

GE Energy

# Solutions

for the food and  
beverage industry



GE imagination at work

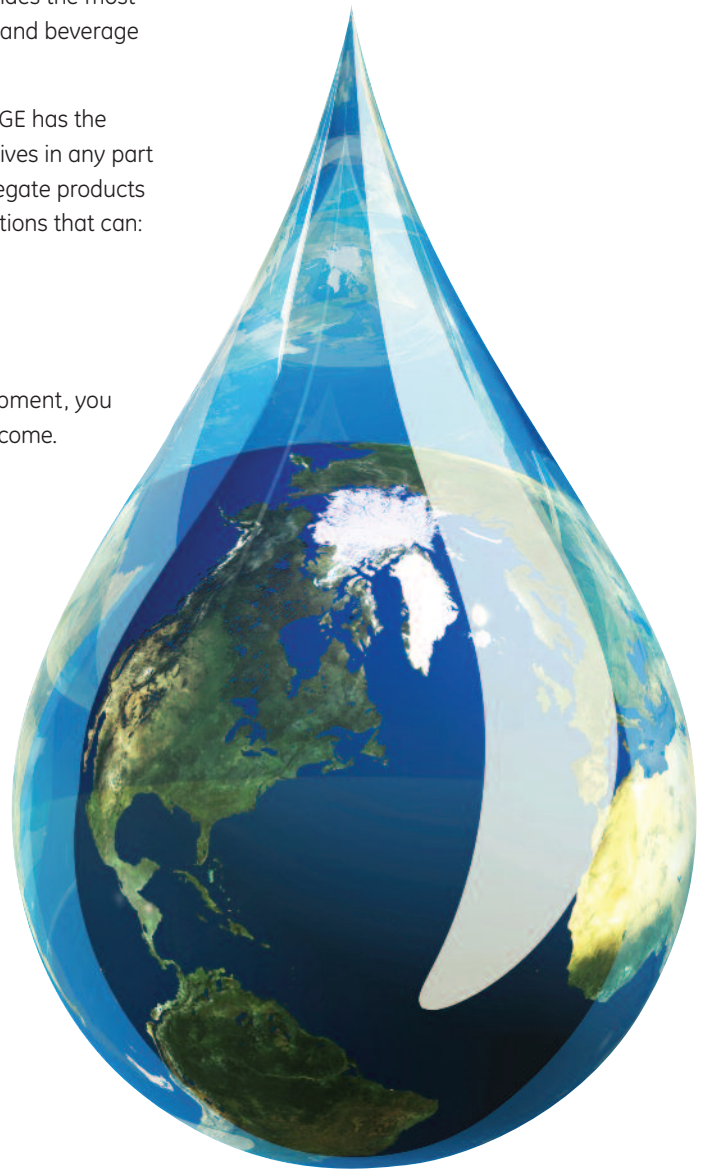
# Infrastructure solutions for your energy and water needs

As one of the largest infrastructure companies in the world, GE provides the most comprehensive portfolio of energy and water solutions for the food and beverage industry.

From clean energy to pure water to wastewater reuse to financing, GE has the technology, resources and expertise to support your strategic initiatives in any part of the world. We have the breadth and depth of knowledge to aggregate products and services from multiple GE businesses to provide integrated solutions that can:

- Increase productivity
- Reduce production costs and
- Reduce environmental Impact

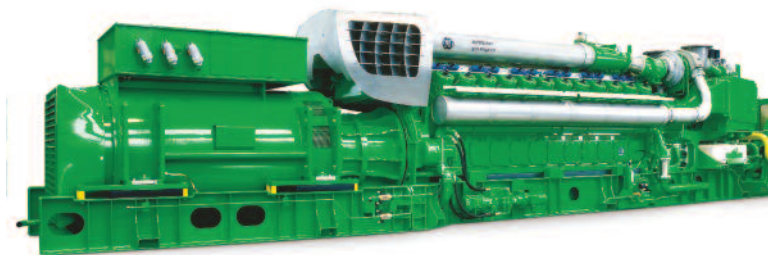
And with our long-term investments in research and product development, you can count on us to be your infrastructure partner for generations to come.



