Analyzing Thermal Meter Data

(With Thanks to Raul Abesamis and his Team)

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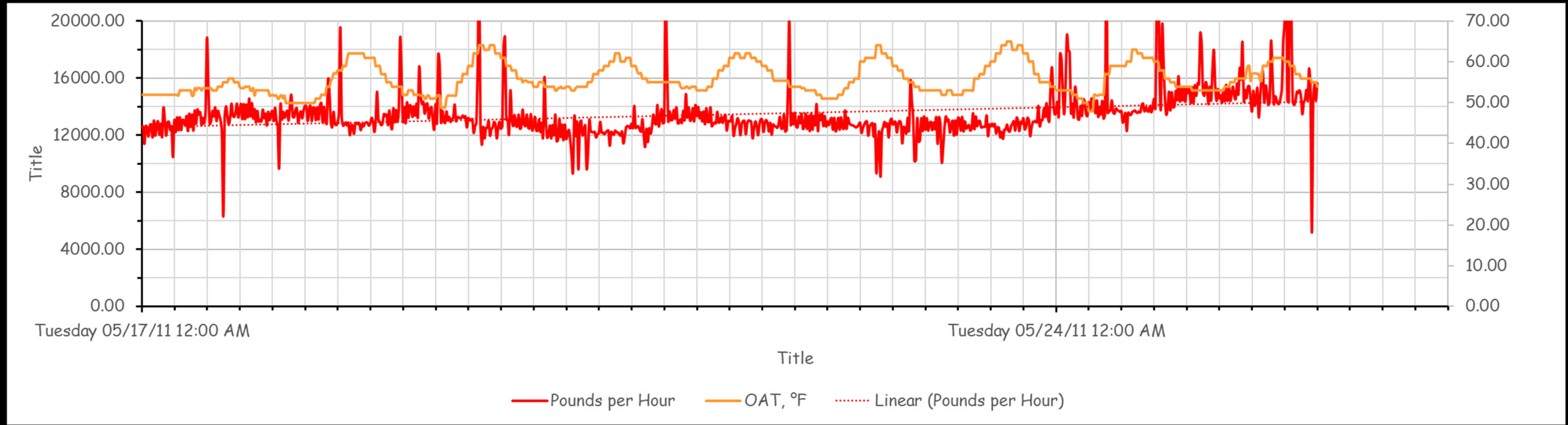
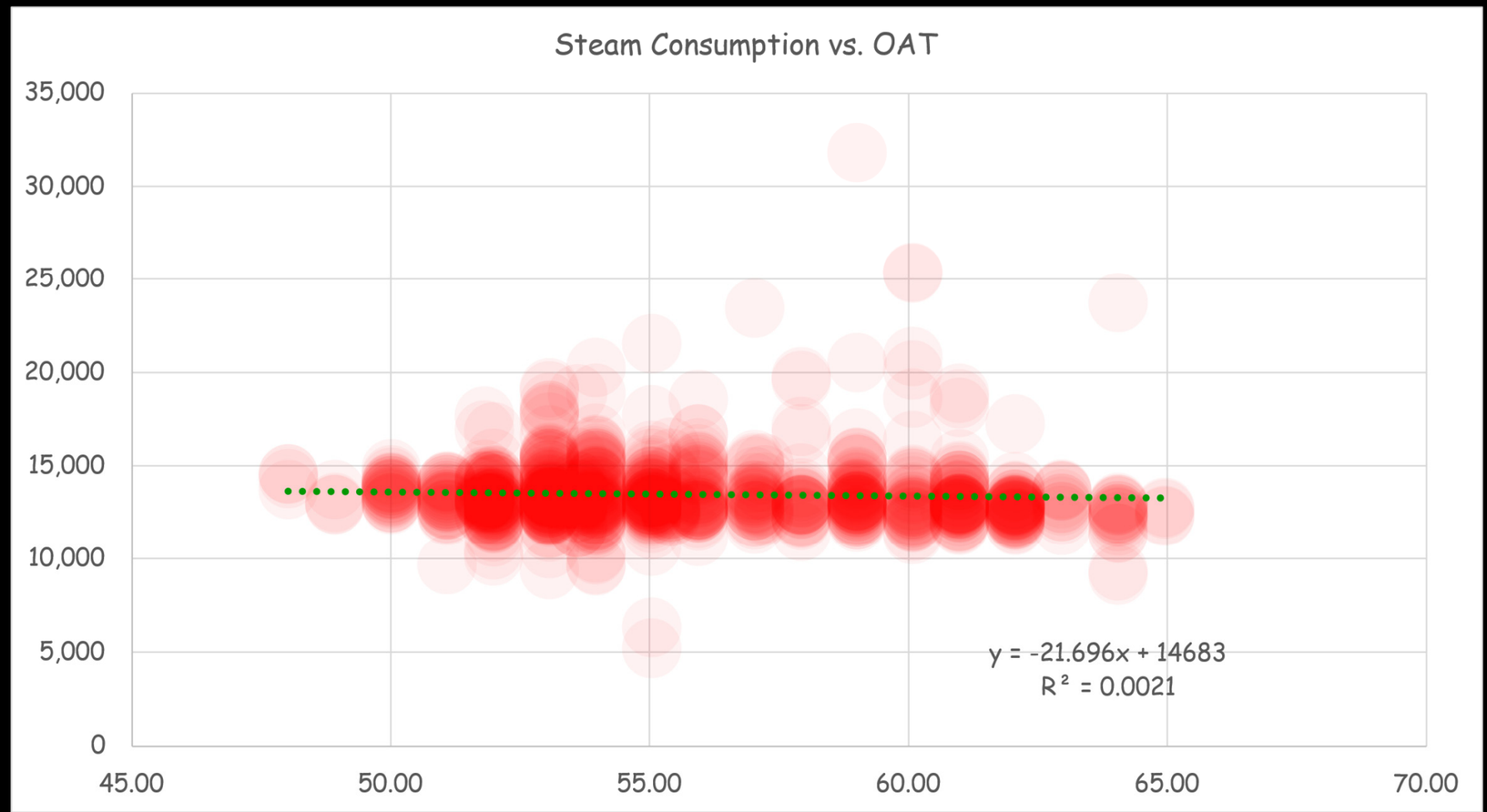
Some Options for Assessing Data

