Combi Systems for Low Load Homes

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Context

- **Low load homes are more common than ever.**
- **Typical space heating and DHW equipment have capacities larger than necessary**
- **A single heating plant could provide high efficiency heat at lower costs, increased durability and improved combustion safety**

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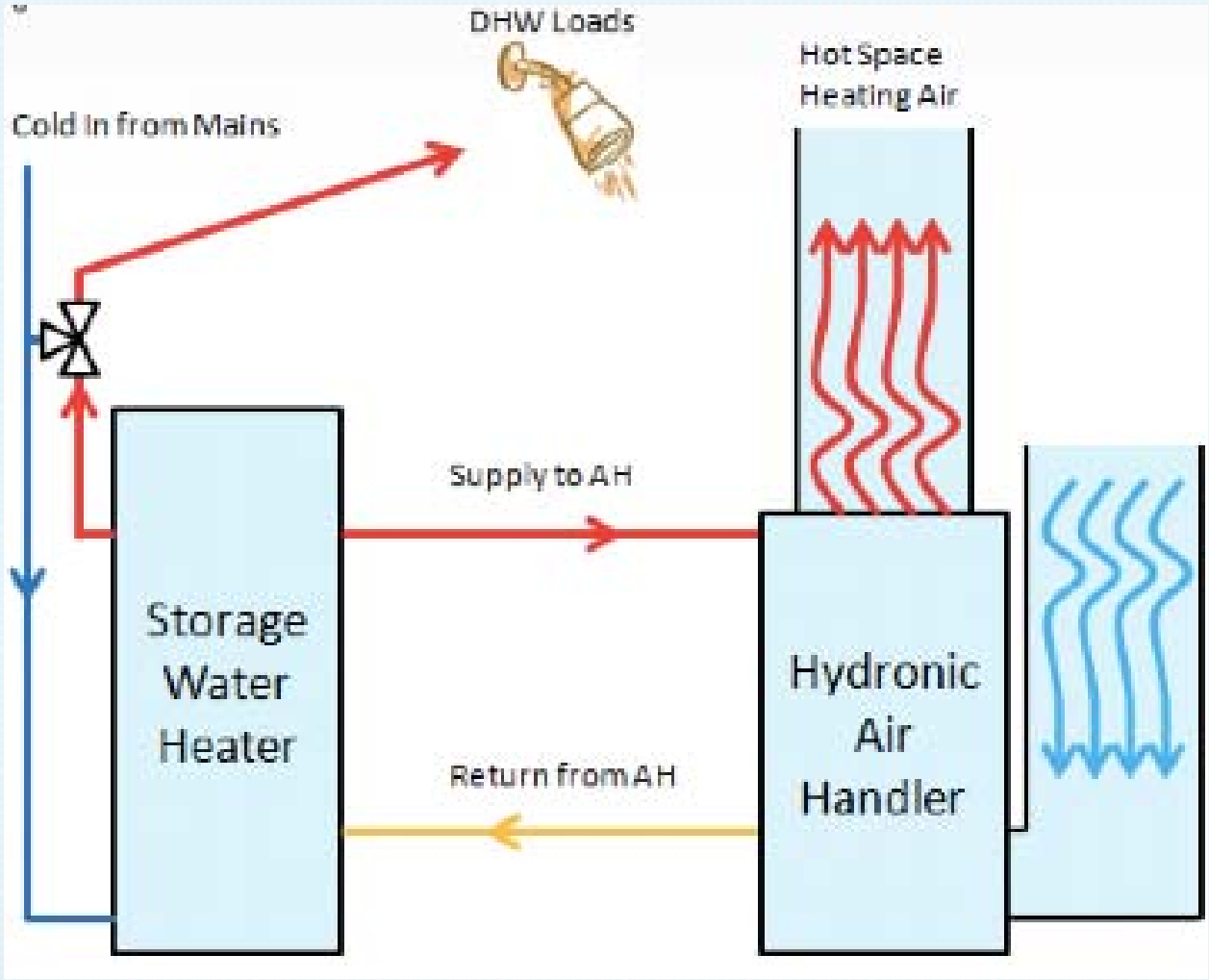
Technical Approach

