WHAT TO DO ABOUT DHW?

Good, bad, and outdated solutions for multifamily buildings

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Common Multifamily DHW Production

- **Individual buildings**
  - **Typically scotch marine steam boiler in basement, DHW from tankless coil in boiler**
- Campus-style developments
  - Typically steam boiler sending steam out to satellite buildings, DHW from steam at building level.
- Auditors recommend separating DHW from heating boilers VERY often

Why Do We Want to Separate DHW and Heating Plants?

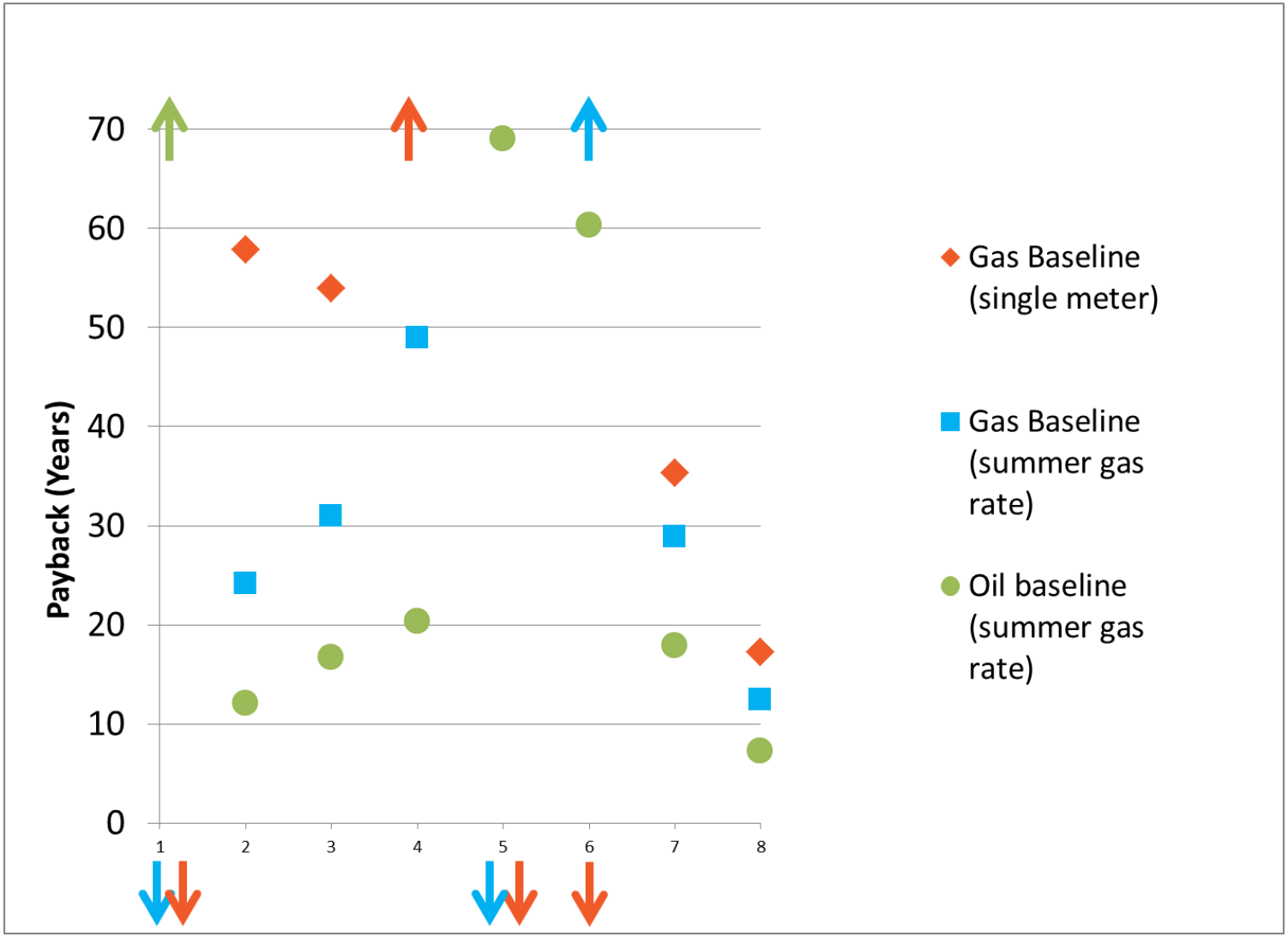
- "Condensing boilers > scotch marines"
- "Smaller dedicated hot water heater = fewer short cycles for DHW production"

