



Saving Energy With Demand Controlled Recirculation in Domestic Hot Water Systems

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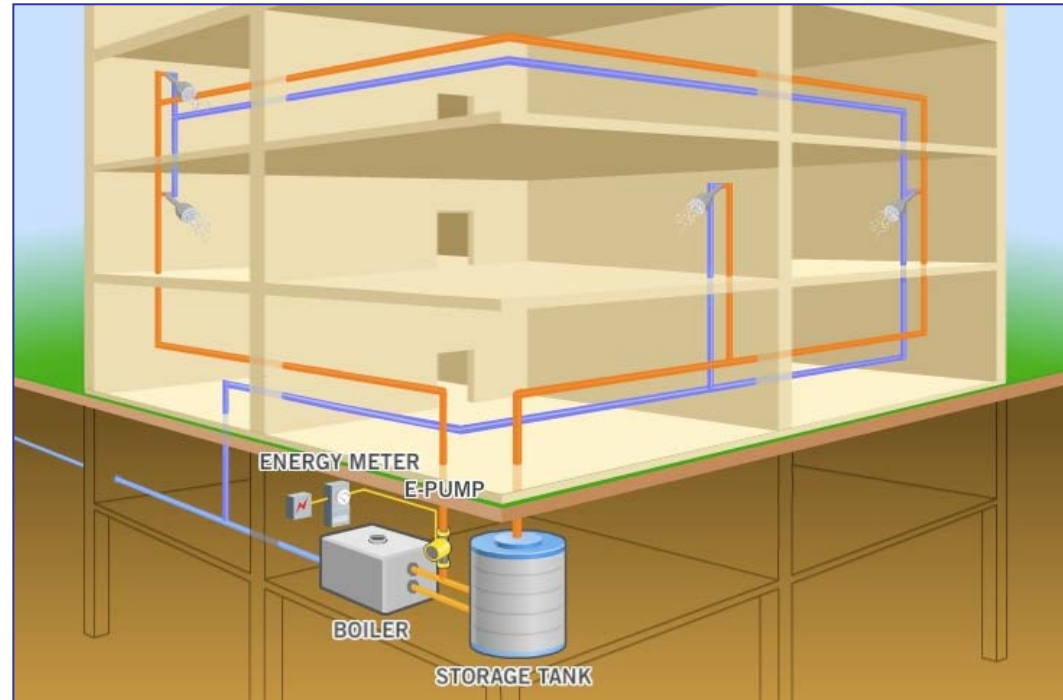
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Typical Recirculation Systems in Multifamily and Commercial Buildings



The Problem:

- Pump typically operates on a 24/7 continuous basis
- Radiant heat loss in the loop accounts for 95% of all system standby heat losses
- Unused, cooler water must be reheated

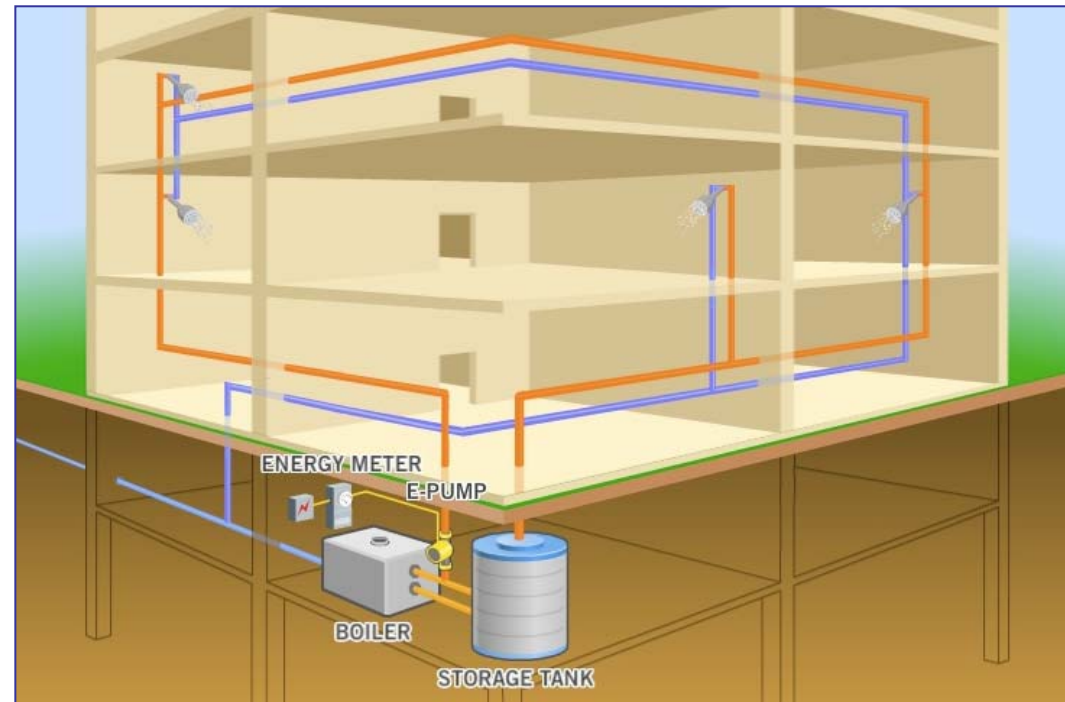


Typical Recirculation Systems in Multifamily and Commercial Buildings



The Solution:

