

Scheduling & Forecasting in Rajasthan

INITIATIVE of IWTMA

Workshop on Current Practices in
Wind & Solar Forecasting
January 22, 2018



INDIAN WIND TURBINE MANUFACTURERS ASSOCIATION

Scenario of Rajasthan- 2016

- Only partial Forecast data available with SLDC.
- SLDC not equipped for **analysis of deviation between scheduled wind power and actual injection**
- No Data integration system in between pooling substations and SLDC for getting the details of Power injection at any time.
- SLDC used to get data on phone and manually maintain a log book, which is not reliable as the data is received at different times, hence are not comparable.
- Availability of actual data of Injected Power is possible only after 30 days from the MRI record.
- SLDC is in the process of installing Fibre optic communications from Pooling Sub Stations to Inter connection Substations, which will take around 4 years.



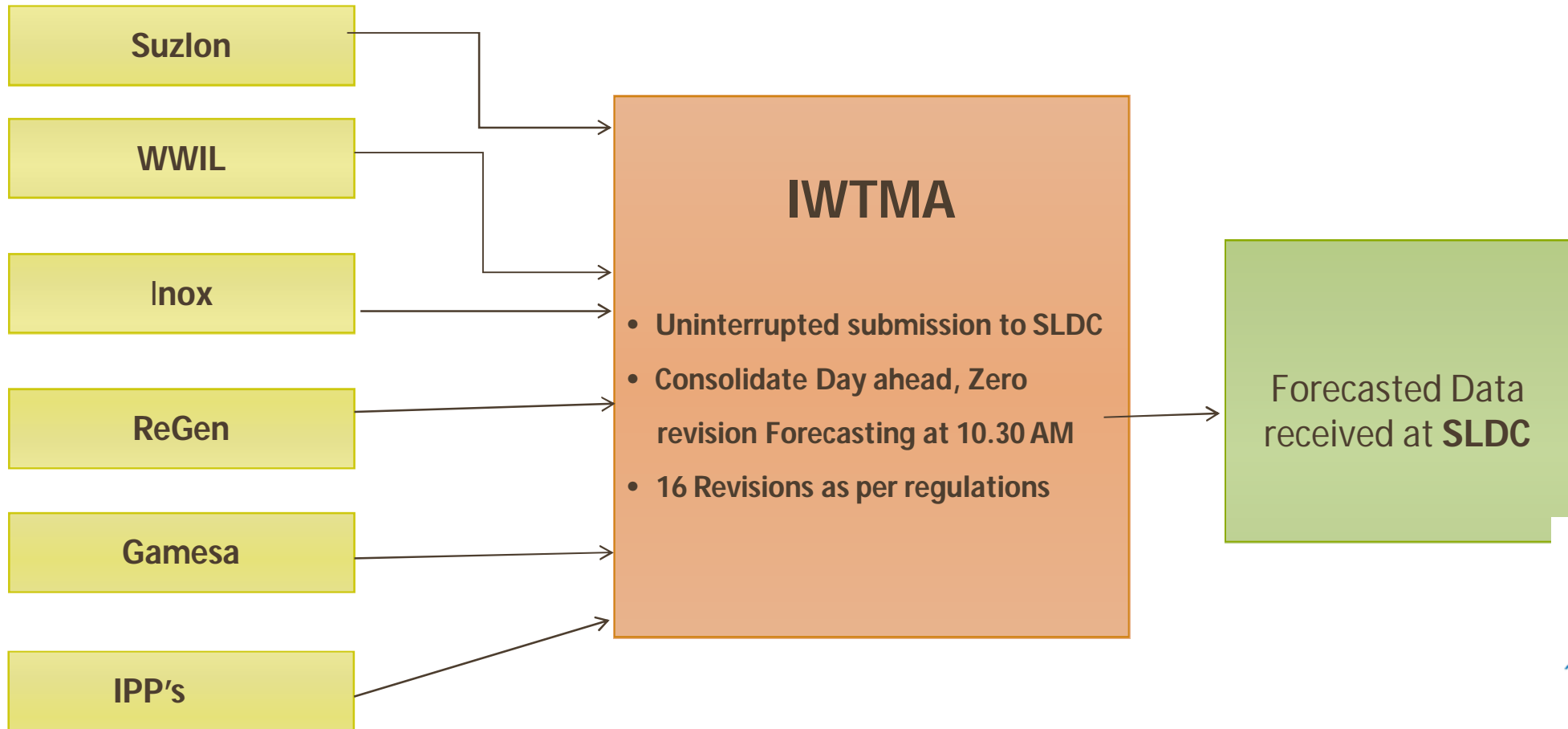
Forecasting & Scheduling – Coordination by IWTMA



