

Renewable Energy Division

February 9th 2018





Growth of Renewable energy

Global

- Renewable Capacity at the end of 2016 was 2017 GW [Hydro -1096 GW mostly large; Wind 487 GW; Solar 308 GW; others]
- In 2016 wind added 54 GW and solar added 75 GW.

India

- Total installed gen capacity of India is 327 GW of which 57 GW is in renewables (~17%)
- Current renewable energy share around 7%
- In FY17 Solar added 5.5 GW and wind added 5.4 GW. Solar edged out for the first time

Renewable Capacity addition in India (MW)

(MW)	INSTALLED CAPACITY 31.03.2015	INSTALLED CAPACITY 31.03.2016	INSTALLED CAPACITY 31.03.2017	TARGET 2022
Solar >1 MW	3744	6763	12289	100000
Wind	23444	26867	32280	60000
SHP	4055	4273	4379	5000
Biomass/Othr	4533	4946	8311	10000
Total Installed Capacity	35776	42849	57259	175000
		(+20%)	(+34%)	



Achievements so far

Ministry of New & Renewable Energy

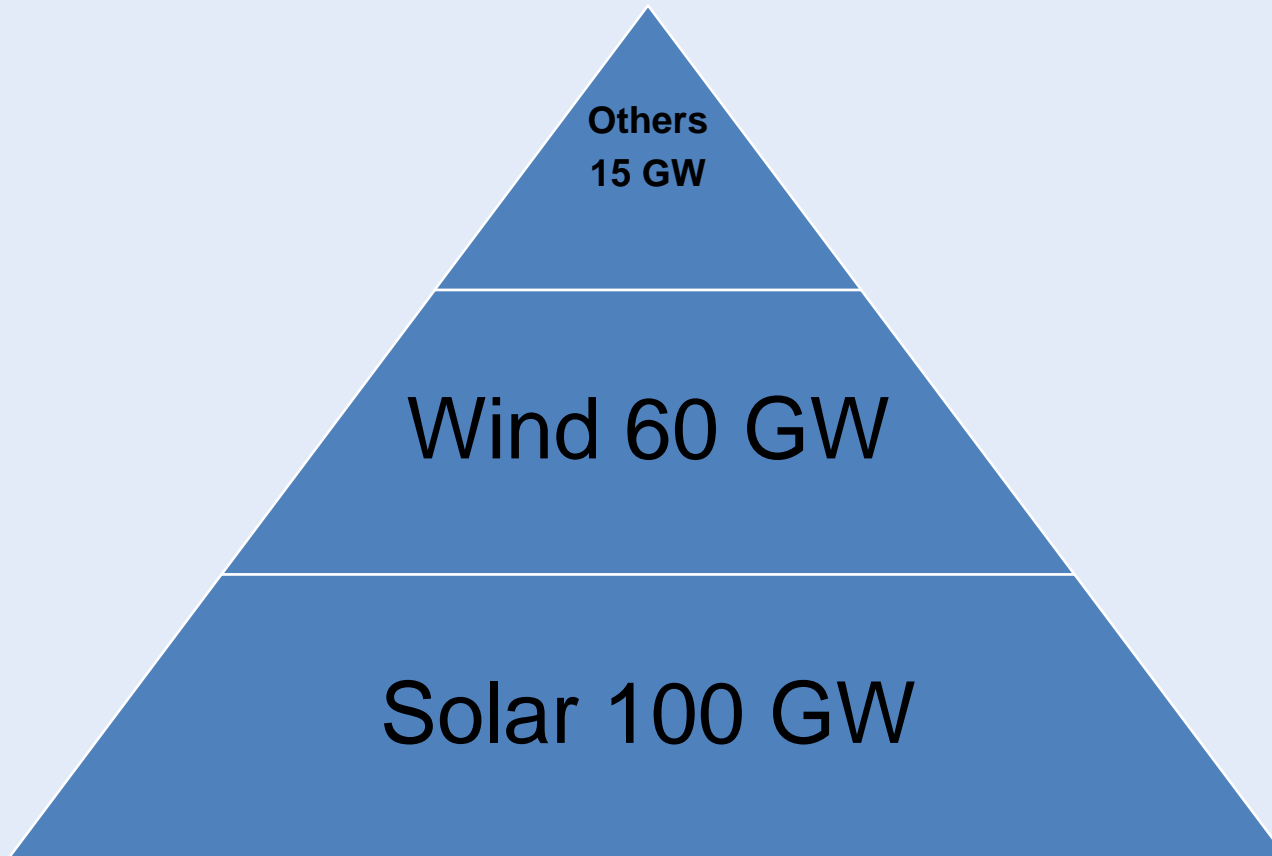
Programme/ Scheme wise Physical Progress in 2017-18 & cumulative upto the month of September, 2017

