

Prescriptions for power revolution

A quick look at state-wise power scenario and policy measures needed to boost this critical sector



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With the two major power blackouts that plunged one-tenth of humanity into darkness, a critical look at the power sector in India becomes relevant. Installed power generation capacity and more importantly power supply position is critically linked to the growth trajectory of any nation. Power sector is important for other sectors as it enables a multiplier effect in the economy.

Power sector growth is a tight ropewalk which has to balance finances, sustainable growth and appropriate policy choices. In this article, we focus on this crucial sector from a demand-and-supply perspective and the potential for renewable energy in India. We conclude with a policy prescription for the states based on their performance, demand and supply position and the potential they have for various technologies.

India recently crossed 2,00,000 MW of installed electricity generation according to latest set of figures released by Central Electric Authority (CEA) in April 2012. However the disparity of electricity access is huge. The top 20 states account for roughly 98% of the total generation capacity (figure 1) and the next 15 entities (states and union territories) for two percent. The top five states in electricity generation are also the major industrial states.

Policy prescription

The present state of electricity supply and potential has a large gap that can be plugged by following appropriate policy choices. Some of the policy choices that could be implemented to increase the competitiveness of the power (especially generation) sector at the state level include:

1. Focussing on green growth in states that have a high potential for renewable sources of energy. These include Gujarat,

Karnataka, Maharashtra, Tamil Nadu and Andhra Pradesh. Rajasthan could focus on solar projects. The states with coastlines could focus on renewable sources.

2. Tapping the hydroelectric potential of states that have a high hydroelectric potential (HEP). Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh and other states along the Himalayan mountain ranges could add significantly to the power generation capability of the nation.

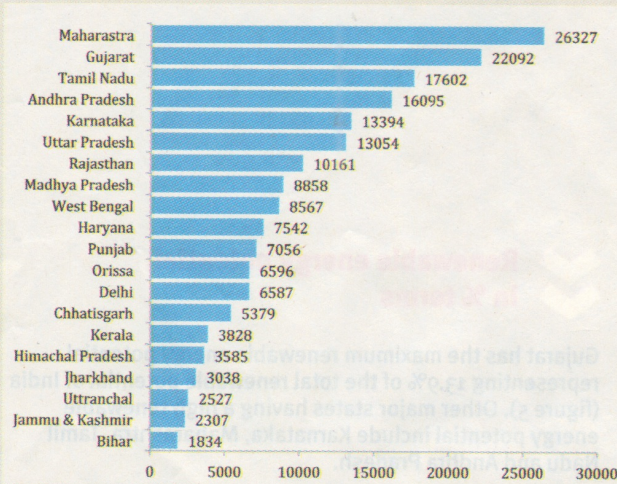
3. Focussing on thermal power stations and ultra mega power projects (UMPPs) where there is abundant supply of coal and natural gas, for example, Jharkhand, Chhattisgarh, Orissa and Andhra Pradesh. UMPPs should come up in other parts where they could be run on a public-private partnership basis.

4. Focusing on nuclear energy in states that have abundance of nuclear fuel (thorium and uranium) only when the power plant generational facility is away from densely populated areas. This could be done in the southern states.

5. Inviting private players for setting up facilities would also go a long way in reducing the energy deficit position that the states face at present due to crippling infrastructure.

If these suggestions are followed appropriately, the states can see a power revolution in the coming years. Add to that the focus of the PMO and central government on manufacturing and what we could indeed have is a different growth trajectory for the Indian economy as a whole.

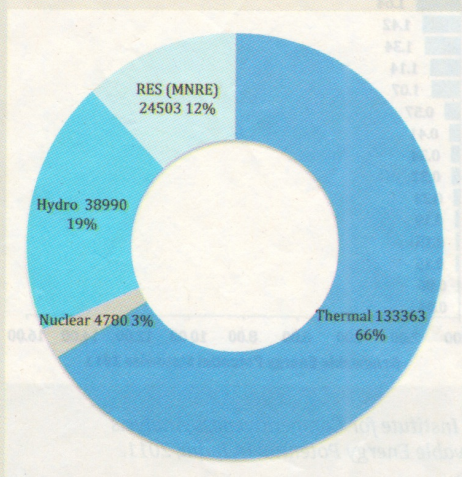
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Source: CEA, Institute for Competitiveness Analysis.
Figure 1: Installed generation capacity in top 20 states

Breakup of Total Installed Capacity

The total installed generation capacity is broken down based on the source of generation. At an all-India level maximum contribution comes from thermal followed by large hydro (figure 3).