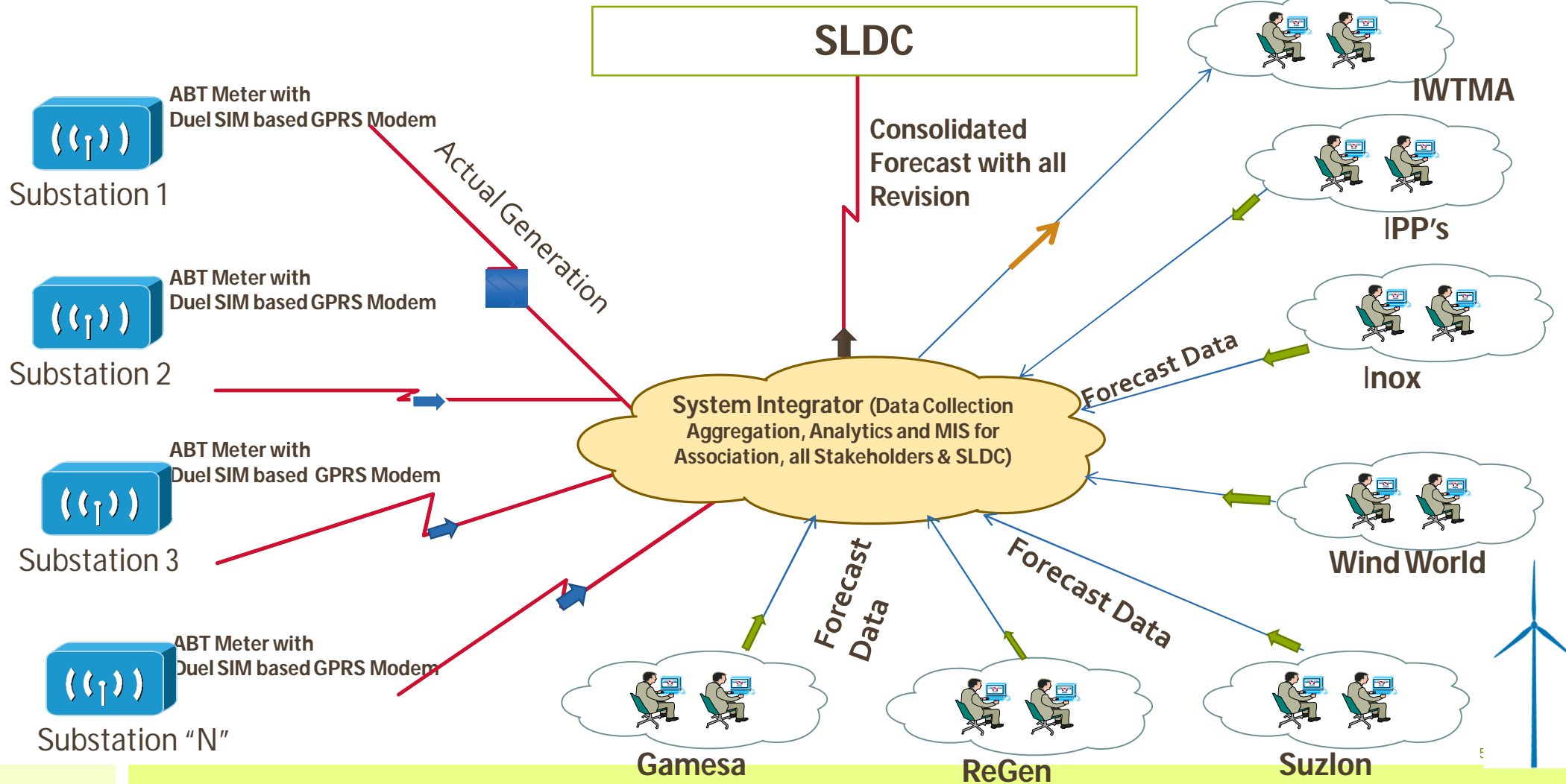
- IWTMA is playing a role as a single co-ordinating agency for compiling all data as received from various developers / generators and forwarding to SLDC.
- Approx 4246 MW Zero revision forecast data on Day ahead basis is being forwarded to SLDC before 10:30 AM daily. This is followed by 16 revisions as per regulations
- IWTMA engaged REConnect Energy as **System Integrator** for making the exercise dynamic and analytical.
- System Integrator will be responsible for installing ABT meter with Dual SIM based GPRS Modem in all the polling substations. The modems will work on storage & forward concept.
- System Integrator will also install RTUs in pooling substations with a dedicated Gateway at SLDC to synchronize all RTUs in SLDC System as per their requirement.



