Steam Efficiency Upgrades at Post Consumer Brands

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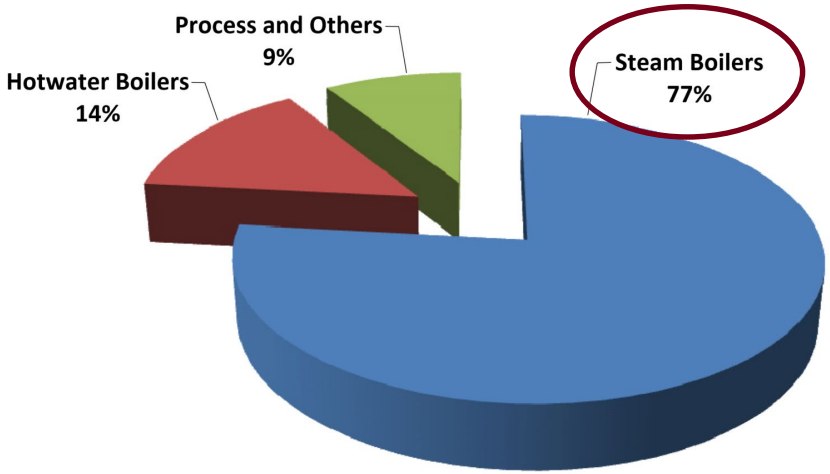
Driven to Discover℠

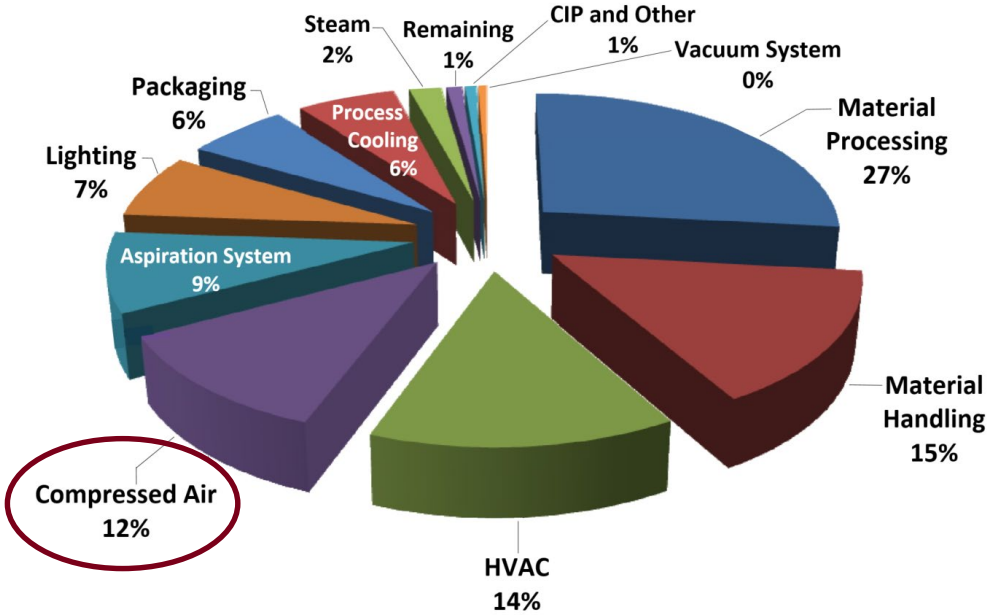
Post Consumer Brands (PCB)

- Northfield, MN
- 650 employees
- Largest ready-to-eat cereal manufacturer in USA

