Railway Energy Management Company Limited (REMCL)

A JV company of Indian Railways & RITES Ltd.

Renewable Energy Opportunities in Indian Railways
Way Forward

Presented By
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About REMCL

- REMCL- A JV of Indian Railways & RITES (49%:51%)
- Incorporated in Aug'2013 under Companies Act

Business Areas:-

1. Planning & execution of Renewable energy Projects
2. Power Planning and Procurement.
3. Advisory on Regulatory matters.
4. Planning and Management of ISTS connected Transmission lines
5. Consultancy Services.
6. Capacity Building to IR personnel.

Key Statistics of Indian Railways (2016-17)

- IR consumption 18 billion units-
  - 15.50 BUs for traction
  - 2.50 BUs for non traction
- Total annual bill - Rs.11,000 crore
  - Rs. 9,700 cr. for traction
  - Rs. 1,300 cr. for non-traction
- Peak requirement of power for Trcation - 2000 MW(Tr.)
- Average Requirement - 1800 MW (Tr.)
- Average growth rate - 3-5%per annum
- Electrification Target (next 5 years) - 25,000 RKM

Vision of Indian Railways for Renewable Energy

- To reduce carbon foot print of Indian Railways
- To substitute fossil fuel based power with renewable energy progressively.
- To procure renewable power at economical tariff.
- To fulfil Renewable Purchase Obligation of Railways
- To harness 1000 MW Solar power through EPC/Tariff Based Bidding by 2020.
- To harness 200 MW wind power by 2020.

State-wise RPO Obligation of Railways

Sr.	State	Traction Power		SPO*		NSPO**	
		MUs	MW	MUs	MW	MUs	MW
1	**Maharashtra**	2579	339	206	138	258	147
2	**Gujarat**	710	93	57	38	53	30
3	**MP**	1796	236	144	96	117	67
4	**Chattissgarh**	896	118	72	48	22	13
5	**WB**	1130	148	90	60	59	34
6	**Jharkhand**	503	66	40	27	15	9
7	**Bihar**	686	90	55	37	26	15
8	**Odisha**	966	127	77	52	72	41
9	**UP**	1562	206	126	72	79	50

Sr.	State	Power Requirement		SPO*		NSPO**	
		MUs	MW	MUs	MW	MUs	MW
10	**Rajasthan**	403	53	32	21	31	18
11	**Punjab**	173	23	14	09	7	4
12	**Haryana**	270	35	22	14	8	4
13	**Delhi**	88	12	7	5	-	-
14	**TN**	784	103	63	42	78	45
15	**Telangana**	387	51	31	21	19	11
16	**Kerala**	201	26	16	11	-	-
17	**AP**	1524	200	122	81	76	44

* SPO as per the National Tariff Policy January 2016
** NSPOs as per Orders of SERCs for FY 2016-17

Road Map of IR for Renewable Energy

Solar Energy

Roof Top Solar Plant: 500 MW for non-traction application

- 25 MW commissioned
- 115 MW contracts awarded and execution in progress.
- 32 MW tender under invitation by REMCL
- 328 MW CFA awaited from MNRE

❖ **Lowest discovered tariff of Rs. 3.49 per kWh with 25% CFA and Rs 4.46 per kWh without CFA**

Ground Mounted Solar Projects: 500 MW for Traction Use

Proposal to harness solar energy in Railway land/ Private land/ State Solar park

- 50 MW Bhilai in Chattissagarh in Railway land
- 50 MW in Solar Park in Rajasthan
- 400 MW Centralized/Distributed State-wise

Road map for Renewable Energy

Wind Energy

Already Commissioned:

- 10.5 MW by ICF at Tamil Nadu for non traction use with banking facility
- 26 MW by REMCL in Rajasthan for traction use.

Ongoing Projects:

- 6 MW for non-traction in Maharashtra for CR under Tariff based bidding route
- 10.5 MW under EPC in Tamil Nadu for SR.