Sector	FY- 2017-18		Cumulative Achievements
	Target	Achievement (April - September, 2017)	(as on 30.09.2017)
I. GRID-INTERACTIVE POWER (CAPACITIES IN MW)			
Wind Power	4000.00	420.88	32700.64
Solar Power - Ground Mounted	9000.00	2348.81	13981.64
Solar Power - Roof Top	1000.00	134.22	790.22
Small Hydro Power	200.00	9.70	4389.55
BioPower (Biomass & Gasification and Bagasse Cogeneration) #	340.00	0.00	8181.70
Waste to Power	10.00	0.00	114.08
Total	14550.00	2913.61	60157.83



How is 175 GW by 2022 going to be achieved

- The two key drivers would be capacity addition in Wind and Solar





Renewable Energy Potential & Targets in India

Sources	Potential (%)	Potential (GW)
Wind Power (Onshore)	11%	103
Solar	83%	749
Small Hydro	2%	20
Biomass /Bagasse	3%	23
Waste to Energy	0%	2.7
Total Potential (GW)	100%	897.7
Wind Power (Offshore)		127
Grand Total Potential (GW)		1024.7

Source : Wind Energy Mission Doc, C-Wet , NISE estimates, MNRE

Target 2022 of 175 GW is just 20% of total potential

- India has taken a voluntary commitment to reduce emission intensity by 33-35 per cent from 2005 levels by 2030.
- India to achieve about 40 per cent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030. Might achieve it much before. !
- Core drivers for renewable energy in India being **Energy security** (reducing dependence on fossil fuels); **Electricity shortages** (to meet the growing requirements) and **Energy Access for all**



REC – facilitating green power

- Around the launch of National Solar Mission in 2010-11, REC formed a separate Renewable Division for focused credit delivery for the renewable power developers.
- At REC we have adapted to the dynamic requirements of the sector and improved the efficiency and quality of credit delivery mechanism
- Cumulative Sanctions – Rs 12,356 Cr
- Cumulative Disbursement - Rs 5,285 Cr [Over 80% Solar PV]
- Target to exceed 8000 Cr (Sanc) and 5000 Cr (Disb) in FY17-18
- As of Nov-17, we have sanctioned Rs 3506 Cr and disbursed Rs 2025 Cr
- In last 7 years we have assisted 75 projects with sanctions of 10,328 Cr aggregating capacity of 1916 MW



Renewable Energy : Current Scenario

A) Solar

- India is set to become the third biggest solar market globally in 2017, overtaking Japan
- In the Q1 2017 India added 3,120 MW of utility scale solar capacity, pace in Q2 2017 was relatively slow at 1,437MW against a scheduled capacity addition of 3,300MW because of delays arising from land and transmission
- There has been a significant lull in announcement of utility scale solar tenders from the Solar Energy Corporation of India (SECI). It has announced only one tender Bhadla 750 MW this year in comparison to around 5 GW of new tenders in 2016
- Tendering delays have been caused by multiple factors i.e. weak growth in power demand affecting DISCOM appetite to issue any new tenders and the new competitive auction guidelines announced in August 2017, which require use of standard bidding documents
- Challenge is to sustain this growth as DISCOMs seem to be frozen in the headlights with falling tariffs and weak power demand.”



