

Vermont Weather Analytics Center



Joint Development Agreement (JDA) Close Out

Developments

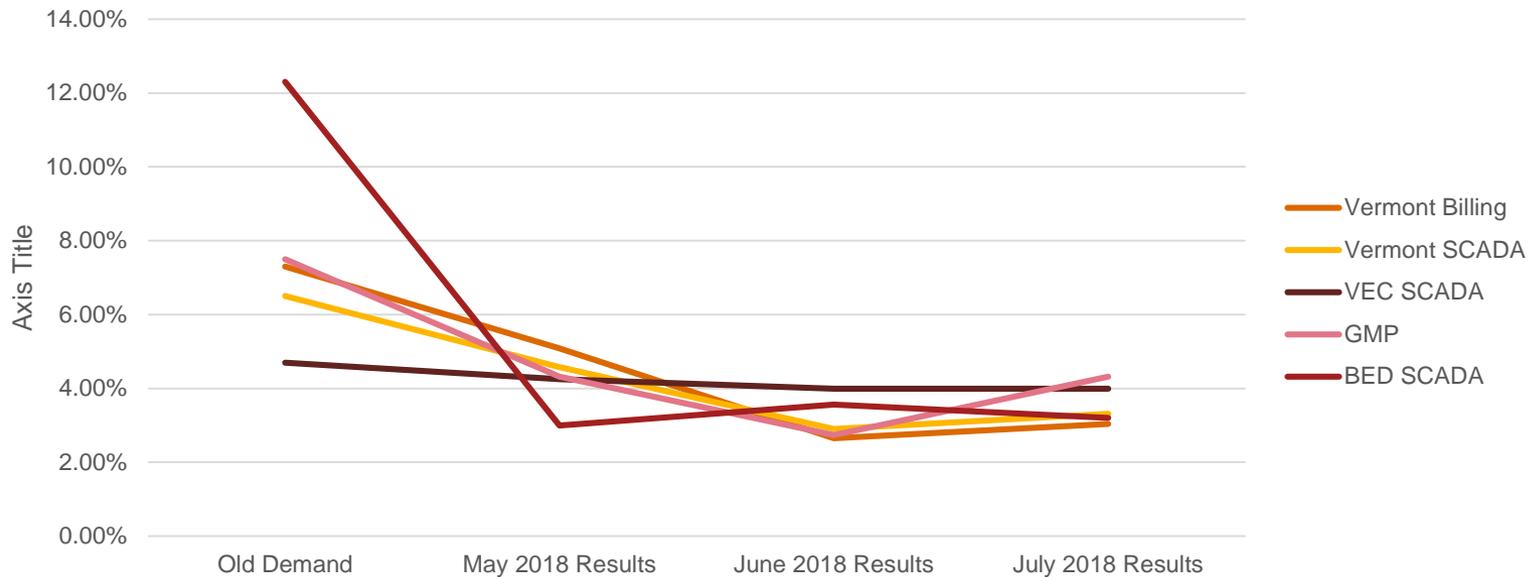
- Improvements/corrections identified in Recovery Plan have been implemented by UI
- UI Recovery Plan status-
 - Demand model improvements have been deployed and monitored
 - New “Adaptive Tuning” improvements on Demand Model deployed in June
 - Demand Model Mean Average Percentage Error (MAPE) Results are shown in slides 3 and 4 for May, June, and July
- JDA Close Out activities-
 - JDA close out activities are scheduled from July through November
 - Close out work includes documentation, plan for migration of HW/SW to new data center, work with UVM, and items covered in the Implementation Plan
 - Team will also address any minor defects in the displays or operation of the JDA software

Next Steps

- Work with UI on metrics and benefits tracking for assets
- Incorporate learnings and proposed improvements into Strategy Partnership Agreement Work Plan
- Refresh Business Case for Demand and PLM efforts