Gas Usage at PCB



Electric Usage at PCB

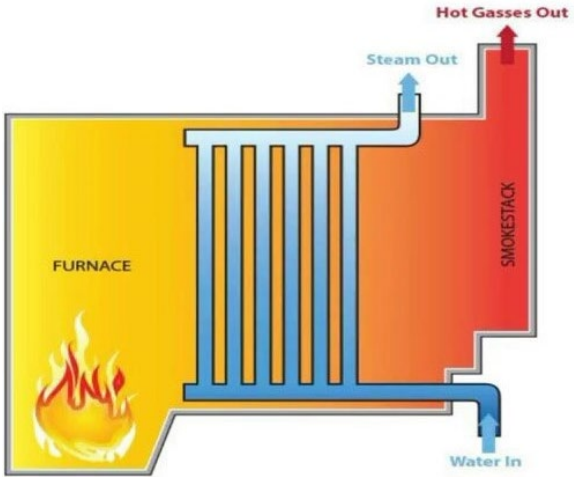


Data: Xcel Energy & Graphet Engineering

Investing in the Future

Types of Boilers

Water Tube



Fire Tube

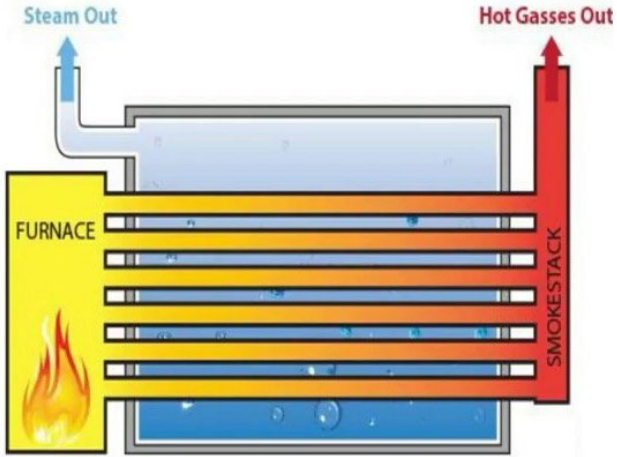


Image: igiantech.com

	Water Tube	Fire Tube
Units of Capacity	lbs steam/hour	horsepower
Startup Cost	more expensive	cheaper
Efficiency	~83%* max *with economizer	~94%* max *with economizer
Startup Time	faster	slower
Reaction Time	slower	faster
Max Pressure	800+ psig	350 psig

