

## BACKGROUND

**11.1** The need for enacting policies to support renewable energy is often attributed to a variety of barriers or conditions that prevent investments. As a result of barriers renewable energy is put at an economic disadvantage relative to other forms of energy supply. The first is the general perception that renewable energy costs more than other energy sources, resulting in cost-driven decisions and policies that avoid renewable energy. While making such comparisons, the explicit or hidden subsidies for competing fuels is often ignored. Second, even though lower fuel and operating costs may make renewable energy cost-competitive on a life-cycle basis, higher initial capital costs can mean that renewable energy provides less installed capacity per unit of initial investment than conventional energy sources. Thus, renewable energy investments generally require higher amounts of financing for the same capacity. Third, due to its inherent intermittent nature, renewable energy sources feeding into an electric power grid do not receive full credit for the value of their power. Fourth, renewable energy projects are typically smaller than conventional energy projects and generally have high transaction costs, including for resource assessment, developing project proposals, assembling financing packages and also for negotiating power-purchase contracts. Fifth, the environmental impacts of fossil fuels (externalities) that often result in real costs to society are difficult to evaluate. Sixth, although environmental impacts and associated costs are often included in economic comparisons between renewable and conventional energy, investors rarely include such environmental costs in the bottom line used to make decisions.

### Electricity Act 2003 and Subsequent Policies

**11.2** The development of grid interactive renewable power has essentially taken off with the Electricity Act 2003 – which mandates the State Electricity Regulatory Commissions (SERCs) to (i) promote generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and (ii) fix certain minimum percentages for purchase of renewable power. The National Electricity Policy 2005 has further provided for progressive increase in these levels and purchases by distribution companies through competitive bidding process. The Tariff Policy 2006 requires fixation by SERCs of a minimum percentage of Renewable Purchase Obligation (RPO) from such sources taking into account availability of such resources in the region and its impact on retail tariffs and procurement by distribution companies at preferential tariffs determined by the SERCs. The tariff policy also states that procurement of renewable power for future requirements shall be done through renewable resource specific competitive bidding process and in the long-term, renewable energy technologies would need to compete with other sources in terms of full costs. As of date, most of the SERCs have specified percentages for purchase of electricity from renewable sources of energy (**Table 11.1**). Preferential tariff for grid interactive renewable power is being given in most potential States. Uniform guidelines by Central Electricity Regulatory Commission (CERC) for fixation of such preferential tariffs have been issued. Further, the recent amendment in Tariff Policy provides for 0.25% Solar RPO by 2013 and 3% by 2022.

## **National Action Plan on Climate Change**

**11.3** On 30 June 2008, India's first *National Action Plan on Climate Change* (NAPCC) outlining existing and future policies and programs addressing climate mitigation and adaptation was released. NAPCC has advised that starting 2009-10, RPO's be set at 5% of total grids purchase, and be increased by 1% each year for 10 years. It further states that appropriate authorities may also issue certificates that procure renewables

**Table 11.1 Renewable Portfolio Obligation (RPO) Specified by the State Electricity Regulatory Commissions**

Sr. No.	State	Renewable Energy Source	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Gujarat	wind	4.5%	5.0%	5.5%			
		Solar	0.25%	0.5%	1.0%			
		others	0.25%	0.5%	0.5%			
		Total	5%	6%	7%			
2	Maharashtra	Solar	0.25%	0.25%	0.25%	0.50%	0.50%	0.50%
		Non-solar	5.75%	6.75%	7.75%	8.5%	8.5%	8.5%
		Total	6%	7%	8%	9%	9%	9%
3	Uttaranchal	Solar	0.25%	0.5%	1.0%	0.25%	0.5%	1.0%
		Non-solar	3.75%	4.5%	5.0%			
		Total	4%	5%	6%			
4	Manipur	Solar	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
		Non solar	1.75%	2.75%	4.75%			
		Total	2%	3%	5%			
5	Mizoram	Solar	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
		Non solar	4.75%	5.75%	6.75%			
		Total	5%	6%	7%			
6	Jammu & Kashmir	Total	1%	3%	5%			
7	Uttar Pradesh	Solar	0.25%	0.5%	1%	0.25%	0.5%	1%
		Non solar	3.75%	4.5%	5.0%			
		Total	4%	5%	6%			
8	Tripura	Solar	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
		Total	1%	1%	2%			
9	Jharkhand	Solar	0.25%	0.5%	1%	0.25%	0.5%	1%
		Non solar	1.75%	2.5%	3.0%			
		Total	2%	3%	4%			
10	Himachal Pradesh	Solar	0.1%	0.1%	0.1%	0%	0.1%	0.1%
		Non solar	10%	11%	12%			
		Total	10.10%	11.10%	12.10%			
11	Orissa	Solar	0%	0.10%	0.15%	0.20%	0.25%	0.30%
		Non-solar	1.0%	1.2%	1.4%	1.6%	1.8%	2%
		Co-gen	3.50%	3.70%	3.95%	4.20%	4.45%	4.70%
		Total	4.5%	5%	5.5%	6%	6.5%	7%
12	Assam Draft	Solar	0.05%	0.1%	0.15%	0.2%	0.25%	
		Total	1.4%	2.8%	4.2%	5.6%	7%	
13	Tamil Nadu	Total	14%					
14	Delhi	Total	1%					
15	Andhra Pradesh	Total	5%					
16	Karnataka	Total	11%					
17	West Bengal	Total	10%					
18	Rajasthan	Total	9.5%	9.5%				
19	Madhya Pradesh	Total	10%					
20	Punjab	Total	4%					
21	Haryana	Total	10%					