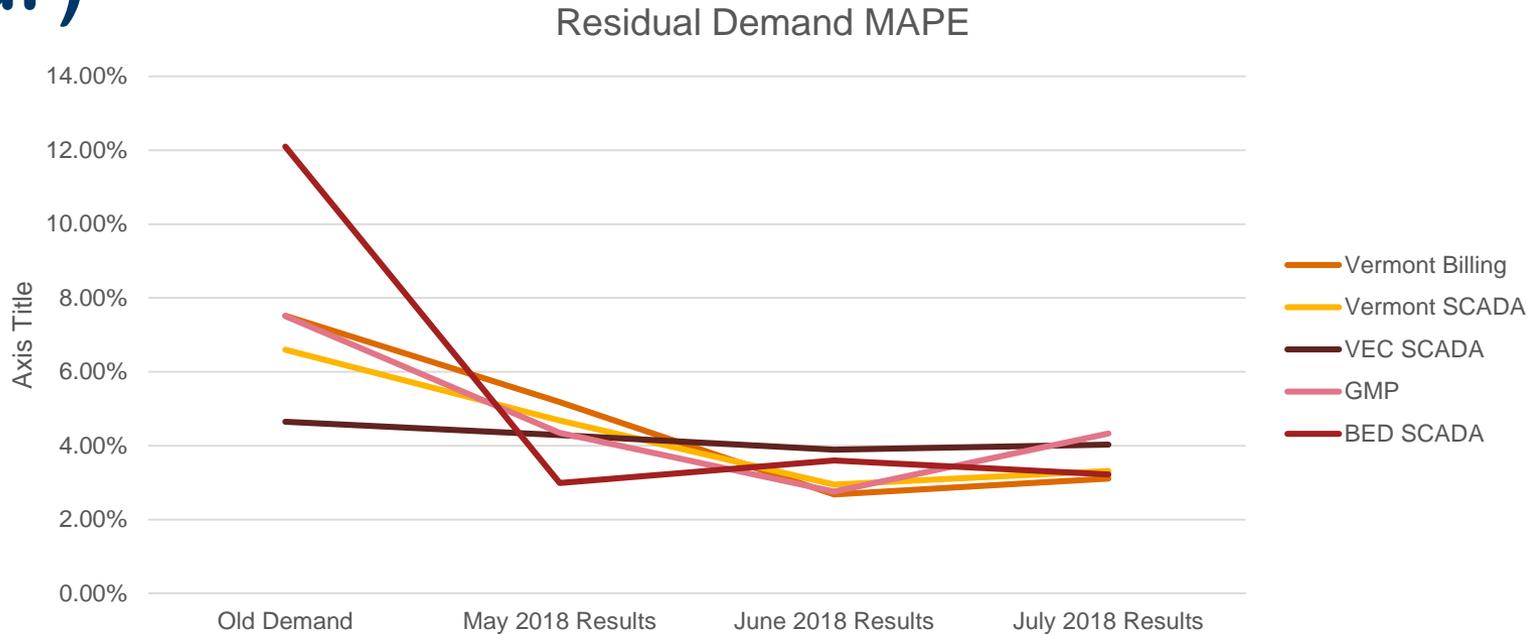
Residual Demand MAPE Results (12 hour)

Residual Demand MAPE



	Old Demand	May 2018 Results	June 2018 Results	July 2018 Results
Vermont Billing	7.30%	5.08%	2.65%	3.04%
Vermont SCADA	6.50%	4.58%	2.90%	3.31%
VEC SCADA	4.70%	4.25%	3.99%	3.99%
GMP	7.50%	4.32%	2.74%	4.32%
BED SCADA	12.30%	3.00%	3.56%	3.20%

Residual Demand MAPE Results (24 hour)



	Old Demand	May 2018 Results	June 2018 Results	July 2018 Results
Vermont Billing	7.52%	5.18%	2.68%	3.11%
Vermont SCADA	6.60%	4.68%	2.95%	3.32%
VEC SCADA	4.65%	4.29%	3.89%	4.03%
GMP	7.51%	4.35%	2.76%	4.33%
BED SCADA	12.10%	2.99%	3.60%	3.22%

Weather Status

Developments

- Forecasting and visualization improvements
 - DU feedback on visualization conveyed to UI (follow up from individual DU Meetings)
 - Weather Insights bandwidth issue addressed with the application now consuming about one half the capacity; however the application still experiencing some issues with consistent running at VELCO
 - 7-10 day forecast development on the VELCO HPCC is now completed and deployed in production
 - Lightning prediction now enabled with VELCO WRF model