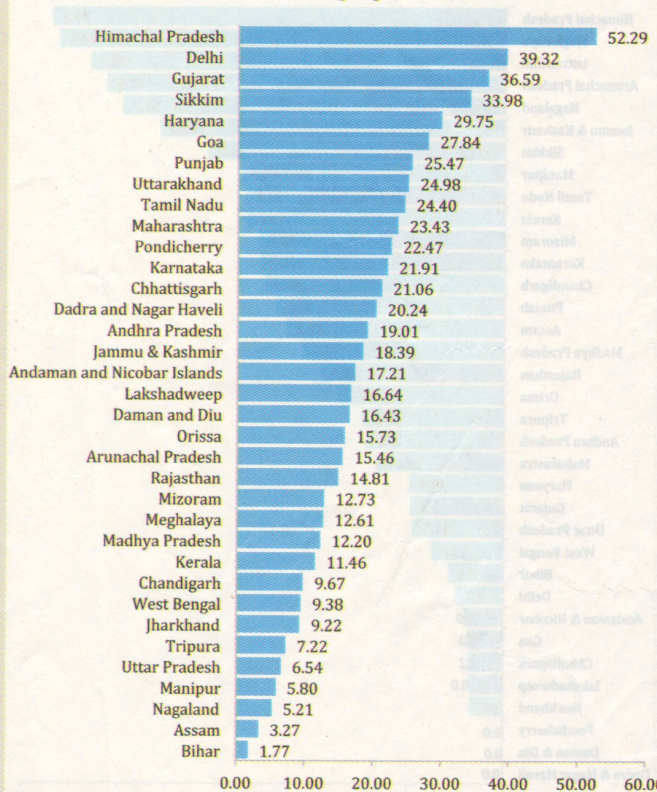
Source: CEA
Figure 3: Generation from various Kinds of Source- All India

Installed power generation capacity in top 20 states in MW

Installed power infrastructure in the state in watts per 1,000 people

On per-capita installed infrastructure generation basis, Himachal Pradesh (fuelled largely by hydroelectric power), Delhi, Gujarat and Sikkim perform well (Figure 2). Bihar, Assam, Manipur, Nagaland and Uttar Pradesh perform poorly on this count due to a large population and a low installed generation capacity.

Installed Power Infrastructure in the state in watts per 1000 people

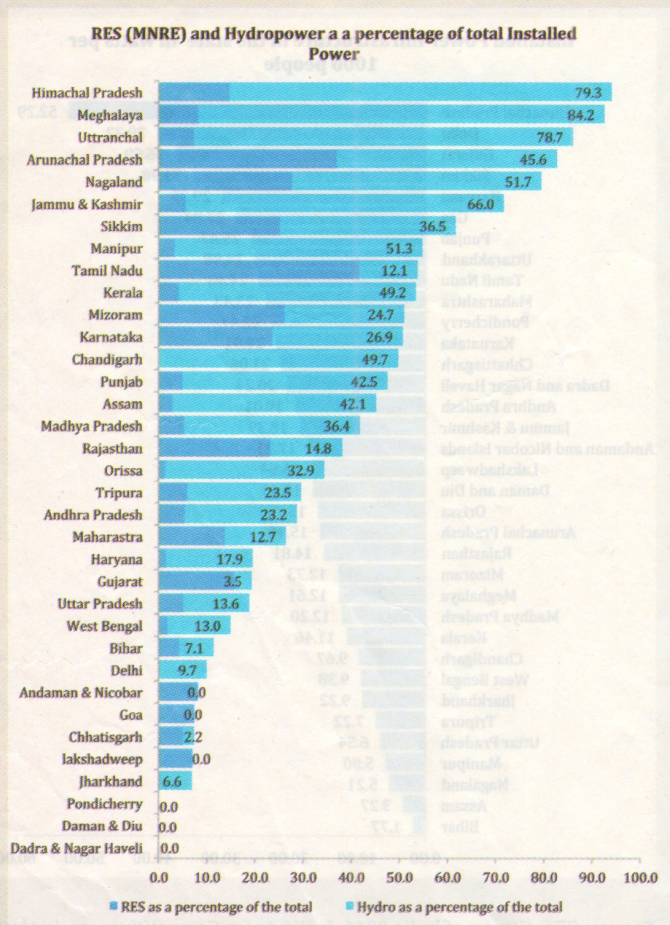


Source: CEA, Census of India 2011, Institute for Competitiveness Analysis
Figure 2: Installed Energy generation Infrastructure per capita

RES (MNRE) and hydropower a percentage of total Installed Power

Let us delve a bit deeper into the renewable energy story in India. Roughly 31% of the total electricity produced in India comes from renewable sources of energy: 12% by renewables and 19% by large hydroelectric power projects.