Renewable Energy : Current Scenario

B) Wind

- After a steep fall in solar power prices in India, it is now the turn of wind energy. During an auction conducted in Oct 17 by the SECI for 1,000 MW of wind power installations, tariffs fell to a new low of Rs 2.64 per unit, down 24% from even the previous low of Rs 3.46. The prices are now competitive with the solar energy segment which hit a record-low of Rs 2.44 per unit in May.
- Following the introduction of the new tariff-determination system, the central and state governments hadn't conducted any wind farm auctions, leaving companies without a pipeline of projects to work on.
- DISCOMs also wanted to pull out of previously-signed PPA, instead pressuring power firms to sell at the newly-discovered low rates for renewable energy. As a result, the sector has seen a sharp fall in new capacity additions in 2017 compared to the previous year.
- The slowdown has also driven down wind turbine costs and lowered the expectations of return on investments, resulting in tariff reduction. The availability of more efficient and advanced wind turbines has also helped reduction in cost.
- While falling tariffs make renewable power more attractive to consumers, it creates risks for investors and lenders. The viability of these projects depend on the project execution capability of the firms involved and its capability of land acquisition in high wind zone areas with good grid connectivity.”



Financing Norms of REC for renewables

Technologies Covered	All – Solar, Wind, Small Hydro, Biomass* <i>*upto 10 MW</i>												
Rate of Interest	IR-1	IR-2	IR-3	IR-4	IR-5								
(reset every 1/3/5/10 years)	9.75%	10.00%	10.25%	10.50%	11%								
	<p>‘* 10 year fixed rate is 15 bps lower</p> <p>‘** For biomass add 125 bps</p>												
Moratorium period	<p>Maximum 1 Year after COD subject to : Maximum period from Date of 1st Disbursement</p> <table border="1"> <thead> <tr> <th>Solar PV</th> <th>Biomass</th> <th>Sol. Thermal</th> <th>Small Hydro</th> </tr> </thead> <tbody> <tr> <td>2 Years</td> <td>3 Years</td> <td>4.5 Years</td> <td>6.5 Years</td> </tr> </tbody> </table>					Solar PV	Biomass	Sol. Thermal	Small Hydro	2 Years	3 Years	4.5 Years	6.5 Years
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Repayment Period	<p>Normally 15 years after moratorium period</p> <p>May be extended based on merits but not exceeding 80% of economic life / PPA</p>												
Debt Equity Ratio	<p>70:30</p> <p>[relaxable to 80:20 based on IR grading]</p>												



Financing Norms of REC

Upfront Equity

- 100% upfront for projects upto 10 MW
- For larger projects depending on Entity Grade obtained

Entity Grade (GR)	% Upfront Equity*
GR-1	33%
GR-2	45%
GR-3	50%
GR-4	75%
GR-5	100%

Extent of Funding / Sole Lending

- Minimum project size 5 MW
- Sole lending limits
 - SOLAR & WIND– Debt of upto 500 Cr (IR1 to IR4)
 - SHP - Debt of upto 150 Cr
- For Biomass maximum project size-10 MW (IR-1 to IR4 category only)

Consortium Lending

- For IR-1 to IR-4 categories, upto 500 Cr or 50% of Project Cost whichever is higher for Wind and Solar



Financing Norms of REC – Fee Structure

Application cum Processing Fee ¹	0.1% of loan	(Min 5 lakh and Max 30 lakh,
Upfront Fee ²	0.1% to 0.25%	IR-1 & IR-2 - 0.1% IR-3 & IR-4 - 0.2% IR-5 - 0.25%
Lead Fee ³	0.1% to 0.25%	IR-1 & IR-2 - 0.1% IR-3 & IR-4 - 0.15% IR-5 - 0.25%

1. Application fee - 50% payable on application, balance on sanction. Non-Refundable
2. Upfront fee is payable before execution of the loan agreement. Non-refundable
3. Lead Fee is chargeable where REC is lead lender or Sole Financier. 50% payable on sanction, balance on execution of loan agreement



