DER-VET Task Force

ESIC Working Group 1: Grid Services and Analysis

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February 4, 2021

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- Advise or try to influence others on their business decisions (except to the extent that they are already public);
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- To allocate customers/suppliers/territories;
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- The webcast is being recorded along with all Q&A. Your participation provides consent to that recording.

- As a result, please make sure your phone is on mute throughout the webcast unless speaking. Do not place your phone on hold.

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Agenda

- Resource Adequacy and Demand Response Programs
- DER-VET Workshop Announcement
- DER-VET Full Release Logistics

Resource Adequacy and Demand Response Programs

RA vs DR in DER-VET

Resource Adequacy

- Attempts to mimic hard resource adequacy operational constraints
  - Different options for identifying system peaks
  - Capacity-constrained vs energy-constrained
  - Sets the number of events per year
  - System commits or doesn't commit for its life
  - Optional time-series input to identify specific time steps for RA
  - Monthly price input

Demand Response

- Attempts to mimic common structures in demand response programs:
  - Provide notification a day ahead of time or shortly before and event
  - Sets the number of events per year
  - Defines timing of the events (e.g. weekdays only, certain times of day)
  - Monthly participation
  - Monthly capacity and energy price input

Demand Response Programs

How many DR events per year?

Duration of a demand response event

Can a DR event happen on weekends?

When can DR events occur?

Are participants notified far enough in advance to prepare (e.g. charge a battery)?

Tag	ID	Key	Optimization Value	Units
DR	1	days	10	days
DR	1	length	4	hours
DR	1	weekend	0	y/n
DR	1	program_start_hour	11	hour
DR	1	program_end_hour		hour
DR	1	day_ahead	1	y/n
DR	1	growth	0	%/yr

Demand Response Programs

Monthly Payment = QC * DR Capacity Price + Energy Dispatched * DR Energy Price

What months is the DR program active for?

What is the maximum monthly participation in the DR program in kW?

Year	Month	DR Months (y/n)	DR Capacity (kW)	DR Capacity Price ($/kW)	DR Energy Price ($/kWh)
2017	1	0	0	100	20
2017	2	0	0	100	20
2017	3	0	0	100	20
2017	4	0	0	100	20
2017	5	0	0	100	20
2017	6	1	10	100	20
2017	7	1	10	100	20
2017	8	1	20	100	20
2017	9	1	10	100	20
2017	10	0	0	100	20
2017	11	0	0	100	20
2017	12	0	0	100	20

Resource Adequacy

How many RA events per year?

Duration of a RA event (this determines qualifying capacity)

How are the DERs operated for RA (hard power output or energy readiness)?

How are RA events identified from the system load?

- Top n days per year
- Top n days in each month
- Top n peaks in month when RA is active

Tag	ID	Key	Optimization Value	Units
RA	1	days	20	Count
RA	1	length	4	hours
RA	1	dispmode	1	N/A
RA	1	idmode	Peak by Year	N/A
RA	1	growth	0	%/yr

Resource Adequacy

Monthly Payment = QC * RA Capacity Price

Year	Month	RA Capacity Price ($/kW)
2017	1	30
2017	2	30
2017	3	30
2017	4	30
2017	5	30
2017	6	30
2017	7	30
2017	8	30
2017	9	30
2017	10	30
2017	11	30
2017	12	30