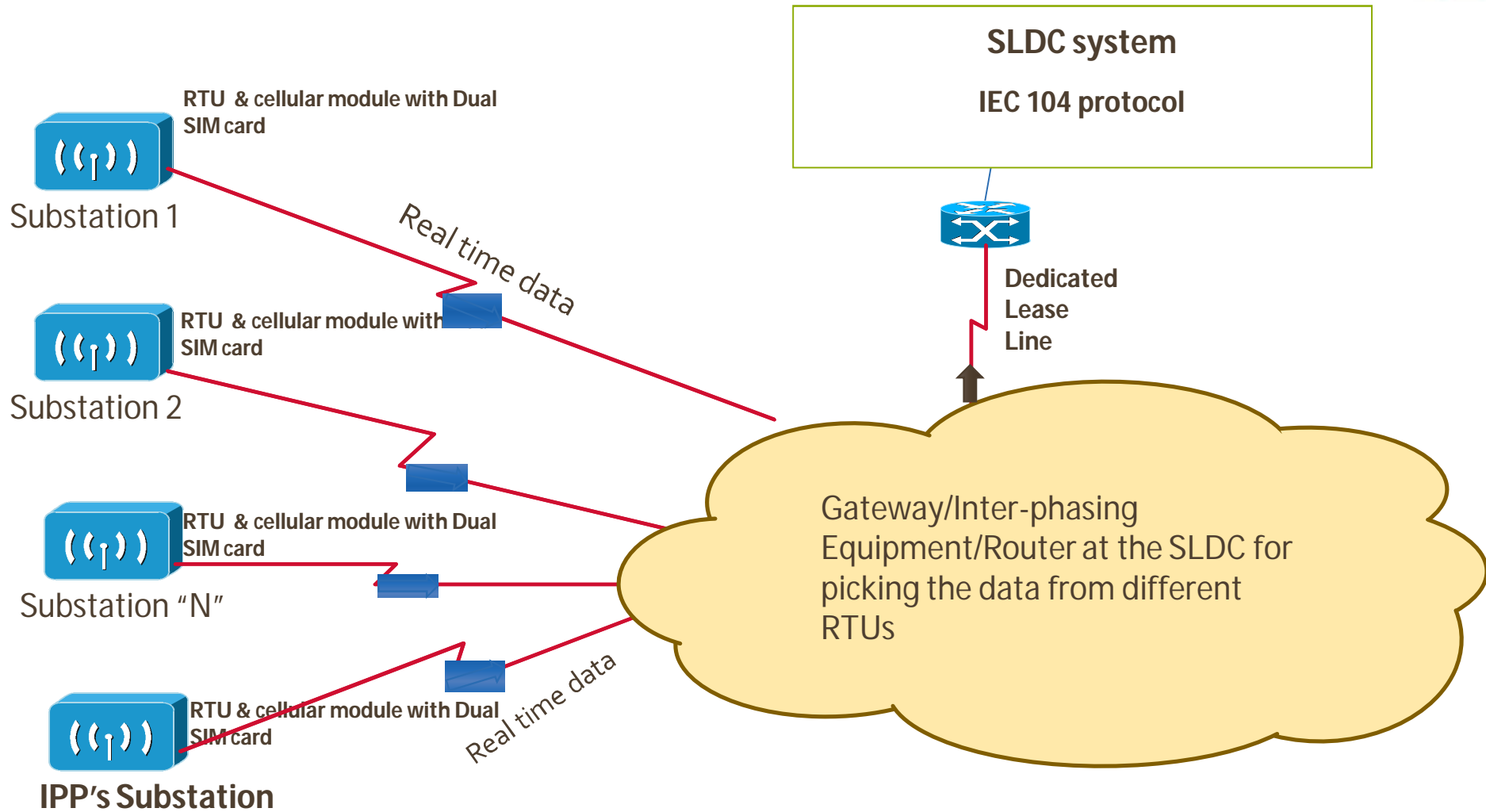
Present Status



Working Architecture : For ABT Meter Data Acquisition & Role of System Integrator



Data Transfer Architecture : From RTU to SLDC



Scope of System Integrator



- Maintain the Communication system for transfer of data from ABT meters to Developer/Generator and SLDC .
- Maintain the RTU/Data Acquisition System and Gateway/Inter-phase equipment at the SLDC.
- Compilation of forecast data including all Revisions, as per regulation and submit to SLDC.
- Co-ordination with SLDC, RDPPC, Sub Stations, Developers / Generator or any other designated agency
- Prepare periodic Reports covering Analysis, issues of curtailment, Actual Forecasted Deviation etc.
- Reports and Management Information System for SLDC /OEM/ Developers/Generators or any designating agencies.



Status as on Date (Hardware & Software)

- **ABT Meters (L&T Make) and Dual Modems (*iMDAS* by REConnect Energy)** installed at all Pooling Substations and streaming real-time data to SLDC
- **8 RTUs installed with dual-modem** and some of the pre-existing RTU's are streaming data to **dedicated wind energy gateway** installed as SLDC
- **7 different OEMs being integrated** into the system from the hardware and software point of view (Suzlon, WWIL, ReGen, INOX, Gamesa, Greenko, Tata/Welspun)
- SLDC Rajasthan and IWTMA having a real-time access to data (static and power) through a **state-of-the-art web-application (GRID Connect)**. Each other stakeholder has access through password for their own data

Status as on Date (Forecasting & Scheduling)

- **Forecast - Aggregation & Scheduling**

- Data received from multiple forecasters is being aggregated and sent to SLDC
- Daily 36 PSS (4246.75MW) are sending day-ahead forecasts
- Daily 36 PSS (4246.75MW) are sending intra-day forecast revisions (16 revisions)