# Products and Services

GE provides a comprehensive portfolio of products and services for the food and beverage industry. For more information on each of the capabilities listed below, visit [www.ge.com/foodandbeverage](http://www.ge.com/foodandbeverage)

- Boiler Maintenance
- Boiler Water Treatment
- Compressors
- Drives
- Electrochemical Separations
- Environmental Technologies
- Gas Turbines
- Industrial Security
- Lighting
- Maintenance & Repairs
- Membrane Bioreactor
- Microfiltration
- Motor Control Centers
- Motors
- Plant Automation
- Power Distribution
- Reciprocating Engines
- Reverse Osmosis
- Sensing Technologies
- Solar Energy
- Steam Turbines
- Switchgear
- Transformers
- Ultrafiltration
- Water Chemicals
- Water Reuse
- Wind Turbines
- Zero Discharge

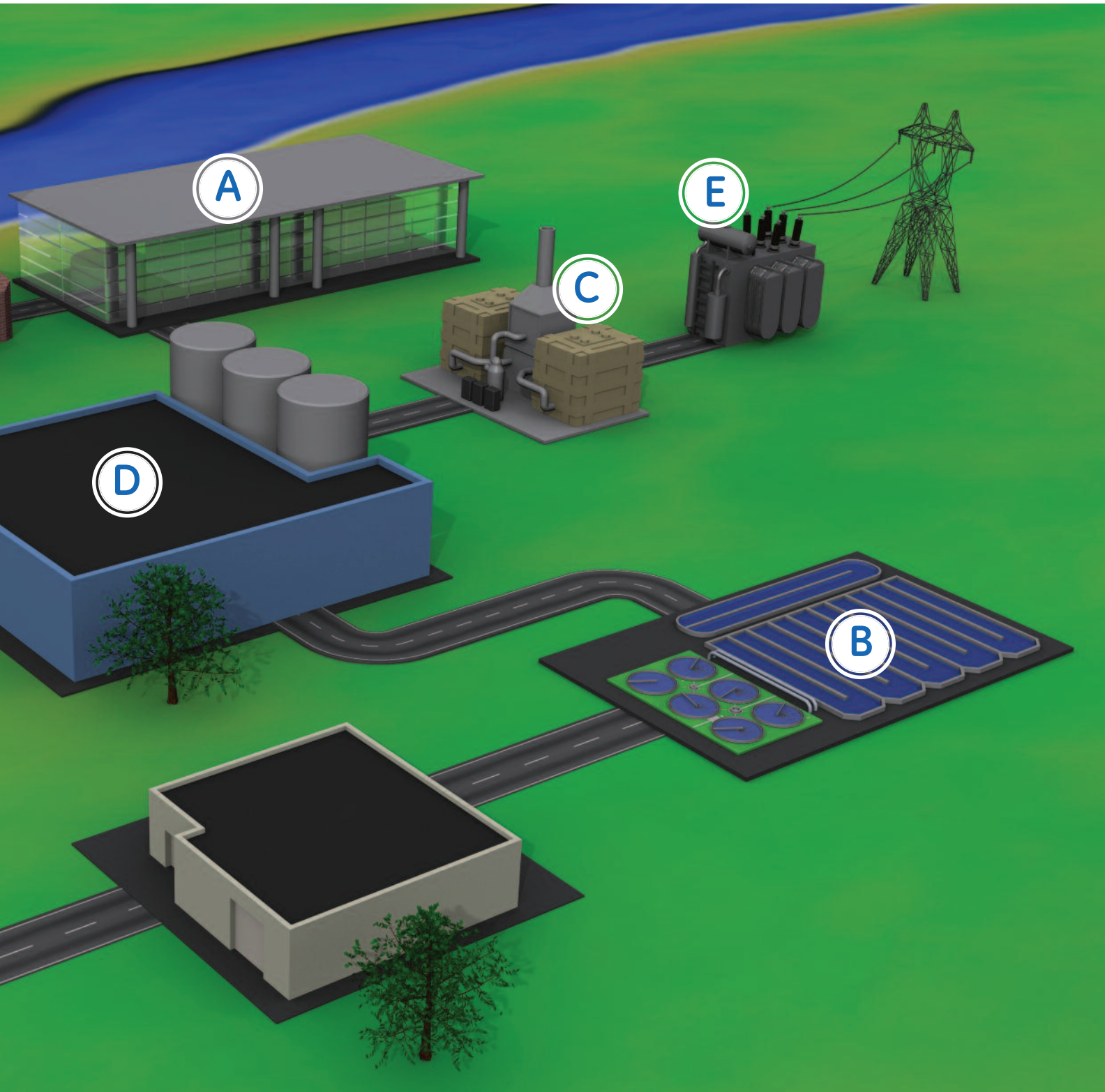


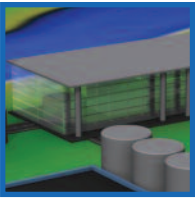
# Infrastructure Solutions

## Applications

- A** Water Treatment
- B** Wastewater Treatment
- C** Power Generation
- D** Energy Efficiency
- E** Power Distribution
- F** Boiler Management







# Water Treatment

GE has the ability to purify water to suit your specific needs, whether for processing, cleaning, or as feed water for your boiler. Whether the source of water is a river, a well, a municipality or a combination of these, GE has an array of technologies to clean the water to your precise specifications.

## Electrochemical Separations

The ability to remove minerals and salts provides a solution to convert previously unusable waters to high purity resources for drinking water or high purity industrial uses.

## Microfiltration

Microfiltration is a pressure-driven barrier to suspended solids and bacteria to produce water with very high purity. It is also used as pretreatment for surface water, seawater, and biologically treated municipal effluent before reverse osmosis and other membrane systems.