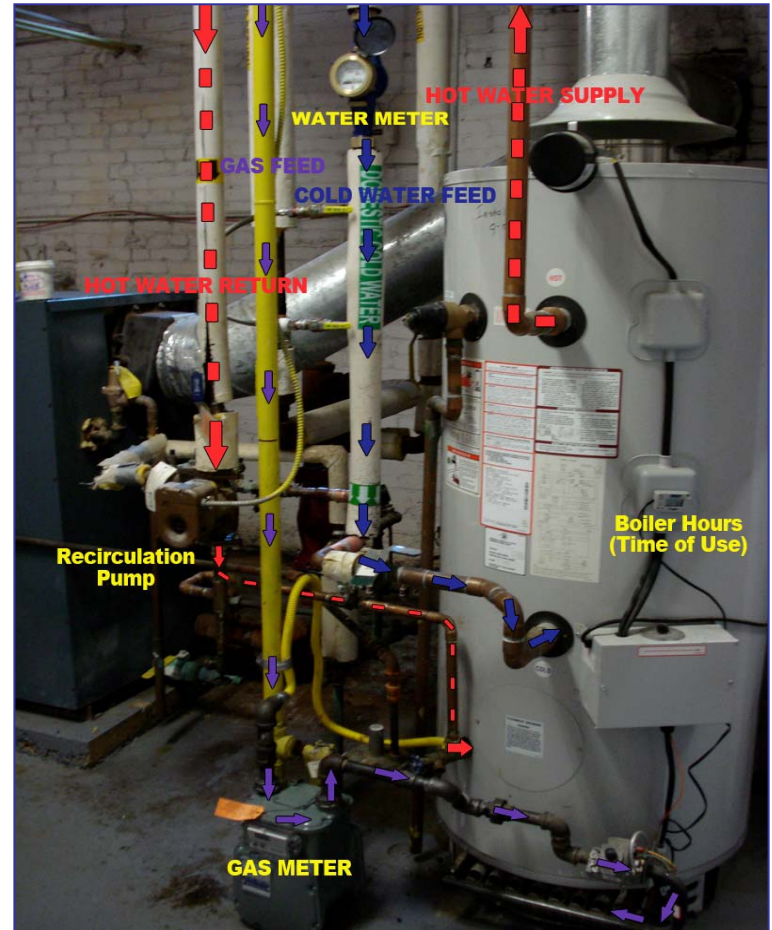
- Operating the loop based on temperature and demand
- Pump will operate up to a few hours a day
- Helps offset heat losses by reducing constant dumping of cooler water
- Less boiler run time and less pump run time



Analysis on 4 story, 47 unit apartment building in Los Angeles



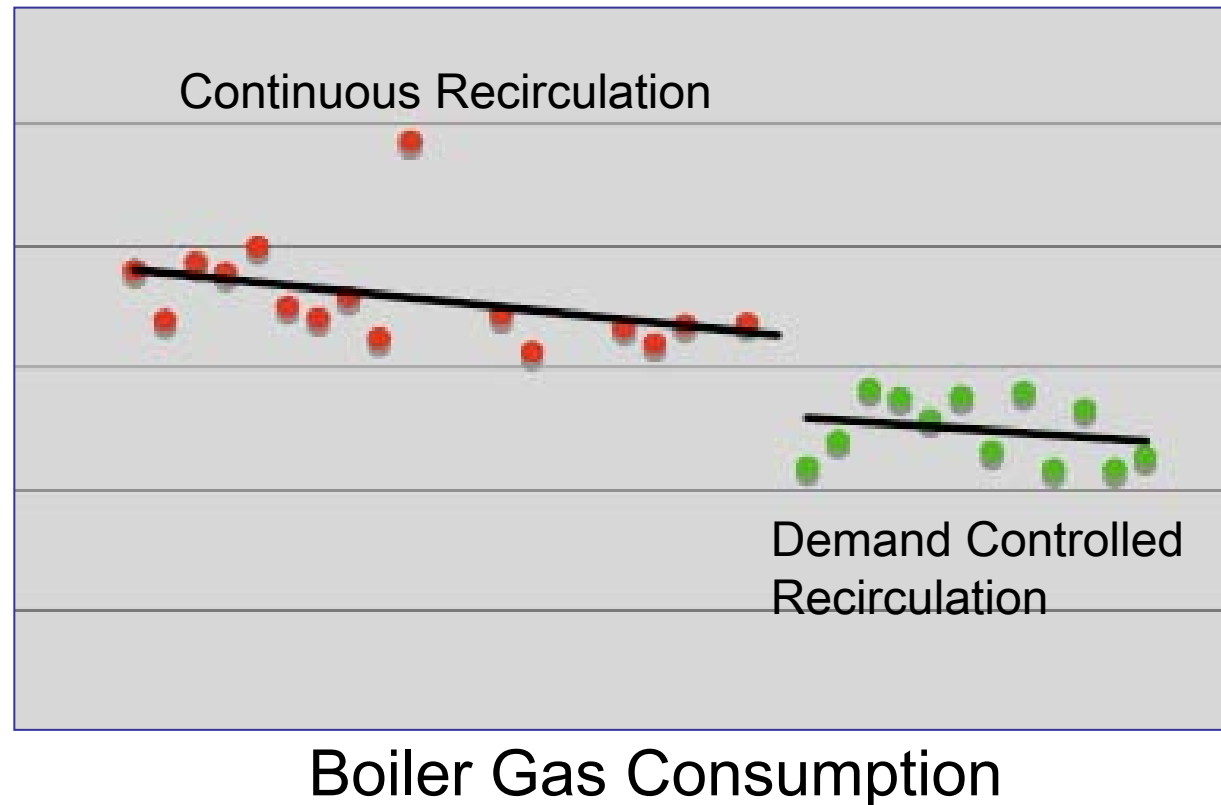
- Isolated boiler system with dedicated gas and water meters
- Also hooked up run time meters on boiler valves and pump
- Alternated pumping methods every week and monitored gas/water consumption and run time