Future Projects:

- 147 MW being proposed under tariff based bidding option

Challenges in harnessing Renewable Energy

- State-wise requirement of Railway varying from 25 MW to 340 MW limiting use of Renewable energy
- Scheduling issues of renewable energy for traction application as deemed licensee.
- Power balancing issues
- Backing down of conventional power during peak generation of renewable power.
- Additional financial implication of fixed charges of conventional power during use of Renewable Energy
- Non banking of renewable energy by DISCOMs as Railway itself is deemed licensee.
- High transmission charges of full installed capacity.
- MoP guidelines for waiver of CTU charges only for meeting RPO will limit the renewable energy requirement.
- Higher landed tariff even with lower ex bus cost.

Options for harnessing Renewable Energy

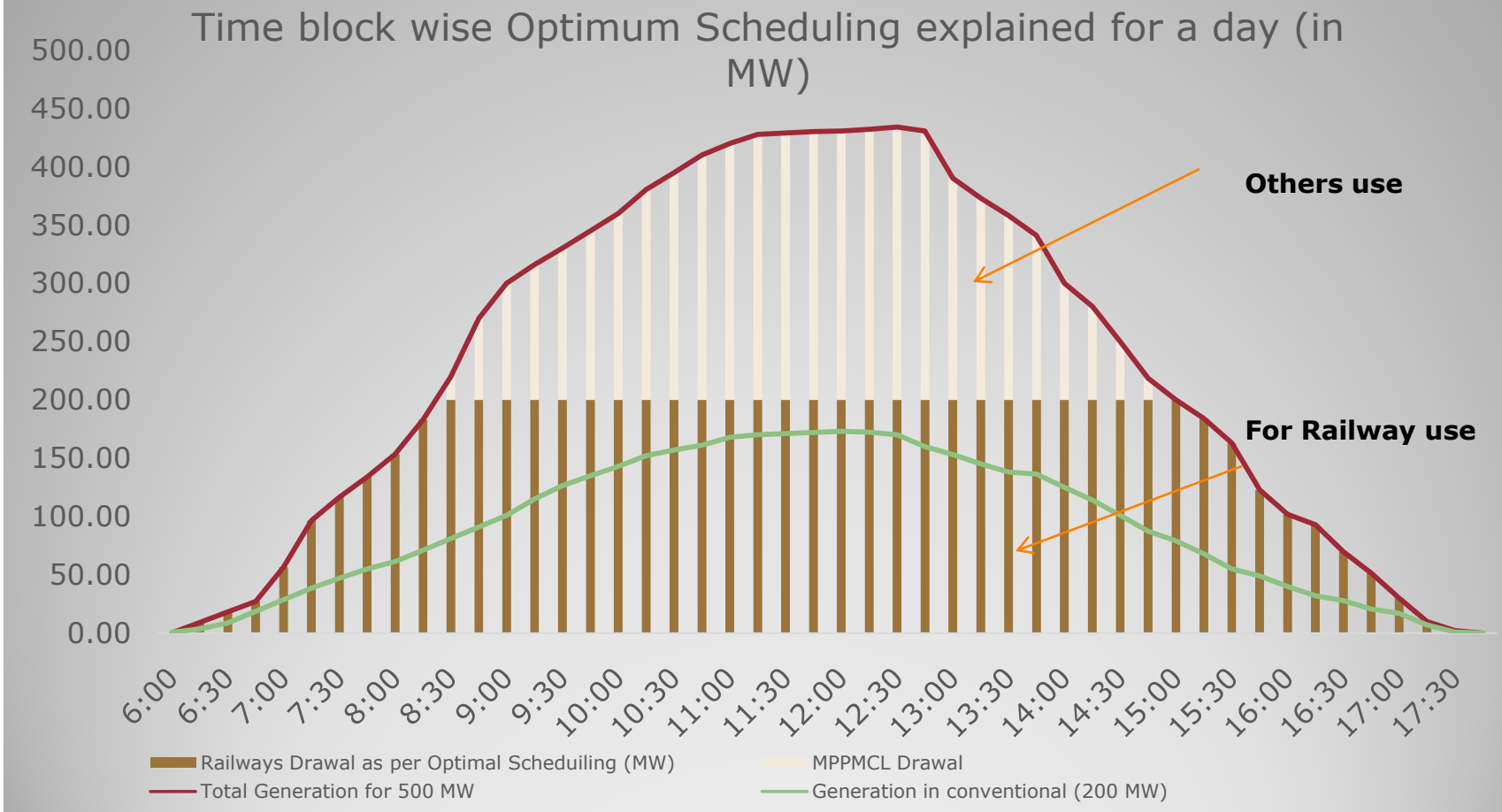
- Banking arrangement with State DISCOMs
- Introducing concept of chopped renewable power