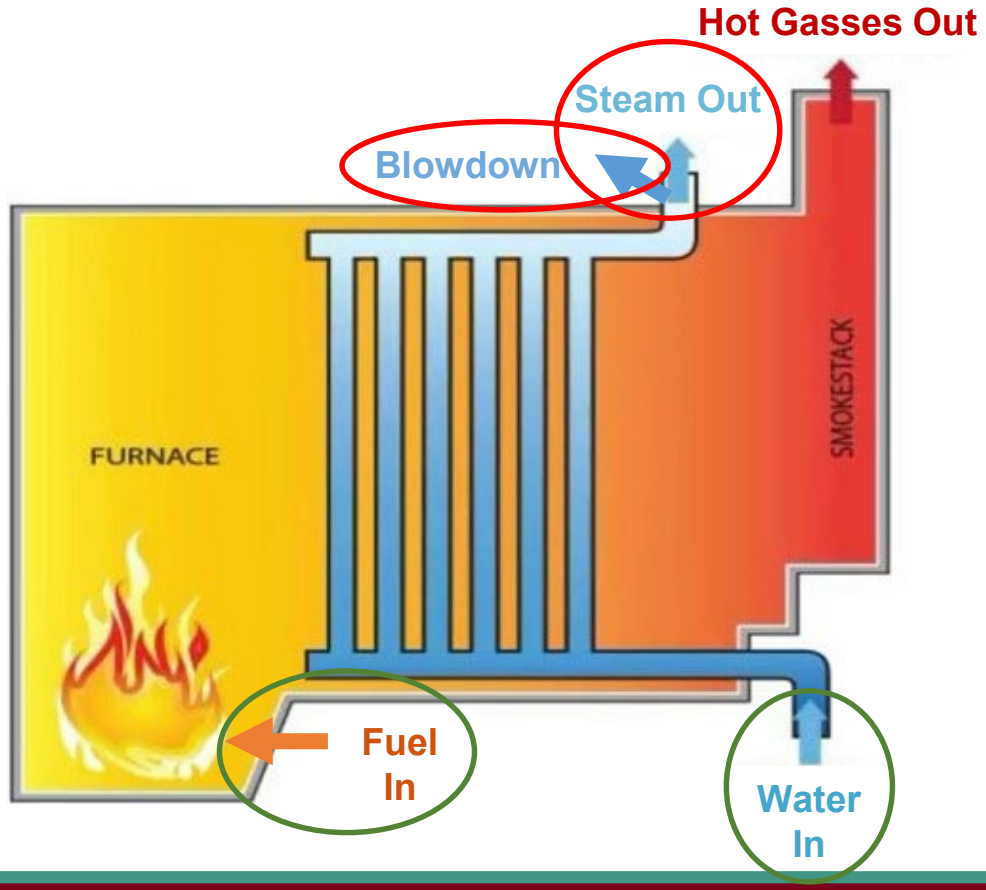
Boiler Efficiency

Fuel-to-Steam Efficiency

Input-Output Method:

$$efficiency = \frac{Output\ [Btu]}{Input\ [Btu]}$$

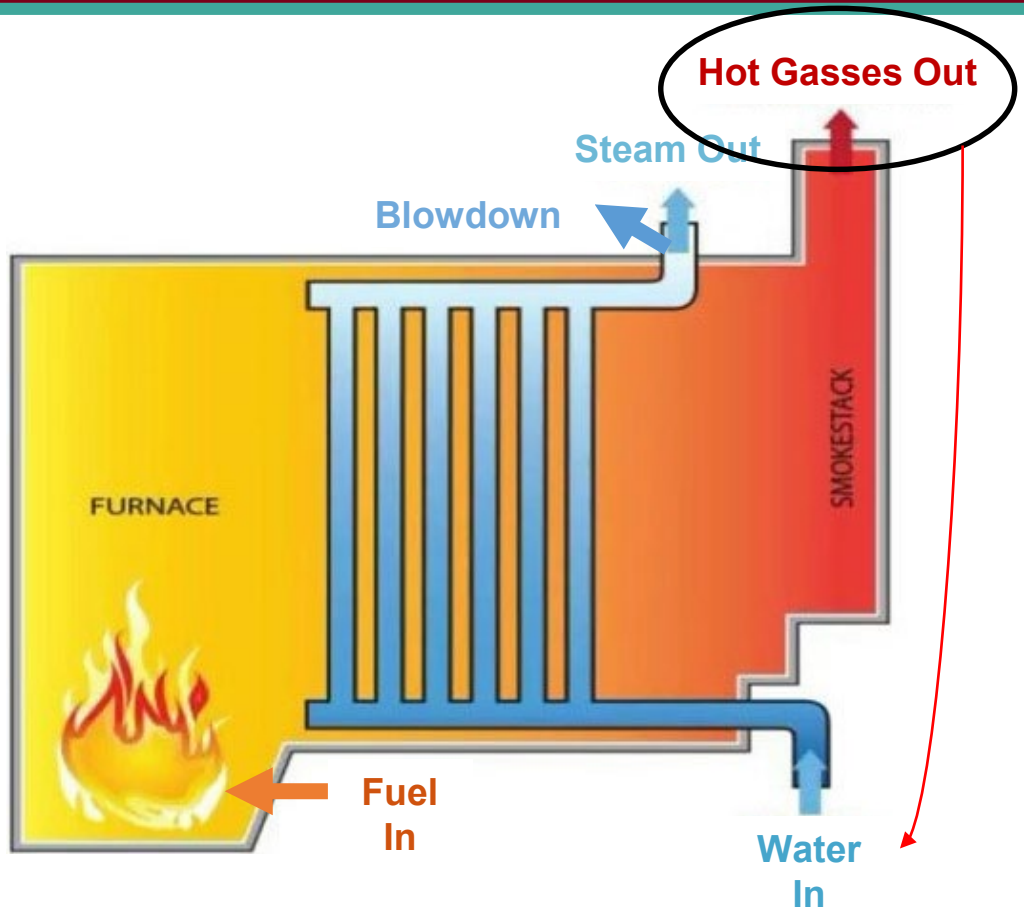
$$= \frac{steam_{out} + blowdown}{water_{in} + fuel_{in}}$$



