Turbosteam LLC
161 Industrial Boulevard
Turners Falls, MA 01376
Phone: 413.863.3500
Fax: 413.863.3157
www.turbosteam.com

COGENERATION SYSTEM INSTALLATIONS BY INDUSTRY

CHEMICAL

Air Products & Chemicals
System Output: 1,500 kW
Design Pressure: 500 psig to 175 psig
Steam Flow: 135,000 lbs/hr
Type: Induction
Houston chemical plant produces electricity by reducing steam down for process use.

Borden Chemical Inc.
System Output: 397 kW
Design Pressure: 100 psig to -5 psig
Steam Flow: 16,000 lbs/hr
Type: Induction
The system is installed at the South Glens Falls, New York formaldehyde production plant. Formaldehyde is produced in an exothermic reaction of methanol with a catalyst. The heat production inherent to the exothermic reaction is removed by water, thereby producing steam. Prior to the installation of the Turbosteam turbine-generator, the steam energy was wasted to the atmosphere. This system design won the EPA/USCHPA Energy Star Award.

Calgon Carbon
System Output: 732 kW
Design Pressure: 215 psig to 45 psig
Steam Flow: 45,600 lbs/hr
Type: Synchronous
The steam is generated in a waste heat recovery boiler and the exhaust steam is used for process needs.

Celanese Mexicana
System Output: 200 kW
Design Pressure: 600 psig to 75 psig
Steam Flow: 10,800 lbs/hr
Type: Synchronous
The system provides stand-alone power for a chemical plant in Veracruz, Mexico. Controls are provided to allow the system to follow isolated electrical loads.

E.I. du Pont de Nemours & Co.
System Output: 512 kW
Design Pressure: 700 psig to 65 psig
Steam Flow: 25,000 lbs/hr
Type: Synchronous
The installation is in a Cape Fear, North Carolina textile fibers plant. The system provides steam to process and heating requirements.

E.I. du Pont de Nemours & Co.
System Output: 249 kW
Design Pressure: 65 psig to 15 psig
Steam Flow: 24,800 lbs/hr
Type: Induction
The installation is in Cape Fear, North Carolina. This system is utilized for absorption chilling equipment.

E.I. du Pont de Nemours & Co.
System Output: 929 kW
Design Pressure: 175 psig to 10 psig
Steam Flow: 40,000 lbs/hr
Type: Synchronous
The installation is at a Nashville manufacturing plant. The system is designed to provide steam for process requirements.

Laxmi Organics
System Output: 130 kW
Design Pressure: 149 psig to 40 psig
Steam Flow: 11,000 lbs/hr
Type: Induction
The system is installed at a chemical plant outside Bombay, India and exhausts to process loads.

Rohm & Haas
System Output: 283 kW
Design Pressure: 402 psig to 55 psig
Steam Flow: 23,075 lbs/hr
Type: Synchronous
The system is installed in a Philadelphia manufacturing plant and provides steam for process needs.

ETHANOL

Cilion (2 Systems)
System Output: 4.055 kW
Design Pressure: 450 psig to 40 psig
Steam Flow: 128,500 lbs/hr
Type: Synchronous
The two systems provide 80% of the electrical needs for the wet mill plant.

Poet
System Output: 1,024 kW
Design Pressure: 225 psig to 20 psig
Steam Flow: 46,000 lbs/hr
Type: Synchronous
The system reduces steam for a dry mill process in Minnesota.

COLLEGES & UNIVERSITIES

Carnegie Mellon University
System #1
System Output: 50 kW
Design Pressure: 175 psig to 15 psig
Steam Flow: 2,700 lbs/hr
Type: Synchronous
The system in Pittsburgh, PA reduces steam flow for heating, ventilation and equipment loads in a Research Lab.
System #2
System Output: 75 kW
Design Pressure: 175 psig to 50 psig
Steam Flow: 3,500 lbs/hr
Type: Synchronous
The system reduces steam flow at the Mellon Building. The systems supplement the buildings' electric demand in synchronous parallel and stand alone mode of operation.