- **Real time Generation Data**

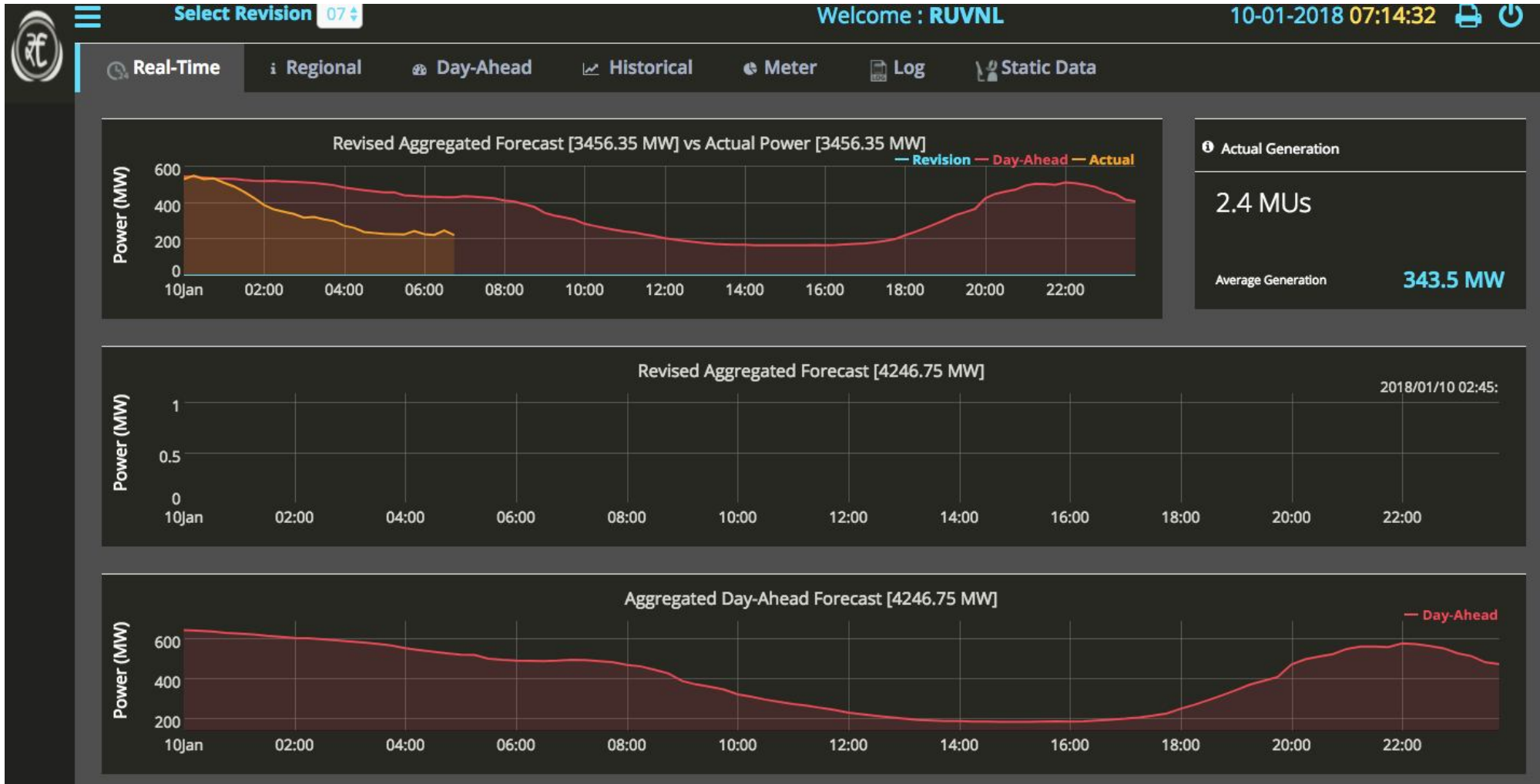
- Daily 3456.35 MW actual generation data is beamed to SLDC through Gateway installed at SLDC. The work is in progress for the balance capacity of 790.4 MW

Reports Generation and Download options

Following reports can be downloaded from the portal, in Excel (csv) & PDF Format. Can also be Copied & Printed

- Current Day's Aggregated Day Ahead Forecast, Revised Forecast and Actual Power Generation
- Next Day's Day Ahead Forecast Pooling Sub Station wise.
- Historical Aggregated Revised Forecast and Actual Power with date selection option.
- Current Day's Region wise Aggregated Revised Forecast and Actual Power Generation
- Pooling Sub Station wise Forecast Vs Actual generation
- Static Details Pooling Sub Station wise with project status.

