging stations in 68 cities across 25 states/UTs. Also, it has sanctioned 1,576 charging stations across 16 highways & nine expressways.[37]
- BPCL to convert 7,000 conventional petrol pumps into multi-fuelling stations including EV charging.[38]
- Adani Total Gas Limited will deploy 1,500 EV charging stations in India.[39]

End-use products:

- Ez4EV has launched EzUrja mobile charging stations under the ambit of 'Charging-on-demand'.[40]

IMPACT

India realises EV sales penetration of 30 percent of private cars, 70 percent of commercial cars, 40 percent of buses, and 80 percent of two & three-wheelers by 2030.

KEY RECOMMENDATIONS

1. Inclusion of guidelines around vehicle-grid interaction such as V1G, and V2G can provide sundry benefits around grid management, renewable energy integration, and more.

2. The Central Nodal Agency, BEE, can be asked to develop tools in collaboration with think tanks apart from data collection that assists in optimal siting and designing of PCS.

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