

ConDex

Condensing Economizer Systems



ConDex Condensing Economizer Systems
Less Exhaust Gas - Less Pollution - More Dollar Savings
www.condenergy.com



How is a Condex different?

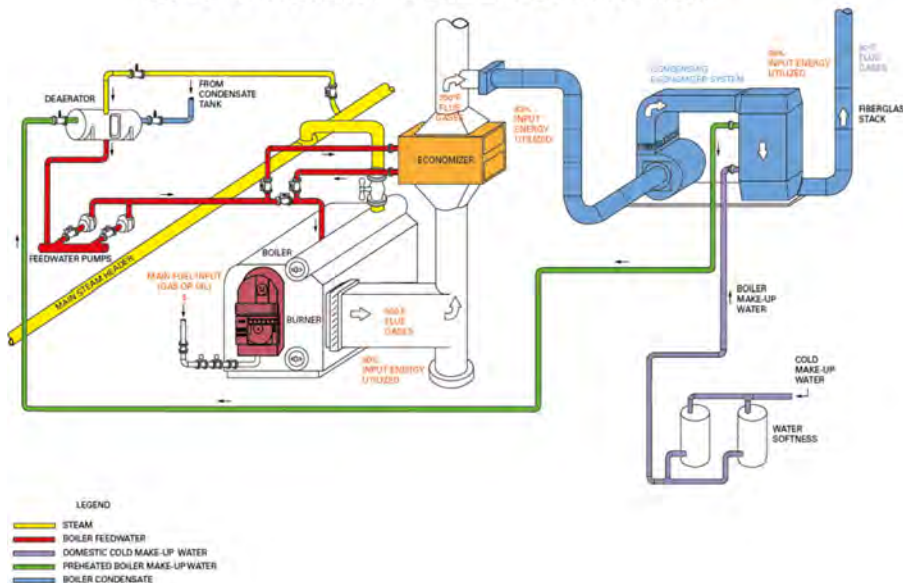
Standard Economizer



- Heats boiler feedwater only
- Must be sized for maximum boiler gas flow
- Adds pressure drop potentially impacting FD Fan Sizing
- Gas side can not be bypassed
- Minimum outlet temperature requirements 250-300F
- Adds 6-8 % efficiency to the boiler system

Condex

95% EFFICIENT BOILER OPERATION



- Heats Make Up Water
 - Process water
 - CIP fluids
 - Glycol
 - ETC.
- Sized for optimum heat recovery
- No added draft loss on gas side
- Outlet water temperature control and full bypass available
- Outlet gas temperature unrestricted
- Capable of Multiple liquid loops
- Adds 14-18% efficiency to the boiler system
- Reduces Carbon and Greenhouse Gas emissions
- Recovers usable water from flue gas vapor
- Can include standard economizer section or be used after a separate economizer

Condex Paper Industry Applications

Graphic Packaging – Kalamazoo, MI (2015)

Energy Recovered – 8.47 MMBTU/hr

Standard Condex system with two coils heating make up water and process water with 155,000 Lb/Hr of boiler flue gas entering at 325F, leaving at 131F. 65 Gallons per hour of reusable water is recovered from the flue gas and 5,238 Tons of CO₂ and 6,640 Lbs of NO_x are offset per year.



Graphic Packaging – Santa Clara, CA (2008)

Energy Recovered – 25 MMBTU/hr

Standard Condex system with a single coil heating 1,300 GPM of process water with exhaust from a gas turbine HRSG. 28 Gallons per minute of reusable water are recovered at peak load.



Kimberly Clark – Mexico City, Mexico (2011)

Energy Recovered – 11.2 MMBTU/Hr

Standard Condex system with a single coil heating boiler make up water from 80 to 180F using exhaust from 2 boilers. Annual fuel savings \$400,000.00



Procter & Gamble – Mehoopany, PA (2018)

Energy Recovered – 36.7 MMBTU/Hr

Standard Condex system with a single coil heating 700 GPM of boiler make up water from 65F to 170F. DA steam is reduced by 30,000 lb/hr and fuel savings is over \$1MM/year.

