



**Renewable Regulatory Fund (RRF):-
Implementation Mechanism**

14.10.2011

Outline



- Overview
- Wind generation in WR Grid : Brief Details
- RRF Implementation : Role of Stakeholders
- Issues emerged at Delhi & Bengaluru workshop and possible avenues



RRF: Chronology of events



- IEGC Regulations, 2010 notified on 28.04.2010
- Clause 5 and Clause 7 of Annexure 1 of IEGC :
UI charges arrived at due to the variation of generation by wind and solar shall be shared amongst all the states through 'Renewable Regulatory Charge' to be operated through 'Renewable Regulatory Fund'.
- Clause 9 of Annexure 1 of IEGC :
NLDC shall prepare a detailed procedure for implementation of the mechanism of Renewable Regulatory Fund and submit the same for approval by the Commission.
- CERC examined the proposal submitted by NLDC and the modified procedure was notified on 18.02.2011
- Implementation of RRF to be effected from 01.01.2012

RRF: Objectives at a glance



- » Better prediction of generation by Wind/Solar generators and participation in scheduling
- » Generation from renewable to become more acceptable and market friendly
- » States already having met RPO targets may not find it averse to encourage renewable generation further
- » Better System Operation



RRF: Approach



- » Achieve better generation prediction using weather forecasting tools
- » Immune wind generators from paying deviation in UI charges upto a certain level of variation
- » No UI charges payable/receivable by Solar Generator
- » Socialize the deviation charges arrived due to variations amongst different state utilities
- » Develop a self sustaining mechanism towards better acceptance of intermittent generation



Wind generation in WR Grid : Brief Details



Role of different stakeholders towards RRF Implementation



Role of Wind Farms/Solar Generators



Wind farms – 10 MW and above and Solar plants - 5MW and above, connected at 33 KV and above :

- » Connectivity details to concerned SLDC/RLDC
- » Declaration about agreement if any
- » Provide details of Contracts and Contracted path to the concerned SLDC →RLDC→RPC
- » Generation forecast with periodic updates to SLDC/RLDC
- » To provide Data Acquisition System (DAS) facility to SLDC/RLDC



Role of SLDCs/RPCs/RLDCs/NLDC



SLDCs

- » Scheduling on daily basis with periodic revisions
- » Schedule and 'actual generation meter data' to be sent to RLDCs and RPCs
- » Payments/receipts to concerned Generators and Settlement of accounts with RRF

RPCs

- » Issuance of Statement of Energy Accounting on Weekly basis
- » Data handling of contracts and contracted price for issuance of energy and deviation accounts
- » To work out details towards Capping, Additional UI charges etc. if any.

RLDCs

- » Processed data of energy meters along with final schedule to be sent to RPCs on weekly basis
- » Vetting of solar generation schedule & Monitoring and performing checks
- » Direct co-ordination with Regional entities for contracts & energy meter data

NLDC

- » To maintain and operate RRF
- » Settlement of payments from RRF to Various Wind/Solar power plants/ State utilities
- » Issuance of statement & collection of Renewable Regulatory Charge

RRF: Enablers



- » Weather forecasting and generation prediction mechanism in place
- » SCADA and telemetering facilities
- » SEM at inter-connected points and Compatible metering
- » Collection of Renewable Regulatory Charge from utilities
- » Capacity building of stakeholders
- » Dedicated group in load dispatch centers
- » Institutional Mechanism in place
- » Expediting Ancillary Market




Issues emerged at Delhi & Bengaluru Workshop and possible avenues



RRF: issues emerged at Delhi workshop & possible avenues



1. Submission of requisite information:

- » Specific Information to be furnished by Wind Farms/Solar generators 
- » Declaration of PPAs and details thereof
- » SLDCs to take further initiatives in consolidation of such information

Submission of requisite information from SLDCs/Wind Generators 

RRF: issues emerged at Delhi & Bengaluru workshop and possible avenues



2. Forecasting and scheduling by all wind generators

- » 14989 MW installed capacity as on 31st Aug 2011
- » 2349 MW and 833 MW capacity installed in 2010-11 & 2011-12 respectively
- » In case only those units for which PPAs are signed after 3.5.2010 are considered then only 3182 MW may be the possible candidate for RRF (~20% of installed capacity)
- » Section 6.5.23 (i).....extend scheduling for all wind generators

