Political Economy of Renewable Energy Deployment in India: Case Study of Karnataka

Authors: Pooja Vijay Ramamurthi

Affiliation: Center for Study of Science, Technology and Policy, # 18, 10th Cross, Mayura Street, Papanna Layout, Nagashettyhalli, RMV II Stage, Bangalore-560094 and Energy Policy Institute at University of Chicago (EPIC), DLF Capitol Point, Baba Kharak Singh Marg, Connaught Place, New Delhi, 110001

Tel: +91 9560481145

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Introduction

Over the past few years, India has paid considerable attention to the development of its Renewable Energy (RE) capacity. This can be attributed to the country's energy security concerns, necessity to provide reliable electricity to its citizens and the global need to mitigate climate change. India's ambitious targets project that by 2020, 10 per cent of its power shall come from renewable sources and by 2022 there will be 165 GW of RE capacity installed. Of this target capacity, there will be a 100 GW of installed solar capacity, 60 MW from wind and 5 MW from other sources such as small hydro and bioenergy (Vashishtha 2014). This implies that within the next five years, India has to undertake the mammoth task of almost doubling its RE contribution to the energy mix from the current 6 per cent. The solar sector faces the largest challenge of scaling up its capacity by almost 20 times in six years, from the current 4.7 GW (MNRE 2016).

Such tremendous growth can only be accomplished through an effective policy and regulatory framework, which is essential to incentivise the deployment of RE. Pegels and Lütkenhorst (2014) state that government intervention is particularly necessary for energy policy because market mechanisms such as falling prices alone are not sufficient to ensure the development of long-term sustainable infrastructure. They further say that as a nation's energy policy determines the future of the basic public services, it is important to have a holistic view from the political, socio-economic and technological aspects.

In India however, RE policy interventions have not taken such a holistic approach. Current national policies such as preferential-grid access, Feed in Tariffs (FiT), Renewable Purchase Obligations (RPO) on utilities, tax holidays, RE Certificate (REC) trading and Accelerated Depreciation (AD) only address techno-economic barriers. While these are surely important incentives, in the past they haven't been sufficient for Indian states to meet their RE targets. Further, it appears unlikely that India will manage to meet its FY 16 targets in the next few months looking at the large gap

between target and achievement (Figure 1). Therefore the question arises: What more does India need to do to ensure that it's RE aspirations do not remain a pipedream?

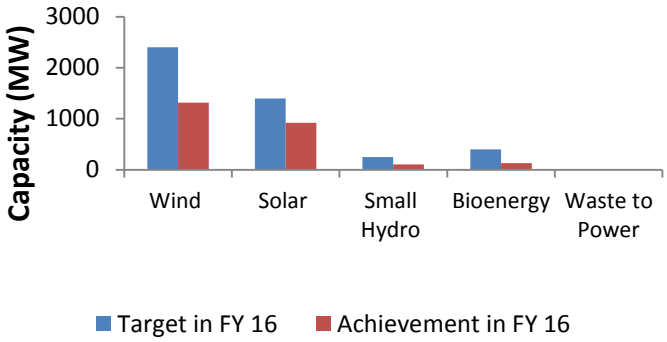

Figure 1: Targets and achievement of RE in India in FY 16, as on November 2015 (MNRE 2016)

As Sreekumar and Chitnis (2014) point out, in order to have a complete idea of the electricity sector, in addition to techno-economic considerations, a political perspective is also imperative. Hence, this article attempts to answer the question posed above by providing insights into the political economy of the RE sector in India. Key observations from an extensive stakeholder consultation (n=20) conducted in the Indian state of Karnataka have been used in this study (CSTEP 2014).

This case study revealed that despite high targets and two comprehensive RE policies (GoK 2014; GoK 2010) the deployment of RE technologies has faced significant barriers in Karnataka during the past five years. The state was unable to meet its targets for RE capacity installation in all renewable sources (biomass, wind, solar, small-hydro) that were laid down in the Karnataka 2009-2014 RE policy. Although the state did have an impressive 10 per cent of its electricity from RE sources in Financial Year (FY) '13, there was an unmet peak demand of 1.4 GW and electricity deficit of 14 per cent (CSTEP 2013).