- "Running a big steam boiler for a small DHW load is inefficient"
  - does the solution pay back?

IT'S NOT A SLAM DUNK

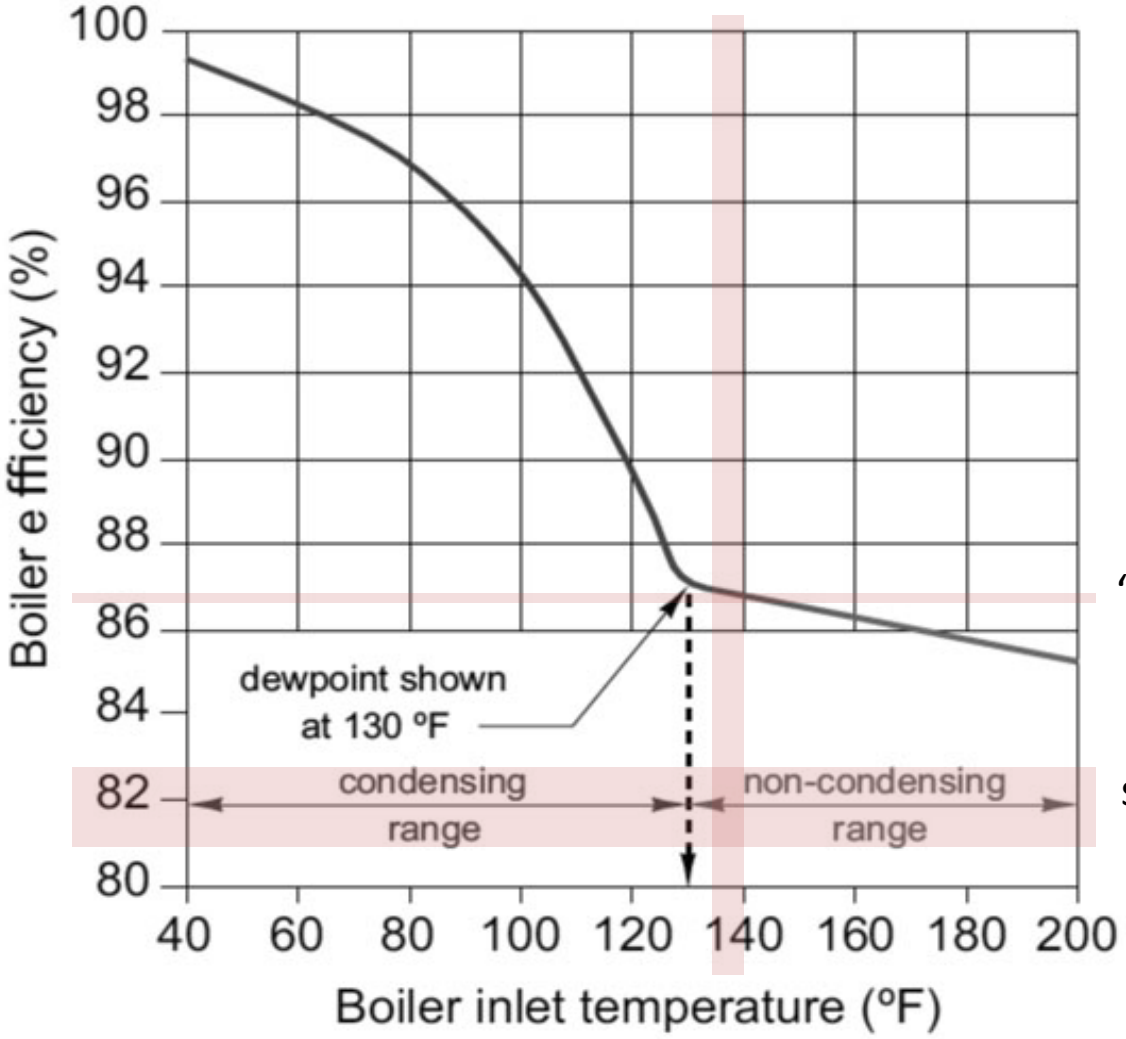
Fuel Savings Are Not Big

Paybacks Are Not Great*



*Oil-heated, campus-style with leaky steam distribution piping, and easy-to-[sidewall] vent applications aside

but we have condensing boilers!



