



Development of Renewable Energy

Role of Proper Incentive Mechanisms

Presentation By

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Comparison of various types of power sources

Particulars	Coal Based power plants	Renewable Energy based power plants				
		Biomass	Cogeneration	Wind	Small Hydro	Solar PV
Capital Cost (Rs.Crores / MW)	5.5	5	5	6	8	8
Cost of Fuel (Rs. In tonnes)	2000	2500	800	Nil	Nil	Nil
PLF	80%	90%	60%	25%	55%	20%
Variable Cost/running cost (Rs/unit)	Rs 0.8- 1.6	Rs 3.0	Rs 1.80	Rs 0.50	Rs 0.60	Rs 0.6-0.7
Cost of generation (Rs.per unit)	Rs. 1.40 to Rs. 2.60	Rs. 3.80 to Rs. 4.00	Rs. 3.20 to Rs. 3.80	Rs. 3.00 to Rs. 4.00	Rs. 2.50 to Rs. 3.00	Rs 6.00 -8.00

Rational of Incentives

Availability of most of the conventional sources is limited. Need to develop stable alternatives for power supply.

- Capital costs of renewable energy generation is higher side than conventional projects. Initial take off of renewable energy requires support. Provisions like Accelerated depreciation ,preferential tariffs, fiscal incentives makes attractive business case and provides scale up opportunities.

Overtime the costs of generation from conventional power are increasing.

- Environmental impact of continuous use of conventional sources is detrimental and needs to be reduced on priority.

Renewable energy can support energy needs in much efficient way by distributed generation and micro grids.

Importance / Benefits of these Incentives

- The overall project cost reduces.
- Due to back hand capital subsidy, the financial burden on the projects reduces.
- In case of SDF supported projects, the requirement of promoter contribution reduces from normally 30% to 10% of total project cost.
- Higher returns to project promoters as compared to other type of industries.

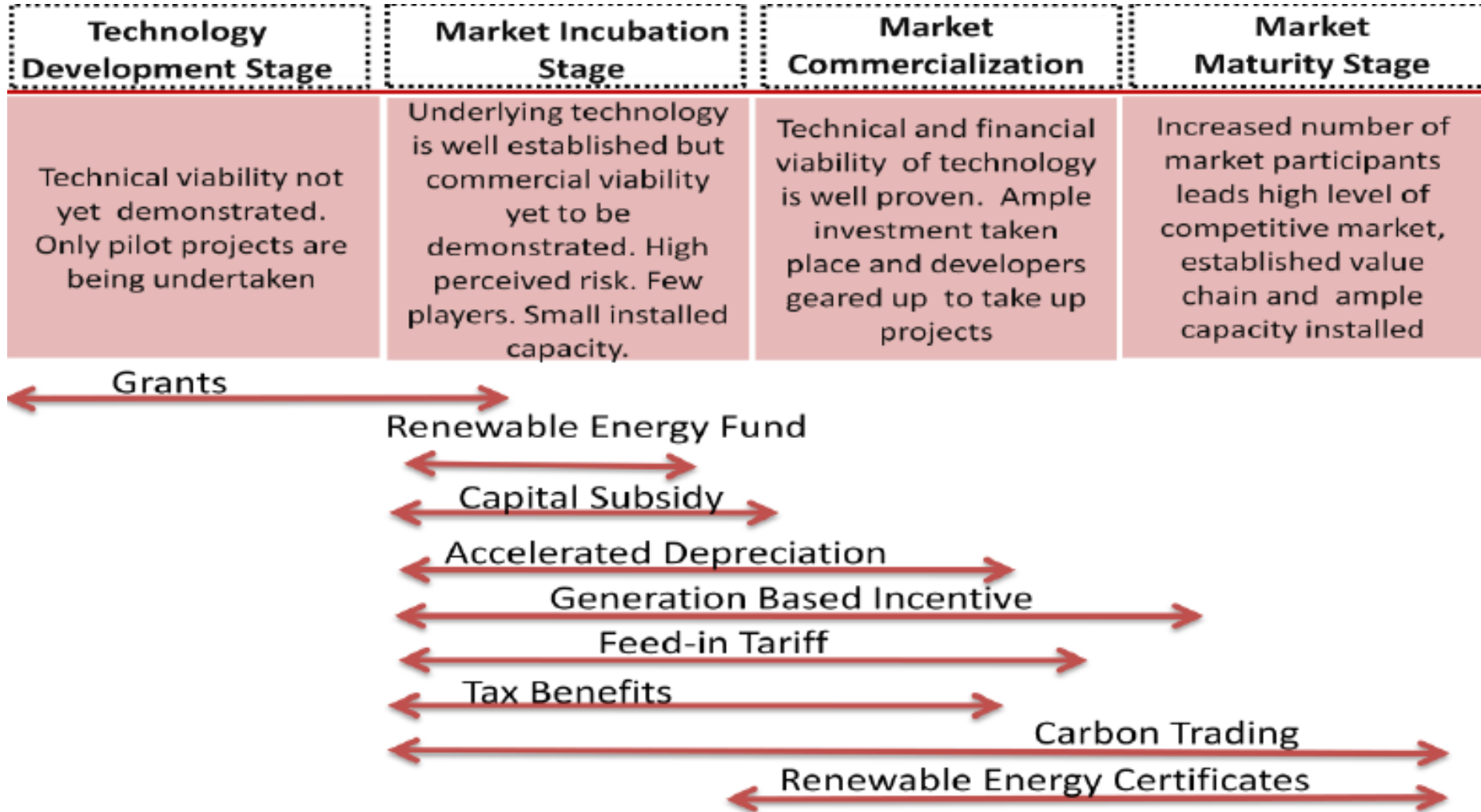
Incentives in Vogue

Feed-in tariff (incl. premium payment)	REGULATORY POLICIES
Electric utility quota obligation/ RPS	
Net metering	
Biofuels obligation/ mandate	
Heat obligation/ mandate	
Tradable REC	