**For better system monitoring and control
extend scheduling for all wind generators**



RRF: issues emerged at Delhi & Bengaluru workshop and possible avenues



3. Commercial and settlement

Handling the situations having :

- » Part collective and part bilateral sale of power
- » A Wind/Solar Generators having part capacity under past PPA and part new capacity

Treatment through pro-rata

4. Real time monitoring and data loss

- » Lack of reliability of communication between wind farms to developer's control centre
- » Loss of data resulting into forecasting errors
- » Non availability of telemetry

Infrastructural improvements



RRF: issues emerged at Delhi & Bengaluru workshop and possible avenues



5. Administration of RRF

» Parties to RRF spread across the entire country (state utilities, wind generators and other open access users required to fulfill RPO).....>50



» Minimizing the number of parties might be preferable (host state only).....no of parties < 10

RRF to operate as a separate account and possibility of meeting shortfall from other pool accounts and/or other means.....



RRF: issues emerged at Delhi & Bengaluru workshop and possible avenues



6. Accuracy towards RRF charge collection

- » Apportionment of RRF Charge collection percentage amongst different state utilities

Possibility for desired accuracy calculations - upto four/six decimal places

7. Accounting

- » Purchaser in different region/regions from host state
- » Inter dependency between RPCs/RLDCs/SLDCc
- » Complexity and challenges in reconciliation

Possibility of accounting in a hierarchical manner



RRF: issues emerged at Delhi & Bengaluru workshop and possible avenues



8. Generation by WG above 150% schedule:

- » Clause 5.3 of Procedure: Charge payable to WG would be UI charge applicable corresponding to 50-50.02 Hz (Rs. 1.55/ Unit)
- » This would however affect the host state adversely in case frequency > 50.02 Hz