Looking at RE - beyond climate change mitigation

Currently, Indian coal reserves only cater to around 65 per cent of the coal requirement of the country's thermal plants (Kohli 2015). Hence, the country is highly dependent on energy imports to meet the country's electricity needs. It is therefore heartening that the present government has recognised the critical role that RE solutions can play to reduce this dependence. However, the policies do not fall in line; all the current dialogue on RE takes place under the Prime Minister's National Action Plan on Climate Change (NAPCC). This has a vital implication on how state governments view RE deployment. The Centre's advice to focus on RE implementation as a climate change mitigation technique gives the states an incorrect message (Dubash and Jogesh 2014).

The fallout is that states set incremental RE targets often merely to comply with RPO targets mandated to them under NAPCC; rather than as a tool to reduce their electricity deficits, decrease their electricity imports and provide quality energy services to

underserved communities. This is primarily because states have to deal with the barriers of relatively high priced renewables in the context of financially weak utilities, challenges with grid integration and lack of suitable inter-state power off-take mechanisms.

Need for intra-governmental interaction

Although 67 per cent (19,772 MW) of the state's RE potential has been allocated by the state nodal agency, the Karnataka Renewable Energy Development Ltd. (KREDL), only about 17 per cent (4,887 MW) has been commissioned (KREDL, 2016). Getting permits and clearances is a tedious and opaque process, often taking up to a year. Poor ease of business in the state has made developers opt for Gujarat and Rajasthan, where a Single Window Clearance mechanism which adheres to strict time-lines exists.

Most of these issues are caused due to "right of way" and land-use uncertainty as RE targets are not formally integrated with land-use planning at the district-level and are based on land acquisition for individual projects. This impacts equity, and established businesses with political contacts are easily able to acquire land for large RE projects. Smaller companies face barriers to enter markets and are unable to secure financial closure.

State development agendas need to be studied in order to integrate RE planning with other major inter-related factors such as land-use, rural development and environmental sustainability. The targets set out should not merely be based on technical estimates made by central satellite measurements; efforts should be made to assess corresponding land-use and national targets should be rooted based on these bottom-up assessments. Transparent guidelines for usage of scrub forests and barren lands under the control of the Forest Department should be issued by central authorities such as the Ministry of Environment and Forestry (MoEF).

Grid infrastructure constraints

Achieving the nation's renewable targets would require states, which are rich in RE, to contribute heavily to this endeavour. Being amongst the top renewable rich states, Karnataka is expected to have high RE deployment in the next few years. This is evident with the central government planning to set up a 2000 MW solar park in the state. However, increased addition of RE capacity does have implications on the Transmission and Distribution (T&D) network of the state. Solar developers are cautious in setting up plants in northern Karnataka, although it has a good solar resource, as the region is rich in wind resource and already has a considerable amount of wind capacity. Hence, they envisage future grid evacuation challenges, similar to Tamil Nadu, where currently up to 30 per cent (2000 MW) of installed wind capacity cannot be evacuated (Sushma, 2014).

The cost of infrastructure to handle this load variability is primarily borne by the state. While concessional open access regimes and attractive FiTs might encourage RE

deployment, these costs coupled with Unscheduled Interchange (UI) charges are passed on to the state. Regulated tariffs prevent customers from bearing the brunt of these charges. The Power Grid Corporation of India Limited (PGCIL) in coordination with state-owned transmission facilities has started developing inter-state green energy corridors in Karnataka. While, developers feel that this is a welcome move, there is scepticism on the speed of infrastructure development as such plans have been in the pipeline since 2011.

Lack of Central government intervention could result in state governments not taking full advantage of their RE resource due to heavy expenses that need to be borne by them. In order to remedy this situation, it is vital that a provision for clean energy financial support is available to the state for RE integration.

The Green Energy Corridor projects seek to synchronise the transmission of conventional and RE sources. However, the country sees a dearth of formal institutional mechanisms to integrate RE investment decisions with conventional power sector planning for generation. This leads to a situations where states which have severe electricity deficits are unable to use their surplus RE generation to meet these needs.

Rural Electrification: Centre vs State

The brunt of electricity deficits is often felt by rural population, who face constant electricity cuts and brownouts. Officially Karnataka's villages are 99.95 per cent electrified, however keeping in mind the national definition of rural electrification – 'a village is considered electrified if public buildings and 10 per cent of the village population has electric connections' – there are still around 10 lakh people who do not use electricity as their primary source of lighting.

