DER-VET Task Force

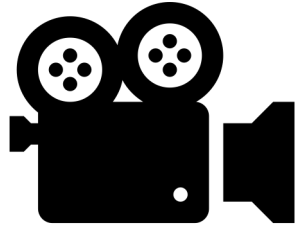## ESIC Working Group 1: Grid Services and Analysis

Miles Evans | EPRI
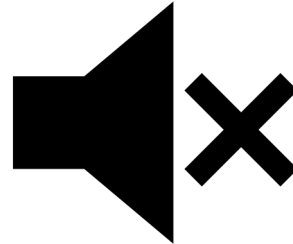
Andrew Etringer | EPRI

January 6, 2022

Webcast Reminders

This webcast is being recorded. **Your participation provides consent to the recording.**

Please mute your phones when you are not speaking. To un-mute, press *6 or push the un-mute icon in WebEx.

Abide by Antitrust Guidelines

Chat to "Everyone" for maximum interaction

The slides and recordings will be posted to www.der-vet.com/esictf/

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Agenda:

- DER-VET Software Update

- CHP Validation Paper

- Task Force 2022

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DER-VET Software Update

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DER-VET and Log4j vulnerability

Is DER-VET susceptible to the Java Log4j vulnerability?

No.

For DER-VET in particular, there is no impact. DER-VET does not use any Java code or libraries, and we do not host our app as a website (so there are no servers to worry about). All of the Desktop App (GUI) and command-line (Python) versions of DER-VET that EPRI has released do not have any Log4j vulnerabilities.

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DER-VET: New Release is coming soon

- **Bug Fixes** (Mostly Python backend)

  - **Known Bugs (under development):**
    - MACRS depreciation value cannot exceed 20 years
    - Enable user service to apply min charge and discharge constraints
    - FR energy throughput cost does not handle RTE
    - DR not compatible with bill reduction services
    - Coupled sensitivity analysis feature can have errors
    - Variable O&M in Pro Forma should include energy throughput from ancillary services
    - GUI Battery cannot be saved in certain circumstances

Thank you for reporting these bugs with us.
Please do send any new bug reports to us and we will address them.

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DER-VET: New Release is coming soon

- **Python Backend New Capabilities**

  - New Technologies for thermal loads: CHP / Boiler / Chiller

    Note: these technologies will not be a part of the GUI in this release

  - Fuel Costs: improved methods
    - www.der-vet.com/esictf/ (ESIC Task Force Meeting on 12/02)

  - Support for more recent Python versions
    - Python 3.6 has reached it's EOL

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DER-VET: New Release is coming soon

- **GUI Improvements**

  - Effort to refactor code using 'DRY' principle
    - Removes code redundancy
    - New features can be added easier and faster
    - Reduces the likelihood of bugs
  - Simplification of project import/export
    - Single JSON file
    - Python script to translate older format to new format
  - Made all technologies single-page
    - For better user experience

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DER-VET: New Release is coming soon

DER-VET: New Release is coming soon

CHP Validation Paper

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CHP Validation Paper

- Available **free** to the public on epri.com

- EPRI deliverable number **3002021882**

- Formulation and realistic validation case studies

https://www.epri.com/research/products/000000003002021882

Case Study 1 - WWTP

- CHP
  - offsets need for boiler (capital cost savings)
  - reduces electricity costs (demand and energy charge reduction)
  - increases fuel costs
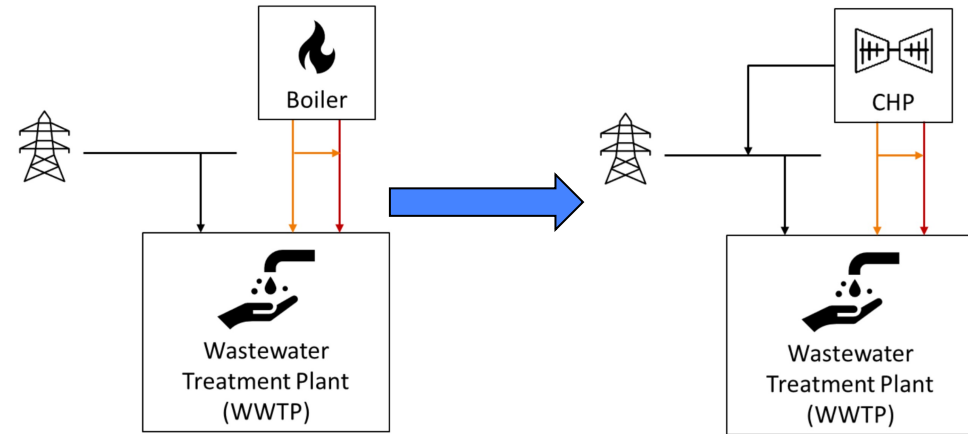
	Base Case	Change Case with CHP
Grid-connected	Yes	Yes
Boiler	Yes 6 MMBtu/hr $\eta = 80\%$	No
CHP	No	Yes 1.75 MW $\frac{P}{H} = 1$ $MSR = 1$
Chiller	Not applicable	Not applicable