Colby College
System Output: 600 kW
Design Pressure: 300 psig to 40 psig
Steam Flow: 30,000 lbs/hr
Type: Synchronous
This Waterville, Maine system serves campus heating and can transition to stand-alone capability when the local utility fails. The turbine generator will allow the campus to generate approximately 50% of its own electricity in the event of power loss, the other 50% to be supplied by emergency diesel generators.

College of Wooster
System Output: 375 kW
Design Pressure: 170 psig to 25 psig
Steam Flow: 23,500 lbs/hr
Type: Induction
This innovative Ohio college system provides steam for campus district heating and includes an automatic multi-valve inlet assembly system (replacing conventional single inlet and manual hand valves) to improve electricity production under partial steam flow conditions.

Colorado State University at Fort Collins
System Output: 800 kW
Design Pressure: 170 psig to 50 psig
Steam Flow: 32,250 lbs/hr (per turbine)
Type: Induction
This dual turbine induction generator system is designed to optimize electric output based off of varying seasonal campus loads. Each turbine reduces steam for steam distribution across the campus.

Mankato State University
System Output: 434 kW
Design Pressure: 150 psig to 50 psig
Steam Flow: 40,000 lbs/hr
Type: Induction
The system serves the campus underground heating system at Mankato State University, Mankato, Minnesota.

Middlebury College
System Output: 830 kW
Design Pressure: 250 psig to 22 psig
Steam Flow: 45,000 lbs/hr
Type: Synchronous
This system at a college campus in Vermont uses the steam for campus heating requirements. This system is a winner of the EPA/USCHPA Energy Star Award.

Montana State University
System Output: 589 kW
Design Pressure: 175 psig to 40 psig
Steam Flow: 42,300 lbs/hr
Type: Induction
This system provides steam for the campus heating network. Since a boiler upgrade in 1997, which increased the inlet pressure to the turbine to 275 psig, the system has been generating up to 650 kW.

Portage College
System Output: 24 kW
Design Pressure: 100 psig to 10 psig
Steam Flow: 2,500lbs/hr
Type: Synchronous
The system installed at the Lac la Biche, Alberta campus is designed for steam training purposes.

Southern Alberta Institute of Technology
System Output: 480 kW
Design Pressure: 420 psig to 100 psig
Steam Flow: 26,000 lbs/hr
Type: Synchronous
This university campus in Calgary, Alberta, Canada utilizes the steam for campus heating loads.

University of Maryland, College Park
System Output: 4,900 kW
Design Pressure: 600 psig to 125 psig
Steam Flow: 160,000 lbs/hr
Type: Synchronous

Steam is generated for he turbine generator set using HRSGs (Heat Recovery Steam Generators) fed by two 11 megawatt gas turbines with which the steam turbine generator runs in parallel.

University of Massachusetts, Amherst
System Output: 4,000 kW
Design Pressure: 200 psig to 15 psig
Steam Flow: 120,000 lbs/hr
Type: Synchronous
This system was designed for campus heating needs and the fluctuation in seasonal and campus steam usage.

University of Montana
System Output: 447 kW
Design Pressure: 165 psig to 40 psig
Steam Flow: 30,000 lbs/hr
Type: Induction
This system is utilized for the district heating network. The system includes automatic hand valves to improve efficiency at partial loads.

University of South Carolina
System Output: 1,485 kW
Design Pressure: 615 psia to 140 psia
Steam Flow: 60,000 lbs/hr
Type: Synchronous
This system is designed to reduce steam for the campus heating and cooling needs.

University of Wisconsin
System Output: 420 kW
Design Pressure: 165 psig to 60 psig
Steam Flow: 42,000 lbs/hr
Type: Induction
This system is located on the University's hospital campus. The turbine generator reduces steam for use in the facility's heating and process loads.