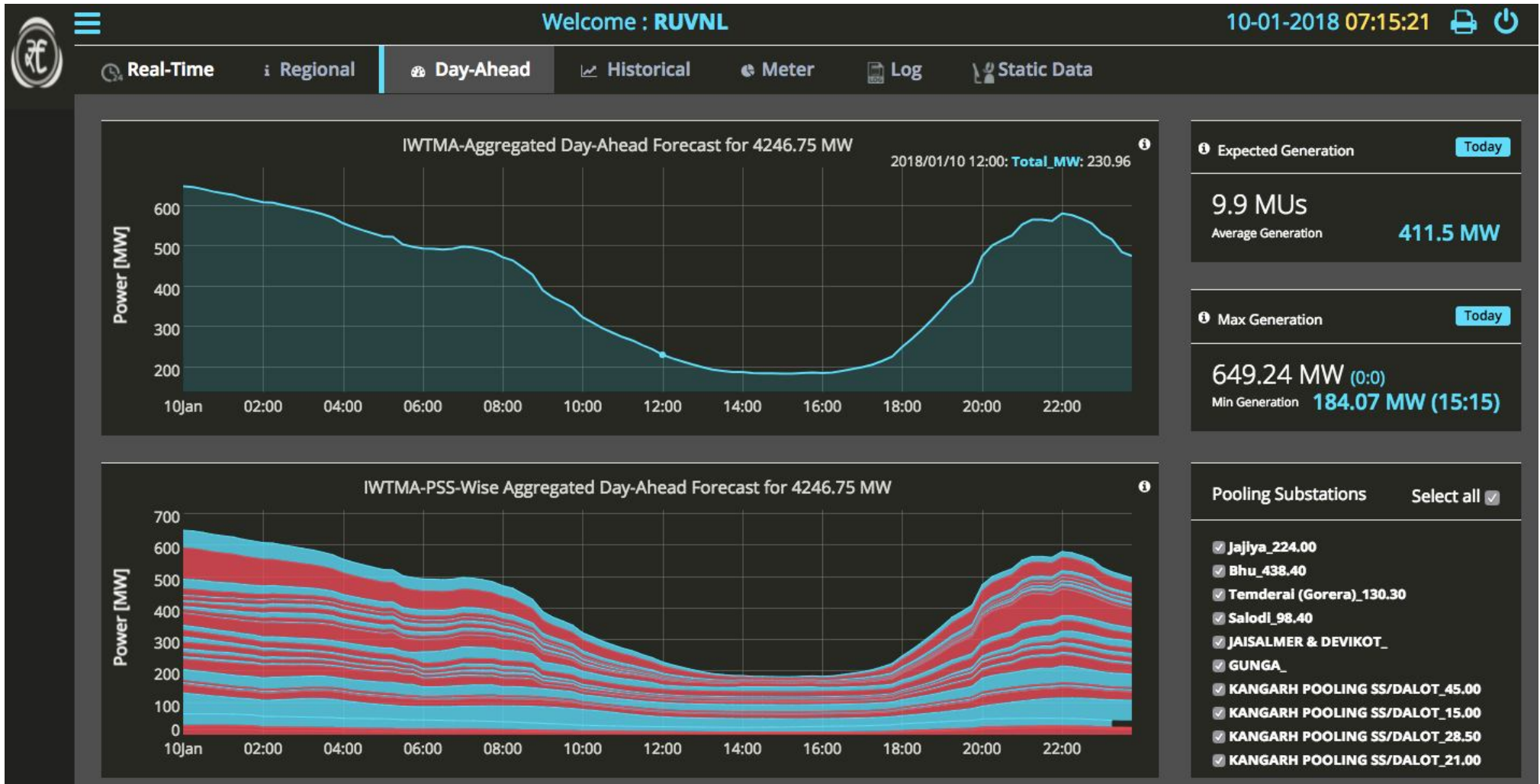
Web-application (real-time FC vs. Actual state level)