Changes in REC financing norms to increase business

Reduction in Interest Rates	Interest rate band reduced to 9.75%-11% (Earlier 10.5%- 13% for IR-1 to IR-5 category borrower)
Rebate in Interest Rate post-COD	For IR-1/2/3, 25 bps rebate from card rate is given six months after COD
Repayment Period increased	Normally 15 years to not exceeding 80% of economic life / PPA
Structured Repayment Schedule	Permitted instead of equal quarterly
Increase in Moratorium Period	From 6 months to 1 year
Increase in timelines for creation of mortgage of land	Additional time provided for creation of mortgage of land
No prepayment charges at time of reset	Prepayment premium may not be charged for renewable energy loans where reset option availed is 3/5/10 year and where entire loan is prepaid at the time of reset of 1st tranche of loan
Sole Funding	Solar Projects - Upto debt of 500 Cr Wind Projects – Upto debt of 500 Cr Small Hydro - Upto debt of 150 Cr
DSRA	One quarter DSRA being financed in Project Cost
Collateral Security	No collateral security required for IR-1 to IR-4 category
Disbursement pending creation of security	Allowed upto 90% of loan sanctioned
Consortium Lending	Terms and conditions of sanction to be aligned with the lead lender
Underwriting	REC underwrites large size renewable projects
Refinancing	REC refinances commissioned renewable projects based on external credit rating



Some Issues in financing RE Projects

- **Technical**
 - Energy Yield Assessment, loss accounting and uncertainties
 - Quality of Equipment. More of a challenge in solar
 - Readiness of evacuation infrastructure and grid integration
- **Financial**
 - Low cost long term resources
 - Reverse Bidding – lower tariffs
 - Post-Commissioning financing, absence of long term takeout financing
- **DISCOMs**
 - Payment delay by DISCOMs may turn accounts into NPAs
 - Tendency to curtail costlier power at feed in tariffs
- **GENERAL**
 - Land – acquisition and approvals – time consuming
 - Water Scarcity for module cleaning – potential to reduce solar output



Efforts of REC in Facilitating Green Power

- ❑ **Requirement:** With winning tariffs getting more and more aggressive, to maintain project viability, there was a need for longer tenor loans.
- **REC has modified its terms of lending to accommodate door to door loan tenor of upto 18 -20 years, based on individual project requirement.**
- **Moratorium of 1 year is being given to allow the project to stabilize before repayment starts.**
- **Further, structured repayment schedule is also permitted to ease the cash flows during initial stabilizing periods as applicable.**



Efforts of REC in Facilitating Green Power

- **Requirement:** With project sizes getting bigger, developers were finding it difficult to deal with multiple lenders when ceiling of loan amount was restricted.
- **REC has increased its sole lending limits to debt of Rs.500 Cr for solar and wind. In consortium, REC can take upto 50% of the project cost or Rs.500 Cr whichever is higher.**
- **Terms and conditions of sanction to be aligned with the lead lender (except interest rates & fees)**



Efforts of REC in Facilitating Green Power

- ❑ **Requirement:** With Discoms delaying the payment to developers, two quarters DSRA was becoming a necessity. However, with tighter margins, it was difficult to build two quarters DSRA from project revenues.
- **REC funds one quarter DSRA, Also, to permit the building up of second quarter, longer moratorium period is permitted.**



Efforts of REC in Facilitating Green Power

- Requirement: To remain competitive in market, better pricing was required.
- REC has reduced its rates for various categories of borrowers, with rates now ranging as 9.75%, 10%, 10.25%, 10.5% and 11% for the various grades.
- Also, post COD rebate of 25 bps is permitted.
- 1/3/5/10 year reset options available



Efforts of REC in Facilitating Green Power

- Requirement: Refinancing of commissioned projects
 - In keeping with the reduced risk profile of commissioned projects, REC takeout / refinance outstanding loans of other borrowers based on a simplified process of external credit rating and project appraisal matrix to check viability of project.
 - Also, post COD rebate of 25 bps is permitted.



Efforts of REC in Facilitating Green Power

- ❑ Requirement: Various forms of promoter contribution
 - In keeping with the requirement of developers to allow various forms of quasi instruments, permitting of such instruments like CCD / CCPs etc is being considered.

- ❑ Requirement: Timelines for security creation
 - Based on unique requirements of states, varying timelines of security creation are being considered.



Efforts of REC in Facilitating Green Power

❑ Requirement: Simplification of Refinancing of Projects

- Refinancing of renewable projects based on the external credit rating has been introduced.

❑ Requirement :Prepayment of Renewable Energy Loans

- Prepayment premium may not be charged for renewable energy loans where reset option availed is 3/5/10 year and where entire loan is prepaid at the time of reset of 1st tranche of loan

Thank you for your kind attention