DISTRICT ENERGY

Blaustein Building
System Output: 713 kW
Design Pressure: 150 psig to 20 psig
Steam Flow: 40,000 lbs/hr
Type: Synchronous
This system is installed in a steam sub-loop of the Trigen-Baltimore District Heating steam distribution system. The turbine reduces steam for downtown heating and cooling loads. This system is located in the Blaustein Building, a twenty-five story downtown office building that houses Trigen – Baltimore's headquarters.

Concord District Steam
System Output: 1,500 kW
Design Pressure: 600 psig to 70 psig
Steam Flow: 50,000 lbs/hr
Type: Synchronous
This system is installed in the Concord, NH District Heating Steam Plant. The system reduces steam for distribution into the network.

Core Energy
System#1
System Output: 417 kW
Design Pressure: 420 psig to 125 psig
Steam Flow: 29,500 lbs/hr
Type: Induction
This system is designed for distribution in the district heating system.

System#2
System Output: 92 kW
Design Pressure: 125 psig to 10 psig
Steam Flow: 5,000 lbs/hr
Type: Induction
This system is designed meet low pressure steam loads in the plant.

CPCU – Bercy
System Output: 49 kW
Design Pressure: 145 psig to 4.35 psig
Steam Flow: 3,000 lbs/hr
Type: Induction
This sytem is installed at a Paris district heating company headquarters and exhausts to a steam-to-hot-water heat exchanger.

CPCU – Ivry
System Output: 1,578 kW
Design Pressure: 270 psig to 8.7 psig
Steam Flow: 44,100 lbs/hr
Type: Synchronous
This system was installed at Paris district heating plant and exhausts to the boiler de-aerators.

CPCU-St. Exupery
System Output: 1,388 kW
Design Pressure: 145 psig to 4.35 psig
Steam Flow: 44,100 lbs/hr
Type: Synchronous
This system was installed at a Paris district heating firm and the steam exhausts to a hot water heat exchanger serving a hot water district-heating sub-loop.

District Energy St. Paul
System Output: 900 kW
Design Pressure: 150 psig to 5 psig
Steam Flow: 43,000 lbs/hr
Type: Synchronous
This system was installed at a Minnesota district heating plant and is capable of providing emergency power during utility outages.

Dupont/Marshall Labs
System Output: 150 kW
Design Pressure: 210 psig to 12 psig
Steam Flow: 8,000 lbs/hr
Type: Induction
This system serves process loads at a Philadelphia area industrial facility.

P.E.I. Energy Systems
System Output: 1,240 kW
Design Pressure: 400 psig to 5 psig
Steam Flow: 40,000 lbs/hr
Type: Synchronous
This system was designed for Charlottetown district heating system on Prince Edward Island, Canada and exhausts to a steam-to-water heat exchanger. The system features a multivalve inlet assembly system for better efficiency at part loads. The system controls are tied into a plant-wide computerized control system and allow seamless transfer to stand-alone mode when the local utility fails.

Queen's Park
System Output: 236 kW
Design Pressure: 200 psig to 125 psig
Steam Flow: 51,800 lbs/hr
Type: Synchronous
This system provides steam for the building heating needs.

Trigen – Boston
System Output: 525 kW
Design Pressure: 300 psig to 160-220 psig (seasonal)
Steam Flow: 95,500 lbs/hr
Type: Synchronous
This system is installed in a Boston district heating plant. This system will provide most of the electrical needs of the Kneeland Station plant, Trigen's main boiler plant serving Boston.

Trigen Oklahoma City
System Output: 50 kW
Design Pressure: 150 psig to 8 psig
Steam Flow: 3,500 lbs/hr
Type: Induction
The system is installed at the Oklahoma City Federal Courthouse and Post Office and exhausts for use in the building's heating and hot water systems.

Trigen – St. Louis
System Output: 100 kW
Design Pressure: 185 psig to 5 psig
Steam Flow: 8,000 lbs/hr
Type: Induction
This system is designed a St. Louis district heating and exhausts to the deaerators, increasing overall system efficiency.