Results with Multifamily Building in Los Angeles



- Boiler Gas Consumption decreased by 28%
- Pump electricity consumption decreased by 85%

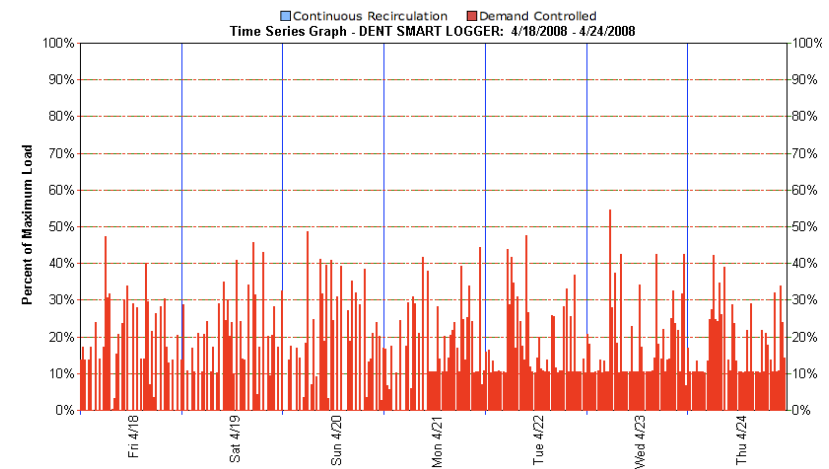
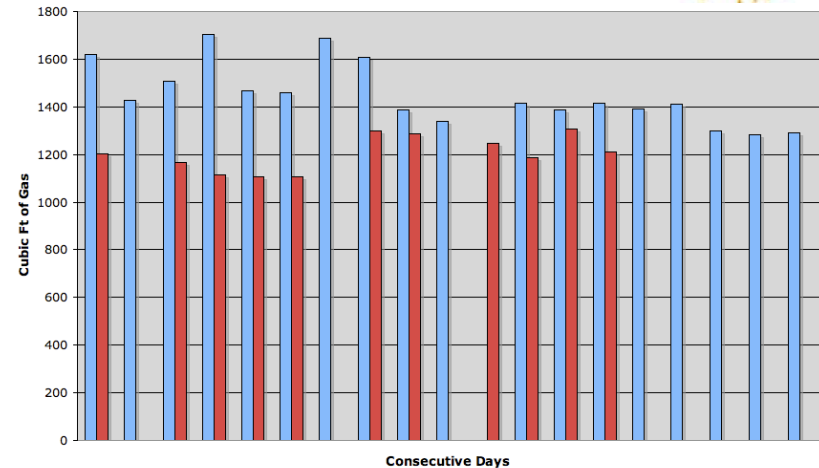


Analysis on 17 and 34 Unit Apartment Building In Washington D.C.



- Same methodology employed
- Gas consumption decreased by 15% (both buildings)
- Electricity consumption decreased by 97%
- Note that water consumption stayed relatively constant
- No complaints from tenants about delays

Gas Consumption Per Day (cubic ft)



Market Potential



- Focus of studies have been on multifamily
- 474,727 multifamily buildings of 5 or more units (2001 US Census Bureau)
- Water heating makes up 32% of multifamily energy use (DOE)
- Demand Controls can be easily retrofitted in any building that has a central domestic hot water system
- Hotels, Schools, Hospitals, Government, Military, Office

Studies Being Planned or Currently Underway



- Retail (Walgreens)
- Hotel/Hospitality (Marriott)
- Special Use (Stadiums)