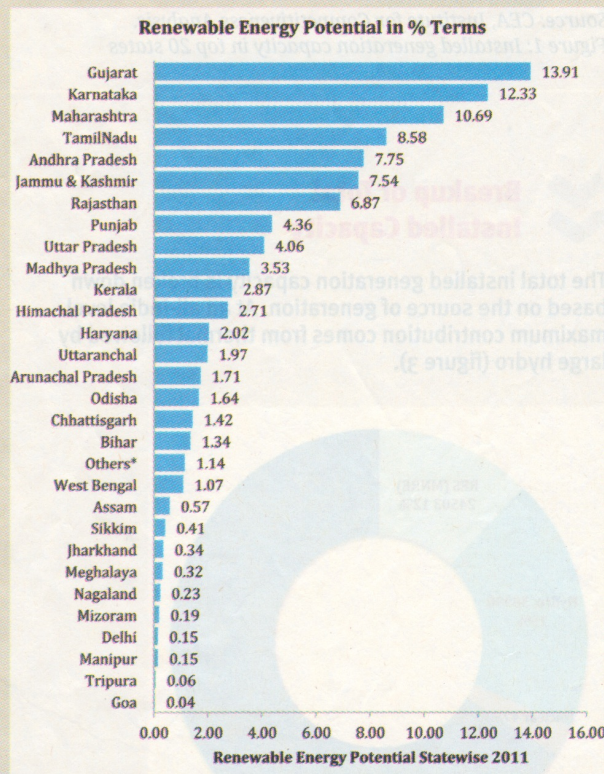
At the level of the states the maximum percentage contribution for generation by these renewable sources as a percentage of total generation is in Himachal Pradesh, followed by Meghalaya and Madhya Pradesh (figure 4). Among bigger states Jharkhand and Chhattisgarh have the least renewable energy dependent economies. Maximum contribution is from non-renewable sources of energy particularly coal for thermal power plants which is found in abundance in these states.



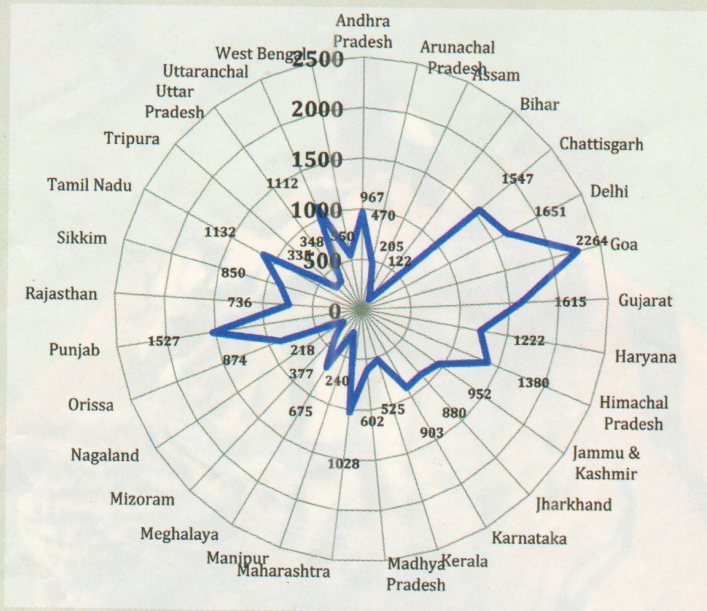
Source: CEA, Institute For Competitiveness Analysis
Figure 4: RES and hydropower as a percentage of total installed power

Renewable energy potential in % terms

Gujarat has the maximum renewable energy potential representing 13.9% of the total renewable potential of India (figure 5). Other major states having a high renewable energy potential include Karnataka, Maharashtra, Tamil Nadu and Andhra Pradesh.



Source: MNRE, Institute for Competitiveness Analysis
Figure 5: Renewable Energy Potential in India, 2011.



Per Capita Consumption of Electricity in KWh (2009-10)

Let us look at the per capita consumption of electricity in various states of India to understand the dynamics of energy consumption (figure 6). The maximum per capita consumption takes place in Goa, followed by Delhi, Punjab and Gujarat. The least per capita consumption takes place in Bihar, which is largely owing to lesser installed capacity and a large population.

Source: Power and Energy Division, Planning Commission of India 2010-11.

Figure 6: Per Capita Consumption of Electricity.

Power supply position in states

The power supply position in India is in a shortfall, which is not surprising considering that every plan falls short of achievements of predefined targets. At an aggregated level India had an energy deficit of 8.5% and a peak deficit of 10.3% as of 2010-11. The energy deficit and peak deficit are powerful indicators that show the existing state of electricity supply position in various states. This is centrally linked to the idea of performance of state electricity boards (SEBs) and electricity departments (EDs) in states. Figure 7 shows the power supply position in various states. The worst situation is in Jammu and Kashmir and the best supply position is in Chhattisgarh.

Power Supply position in States of India