- **A condensing water heater and hydronic air handler will used to provide space and water heating loads in almost 300 weatherized homes.**
- **System specifications, sizing, and installation optimization guidelines were all developed.**
- **Contractor capability was developed in MN market, but may not be developed in all local.**


EXISTING


COMBI


DHW Loads
Hot Space Heating Air
Cold In from Mains
Supply to AH
Storage Water Heater
Hydronic Air Handler
Return from AH

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Recommended Guidance

- **Determine peak load on system:**
  - Space heating design load (ie 40,000 Btu/hr)
  - DHW load (1.5 gpm at 90F temp rise is 70,000 Btu/hr)
- **Choose a water heater (110,000 at 90% -> 125,000 Btu/hr input)**
- **Choose an air handler (typically required capacity of about 2 times rated)**

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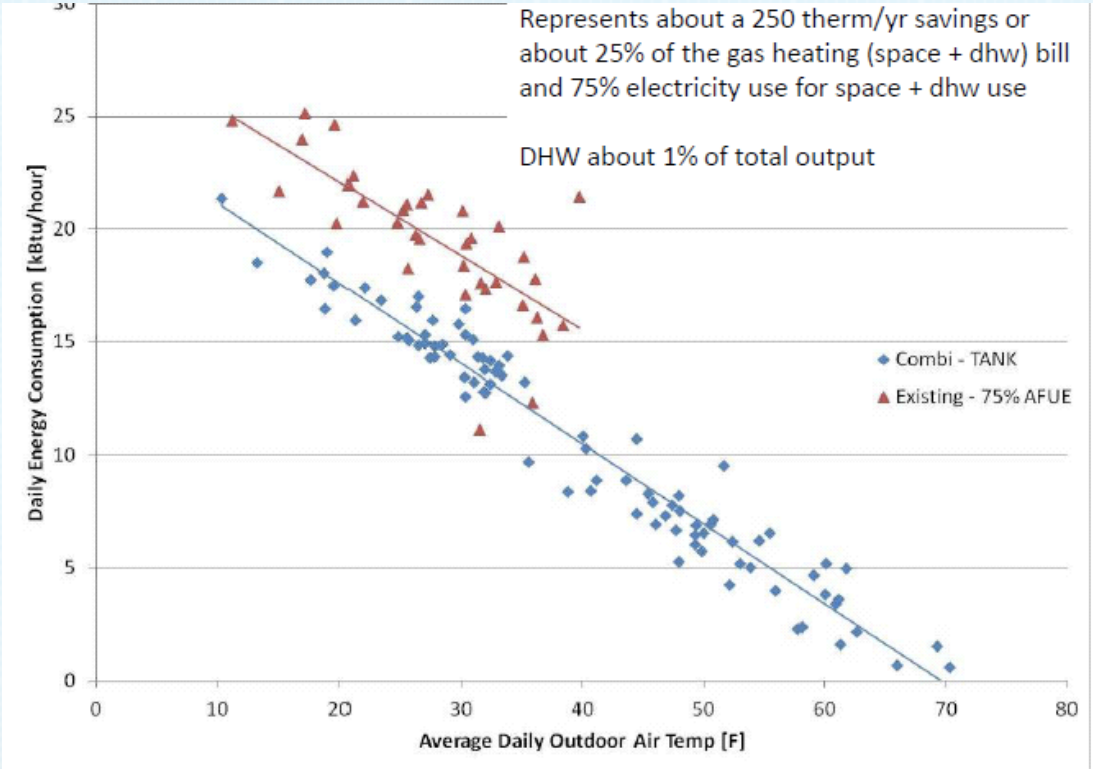
Value

- **Energy and cost savings**
- **Combustion safety**
- **Allows for further air sealing and insulating**
- **Single burner potentially**
  - Reduces maintenance
  - Reduces cost

Value

- **90% or greater space and water heating**
  - Around 160 therms/year saved over an 85% AFUE furnace and 60% EF water heater



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Market Readiness

- **Current installations possible**
  - 300 in Minnesota
  - Required engineering design and oversight
- **Next generation equipment**
  - Less site specific work
  - More functionality

- **Pros:**
  - Cheaper to install than a condensing furnace and water heater
  - More durable than typical heating systems
  - Reduce energy consumption
- **Cons:**
  - Field engineering
  - A typical installation