Trigen – Tulsa
System Output: 479 kW
Design Pressure: 600 psig to 150 psig
Steam Flow: 27,000 lbs/hr
Type: Synchronous
This system is designed for use in Tulsa's district heating system. This system features a multivalve inlet assembly for better efficiency at part loads.

FOOD PROCESSING

Canadian Salt
System Output: 1,000 kW
Design Pressure: 236 psig to 10 psig
Steam Flow: 39,000 lbs/hr
Type: Synchronous
This system was designed the Windsor, Ontario processing facility and is exhausted for process needs. This synchronous paralleling system's controls are designed to provide stand-alone power when the local utility fails.

Caritec/Coopeagropal
System Output: 750 kW
Design Pressure: 290 psig to 5 psig
Steam Flow: 21,500 lbs/hr
Type: Synchronous
This system is designed for a Costa Rican palm oil plant for use in distilling palm oil and for producing electricity. The control system allows the turbine generator to run in parallel with the local utility or as an energy island along with other on-site generators.

CPC International
System Output: 900 kW
Design Pressure: 145 psig to 15 psig
Steam Flow: 50,000 lbs/hr
Type: Synchronous
This system is installed at a corn processing facility in Winston-Salem, North Carolina and utilizes the steam for for process requirements.

Del Monte Foods
System Output: 715 kW
Design Pressure: 275 psig to 60 psig
Steam Flow: 36,490 lbs/hr (Turbine #1)
10,425 lbs/hr (Turbine #2)
Type: Induction
This dual induction backpressure system is designed to optimize electric output based off of varying seasonal process loads. The steam will be utilized in canning and process needs.

Distiladora De Alcoholes & Rones, S.A.
System Output: 1,750 kW
Design Pressure: 600 psig to 20 psig
Steam Flow: 45,000 lbs/hr
Type: Synchronous
This system is designed to supply process steam to an alcohol distillery and provide electricity to a manufacturing plant complex in Guatemala.

Morning Star (I, II, III)
<u>System #1</u>
System Output: 1,000 kW
Design Pressure: 450 psig to 30 psig
Steam Flow: 39,833 lbs/hr
Type: Synchronous
<u>System #2</u>
System Output: 1,000 kW
Design Pressure: 450 psig to 120 psig
Steam Flow: 39,833 lbs/hr
Type: Synchronous

System #3
System Output: 1,000 kW
Design Pressure: 450 psig to 120 psig
Steam Flow: 68,700 lbs/hr
Type: Synchronous
These systems are installed in a California tomato processing facility and provide steam to the canning process. Morning Star is capable of generating 100% of its own electricity with the steam it already uses to process tomatoes. While the plant runs in parallel with the local utility, the system controls allow a bumpless transition to stand-alone power in the event of a utility failure.

Morton Salt
System Output: 420 kW
Design Pressure: 190 psig to 30 psig
Steam Flow: 25,000 lbs/hr
Type: Induction
This system was installed in the Silver Springs, NY facility and provides steam for heating and process loads.

Rio Bravo Tomato
System Output: 2,694 kW
Design Pressure: 450 psig to 20 psig
Steam Flow: 85,000 lbs/hr
Type: Synchronous
This system is designed to provide steam for canning and process needs. The three month annual operation of this system allows for the savings of approximately 50% of annual electric purchase.

FOREST PRODUCTS

AristoKraft (a division of American Brands)
System Output: 825 kW
Design Pressure: 225 psig to 15 psig
Steam Flow: 34,000 lbs/hr
Type: Induction
This system uses steam from a wood waste-fired boiler to produce electricity plus steam for dry kilns and plant heating. It is installed at a furniture manufacturing facility in Tennessee.

Bell-Gates Lumber Co.
System Output: 75 kW
Design Pressure: 125 psig to 10 psig
Steam Flow: 5,000 lbs/hr
Type: Induction
This Vermont-based sawmill utilizes steam from a wood waste-fired boiler to produce electricity plus steam for heating and dry kilns. The system allows automatic venting for maximum power production when excess fuel is available and plant electrical demand is high.