Boiler Efficiency

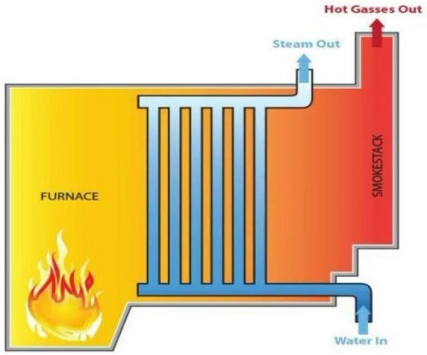
Economizer:
~5-10% efficiency gain

Collecting temperature data from boilers



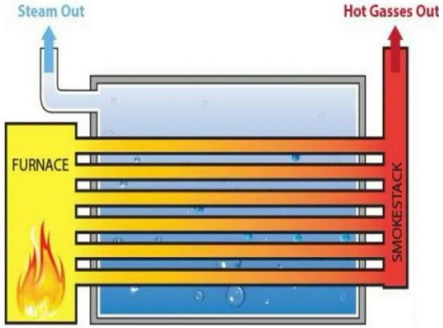
Primary Recommendation

Current Boilers



~80% efficient

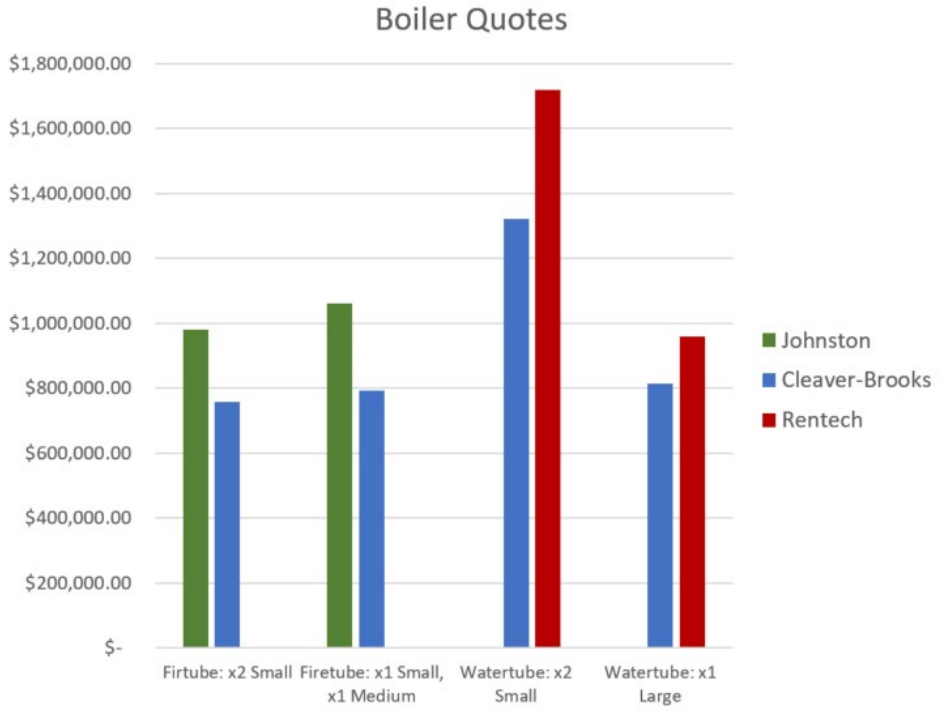
New Boilers



~93% efficient

<u>Δ13% efficiency</u>
~95,000 Therms saved/year
~$32,000 saved/year

Primary Recommendation



Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
1a. Replace Boilers with High-Efficiency Water Tube Models	pending	pending	pending	pending	Recommended
1b. Replace Boilers with Fire Tube Boilers	~140,000 Therms	~$2,900,000	~$70,000	~41 years	Recommended
1c. Install a Topping Cycle Combined Heat and Power System	pending	pending	pending	pending	Recommended
2. Identify and repair leaks in bag house compressed air lines	12,000,000 kWh	$163,000	$967,000	2 months	Recommended

Thank you


Post
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