## Reverse Osmosis

Reverse osmosis systems from GE deliver high performance at the lowest life-cycle costs. Our pre-engineered systems are built with high-quality components designed specifically for water purification. They arrive at your facility ready to run with all filters, membranes, pumps, piping, controls and automation.

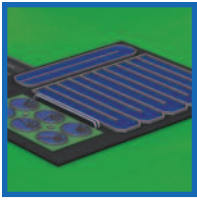
## Ultrafiltration

GE ultrafiltration systems consistently deliver water to meet your specifications, with the added benefits of effective pathogen removal, lowest life-cycle cost through optimized energy and chemical use, and compact design that results in a small system footprint.

## Water Chemicals

Drawing on 30 years of experience in the industry, GE works closely with you to provide solutions to your most pressing process needs.





# Wastewater Treatment

GE offers a suite of chemicals and technologies to treat the dirtiest of water. Water thus cleaned can be reused or safely discharged, reducing your environmental impact. Also, for complex wastewater issues, GE has the expertise to integrate a variety of technologies into a comprehensive solution.

## Membrane Bioreactor

With membrane bioreactor installations totaling over 450 MGD of treatment capacity, GE's reinforced hollow fiber membranes allow you to invest in peace of mind as well as technology.

## Water Chemicals

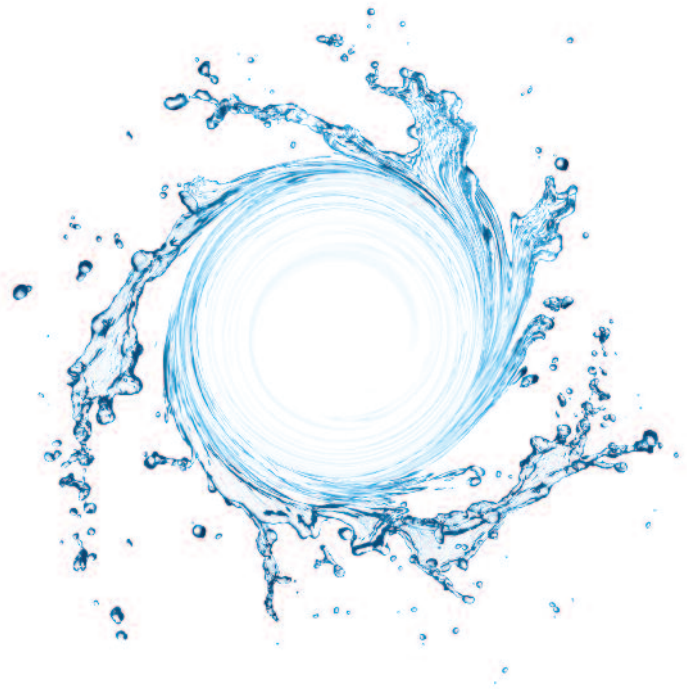
Our treatment programs use specialty chemicals to remove pollutants and minimize sludge handling and disposal costs—improving effluent quality and promoting water savings and recycling.