Bertch Cabinet
System Output: 279 kW
Design Pressure: 125 psig to 12 psig
Steam Flow: 15,525 lbs/hr
Type: Induction
This system is installed at a cabinet manufacturing facility in Iowa and produces steam from a wood waste-fired boiler to produce electricity plus steam for heating and cooling a manufacturing building. The system includes an air-cooled condenser for maximizing power production when excess fuel is available and plant electrical demand is high.

Brattleboro Kiln Dry and Milling Co.
System Output: 380 kW
Design Pressure: 225 psig to 15 psig
Steam Flow: 18,100 lbs/hr
Type: Induction
This system is installed in a Vermont kiln drying firm and utilizes steam from a wood waste-fired boiler to produce electricity plus steam for dry kilns and plant heating.

Bruce Hardwoods
System Output: 525 kW
Design Pressure: 250 psig to 80 psig
Steam Flow: 40,000 lbs/hr
Type: Synchronous
This system is installed at a Tennessee flooring manufacturer and utilizes steam from a wood waste-fired boiler to produce electricity plus steam for dry kilns and plant heating.

Buehler Lumber
System Output: 462 kW
Design Pressure: 250 psig to 10 psig
Steam Flow: 20,700 lbs/hr
Type: Induction
This system is installed at a Pennsylvania lumber firm and utilizes steam from a wood waste-fired boiler to produce electricity plus steam for dry kilns and plant heating.

Cox Waste to Energy
System Output: 1,000 kW
Design Pressure: 235 psig to 30 psig
Steam Flow: 45,000 lbs/hr
Type: Synchronous
This system is installed at a Kentucky manufacturer of hardwood lumber and hardwood interior products and utilizes steam to produce electricity while providing steam for dry kilns and plant heating.

Fitzpatrick & Weller
System Output: 450 kW
Design Pressure: 125 psig to 12 psig
Steam Flow: 21,450 lbs/hr
Type: Synchronous
This system is installed at a furniture manufacturer in upstate New York and utilizes steam to produce electricity while providing steam for dry kilns and plant heating.

Kendrick Forest Products
System Output: 50 kW
Design Pressure: 160 psig to 12 psig
Steam Flow: 3,800 lbs/hr
Type: Induction

This sytem is designed to reduce steam for kiln drying. The steam will be sent to a condenser when the demand from the kilns is decreased.

Marcel Lauzon
System Output: 335 kW
Design Pressure: 225 psig to 15 psig
Steam Flow: 17,000 lbs/hr
Type: Synchronous
This system is installed at a sawmill in Quebec, Canada. This system uses steam from a wood waste-fired boiler to provide electricity to a new boiler plant plus steam to kilns. This synchronous system can operate both in parallel and in power-island modes and includes an air-cooled condenser for maximizing power production when excess fuel is available and plant electrical demand is high.

Middleton Building Supply
System Output: 578 kW
Design Pressure: 400 psig to 15 psig
Steam Flow: 21,711 lbs/hr
Type: Synchronous
The steam from this installation is utilized for heating and kiln drying. The steam is generated in a biomass boiler utilizing wood waste from the saw mill operation and the steam will be sent to a condenser when the demand from the kilns is decreased.

Pompanoosuc Mills
System Output: 30 kW
Design Pressure: 130 psig to 10 psig
Steam Flow: 3,900 lbs/hr
Type: Induction
This system is designed for a Vermont furniture manufacturer for use in kilns and heating. Steam is generated by a wood-fired boiler operated according to waste availability. Any steam not used for process loads is exhausted to an air-cooled condenser.

Temple Inland
System Output: 978 kW
Design Pressure: 380 psig to 150 psig
Steam Flow: 93,160 lbs/hr
Type: Synchronous
This system is designed for kiln drying at this Pineland, Texas plant.