Clause 5.3 of Procedure can be suitably modified





Thank You

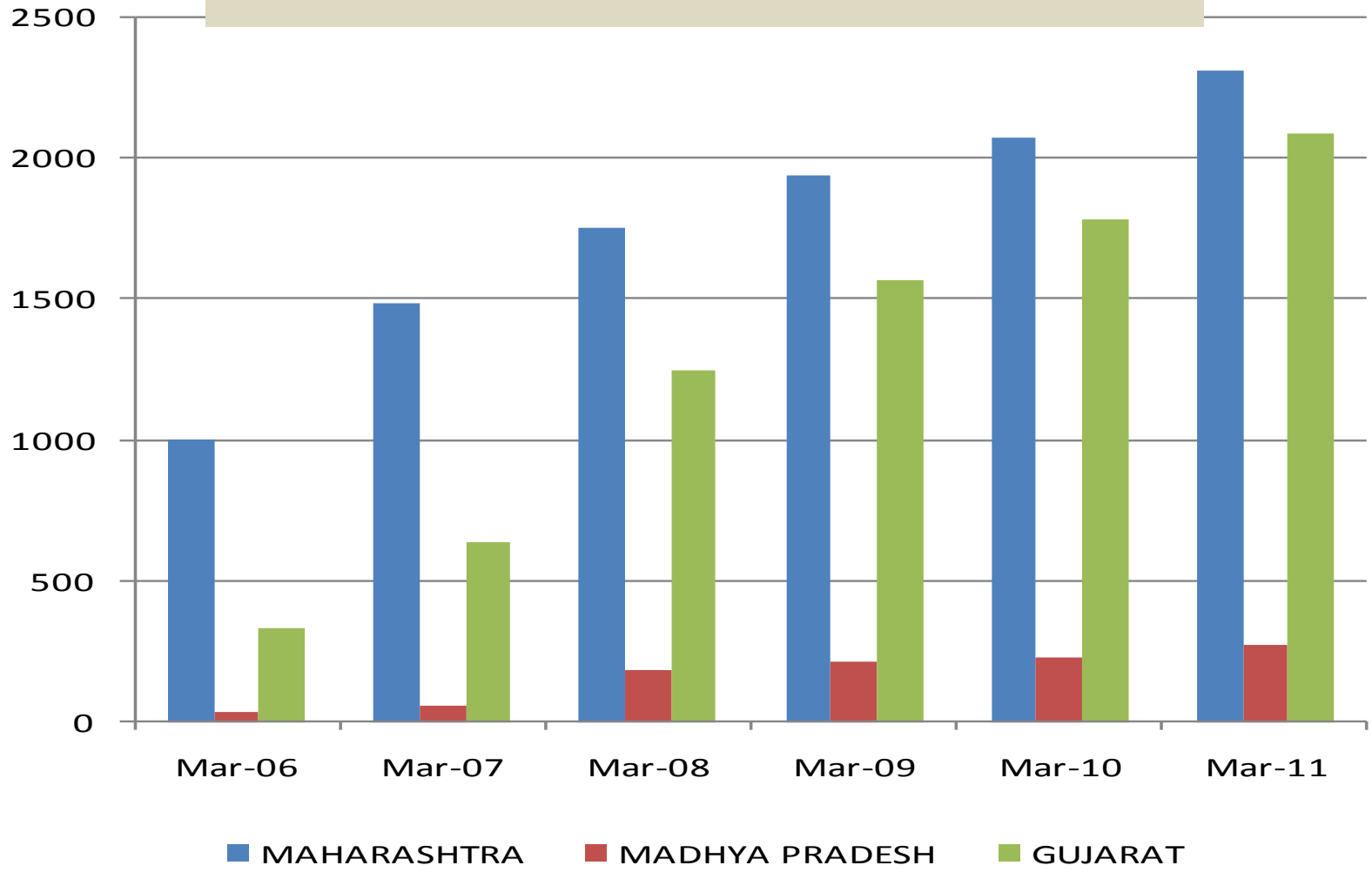
GROWTH IN INSTALLED CAPACITY OF WIND

State	Mar-06	Mar-07	Mar-08	Mar-09	Mar-10	Mar-11
Tamil Nadu	2895	3493	3873	4305	4907	5904
Karnataka	585	821	1011	1327	1473	1730
Maharashtra	1001	1488	1756	1939	2078	2311
Rajasthan	358	470	539	738	1088	1525
Andhra Pradesh	121	123	123	123	236	200
Madhya Pradesh	40	57	188	213	229	276
Kerala	2	2	11	27	28	33
Gujarat	338	637	1253	1567	1864	2176
Others	1	1	1	1	4	0
Total	5341	7091	8754	10242	11807	14158