Next steps

- Develop Weather Insights visualization to include utility infrastructure data, observations, alerting, and additional weather variables and increase forecast length to 10 days which should be addressed in the SPA
- Evaluate ensemble forecasting using Nostradamus, VELCO WRF and Deep Thunder (if needed) focusing on user input with ADS

Peak Load Management

Developments

- PLM application cloud instance made available to DUs February with full improvements available in June
 - All applications accessible through UI landing page
- Improved email alert Vermont monthly peak probability notifications deployed
- Improvements addressing beginning and end of month peak probability also implemented
- PLM Meetings continue on a every other week basis
- Discussions have revolved around summer peak events with incorporation of the 7-10 forecast information for the team
- Evaluation of peak events has been discussed with the PLM team members with feedback being incorporated into future plans by UI

Next steps

- Develop ongoing monitoring and meeting cadence for the SPA
- Incorporate 7-10 day weather forecasting capability with the SPA
- ISO-NE peak probability forecast using ISO-NE load data to implement probabilistic load forecast to be included in SPA
- Upgrade portal graphics to show more VT-specific detail and use GIS derived data

Platform Development

Developments

- Atmospheric Data Sciences (ADS) working with VELCO to develop further plans for the HPCC and how current cloud based model runs should be addressed
- Changes to Weather Insights have resulted in bandwidth consumption dropping by approximately 50%
- VELCO HPPC cluster is now scheduled to be relocated to the new Data Center in Q1 2019 vs. the current plan of Q3 for 2018.
- VELCO HPCC utilized for development of 7-10 forecast contributing to the effort with UI

Next steps

- Investigate using Torque Scheduler to optimize use of VELCO HPCC
- Evaluate hardware configuration for hosting current cloud based models
- Set up formal expectations for those with access to the HPCC

Commercial Software UAT

Developments

- UI assigned PM to manage work down of the UAT and Open Items lists will be fully engaged in mid September
- VELCO reviewed and updated recommended priorities on Open Issues list
- VELCO began documenting defects and enhancements for JDA applications (i.e. Demand, Weather Insights, Peak Load Management)
- Table below shows priority of defect fixes requested on commercial products deployed in December

Count of Severity	Column Labels			
Row Labels	Priority 2 - High	Priority 3 - Medium	Priority 4 - Low	Grand Total
Severity 2 - High	15	2		17
Severity 3 - Medium	1	15	12	28
Severity 4 - Low		16	52	68
Grand Total	16	33	64	113

Next steps

- UI PM to review updated UAT and Open Items lists and develop plan to address UAT in conjunction with planned updates to models
- Continue to work with DUs to gain feedback on Utopus applications

Strategic Partnership (Activities post-June 2018)

Developments

- SPA Work Plan finalized as well as high level schedule and resource requirements
- Billing plan and arrangement between VELCO and UI under discussion
- UI and VELCO currently developing long range forecast plan for resources
- PM Resources are now engaged at UI and having a positive impact on the work
- UI is examining adding weather related activities to the SPA Work Plan with market analysis under review with UI, VELCO, and VEC
- Focus of team is based upon taking the Demand, Peak Load Predictions, and PLM work to a “commercial product” status research phase is over with a new focus on development

Next steps

- UI/Vermont team to take the identified work streams Demand, Peak Probability Forecasting (PPF), and Peak Load Management (PPM) and progress detailed work plans/charters for the work with the Vermont DUs
- Team focusing on governance, scheduling of activities, interim deliverables, and filling any gaps in the proposed effort

Collaborative work summary

- Workshop held with UI, Vestas, and Vermont DUs on 7/17 in Burlington to discuss the three products identified for the SPA
- Meeting with UI and ARC to discuss evaluation and improvements of models following the workshop
- Follow up visits for planning sessions scheduled for mid-September with Vermont DUs
- Changes to governance for effort under development with VELCO, DU, and UI management



The University of Vermont