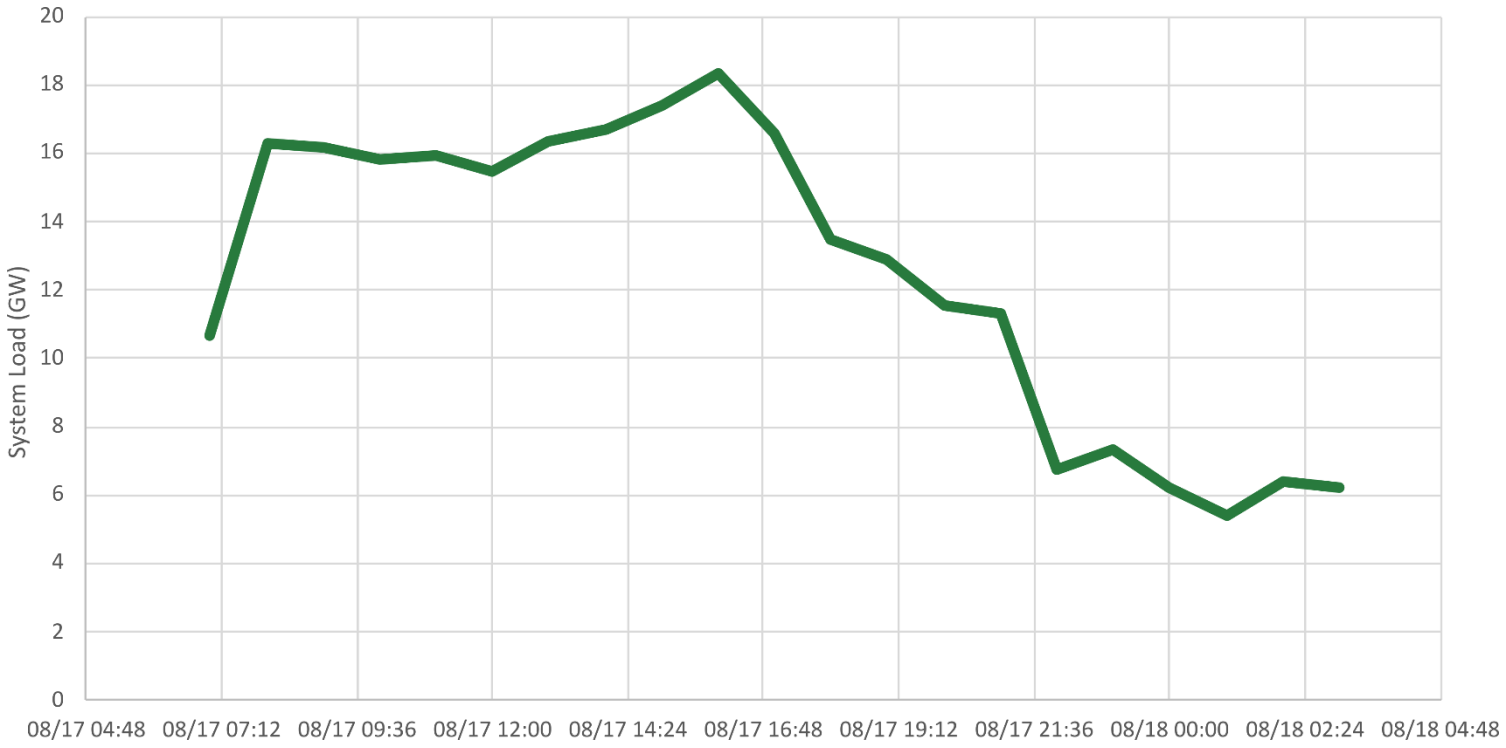
Resource Adequacy

Restrict RA events to certain time steps

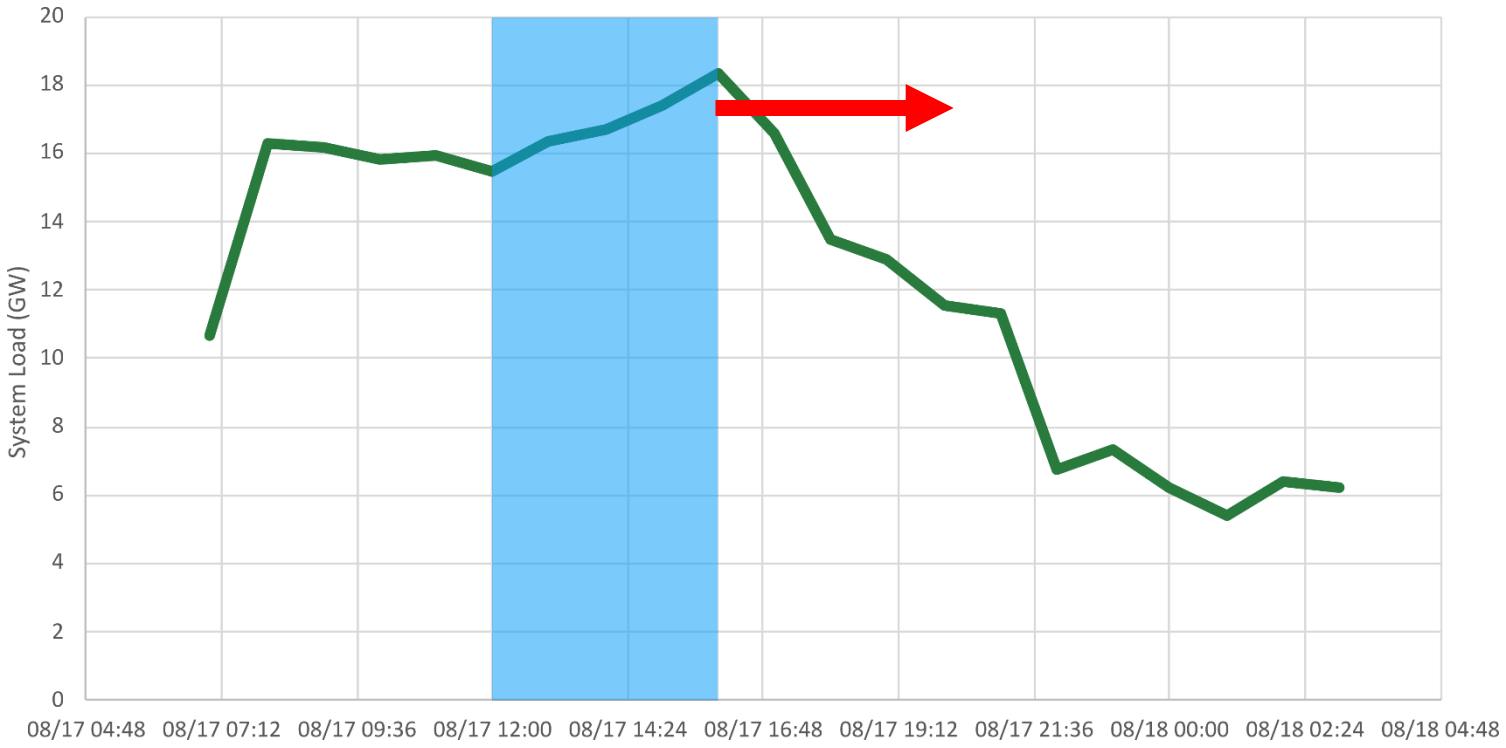
Used to identify RA events

Datetime (he)	System Load (kW)	RA Active (y/n)
2017-01-01 01:00:00	4019608.554	0
2017-01-01 02:00:00	3738652.086	0
2017-01-01 03:00:00	4054570.141	0
2017-01-01 04:00:00	3703137.769	0
2017-01-01 05:00:00	4141420.555	0
2017-01-01 06:00:00	4050901.661	0
2017-01-01 07:00:00	4850896.901	0
2017-01-01 08:00:00	4429817.908	0
2017-01-01 09:00:00	4572633.046	0
2017-01-01 10:00:00	3900506.753	0
2017-01-01 11:00:00	3787672.133	0
2017-01-01 12:00:00	3506213.565	0
2017-01-01 13:00:00	3934668.053	0
2017-01-01 14:00:00	3647279.507	0