GROWTH IN INSTALLED CAPACITY OF WIND - WR

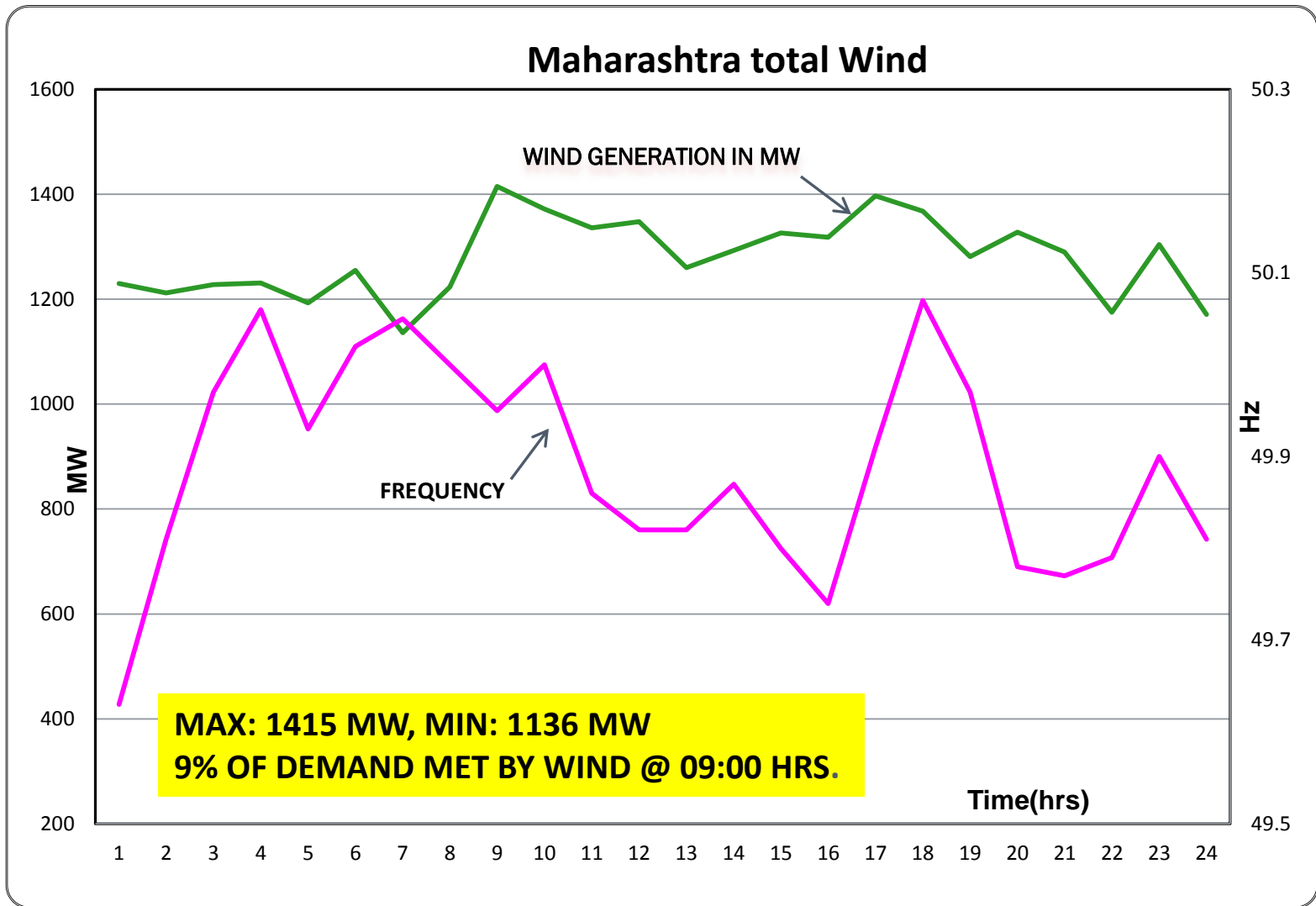
State	Mar-06	Mar-07	Mar-08	Mar-09	Mar-10	Mar-11
Maharashtra	1001	1488	1756	1939	2078	2311
Gujarat	338	637	1253	1567	1864	2176
Madhya Pradesh	40	57	188	213	229	276
Total	1380	2182	3197	3718	4171	4762

