WHAT TO DO ABOUT DHW?
Good, bad, and outdated solutions for multifamily buildings

Nicole Ceci, PE
Senior Mechanical Engineer
Steven Winter Associates, Inc.
307 Seventh Avenue, Suite 1701, New York, NY 10001
nceci@swinter.com
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

24-Hour Profile of Heating Season Boiler Operations

- Boiler Stack Temperature
- Boiler Cycle Temperature Limit
- Steam Pressure
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