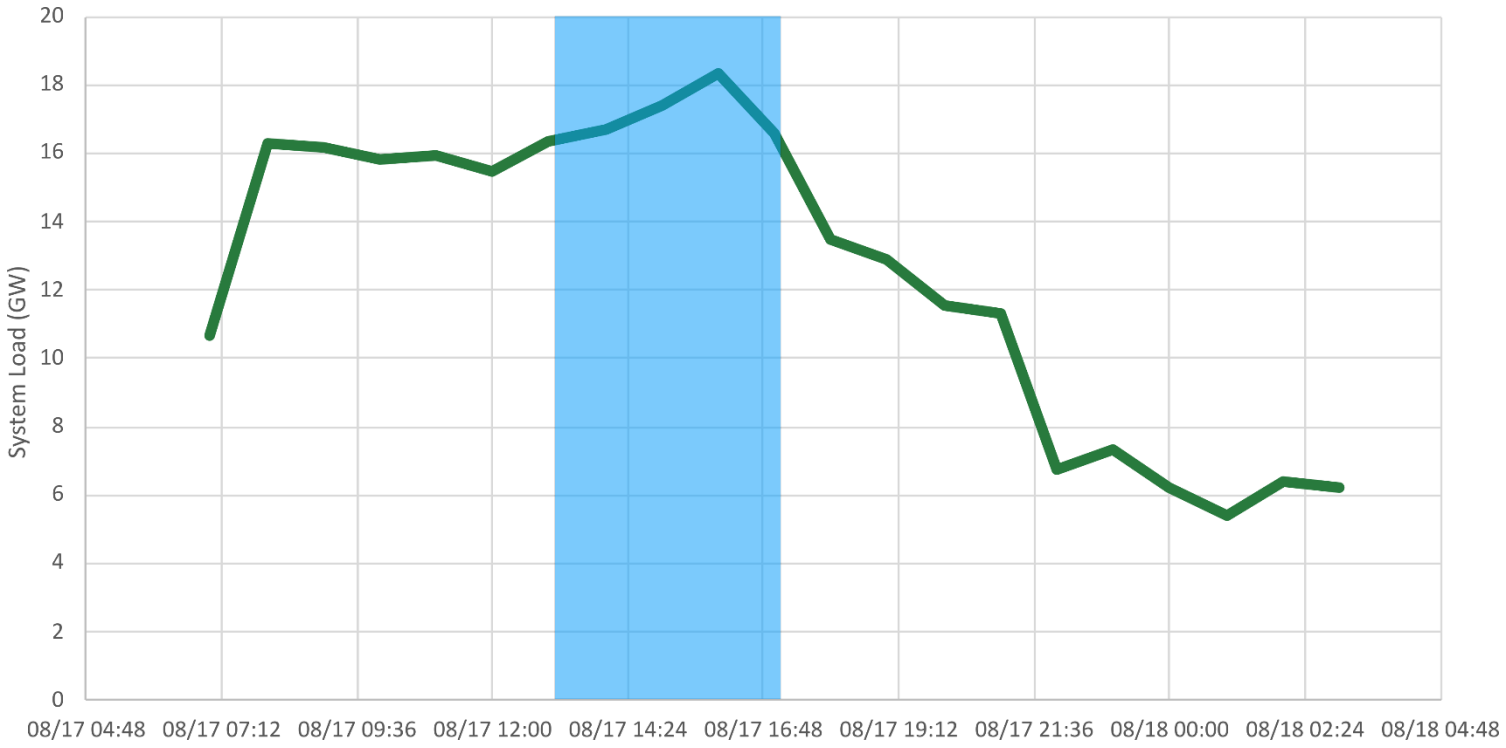
RA System Peak Identification



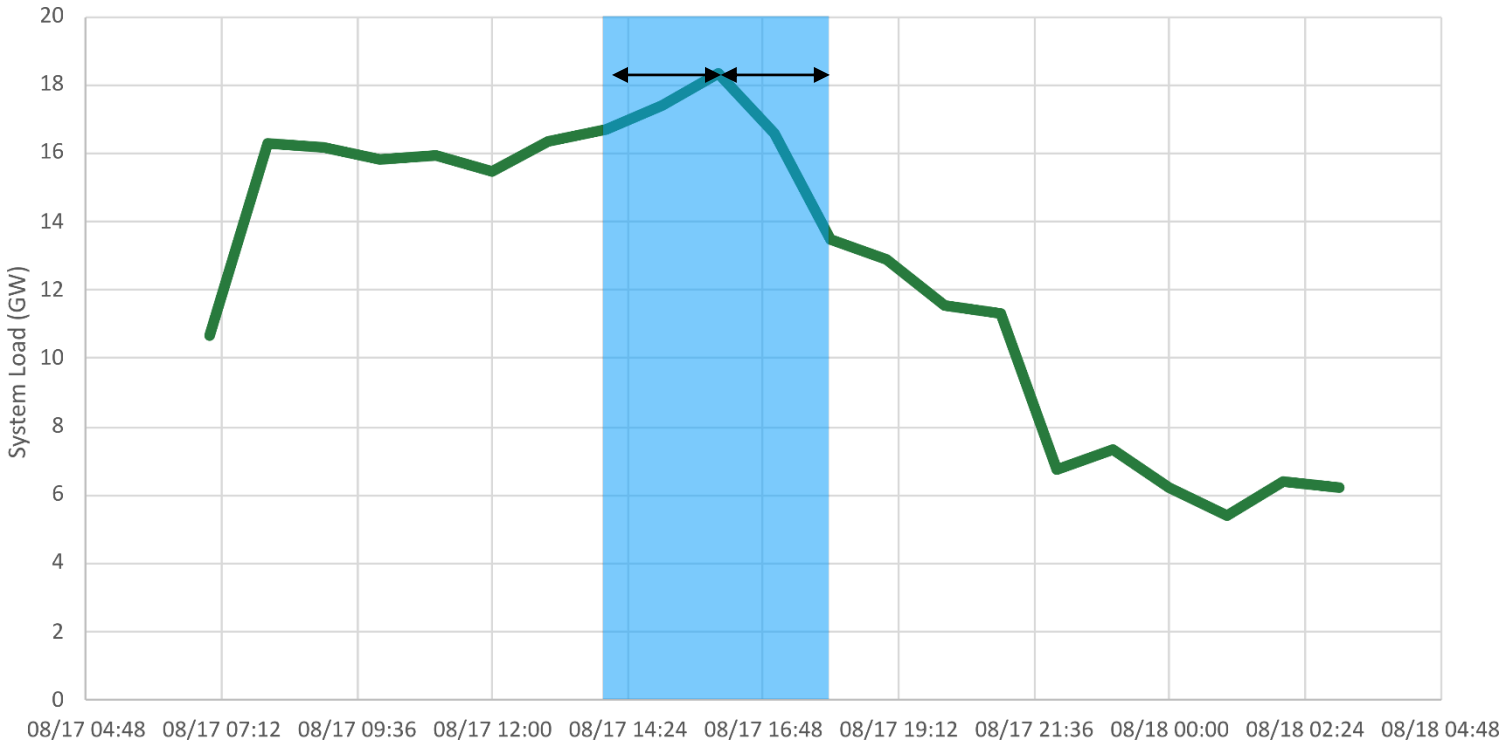
RA System Peak Identification



RA System Peak Identification



RA System Peak Identification



DER-VET Full Release

DER-VET Full Release

- March 31
  - www.der-vet.com
    - Surveymonkey beta tester sign up will be replaced with the DER-VET direct download link (GUI with installer)
  - DER-VET Github page will be set up and linked on the DER-VET website (python source code)
    - Similar to https://github.com/epri-dev/StorageVET
  - EPRI's technology transfer plan will continue
    - "Reference cases"
    - Online wiki user guide
      - As-built mathematical formulation

DER-VET Full Release

- Webinars (see workshop announcement shortly)
- Videos
- Continued DER-VET Task Force Meetings

DER-VET Workshop Announcement

DER-VET Workshop

- Week of April 19 (timing TBD)
- Open to the public
- Focus: explore the utility of the DER-VET full release by getting into the weeds on the technical details of selected case studies