GROWTH OF WIND INSTALLED CAPACITY IN WR



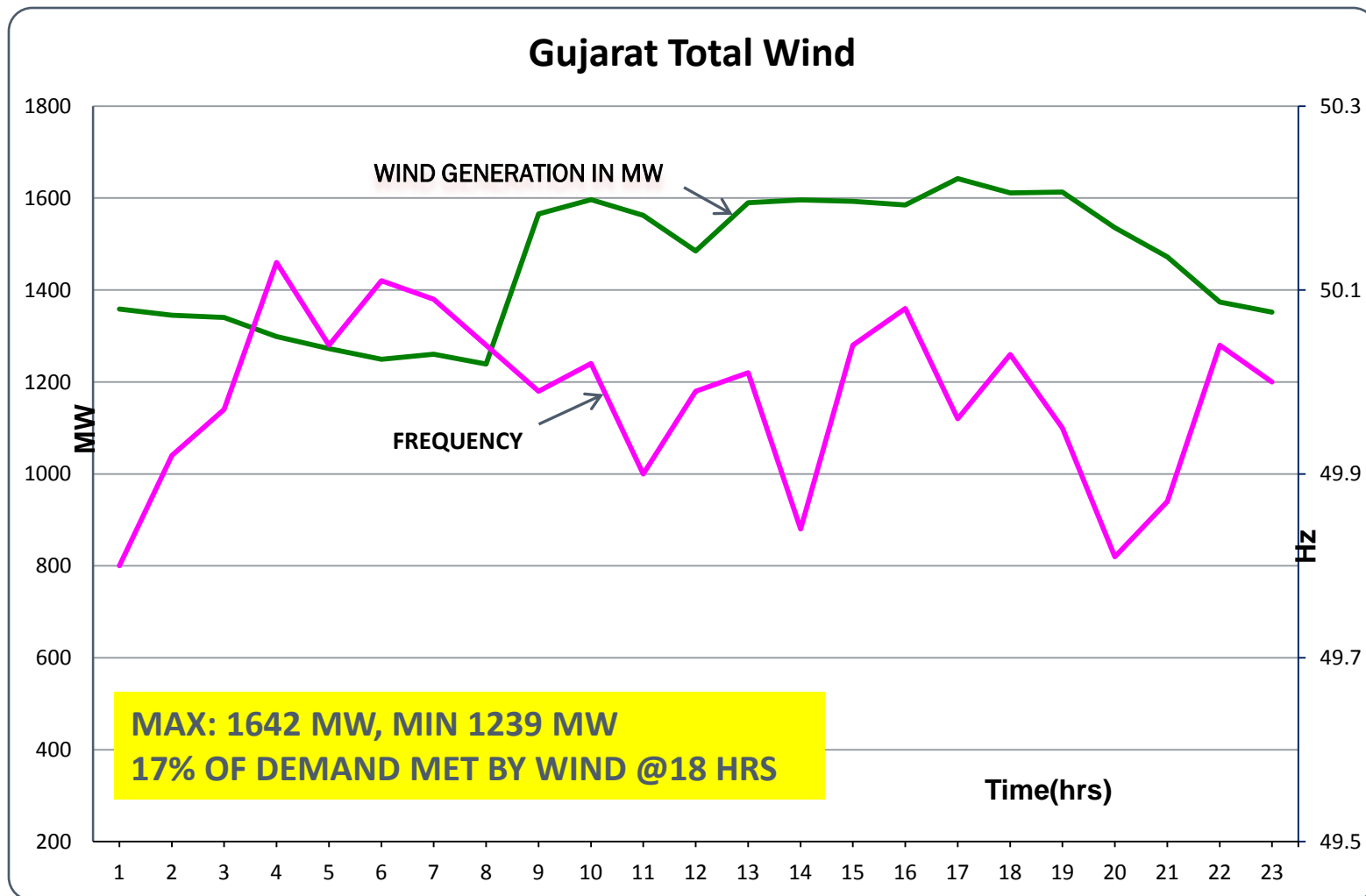
MAX WIND DAY: MAHARASHTRA 25 June 2011

30.69 MU GENERATED, 9.48 % OF TOTAL STATE CONSUMPTION