SCA Tissue North America – Cherokee, AL (2012)

Energy Recovered – 5.1 MMBTU/Hr

Standard Condex system with a single coil heating make up water with 80,000 Lb/Hr of boiler flue gas cooled from 255F to 124F. System recovers nearly 298 gallons per hour of reusable water and offsets 3,197 Tons of CO₂ and 4,053 lbs of NO_x per year.



Westrock - Sheldon Springs, VT (2011)

Energy Recovered – 7.7 MMBTU/Hr

Standard Condex system with two coils, one standard economizer and one condensing section heating boiler feedwater and make up water with 76,500 Lb/Hr of 500F flue gas cooled to 125F.

Condex District Heating Applications

Vicinity Energy – Grand Rapids, MI (2018)

Energy Recovered – 12.1 MMBTU/Hr

Standard Condex system with a single coil heating 200 GPM of district heating loop water from 60 to 190F using 130,000 Lb/Hr of boiler flue gas from multiple boilers.



CCUM – Montreal, QC (2015)

Energy Recovered – 13.8 MMBTU/Hr

Standard Condex system with two stages including condensate return and building heating loop water. Recovers energy from 2 boilers and reduces CO2 Emissions by 8,488 Tons per year.



Condex Schools & University Applications

University of British Columbia – British Columbia, Canada (2014)

Energy Recovered – 3.6 MMBTU/Hr

Standard Condex system with a single campus heating loop of 500 GPM recovering heat from 3 boilers. Annual CO2 emission reductions 2,214 Tons per year



University of California, Davis – Davis, CA (2012)

Energy Recovered – 15.8 MMBTU/Hr

Standard Condex with 3 stages for condensate return, building heating loop and boiler make up water. Recovers heat from two boilers using ultra Low NOx burners. Estimated savings \$1.4MM/Yr with greenhouse gas reductions of 9,194 Tons per year.



Indiana State University - Terre Haut, IN (2010)

Energy Recovered – 4.7 MMBTU/Hr

Standard Condex with a single coil heating condensate return water using exhaust from 3 boilers. Saves \$390,000 per year in fuel and reduces CO2 emissions by 2,930 Tons per year.

Condex Hospital Applications

VA Hospital – Buffalo, NY (2008)

Energy recovered – 2.8 MMBTU/Hr

Standard Condex with a single glycol/water heating loop recovering energy from 3 boilers. Annual fuel savings \$262,000. With CO₂ emissions reduced by 1,577 Tons per year and 960,000 Gallons of water recovered from the flue gas per year.



Scottsdale Medical Center – Scottsdale, AZ (2012)

Energy Recovered – 379,000 BTU/Hr

Cylindrical Condex system with a single coil heating make up water using boiler flue gas cooled from 390F to 129F. The system recovers nearly 9 gallons per hour of reusable water and offsets CO₂ by 235 Tons per year and NO_x by 297 lbs per year.



St. Peter Hospital – Seattle, WA (2009)

Energy recovered 1.8 MMBTU/Hr

Standard Condex with 3 stages recovering energy from multiple boilers. Water recovered 61 Gal/hr and CO₂ emissions reduced by 1,118 Tons per year.

Stroger Hospital – Chicago, IL (2013)

Energy Recovered 6.4 MMBTU/Hr

Standard Condex system with a single stage preheating the heating water loop using energy from multiple boilers. Annual CO₂ reduction of 3,902 Tons per year.



Northwest Community Healthcare – Arlington Heights, IL (2016)

Energy Recovered – 545,841 BTU/Hr

Standard Condex with a single stage preheating make up water using energy from multiple firetube boilers. Annual CO₂ reductions of 338 Tons per year.

Cincinnati Children's Hospital – Cincinnati, OH (2005)

Energy Recovered 7.8 MMBTU/Hr

Standard Condex system with two stages for preheating the heating water loop and make up water using 71,248 Lb/Hr of flue gas at 550F reduced to 136F. Annual CO₂ reduction of 4,850 Tons per year.

Condex Food Manufacturing Applications

Coca Cola Company – College Park, GA (2008)

Energy Recovered – 1.2 MMBTU/Hr

Standard Condex system with a single loop heating make up water using energy from 4 firetube boilers. Annual fuel savings estimated at \$100,000. With CO₂ emissions reduced by 545 Tons per year.