based power in excess of the national standard. Such certificates may be tradeable to enable utilities falling short to meet their renewables standard obligations.

## RENEWABLE ENERGY CERTIFICATE

**11.4** In January 2010, CERC issued a notification on 'Terms and Conditions for recognition and issuance of Renewable Energy

Certificate for Renewable Energy Generation'. Renewable Energy Certificate (REC) seeks to address the mismatch between availability of renewable sources and the requirement of the obligated entities to meet their renewable purchase obligation. It allows certificate holders to sell renewable energy to States deficient on this front, individual or other trading entities is expected to stimulate competition and create a market for power across States. The National Load Dispatch Centre (NLDC) has been appointed as Central Agency for implementation of RECs. Renewable Energy Certificate Mechanism has been launched on 18 November 2010. Based on this, States like Maharashtra, Gujarat, Chhattisgarh and Kerala have started accepting application for accreditation of renewable energy projects. Three Biomass projects in Chhattisgarh have been accredited and registered with Central Agency.

## CERC STUDY

**11.5** In June 2010, CERC commissioned study report titled "Assessment of Various Renewable Energy Resources Potential in different States, Determination of RPO Trajectory and its Impact on Tariff" was released. Major findings of the study are as under: -

- i. Based on the projects in pipeline and new capacities expected, it is feasible to add about 28,000 MW renewable energy based capacity in next five years. In that scenario the total capacity would be about 45,000 MW in year 2015 and which would generate electricity to achieve a 10% RPO in the country as a whole;
- ii. Pan India incremental impact on power purchase cost would be less than 1.5 paise per unit in year 2010-11 and which would reduce to about 0.1 paise per unit in year 2014-15;
- iii. After assessing the scenario in various States, the maximum incremental impact on power purchase cost in any year would be about 4.2 paise per unit. This would be the case in States which have presently almost negligible RPO and would be expected to go to about 7% RPO in year 2014-15;
- iv. The States which are having a present RPO of more than 10% would be expected to go to a level of about 14%, in order to get a national level RPO of 10%; and
- v. The yearly incremental impact on power purchase cost is not substantial and could be accommodated by the State utilities.

## ISSUES AND WAY FORWARD

**11.6** Although the existing regulatory framework for renewable power have created a momentum for harnessing renewable energy based power potential, there appears to be a need for mid-course corrections for rapid growth on renewable power in the country. Renewable energy is location specific and is not uniformly distributed across the country which puts a limit on exploiting renewable power beyond a level under the existing framework, primarily due to the consideration of extra cost to be incurred by the States due to higher feed-in-tariff, on the need for creating spinning reserve and also associated transmission infrastructure development. Further, the experience shows that the existing cost plus based feed-in-tariff regulatory regime does not lead to cost reduction.

**11.7** In the aforesaid background, the Ministry has initiated a dialogue with the CERC, Ministry of Power and also with the State Electricity Regulatory Commissions to devise an approach for rapid growth on renewable power in the country. The options being examined

include renewable energy specific purchase obligations, separate for each renewable resource, aiming at lower tariffs through competitive tariff bidding, and also incentivizing resource rich States for development and exploitation of potential, specifically, for development/upgradation of transmission infrastructure for power evacuation to other States. In addition, as is being done for solar electricity, the possibility of suggesting regulation to ensure low transmission cost of renewable electricity, and support wing developers with low cost funds and also additional fiscal incentives are being explored.