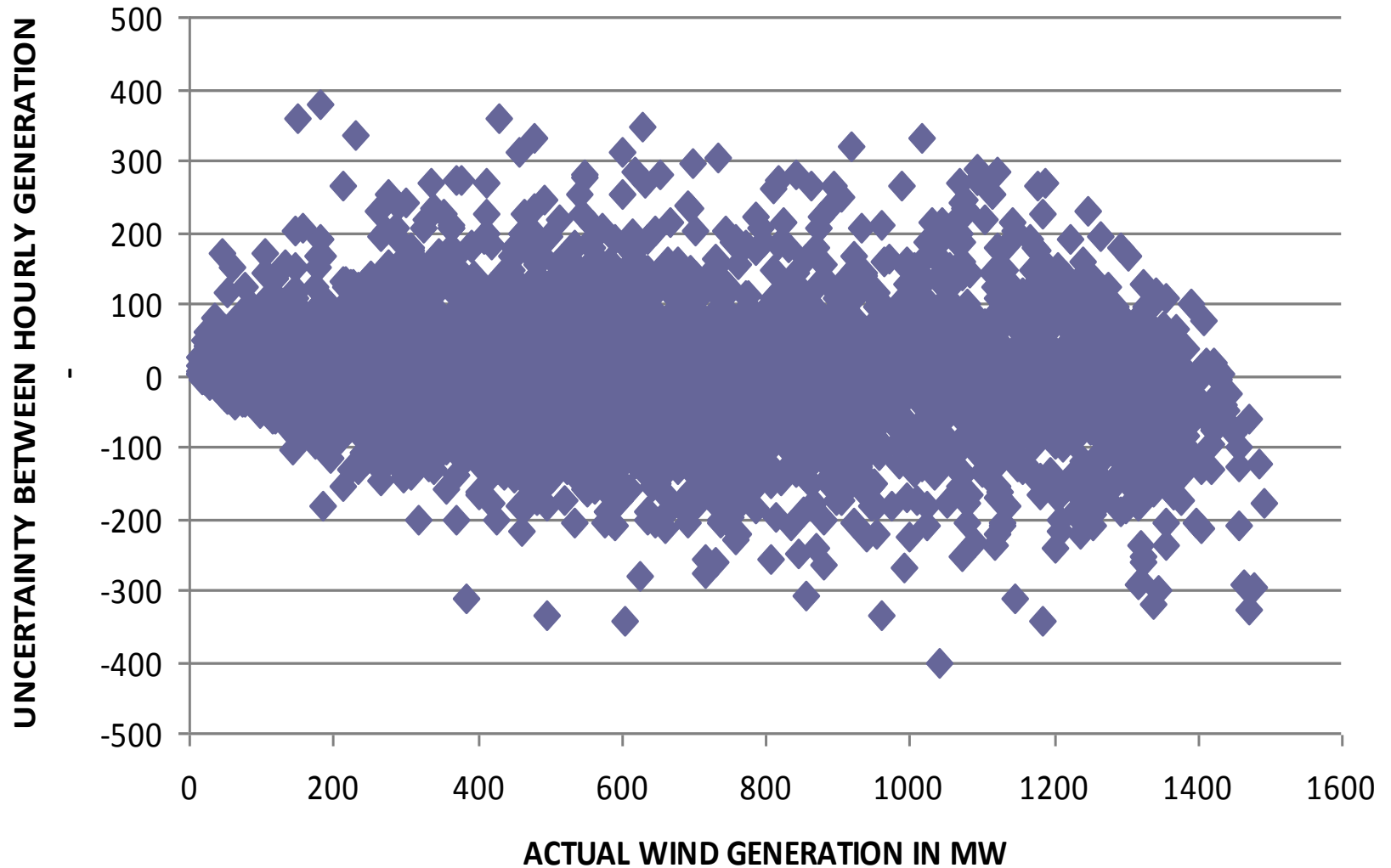


MAX WIND DAY:GUJARAT 17 June 2011

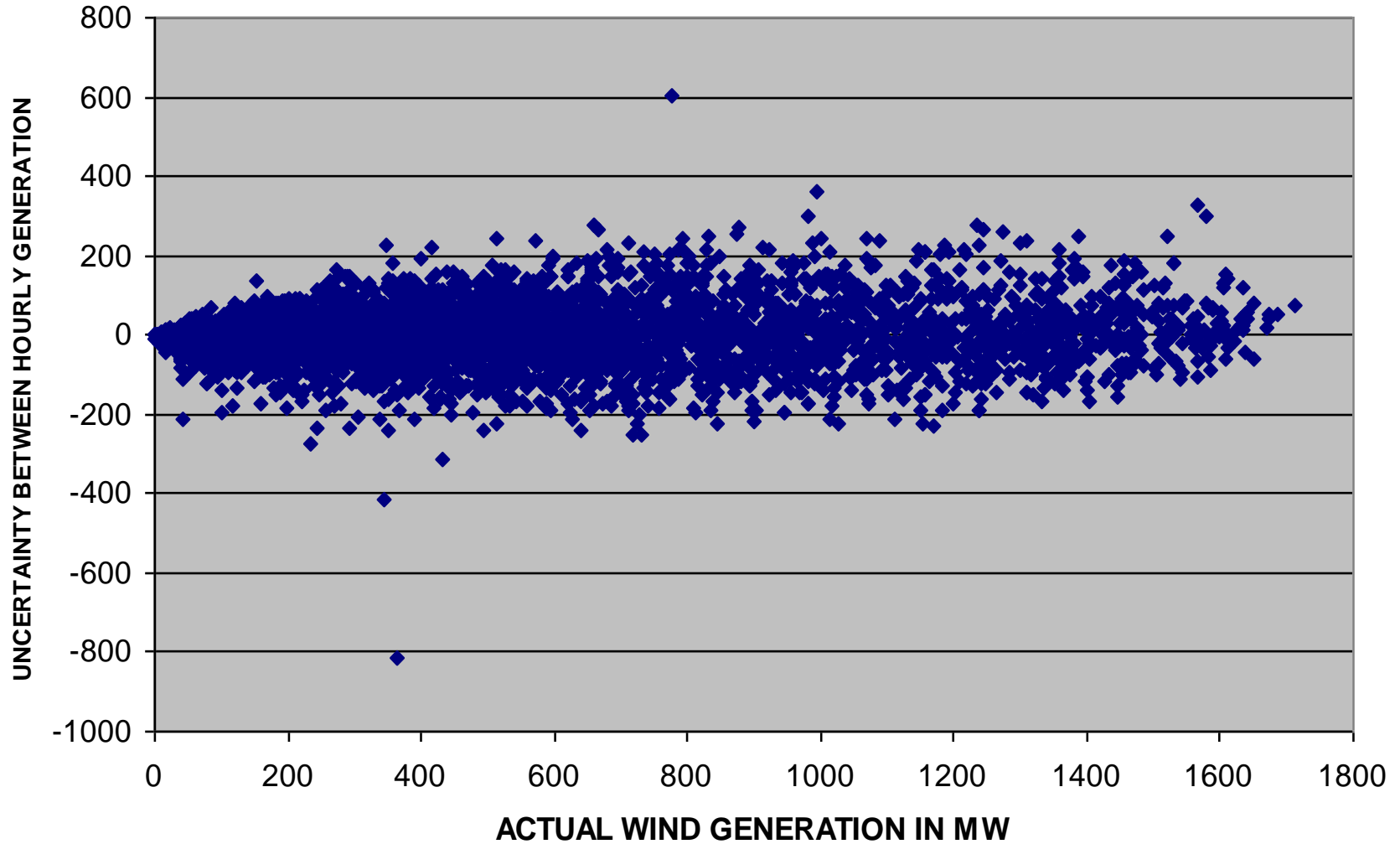
35 MU GENERATED, 15.15% OF TOTAL STATE CONSUMPTION