Capital subsidy, grant, or rebate	FISCAL INCENTIVES
Investment or production tax credits	
Reductions in sales, energy, CO ₂ , VAT, or other taxes	
Energy production payment	
Public investment, loans, or grants	PUBLIC FINANCING
Public competitive bidding	

Stage Wise Policy Incentives



Financial Incentives- Biomass- Cogen

1. Capital Subsidy from Ministry of New and Renewable Energy.

	Special Category States (NE Region, Sikkim, J&K, HP & Uttarakhand)	Other States
Biomass Power projects	$\text{Rs.25 lakh} \times (\text{C MW})^{0.646}$	$\text{Rs.20 lakh} \times (\text{C MW})^{0.646}$
Bagasse Co-generation by Private sugar mills	$\text{Rs.18 lakh} \times (\text{C MW})^{0.646}$	$\text{Rs.15 lakh} \times (\text{C MW})^{0.646}$

PROJECT TYPE	MINIMUM CONFIGURATION	CAPITAL SUBSIDY
Single coop. mill through BOOT / BOLT Model	60 bar & above	Rs.40 L/MW of surplus power *
	80 bar & above	Rs.50 L/MW of surplus power* (maximum support Rs.8.0 crore/ sugar mill)

Financial Incentives – Small Hydro

Area	Upto 1000 KW	Above 1 MW & Upto 25 MW
NE Region, J & K, HP and UK (Special category States)	Rs. 20,000 per KW	Rs. 2 Crores for 1 st MW + Rs. 30 Lakhs for each additional MW
Other States	Rs. 12,000 per KW	Rs. 1.2 Crores for 1 st MW + Rs. 20 Lakhs for each additional MW

Financial Incentives – Solar

Preferential Tariffs

- High GBI
- Schemes at both state and central level

Capital Subsidy

- Off grid
- Process heating, Solar heating

Soft Loans

- Off grid PV projects, solar heating

RPO

- Solar specific RPO

Financial Incentives – Wind

- I-Tax holiday u/s 80 1A
- Excise Duty relief
- Concessional Customs Duty
- Preferential Tariff by SERC
- AD @ 35% for first year
- REC floor price of Rs.1.50/ unit till 2017
- GBI support

RPO across some states

State	2012-13 RPO
Andhra Pradesh	4.75% + 0.25%
Delhi	3.25% + 0.15%
Gujarat	6.00% + 1.00%
Himachal Pradesh	10% + 0.25%
Karnataka	10% + 0.25% (BESCOM, MESCOM, CHESCOM), 7% + 0.25% for others
Madhya Pradesh	3.40% + 0.60%
Maharashtra	7.75% + 0.25%
Rajasthan	7.10% + JNNSM
Tamil Nadu	8.95% + 0.05%

Case Study – Bagasse based Cogen

Assumptions:

- Capacity of project: 25 MW
- Season days: 140
- Off-season days: 20
- Capital Subsidy: Rs. 120 Lakhs
- SDF Loan: Rs. 3630 Lakhs @6% p.a.
- REC: Rs. 1.5/ kwr

Parameter	BEP (%)	IRR (%)	NPV (Rs in lakhs)	DSCR
Projects without Incentives	35.47%	29.54%	10917.93	1.93
Projects with Incentives including MAT, Capital Subsidy, SDF, REC	23.94%	44.44%	20134.80	2.62

Case Study – Small Hydro

Parameters:

Capacity	:	24.6 MW
PLF	:	53.84%
Gross Generation	:	116 MU
MAT	:	20.01%
Commercial Tax Rate	:	33.99%
Capital Subsidy	:	Rs. 9.08 Cr.

	IRR on Equity (After Tax)	DSCR	NPV (Equity) Rs. In Cr.	BEP (MU)	BEP (%)
Base Case without Incentives	14.40	1.39	8.99	66.25	57.11
Base Case+ Tax Incentives	16.16	1.49	17.84	66.25	57.11
Base Case + Tax Incentives + Capital Subsidy	17.61	1.60	2.36	62.99	54.29

Way forward

1. The impact of fiscal and financial incentives i.e., tax benefits, capital subsidy, depreciation benefits is not substantial.
2. Impact of RECs makes project more viable.
3. Financial viability is highly sensitive to preferential tariff and success/failure of the project is highly dependent on it.
4. Benefits under SDF schemes have been encouraging as the promoter contribution reduces to 10% of project cost and interest rate for SDF loan is about 6% p.a.