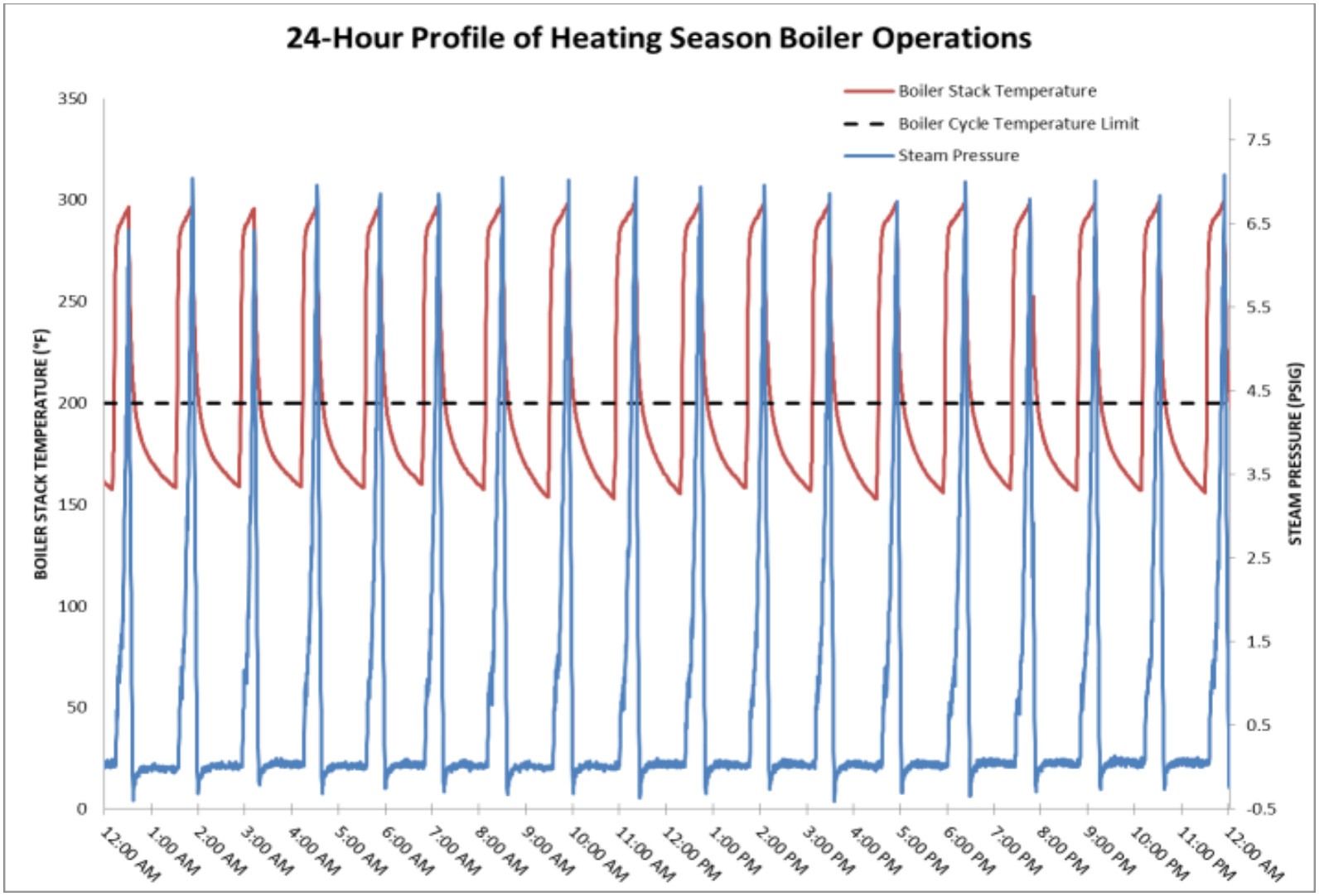
"condensing" boiler ~87%

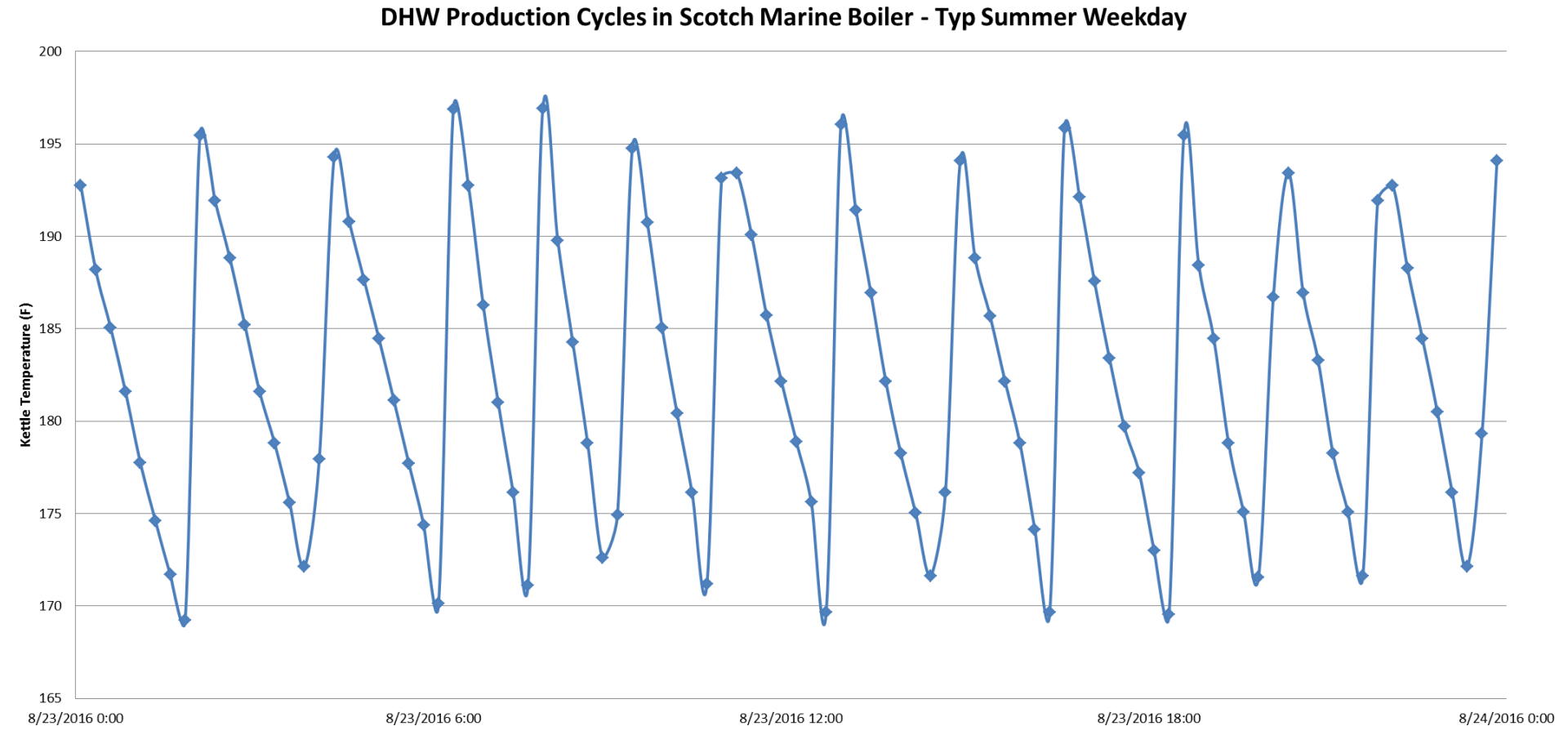
scotch marine boiler ~81-83%

and steam boilers short cycle!

- Off-cycle and purge losses in scotch marines ~2%
- Winter boiler firing is almost always for heating calls
- Scotch marine kettle holds hours of DHW in summer

Heat Timer Example





