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Discom Business Models Require Changes to Promote Distributed Energy Resources

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Introduction

In the first part of this series, we discussed how to empower India's retail customers to improve system efficiency, lower costs and reduce emissions. We laid out the arguments for how deploying distributed energy resources (DER) in scale provides a key opportunity to empower customers. DERs include several elements, such as energy efficiency, demand response, storage resources, distributed generation closer to load (such as rooftop solar), and more. DERs empower customers to modify their electric usage in ways that will save them money, offer reliability products to electric wholesale system operators and distribution companies (discoms) to increase reliability and efficiency of the system, and help reduce emissions. The promotion of DERs, however, requires affirmative action by utility regulators and policy makers.

The first paper discussed different business models that can be used to support DERs and concluded that allowing private sector participants to assist customers and bring the latest technologies and private capital to DER investment is the fastest path to achieving India's goals.[1] It recommended key actions that regulators and policy makers must take; developing the policies needed to facilitate DERs is one of them.

[1] Addepalli, R. (2022, August). *Empowering Retail Customers: Improve Efficiency, Lower Costs and Reduce Emissions*. Regulatory Assistance Project. https://www.raponline.org/knowledge-center/empowering-retail-customers-improve-efficiency-lower-costs-reduce-emissions/

The second paper outlined policies that will facilitate the entry of DER providers including licensing requirements for DER providers, development of business rules for DER providers, and development of DER programs.[2]

This third and final paper outlines changes to the current discom business model to overcome the financial disincentives DERs often face and, instead, to embrace and promote them to improve system efficiency, increase consumer savings, and address climate change goals.

The Reason for Changes to the Current Discom Business Model

The current business model is a typical cost-plus ratemaking model whereby discom costs are reviewed periodically by the regulator in the tariff application review process. Literature suggests and experience shows that, while a cost-of-service approach is useful to evaluate costs, there are limitations to the approach, especially in its inability to provide incentives to utilities to innovate, minimize costs, and provide better services to customers. This problem can be aggravated by circumstances in which financial performance is not necessarily the primary driver of utility behavior—for example, when the utility is state-owned and serves multiple public policy purposes.

Given the financial and operating challenges facing some of India's discoms, they have few resources to focus on promoting DERs that can better empower consumers, lower consumer energy bills, enhance system reliability, and reduce emissions. Promoting DERs requires an understanding of customer energy needs and a grasp of applying modern tools that enable customers to manage their loads. Contrary to the old belief, customer demand isn't inelastic. Now, with the advent of new technologies, they are better equipped and willing to manage their usage and electric bills. There are meaningful opportunities today to exploit the changes in internet, communications, and clean energy technologies that are proliferating, as well as bring in new partners and new sources of capital.

Regulators Should Address Discom Concerns

Discoms may be understandably reluctant to promote DERs given the potential negative impacts to them, such as lost sales, concomitant lost revenues and net income, and concerns about potential job losses. In addition, some discoms may not fully appreciate the reliability value and other benefits that DERs bring to the system, customer and the environment.

To begin with, regulators should articulate certain principles that should be followed in any changes to the discom business model. For example:

- The unidirectional distribution grid must evolve into a more diversified and resilient distributed model, engaging customers and DER providers.

[2] Addepalli, R. (2022, September). *Facilitating Distributed Energy Resources Requires Policy Actions*. Regulatory Assistance Project. https://www.raponline.org/knowledge-center/facilitating-distributed-energy-resources-requires-policy-actions/

- Universal, reliable, resilient, and secure delivery service at just and reasonable prices must be ensured.
- The overall efficiency of the system and consumer value and choice can be enhanced by a productive mix of utility and third-party investment.

The very real concerns of discoms must be addressed to help them support the promotion of DERs. Some of the key concerns and potential approaches to address them are discussed below.

Use Ratemaking Tools to Address Concerns with Lost Sales

DERs can lead to lost sales or the shifting of load shapes. As a result, it is possible that discoms may lose some revenues and net income. The situation is aggravated if the DER participating customer hitherto was subsidizing other customers. This concern alone could discourage discoms to implement DERs lest they lose profitability.

Lost sales and profits can be addressed via a rate-making tool such as a revenue decoupling mechanism (RDM), which enables the utility to collect a specified level of revenue in a period, regardless of actual sales levels. This ratemaking practice has been in place for more than three decades in many countries. It was initially motivated to make discoms indifferent to implementation of energy efficiency measures, but it's been shown to deal admirably with other sales volatility risks—e.g., weather and changes in the economy—to the benefit of both utility and customer. Decoupling ensures that prudent discom costs continue to be covered even if it loses sales, and it also means that excess revenues will be returned to customers if sales go up. And, because a utility's profitability is no longer tied to sales, reducing costs is the only way that a utility can increase net income in the short run; this gives management a powerful incentive to be efficient.

While RDMs remove the disincentive to pursue customer-sited resources, they may not, by themselves, be a sufficient motivation for discoms to embrace and promote DERs. Regulators should consider creating additional profit motives for discoms for successful implementation of DERs. They can, for instance, create metrics that measure successful implementation of DERs and reward discoms for meeting prescribed metrics. Successful performance-based ratemaking models have been adopted in the U.S.