- Contrast Time Series with Other Driving Metrics
- In the Olden Days We did this via Average Daily Energy Consumption
- https://www.av8rdas.com/icebo.html



Some Options for Assessing Data

- Regressions



Some Options for Assessing Data

- Energy Use Intensity (EUI)
- Benchmark
  - EnergyStar https://www.energystar.gov/buildings/benchmark
  - LBNL Building Performance Database https://bpd.lbl.gov/
    - Annual kBtu/sq.ft.
    - Site or Source Energy Perspective

Site Energy

Energy that passes through *your* meter

Site Energy

Energy that passes through *your* meter

Source Energy

Energy that passed through the *power plant* meter

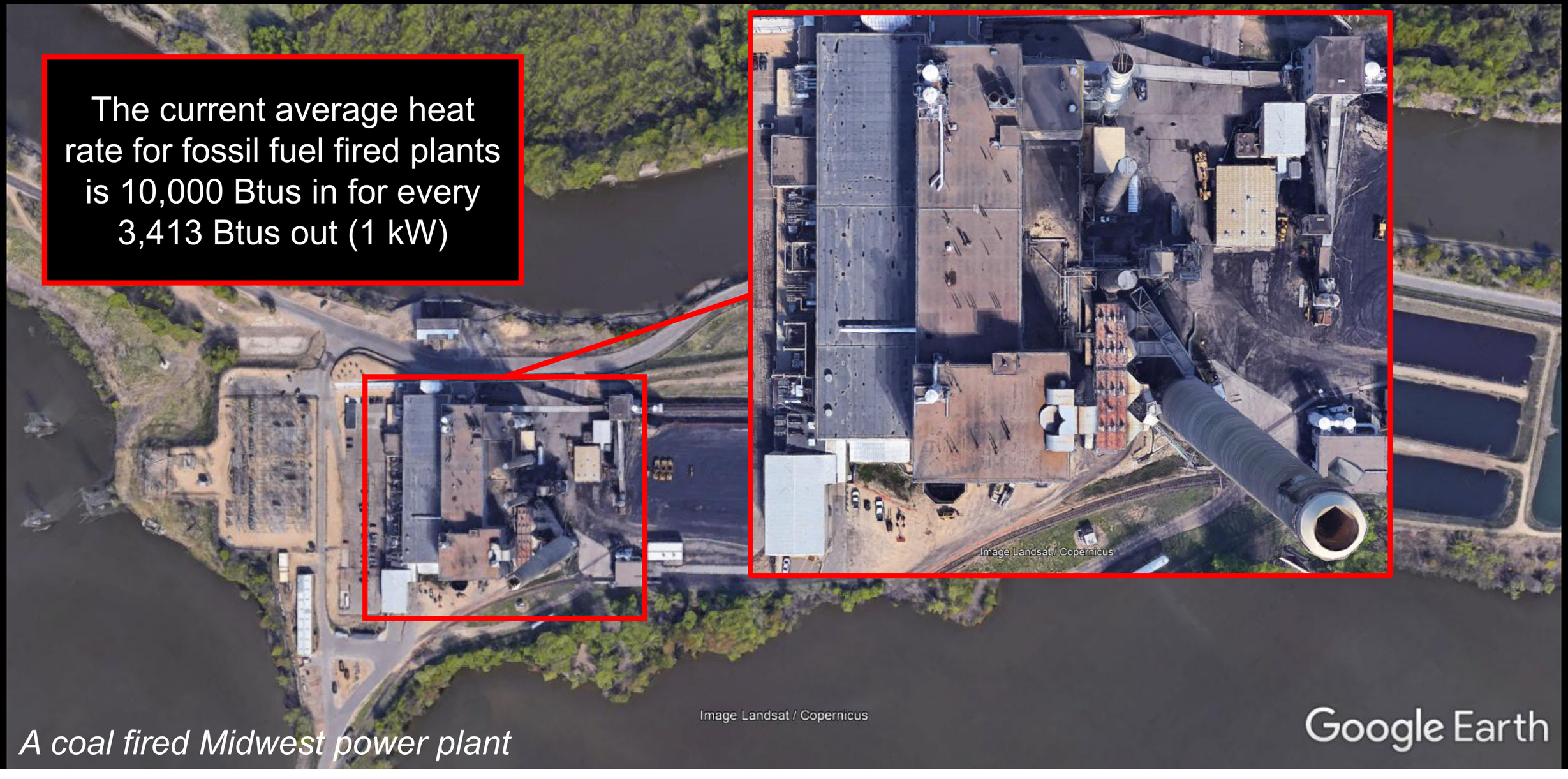
Transmission Losses are Significant

There are currently 6-8% losses in these lines between the power plant and your meter

A coal fired Midwest power plant

Conversion Losses are Significant

The current average heat rate for fossil fuel fired plants is 10,000 Btus in for every 3,413 Btus out (1 kW)



A coal fired Midwest power plant

Physical Principles Will Prevail

A coal fired Midwest power plant

Site vs. Source Energy Resources

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A Steam Heating Resources →

Site versus Source Energy

Posted on June 30, 2017

Author's Note: I originally posted this in September of 2007 and used a report I had found at that time to develop some of the source energy factors I used in my illustration. Since then, I have found a number of other resources on this topic which are more current and also provide more information. I document the new resources in a footnote at the end of this post if you are interested in looking at them.

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How I Thought About This

- I am you at age 67(ish)

Breakout Session

Given:

Nominal latent energy for steam

- 1,000 Btu/lb

Building square footage

- 97,768 sq.ft.

Approximate annual steam consumption in pounds of steam

- 100,388,916 pounds

Calculate the EUI

Breakout Session

Do the Following:

- Calculate the EUI
- Benchmark against the LBNL Building Performance Database
- Be Prepared to Discuss you Observations with the Class