**SCATTERED PLOT OF UNCERTAINTY Vs ACTUAL GENERATION OF MAHARASTRA
WIND GENERATION (HOUR WISE) (April-11 to Sep-11)**



SCATTERED PLOT OF UNCERTAINTY VS ACTUAL GENERATION OF GUJRAT WIND GENERATION (HOUR WISE) (April11 to Sep11)



State/UT/DVC share in Renewable Regulatory Charges (% Contribution) (August 2011-Provisional)

S. No.	State/UTs/DVC	Peak Demand Met (MW)	Contribution to RRF (%)
1	Maharashtra	14904	12.4024
2	Andhra Pradesh	11377	9.4674
3	Uttar Pradesh	10388	8.6444
4	Tamil Nadu	10203	8.4905
5	Gujarat	8637	7.1873
6	Punjab	7882	6.5590
7	Karnataka	7085	5.8958
8	Haryana	6147	5.1153
9	West Bengal	5968	4.9663
10	Rajasthan	5880	4.8931
11	Madhya Pradesh	5322	4.4287
12	Delhi	5028	4.1841
13	Orissa	3341	2.7802
14	Kerala	2890	2.4049
15	Chattisgarh	2739	2.2793
16	DVC	2098	1.7459
17	Bihar	1738	1.4463
18	Jammu & Kashmir	1451	1.2075



State/UT/DVC share in Renewable Regulatory Charges (% Contribution) (August 2011-Provisional)

S. No.	State/UTs/DVC	Peak Demand Met (MW)	Contribution to RRF (%)
19	Uttarakhand	1429	1.1891
20	Assam	1014	0.8438
21	Himachal Pradesh	1011	0.8413
22	Jharkhand	811	0.6749
23	Dadar Nagar Haveli	605	0.5035
24	Goa	426	0.3545
25	Puducherry	310	0.2580
26	Chandigarh	273	0.2272
27	Daman & Diu	272	0.2263
28	Meghalaya	261	0.2172
29	Tripura	191	0.1589
30	Arunachal Pradesh	103	0.0857
31	Manipur	102	0.0849
32	Nagaland	102	0.0849
33	Sikkim	90	0.0749
34	Mizoram	53	0.0441
35	Andaman- Nicobar	32	0.0266
36	Lakshadweep	7	0.0058
	TOTAL	120170	100

