

Annual Cost Example (OPEX). This is only an example and may not be relevant to your application or situation.



Changing From Fossil Fuel Boiler to Electric



Assumptions:

- The steam demand averages 20% of installed capacity
- The steam is required intermittently throughout the day
- Existing 500 BHP natural gas boiler
- One standby boiler kept hot
- Steam distributed throughout plant

•**Key Assumption:** Assumed that Natural gas costs 1/3 the equivalent energy cost of electricity

Annual Cost Example Results

Even though electricity is assumed to cost three times more than natural gas on an energy basis, the total annual operating

Cost Category	Central Boiler Plant Operates 24/7 but is used 20% of Capacity and is used intermittently	Electric Steam Generators Operates on Demand
Fuel/Electric Energy	\$100,000	\$95,000
Boiler Standby Losses	\$25,000	\$0
Hot Standby Boiler	\$15,000	\$0
Steam Distribution Losses	\$12,000	\$1,500
Boiler Blowdown Losses	\$5,000	Minimal
Water Treatment	\$8,000	\$2,500

cost can still be significantly lower because:

- No idling
- No hot standby
- No combustion losses
- Minimal piping losses
- Lower maintenance burden

Electric steam generators include an HMI controller for control and information. No need for separate Boiler Management and Control.



Combustion Maintenance	\$10,000	\$0
Burner Service	\$6,000	\$0
Emissions Compliance (a 500BHP boiler can produce 1.1 tons/h of CO ₂ e Minimum and Maximum Cost	\$4,000 for risk exposure insurance to a possible whopping \$2.9 M million at \$300/ton of CO ₂ e cost.	\$0
Boiler Room Ventilation	\$3,000	\$500
Unplanned Downtime Risk	\$5,000	\$2,000
Total Annual Cost	\$193,000 to approximately \$3 million should a climate tax be enacted.	\$101,500