Webster Industries
System Output: 550 kW
Design Pressure: 275 psig to 5 psig (Turbine #1)
275 psig to 120 psig (Turbine #2)
Steam Flow: 27,600 lbs/hr
Type: Induction
dual back-pressure system in Bangor, Wisconsin, uses steam from a wood waste-fired boiler. The double-shafted generator is coupled to two turbines, one of which feeds dry kilns and the other passes excess steam to an air-cooled condenser.

WoodCraft, Inc.
System Output: 231 kW
Design Pressure: 125 psig to 7 psig
Steam Flow: 12,000 lbs/hr
Type: Induction
This system is installed at a furniture manufacturer in North Carolina and utilizes steam in the kilns. This system required the installation of power factor correction capacitors provided by Turbosteam.

Young Manufacturing Co.
System Output: 300 kW
Design Pressure: 225 psig to 7 psig
Steam Flow: 13,000 lbs/hr
Type: Synchronous
This system is installed in a Kentucky millwork facility and is a combination back-pressure and condensing unit and gets steam from a wood waste-fired boiler. The system also supplies process steam to dry kilns and includes an air-cooled condenser.

HOSPITALS

Auckland Healthcare
System Output: 440 kW
Design Pressure: 450 psig to 50 psig
Steam Flow: 22,000 lbs/hr
Type: Synchronous
This system is installed at a hospital complex in Auckland, New Zealand and reduces a steam flow for heating, laundry and absorption chiller loads. The electricity generated will supply 10% of the hospital's demand and will be available during power outages to supplement existing diesel emergency generators.

Commonwealth of Massachusetts Development Center
System Output: 157 kW
Design Pressure: 190 psig to 40 psig
Steam Flow: 15,000 lbs/hr
Type: Induction
This system was installed in a mental health complex in Monson, Massachusetts. This system runs in parallel with a pressure-reducing valve reducing steam for space heating.

Maryfield Hospital
System Output: 50 kW
Design Pressure: 125 psig to 15 psig
Steam Flow: 3,914 lbs/hr
Type: Induction
This system is installed at a Portsmouth, VA medical complex. The system reduces steam from 125 psig distribution pressure for the facility's steam heating loads.

Mendota Mental Health Institute Turbosteam designed and installed a control system for a 600 kW backpressure steam turbine-generator at this Madison, Wisconsin facility. The system was designed to ride through a utility power interruption and parallel with an emergency diesel generator to supply power for emergency loads for the hospital.

Providence VAMC
System Output: 52 kW
Design Pressure: 110 psig to 30 psig
Steam Flow: 6,696 lbs/hr
Type: Induction
This system is installed at a Rhode Island medical complex and provides steam for the facility's steam heating loads.

Queen Elizabeth Hospital
System Output: 250 kW
Design Pressure: 275 psig to 10 psig
Steam Flow: 17,000 lbs/hr
Type: Induction
This system is installed at a Charlottetown, Prince Edward Island, Canada hospital and reduces steam for heating loads. This hospital is on the Trigen - PEI district heating loop.

Roswell Park Cancer Institute
System Output: 1,418 kW
Design Pressure: 350 psig to 15 psig
Steam Flow: 50,000 lbs/hr
Type: Synchronous
This system is installed at a New York hospital and the steam is being utilized for heating and cooling needs.

Franciscan Sisters of Perpetual Adoration
System #1
System Output: 150 kW
Design Pressure: 125 psig to 30 psig
Steam Flow: 8,000 lbs/hr
Type: Synchronous
System #2
System Output: 100 kW
Design Pressure: 125 psig to 30 psig
Steam Flow: 5,000 lbs/hr
Type: Induction
A synchronous system and an induction system are installed at this LaCrosse, Wisconsin hospital. These systems are coupled with a pressure reducing station that reduces steam pressure and is designed to run in parallel with the utility, or in parallel with an existing diesel stand-by generator in the event of a power outage. In the wake of the August 2002 blackout in the Northeastern US, the United States Combined Heat and Power Association recognized the inherent reliability benefits of this technology, by naming this system their "National CHP Project of the Month" in September 2002.