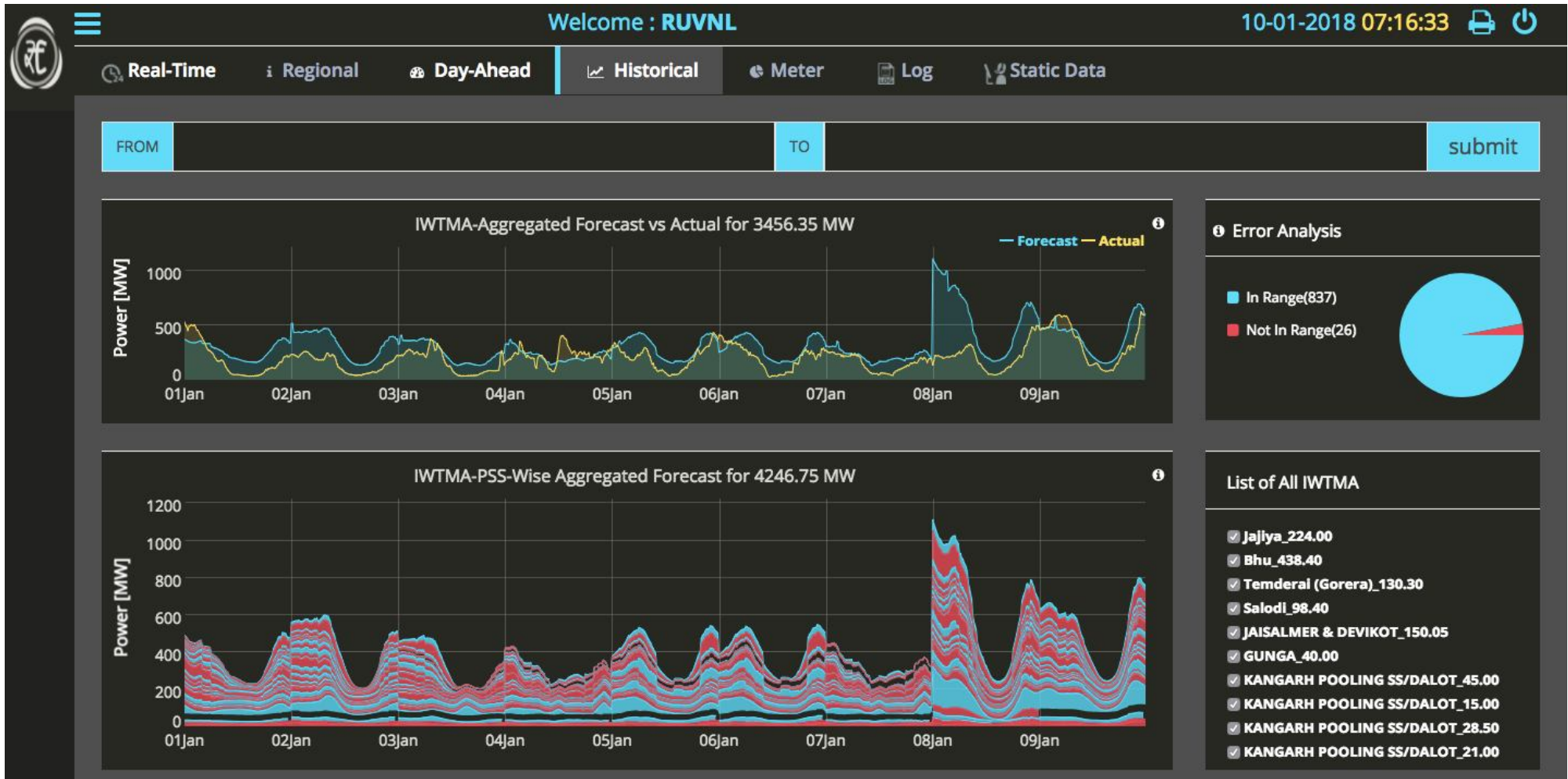
Web-application (regional break-up of actual generation)