  Advantages:

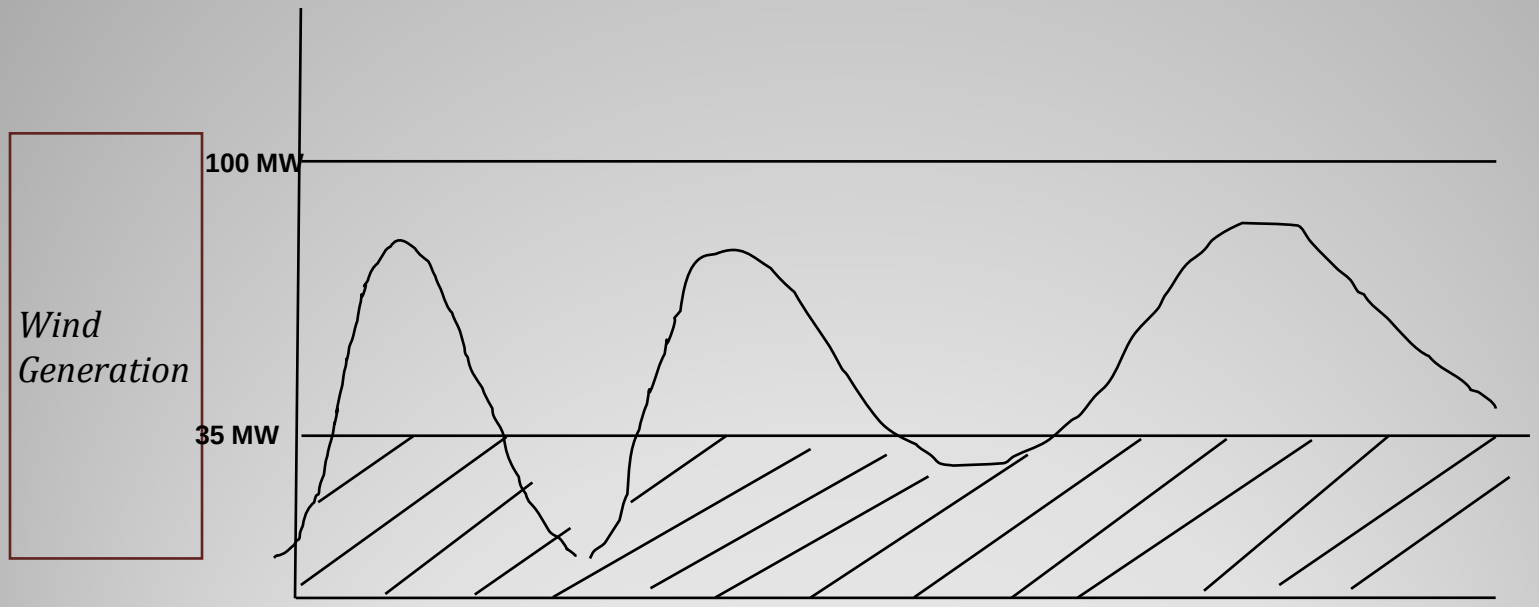
  a) Reduced transmission charges

  b) Reduced impact on scheduling of conventional power
- Purchase Renewable Energy Certificates (RECs) for meeting RPO requirement:
- Solar-wind hybrid plant.
- Solar Plant with battery storage.

Concept of Chopped Solar Power



Wind Model



SUPPLY OF CLIPPED WIND POWER' TO RAILWAY TSS's

Future Planning

- For implementing the chopped concept, a meeting is being held by REMCL with Renewable Power Developers on 2nd Nov. 2017 at 10:30 hrs at RITES Office, Gurgaon.

- Broad issues for discussion during meeting:
  - Period of contract: 12/25 years
  - Quantum (in MW & MUs) to be taken by Railway under chopping option.
  - Centralized/distributed Renewable Energy Plants.
  - Evolving and implementing concepts of Solar & Wind hybrid projects

- Intended Developers may like to participate.

REMCL
Railway Energy Management Co.Ltd.

THANK YOU