Managing the inevitable energy transition

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For the most part of the 20th century it seemed like the electricity industry would defy the truism, *'change is the only constant'*. Planning broadly involved estimating future electricity demand and adding ever larger conventional generating power plants (coal, nuclear, hydro) and connecting these to load centres (cities, factories etc.) through adequate transmission lines. Electricity was supplied to consumers by a monopoly, a vertically integrated utility and pricing was based on the principle of cross subsidy, wherein large industrial and commercial consumers paid higher tariffs to ensure affordable tariffs for agriculture and households. However, all that is rapidly changing, largely due to national policy initiatives and global changes in power sector technologies and their economics.

Competitiveness of renewables (especially wind and solar PV) coupled with reducing costs of battery storage and rising costs of baseload coal power means an increasing share of renewable energy in supply mix. In the long run, this is likely to drive electrification of other sectors such as transport, cooking, and industrial processes, partly addressing issues of local air pollution, energy security and macro-economic implications of ever rising energy imports. Increasing sophistication and reducing costs of information and communication technologies enable precise and granular monitoring and sharing of real time information, thus facilitating innovative business models for transport and electricity services. These trends have the potential to effect a paradigm change in the energy sector in the long run.

The broad political commitment across parties towards universal, affordable and reliable access to electricity as well as to modern and clean cooking fuels is welcome. However, a lot of work needs to be done to turn it into a sustained reality *(100% rural electrification is not enough, Hindu Business Line, 27 March, 2019, Managing India's household energy challenge Hindu Business Line, 7 April, 2019)*. Here, we explore the implications of the emerging trends for planning, and provide a few concrete suggestions in this regard.

Rethinking the institutional framework for planning

Considering the impending transition, the nature of planning needs to become more integrated, i.e., it should consider the interlinkages and interactions between related sectors. The concurrent nature of electricity sector and the multiple ministries involved in energy administration adds to the complexity. However, there is limited rigour in critically evaluating and prioritising needs, anticipating changes and risks, and preparing for them. This can lead to serious long term implications in terms of resource-lock-in and path dependency, especially considering the long life and capital intensive nature of the investments.

Two steps are critical to avoid such lacunae and to improve the planning processes. First, the gaps and discrepancies in public availability of crucial data should be addressed. Second, analytical capability within the government should be significantly enhanced to help it deal with the uncertainties of a dynamic sector.

Energy Analysis Office (EAO)

In order to assist the government in policy and decision making, an analytical agency needs to be set up that is empowered to collect and reconcile data, analyse trends, publish reports and suggest policy interventions. The agency would leverage as much as possible from existing technical agencies such as CEA, PPAC, and CCO so as to not duplicate efforts. This agency, tentatively called the Energy Analysis Office (EAO), should have participation from multiple ministries.

Two important prerequisites for such an office to be effective are policy relevance and independence from political influence. This balance can be arrived at by placing the EAO under the administrative control of the Executive, but by having its budget approved and work reviewed by the Parliament. The EAO should take a long-term view towards the sector's challenges and provide policy relevant inputs to the Executive. Public participation and consultation should also be encouraged.

Freedom for large, focus on small

Within the electricity sector, the emerging trends in renewables and storage create numerous opportunities for large consumers to explore alternative economical sources for meeting their demand, partly or fully. However, loss of sales and revenue from these high paying consumers is likely to mark the end of the current business model of the electricity distribution companies (DISCOMs). Two serious implications for the DISCOMs' future arise. One, given the uncertain demand, power purchase, which accounts for more than 70% of the cost of supply, will become more complex and riskier. Two, loss of cross-subsidising consumers would necessitate sharp increase in tariff for small, rural, and agricultural consumers. Since such tariff increase is often impractical, need for state subsidy is likely to go up. If not managed appropriately, these changes can lead to severe financial stress for DISCOMs, poor supply quality for small consumers, stranded assets, and bailouts, with associated implications for the banking sector.

To avoid such consequences, there is an urgent need for fundamental changes in the way DISCOMs have been planning and operating. Increasingly, markets and competition would need to play a substantial role. Allowing large consumers to choose their suppliers for the long-term can not only help them reduce costs but also enable rational capacity addition at sector level. DISCOMs should avoid adding new baseload capacity without rigorous demand-supply analysis. Solarising agricultural feeders can help in capping subsidy while providing day-time reliable supply to farmers. These measures can allow DISCOMs to focus on improving supply and service to small and rural consumers while giving choice to large consumers.

To summarise, the inevitable transition in the energy sector is mainly being driven by external technology and economic changes and hence uncertain and difficult to predict. Unless guided by conscious policy decisions, the transition will unfold chaotically, with the small and rural consumers being the likely sufferers. However, if negotiated well, it also offers an opportunity to avoid many inefficient resource lock-ins with significant economic and environmental costs. India can chart a new exemplary development path in which it can provide its citizens with modern energy services without necessarily compromising on other resources such as land, air and water, while potentially opening up employment and investment opportunities in many new sectors associated with the transition. The suggestions provided in this article can help India rise up to this challenge.

The writers are with Prayas (Energy Group). This is the last of three articles on challenges facing the Indian energy sector.

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