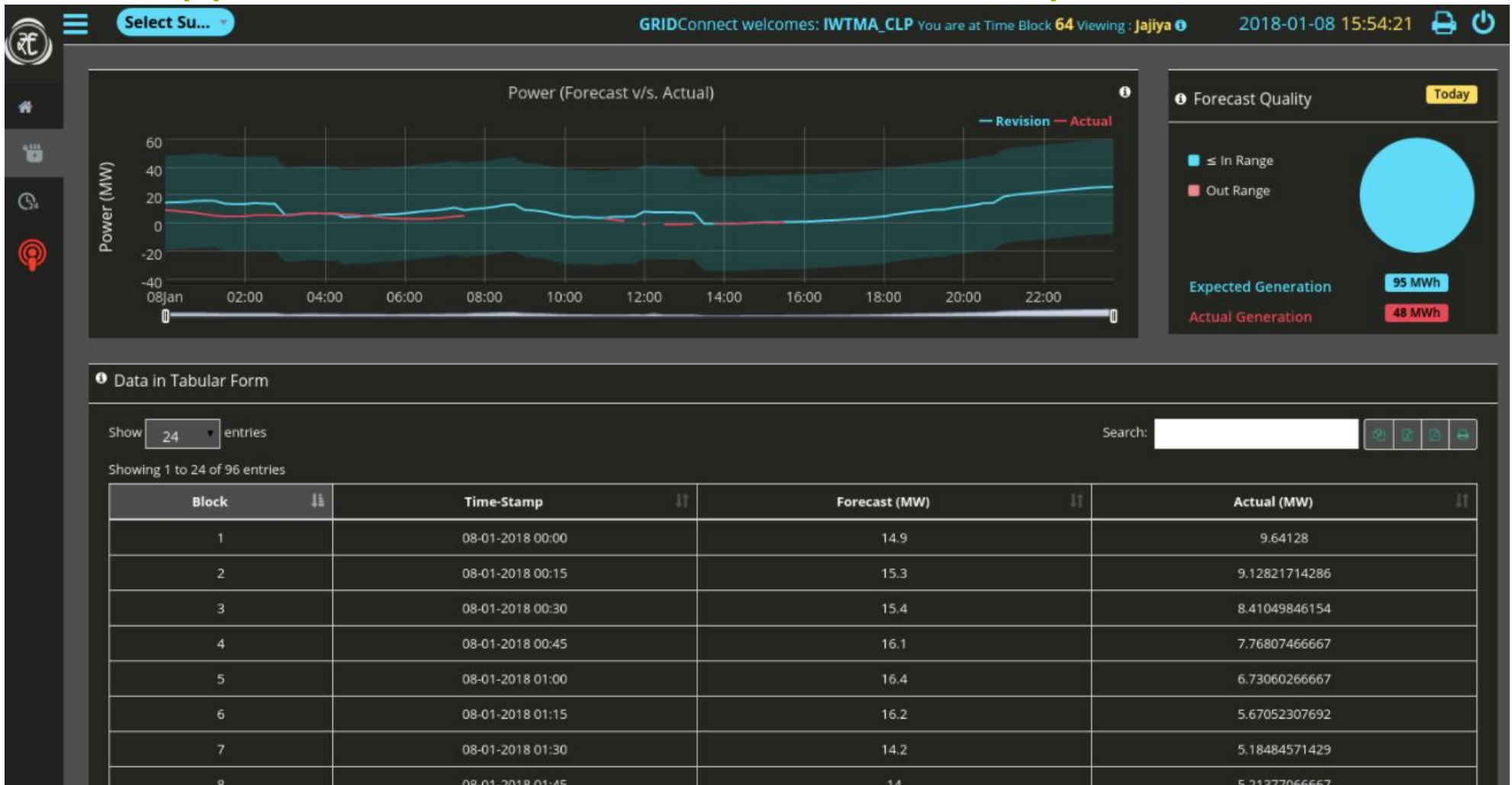
Web-application (DA forecast with each PSS level breakup)



Web-application (Historical data and accuracy MIS)



Web-application (PSS level f/c vs. actual comparison)



THANK YOU..

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INSTALLED CAPACITY OF WIND POWER IN RAJASTHAN

As on 31/04/2017

Developer	Jaisalmer	Jodhpur	Sikar	Barmer	Chittorgarh/ Pratapgarh	Total
RRECL	45.4	2.1			2.25	49.75
Suzlon	1608.95	315.5		9.6		1934.05
WWIL	896.77	98.4	7.2			1002.37
NEPC	0				0.675	0.675
RRB	25.8					25.80
Veer	76.5					76.50
Regen	0				211.5	211.50
Inox	554					554.00
Welspun	0				126	126.00
Gamesa	0			40		40.00
Mytrah	62.9					62.90
Tanot	120					120.00
Rajgarh	74					74.00
Others					15	15.00
Total	3464.32	416	7.2	49.6	355.425	4292.545