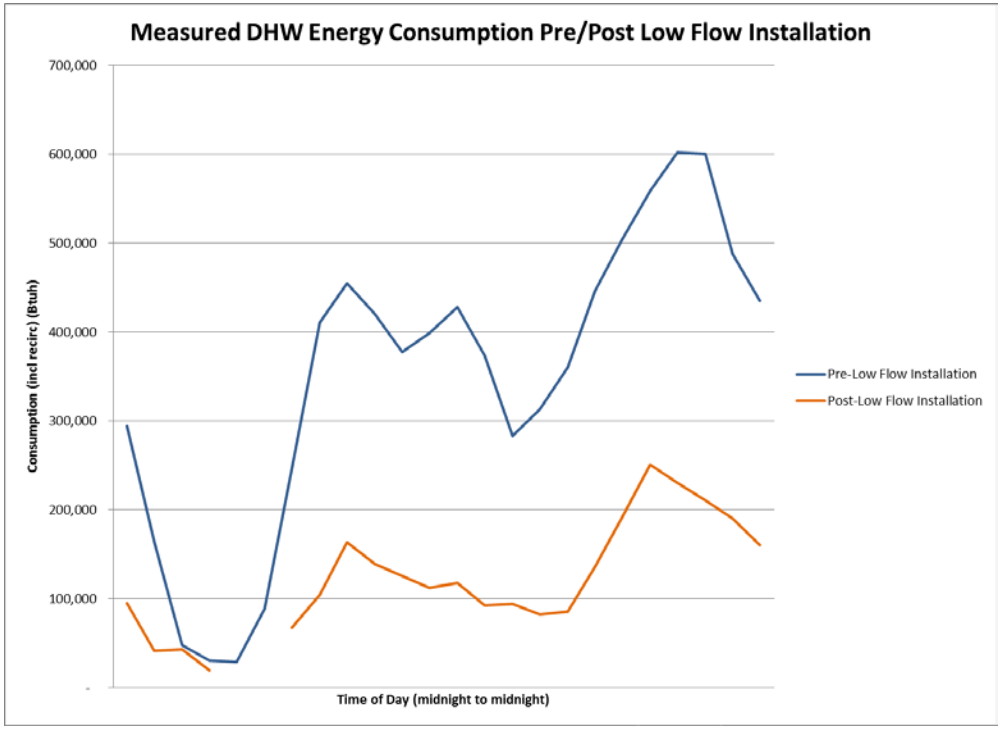
The Verdict

- We would expect to see some savings
  - Replace scotch marine @ 81% efficiency with HWH + storage tank @ 86% efficiency
  - 5% efficiency boost for 33% of the year
  - winter boiler does not fire for DHW, losses not attributed to DHW, reduces efficiency gain to ~3% for 67% of year

but not enough savings opportunity to justify high cost

What Does Work?

- Load reduction – low flows, ENERGY STAR laundry equipment, reduced DHW temperature



Electrification

- Dedicated **electric** ASHP DHW is needed to reach 80x50
- We need to stop putting in new fuel-fired infrastructure by ~2025
- ASHP save GHGs and source EUI with today's grid