INCINERATION

Cape Breton
System Output: 2,500 kW
Design Pressure: 250 psig to 13 psig
Steam Flow: 33,000 lbs/hr
Type: Induction
This Canadian municipal incineration facility uses steam to produce electricity by reducing it. The steam exhausts to a surface condenser and the power is sold to the local utility.

Carrieres-sur-Seine
System Output: 2,900 kW
Design Pressure: 319 psig to 36 psig
Steam Flow: 23,250 lbs/hr
Type: Synchronous
This municipal incineration plant in a Paris suburb uses steam to produce electricity for in-plant use and sale to the utility. In the winter exhaust steam is used for district heating; in summer it is condensed. The system includes paralleling and stand-alone capability.

Eco/Pittsfield
System Output: 800 kW
Design Pressure: 250 psig to 0.5 psig
Steam Flow: 21,069 lbs/hr
Type: Synchronous
This trash incineration plant sends most of their steam to an adjacent plant and condenses the remaining steam to sustain 90% of their electrical plant load.

Halla – Changwon City
System Output: 700 kW
Design Pressure: 227 psig to 4 psig
Steam Flow: 24,000 lbs/hr
Type: Synchronous
This Korean municipal incineration facility exhausts to a district heating circuit in winter and to an air-cooled condenser in summer.

Halla – Pusan City
System Output: 1,100 kW
Design Pressure: 284 psig to 4 psig
Steam Flow: 38,300 lbs/hr
Type: Synchronous
This Korean municipal incineration facility exhausts to a district heating circuit in winter and to an air-cooled condenser in summer.

Polk County Solid Waste Facility
System Output: 389 kW
Design Pressure: 150 psig to 15 psig
Steam Flow: 20,000 lbs/hr
Type: Synchronous
This system installed in a Minnesota solid waste facility is designed to reduce steam for use in facility heating.

MANUFACTURING

Coors - Valley Metal
System Output: 381 kW
Design Pressure: 405 psig to 54 psig
Steam Flow: 18,000 lbs/hr
Type: Induction
This system is installed at a Colorado can manufacturer and reduces steam for processing loads. The plant is owned and operated by Trigen-Colorado.

Ethan Allen
System Output: 620 kW
Design Pressure: 150 psig to 15 psig
Steam Flow: 31,500 lbs/hr
Type: Synchronous
This project was successfully implemented with tremendous aid from the local utility and government agencies from both Vermont and New Hampshire. The installation of this system and the electrical savings that resulted allowed Ethan Allen to continue to operate its Beecher Falls facility and save hundreds of jobs. This system is currently enrolled in the ISO New England Forward Capacity market and receives renewable energy credits from the State of New Hampshire. The steam is used for their heating and process needs.

General Motors - Lansing, MI
System Output: 1,800 kW
Design Pressure: 250 psig to 15 psig
Steam Flow: 68,000 lbs/hr
Type: Synchronous
This system is installed at the General Motors Cadillac manufacturing plant. The system reduces steam to supply the plant's steam process, heating, absorption chiller loads.

U.S. Mint
System Output: 231 kW
Design Pressure: 150 psig to 5 psig
Steam Flow: 11,500 lbs/hr
Type: Induction
This system is installed at the Trigen-Philadelphia steam loop for use in heating this downtown manufacturing building.

Westfield Tanning
System Output: 633 kW
Design Pressure: 175 psig to 10 psig
Steam Flow: 28,000 lbs/hr
Type: Synchronous
This system is installed at a Pennsylvania leather manufacturer and uses steam for use in processing. The system is equipped with controls allowing stand-alone operation when the local utility fails.

MILITARY

U.S. Navy/FMC
System Output: 1,119 kW
Design Pressure: 125 psig to 15 psig
Steam Flow: 60,000 lbs/hr
Type: Induction
This dual back-pressure system is installed at a U.S. Navy strategic manufacturing facility in Minneapolis. The innovative design includes two single stage back-pressure turbines connected to a double-shafted induction generator, allowing efficient balancing of steam loads through seasonal load swings. Integrated controls allow independent or combined operation of the turbines.