Molson Coors – Montreal, Canada (2012)

Energy Recovered – 4.5 MMBTU/Hr

Standard Condex system with a single coil heating process water with energy from 70,000 lb/hr boiler exhaust that is cooled from 243F to 118F. System recovers nearly 275 gallons per hour of reusable water and offsets 2,787 Tons of CO₂ and 3,534 Lbs of NO_x per year.



Hormel Foods – Austin, MN (2009)

Energy Recovered – 5 MMBTU/Hr

Standard Condex system with a single coil heating clean in place water using boiler flue gas that is cooled from 373F to 128F. The system recovers nearly 135 gallons per hour of reusable water and offsets 3,099 tons of CO₂ and 3,929 lbs of NO_x per year. The system is specially coated for added corrosion protection.

ConAgra Foods – Twin Falls, ID (2008)

Energy Recovered – 17.5 MMBTU/Hr

Standard Condex system with two coils heating boiler make up water and process water using boiler exhaust gas that is cooled to 98F for a fuel utilization of 96%. Annual CO₂ emissions are offset by 9,988 tons per year.

Sunkist Beverages – Tipton, CA (2011)

Energy Recovered – 1.2 MMBTU/Hr

Cylindrical Condex units heating 45 GPM of boiler make up water from 75 to 155F using heat from 2 400 HP firetube boilers. Flue gas is cooled from 386 to 105F. Annual CO₂ emissions are offset by 1,120 tons per year.

Mars Foods – Bolton, ON (2018)

Energy recovered 1.43 MBTU/Hr

Cylindrical Condex system with a single coil heating make up water using boiler flue gas cooled from 340F to 106F Water recovered 94 Gal/hr and CO₂ emissions reduced by 885 Tons per year.



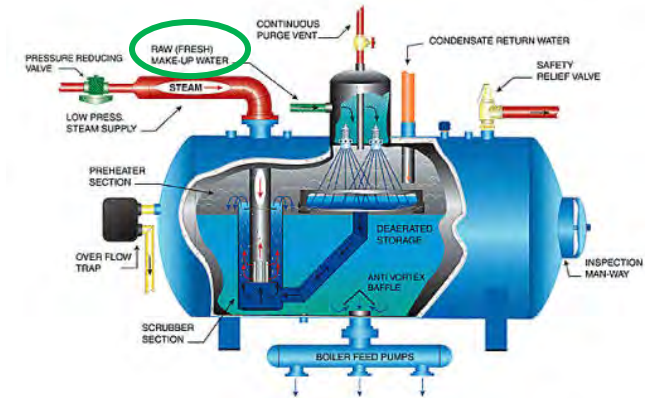
DelMonte Foods – Cambria, WI (2007)

Energy Recovered – 10.4 MMBTU/Hr

Standard Condex system with two coils heating make up water and CIP water using boiler exhaust that is cooled from 389F to 110F. 6,466 Tons of CO₂ and 8,198 Lbs of NO_x are offset per year with the system.

CONDEX Heat recovery systems provide hot water for many applications:

- Make Up Water
- Process Water/ Fluids
- Building Make Up Air Heating
- CIP (Clean In Place)
- Domestic Hot Water
- Combustion Air Preheat
- Under Floor Hydronic Heating
- Paper Machine Shower Water
- Paper Machine Pocket Ventilation
- HVAC Heating
- HVAC Cooling
- Kettle Cooking
- ORC Supply – Electricity Generation
- Swimming Pool heating
- Dehumidification re-heat



Utility Incentives are offered for many Condex installations that reduce natural gas use.



By reducing the amount of fuel needed for the same boiler or hot-water-heater duty, emissions of carbon and greenhouse gasses are reduced, and reductions are quantified in our proposals. Energy recovery is guaranteed based on design inputs.

In many cases, payback is 12-18 months and can be less with utility incentives included.

Case histories and user references are available upon request.

JUST SOME OF THE COMPANIES SAVING ENERGY USING
CONDEX WASTE HEAT RECOVERY SYSTEMS



COMBUSTION & ENERGY SYSTEMS LIMITED