Besides the 'Surya Raitha' - the state solar irrigation scheme - no state-level roadmap for RE delivery to under-served areas exists in Karnataka. The state does not have any specific rural electrification policies and follows the central Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY), formerly known as the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) scheme. The Decentralised Distribution and Generation (DDG) scheme under DDUGJY allows for the implementation of decentralised projects in areas which receive less than six hours of electricity and where grid extension is technically or financially unfeasible. As electrified villages in Karnataka get an average of 16-18 hours of electricity, they cannot reap the benefits of DDG (CSTEP, 2014). However, studies have shown that robust electricity services are imperative to improve socio-economic conditions of the rural population and promote local small enterprises/livelihoods (CSTEP, 2014).

The few DDG scheme projects which called for tenders were not met with much enthusiasm. This is primarily because the capital and operational charges did not fall within the DDUGJY benchmark costs, due to the hilly terrain and scattered nature of the village settlements. This shows that generic Central Government schemes are currently

not capable of meeting the local needs of many un-electrified populations. Incidentally, these are the same population whose remote locations make grid extension unfeasible. Additionally, utilities perceive that they are not in the best position to implement DDG schemes due to their limited manpower and resources.

The DDUGJY scheme only covers villages which have a population larger than 100 people. The remaining hamlets fall under the Rural Village Electrification Programme (RVEP); another Central scheme. The objective of RVEP is to provide financial assistance for the electrification of remote census population through renewable sources. However, the state nodal agency says that they are reluctant to play a big role in implementing RVEP schemes because MNRE subsidies take a very long time to get disbursed.

Although Karnataka and 5 other states have signed Memorandums of Understanding (MoUs) with the Central government to provide 24X7 electrification, these MoUs only deal with broader generation, transmission and distribution infrastructure roll-out needs, rather than streamlining renewable and decentralised targets specific for rural electrification.

This problem is part of a large disconnect that exists between central policies and regional needs, which does not allow rural households to have electricity access, let alone guaranteed reliable electricity supply. The lack of financial incentive to invest in small-scale projects leads to states focusing narrowly on large-scale grid projects, and hence ignoring smaller projects.

Exploring alternatives for rural electrification

In order to tackle these challenges, in addition to government-owned systems, encouraging private sector investments, rural entrepreneurship and public-private ventures could be some of the better ways of promoting decentralised generation. Accessing finance is currently difficult for RE technologies. Loans from Rural Regional Banks (RRB) and Indian Renewable Energy Development Agency (IREDA) are available at an interest rate of 12-14 per cent, which is higher than other rural loans (7-12 per cent) (IREDA, 2015; NABARD, 2015). Soft loans with rates of 4-5 per cent are only available at RRBs for those who have access to capital from a larger entity to promote RE systems. Such programmes were earlier implemented nationally by IREDA for solar heating systems and by the United Nations Energy Programme (UNEP) for Karnataka and Maharashtra. The UNEP programme was very successful in Karnataka and provided a boost for financing small-scale rural RE projects from banks. At present, no such programmes are in effect, and there is no guaranteed access of low-rate loans from any financing agencies.

The lack of a roadmap for rural electrification implies that there is no certainty on when a village might be electrified. Therefore, villagers might be unwilling to pay developers for expensive electricity in the hope that the grid will reach them. The same uncertainty

makes developers reluctant to set-up a system. The government should mandate the setting up of micro-grid based systems, which are grid-interactive (with bi-directional meters) and create a risk mitigation plan, where developers can be compensated if the grid is extended.

Often under capital subsidy-based models, systems fall into disuse due to lack of long-term financial incentive to keep the system functional. Hence, apart from interest rate subsidies, revenue models such as Generation Based Incentives (GBI) using Supervisory Control and Data Acquisition (SCADA) systems and prepaid metres should be implemented. Communities should be provided advance support in terms of training programmes for handling RE plants along with its establishment.

A political economy analysis based on stakeholder consultation reveals that implementation barriers exist due to a lack of shared interests amongst entities in the power sector. The findings suggest that there is a need for sub-national governments to play a more proactive role in RE deployment. National targets rooted in bottom-up assessments from various states for a range of RE technologies would ease implementation as land allocation is a key bottleneck. Since economic costs of RE generation as well as integration are borne by the state, this requires clean energy finance support to be available for the state. Central schemes are unable to cover all the needs of sub-national electrification and state-level action roadmaps are a must. Financial and technical models, suitable for the local context would facilitate the adoption of RE technologies.

India's high renewable targets are a step in the right direction. However, how well India will fare eventually boils down to the extent to which central and state actors' priorities and institutional mechanisms are aligned.

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