Wright Patterson Air Force Base
System #1
System Output: 830 kW
Design Pressure: 400 psig to 125 psig
Steam Flow: 70,000 lbs/hr
Type: Induction
System #2
System Output: 1,245 kW
Design Pressure: 395 psig to 125 psig
Steam Flow: 100,000 lbs/hr
Type: Induction
Two back-pressure induction systems were installed at this Air Force base and provides steam for heating and cooling needs.

PAPER

Crane Paper
A controls retrofit for an existing back-pressure turbine generator set, simplified system operations and improved efficiency at this Western Massachusetts currency and fine paper manufacturer.

Huhtamaki
System Output: 575 kW
Design Pressure: 425 psig to 120 psig
Steam Flow: 41,335 lbs/hr
Type: Synchronous
This system is installed at a Maine molded fiber facility and it is used for process needs.

Kimberly Clark Turbosteam designed and installed a control system for a 1.8 MW condensing steam turbine-generator at this California paper towel and toilet paper manufacturer. The turbine generator was coupled to a gas turbine in a combined cycle configuration, and Turbosteam's controls were designed for zero-kVAR output, so as to minimize the power factor impacts of the entire system, and to prevent any potential for power export on to the electric grid.

Merrimac Paper Co.
System Output: 330 kW
Design Pressure: 190 psig to 45 psig
Steam Flow: 25,000 lbs/hr
Type: Synchronous
This system is installed at a Massachusetts specialty paper manufacturer. Synchronous switchgear and generator allow emergency power generation when the local utility is down.

Rock Tenn I
System Output: 1,135 kW
Design Pressure: 600 psig to 105 psig
Steam Flow: 60,000 lbs/hr
Type: Synchronous
This system is installed in a Vermont paper mill and reduces steam for process needs. Synchronous switchgear and generator allow emergency power generation when the local utility is down.

Rock Tenn II

System Output: 626 kW
Design Pressure: 700 psig to 250 psig
Steam Flow: 50,000 lbs/hr
Type: Synchronous
This system is installed in a Pennsylvania paper mill and reduces steam for process needs. Synchronous switchgear and generator allow emergency power generation when the local utility is down.

Seaman Paper
System Output: 283 kW
Design Pressure: 400 psig to 165 psig
Steam Flow: 24,984 lbs/hr
Type: Synchronous
This system is installed at a specialty paper manufacturer in Massachusetts**.** Steam will be fed to the turbine via a biomass boiler and will be used for process and heating needs.

Wausau-Mosinee Papermill
System Output: 2,821 kW
Design Pressure: 400 psig to 125 psig
Steam Flow: 140,000 lbs/hr
Type: Synchronous
This system is installed to supply steam to this paper-processing mill in Jay, Maine.

PETROLEUM

Amoco Oil Co.
System Output: 350 kW
Design Pressure: 700 psig to 50 psig
Steam Flow: 15,800 lbs/hr
Type: Induction
This system is installed at an installation in Riverton, Wyoming and provides steam for process loads.

Corpoven A multiple gas expander-generator systems installed on Venezuelan gas pipeline network. Sixteen 15-kW generation systems reduce gas pipeline pressure and provide power to remote pipeline stations**.**

PRISONS

Suffolk County Jail
System Output: 50 kW
Design Pressure: 120 psig to 25 psig
Steam Flow: 5,000 lbs/hr
Type: Induction
This system is installed in a Massachusetts jail and provides steam for heating and cooling needs.

MISCELLANEOUS

Shinsho
System Output: 50 kW
Design Pressure: 150 psig to 15 psig
Steam Flow: 4,000 lbs/hr
Type: Induction
This system is installed at a Japanese manufacturer and has been coupled to a small boiler for use as a demonstration project.

Solel
System Output: 50 kW
Design Pressure: 150 psig to 12 psig
Steam Flow: 3,500 lbs/hr
Type: Induction
This system is installed in Jerusalem, Israel and is coupled to a solar steam generation facility.