Require Discom to Conduct Pilot and Demonstration Projects to Get Experience and Comfort Level

Many discoms may not be fully aware of the potential benefits that DERs can bring to the system. A gradual approach to get experience and work through the mechanics of DER programs would be through instituting pilot projects and demonstration projects. They should be well-defined to test one or more hypotheses and produce results in a meaningful time frame to evaluate whether they can be rolled out on a larger scale.

Address Concern About Potential Job Losses

This is a concern often raised any time significant changes in the system are contemplated. It is unclear why there would be overall job reductions with increased DER penetration. The discoms will still need their employees to do the tasks they typically do and more. The increased utility workload comes from interconnection work for distributed generation resources and in work with DER developers and DER programs. Further, there is room for significant new employment opportunities in the development and deployment of clean energy technologies and working with individual customers.

Address Potential Loss of Subsidies from Customers Who Use DERs

As mentioned before, the use of ratemaking tools like RDMs should make the utilities indifferent to customer-sited resources. But while the utilities would be indifferent, it is possible that some of the contribution from the customers using DERs will be lost, possibly resulting in an increase in tariffs for other customers. Ideally, with the deployment of DERs, all else equal, there should be a reduction in certain wholesale supply costs that were incurred before. Further, there are other transmission and distribution costs that discoms can avoid. They should be identified and marked for reduction. There could be an issue between short-term versus long-term avoided costs. These need to be addressed based on the specifics of the discom and the rate of penetration of DERs.

Require Discoms to Evaluate Non-Wires Alternatives (NWAs) to Meet System Needs Where Practical and Cost Effective

The traditional business practice for utilities in general is to plan for load growth using a conventional engineering approach to meet the need through the supply side; to build power plants, substations, to extend the network with cables, and transformers, etc. Another approach to consider, however, is whether the demand side can help fulfill the reliability need just as well as the supply side, but at a lower cost and in a more environmentally friendly way. This approach is called the non-wires alternative (NWA).

Regulators should require discoms to evaluate the use of DERs from the demand side to meet system needs where practical and feasible. The use of a competitive procurement process will allow third parties to offer creative DER solutions that utilize advanced technologies and are cost-effective. Regulators should address any specific discom concerns with implementing NWAs.

Require Discoms to Create Distribution System Platforms

The distribution system platforms (DSPs) will address discom planning and operations to help plan and operate a modern grid capable of integrating and dynamically managing distributed energy resources. As a first step, discoms should reveal their system plans (subject to confidentiality requirements for critical infrastructure, etc.) that contain load forecasts, long-term capital budgets, to provide customers and DER providers the information they need for identifying near-term opportunities for DER development. The plans will deal with issues such as:

- Hosting capacity to facilitate DERs,[3]
- Interconnection portals to allow DERs to interconnect with discom facilities
- NWA opportunities
- Provision of aggregated customer data to DER providers
- Identification of energy storage opportunities
- Incorporation of advanced distribution management systems
- Opportunities for DERs to provide grid support functions

Over time, the discoms in their expanded role as distribution system operators (DSOs) can further develop the DSP to include a holistic planning, operations, and even market management elements. The DSO should be able to optimize the utilization of DERs in its footprint, along with supply side purchases, to minimize total cost to consumers and reduce emissions in meeting reliability needs.

Require Discoms to Modify Tariff Design to Send Unbundled Granular Price Signals to Facilitate DERs

DERs provide value-added services to the grid, both at the retail and at the wholesale level. Their value is enhanced if they face real price signals that are reflective of the discom's true costs – from a locational and time dimension perspective. The discom tariffs should be unbundled first into generation, transmission, distribution, and customer service so the costs are clearly known for each segment, and to determine whether there is a cross subsidy between them.

New tariffs should be designed, if they do not currently exist, to provide the granular unbundled price signals that will help to tease out cost effective DERs. This could include hourly supply price signals and location-based supply pricing reflecting cost differentials. For example, it may cost more to serve customers at certain times of the day and/or season compared to others. Also, due to transmission constraints, it may cost more to serve customers in a particular area than in other

[3] Hosting capacity is the amount of DERs that the electric distribution system can reliably accommodate without material system upgrades.

places. The tariff pricing signals, or in the case of distribution which typically does not reflect locational cost differences, DER compensation signals should reflect these differentials so that DERs can be targeted to higher cost and time locations first. Further, a benefit-cost analysis framework should be developed to evaluate the cost effectiveness of DERs.

Require Discoms to Develop DER Programs

In working with the system operators, discoms should be required to develop specific DER programs such as demand response NWAs or Virtual Power Plants,[4] to help meet system needs and to provide rules of the road for DER providers.

Further, discoms should be required to work with DER providers and participating customers to facilitate and promote DERs.

Develop a Process to Effectuate Changes to the Discom Business Model

Modifying existing paradigms requires careful development of new rules and proposals, consultation with stakeholders, and adopting new models that meet the needs of the stakeholders and that can be carried out effectively by discoms. A process should be developed by the regulators to accomplish the above steps.

[4] Virtual Power Plants are DERs being used in a manner such that they replicate services offered by a power plant.

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