

# BROOKINGS INDIA

New Strategies for Improving and Sustainable Electricity Access in Karnataka: A discussion

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Workshop Report

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Brookings India organized a Workshop / Discussion examining electricity access and sustainability in Karnataka, bringing together leaders from utilities, government, scholars, industry, and civil society.

The discussions were anchored around a to-be-released Working Paper examining rural and urban supply of electricity, which is now available as a Brookings India Working Paper.

## Key Recommendations

- 1) Enhance transparency in supply, with granularity for citizens (time, location, etc.). If necessary, begin with internal transparency, before moving towards public reporting.
- 2) Focus on actual supply of electricity to households, more than the wires based definition of "electrification". Begin collecting data on and then move to a norm for actual supply of power, especially in the 6-10 PM evening peak period.
- 3) Accelerate feeder separation but combine it with more analysis on its net cost-benefits / viability. Experiment with smart meters as a means of sub-feeder level granularity of "feeder separation".
- 4) Improve analytics which requires gathering, storing, and analyzing data with fine granularity. There is already substantial data being generated, but it is not being utilized enough. R-APDRP will produce enormous volumes of more data, but it is not yet used properly.
- 5) Reduce the share of Irrigation Pumpset (IP) loads on the utilities
- 6) Reduce technical losses on the system, and not just commercial ones (which should be done anyways). AT&C blends the two, while improvements for the two require different solutions.
- 7) Examine new accounting and policy innovations to help end load-shedding, now factoring in outage costs, kerosene usage, etc.

A few of the observations and recommendations that were discussed in more detail include:

- 1) There has been historical disparity in supply of electricity between rural, urban, and metro areas. This is expected to diminish with improved supply and feeder separation schemes.
- 2) The definition of electrification based on physical wiring of a home is insufficient. There must be measurements and actual norms for supply of electricity. Even if one cannot end load-shedding in the short term, from a citizen perspective 6-10 PM is a key period for basic electricity supply (i.e., rural

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areas can do with single-phase and not 3-phase supply, which is geared towards pumpsets). The quantum of load from rural areas if limited for lighting is not very high.

- 3) Based on the methodology presented in the Working Paper, there can be an implicit social welfare transfer from those who are load-shed more to those who are load-shed less. While the exact number is debatable, there is some level of transfer based on variance in supply.
- 4) Agriculture is a major component of the challenges for all state utilities, especially Karnataka. No solution can exist without untangling this knot. However, in the absence of true data, a few questions remain:
  - a. How much is the *\*real\** demand from agriculture?
  - b. How will this vary if continuous supply were given? No farmer can use 24 hours of power supply for irrigation.
- 5) Can farmers be given incentives for efficient pumpsets? Instead of subsidizing their consumption of (~free) power, can they be given a coupon/voucher/equivalent for helping them buy an efficient pumpset? This makes them not only buy a more efficient pumpset, but also makes water conservation and crop choices a more rational and societally efficient decision. Instead of an up-front cash transfer, they could be paid at the end of a chosen time period, such that they would then have to follow-through on their efficiency targets to save money. At the end of the period, they could even convert unused vouchers/coupons into cash.
- 6) There are a lot of farmers without pumps, who are truly the poorest of the poor. How does free electricity impact them? This ranges from market impacts to depletion of ground water and otherwise accessible water.
- 7) There is paper regulation of borewells (urban areas) and IP sets (rural) – these need enforcement. A first step may be improved monitoring and analysis.
- 8) Can we strengthen local institutions who can then be in charge of managing consumption and metering and collections in any area?
- 9) What citizens really want as a first step is transparency and predictability in outages. Can we move towards norms and enforcement for the same?
- 10) To improve the supply of power in the evening peak, the concept of peaking power may need to be introduced. While it may be difficult/complex/expensive for small users, it can start with utility operations and generation procurement, and then move to bulk consumers. Today's Time of Day (ToD) pricing is optional and not attractive for the bulk users it is offered to.
- 11) Karnataka is a leader in innovative technologies and solutions, and the first state in India with an 11-kV (distribution) feeder level SCADA (supervisory control and data acquisition) system. This provides enormous data for continuously improving operations and guiding policy, and should be harnessed for the same.
- 12) If one ends *evening* load-shedding then the savings in Kerosene may pay for a substantial fraction of the costs, for a combination of additional supply procurement as well as even smart meters.
- 13) Feeder Separation has been started in Karnataka, and the results need to be analysed in more detail. Fundamentally, rural loads are meant to separate IP set loads via phase-rostering, but this is bypassed by a fraction of users who deploy phase converters. The fundamental question for all such schemes is whether the savings due to removing phase converters is greater than the shortfall in peak supply. If not, feeder segregation will help but not end (lighting period) load-shedding.
- 14) Advantages of Feeder Segregation if undertaken to a meter or at least Distribution Transformer (DT) level include not only more visibility and granularity but even technical loss reductions by staggering rural loads. Rural feeders have either very high loads (and losses) or very low loads/losses (due to phase-rostering between pumpsets 3-Phase supply and household single-phase supply). This was started as RLMS (rural load management systems) but those were based on local intelligence. The lessons of RLMS, which included management and institutional challenges, should be incorporated into future plans.
- 15) The next round of discussions should include additional stakeholders beyond electricity such as agriculture, water, urban development, etc. Workshops and informational sessions for Legislators may also be helpful, something the participants encouraged Brookings India to undertake.