CHP fully covers site thermal loads

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Case Study 2 - Industrial

- CHP
  - Powers the chiller with heat directly instead of electricity
 - Reduces electricity costs
  - Offsets the need for a boiler
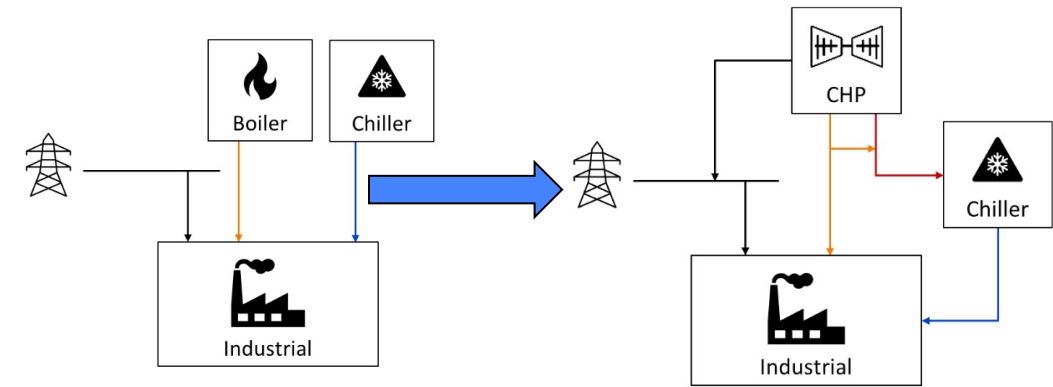
	Base Case	Change Case with CHP
Grid-connected	Yes	Yes
Boiler	Yes 35 MMBtu/hr $\eta = 80\%$	No
CHP	No	Yes, gas turbine 6 MW $\dfrac{P}{H} = 0.5$ $MSR = 10^4$
Chiller	Yes, electric chiller 560 ton COP = 5	Yes, absorption chiller powered by CHP COP = 1.42

CHP and heat-powered chiller cover site thermal loads

Case Study 3 - Hospital

- Boiler cannot be totally offset
- CHP
  - Reduces boiler use
  - Powers chiller instead of electricity
  - Reduces electricity costs
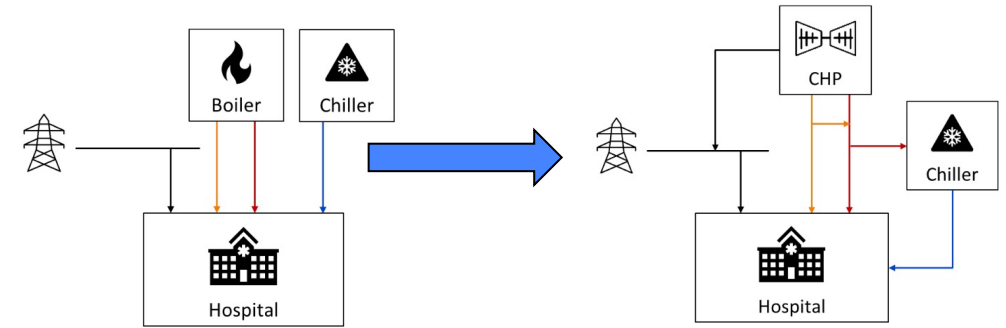
	Base Case	Change Case with CHP
Grid-connected	Yes	Yes
Boiler	Yes 25 MMBtu/hr $\eta = 80\%$	Yes 9 MMBtu/hr $\eta = 80\%$
CHP	No	Yes, gas turbine 3.3 MW $\dfrac{P}{H} = 0.45$ $MSR = 10^2$
Chiller	Yes, electric chiller 3400 ton COP = 5	Yes, absorption chiller powered by CHP COP = 1.42

Task Force 2022

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Next Meeting Feb 3, 2022
11 AM Pacific Time

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Together…Shaping the Future of Energy™

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