## Water Reuse

Every day, GE is helping create a reliable, sustainable supply of water worldwide. By implementing GE's advanced technologies that turn wastewater into a resource, industry customers can increase their profits, while meeting regulatory requirements and protecting the environment.

## Zero Discharge

Zero liquid discharge (ZLD) systems eliminate the liquid waste stream from your plant and recycle high purity water for reuse. In many cases, plant water consumption can be reduced from 10–90% with the addition of a ZLD system.





# Power Generation

On-site generation or self-generation is another great way to lower your energy costs. Generating clean power on-site lowers your carbon footprint, reduces energy costs and offsets thermal energy (cogeneration). GE offers a broad portfolio of power generation technologies to meet your specific requirements.

## Reciprocating Engines

GE's Jenbacher gas engine division is one of the world's leading manufacturers of gas-fueled reciprocating engines, packaged generator sets and cogeneration units for power generation, marrying stringent emission standards with high levels of efficiency, durability, and reliability.

## Wind turbines

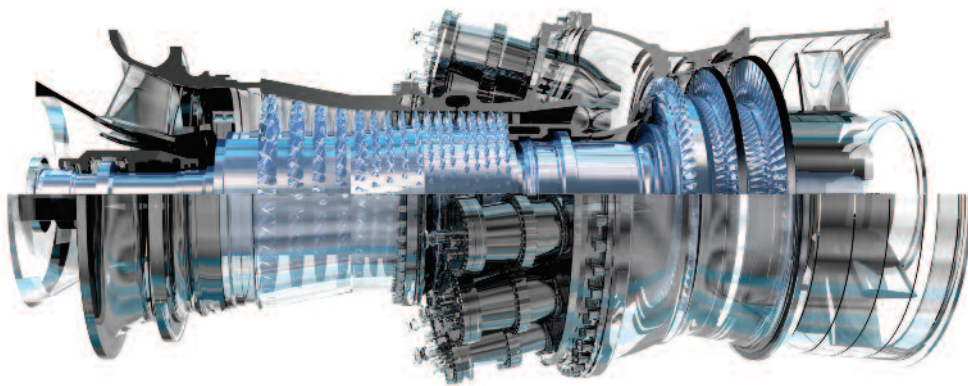
GE is one of the world's leading wind turbine suppliers. With over 10,000 worldwide wind turbine installations comprising more than 15,000 MW of capacity, our knowledge and expertise spans more than two decades.

## Gas Turbines

With power output from 13 to 100 MW and the ability to operate with a variety of fuels and emission control technologies, GE's gas turbines have been selected for a multitude of applications, from power generation to mechanical drive and beyond.

## Steam Turbines

GE offers a complete line of small steam turbines for mechanical and generator drive requirements in industrial plants and oil and gas applications. GE's small steam turbines are based on modular product structures, assuring reliable design and outstanding performance.





# Energy Efficiency

Understanding how your energy costs vary with product mix, production volumes and schedules is critical to improving efficiency. GE offers solutions that provide insight into energy uses and costs and technologies to help you identify areas where you can reduce energy consumption. The result: less energy used per unit produced.

## Plant Automation

Whatever your specialty, GE has the automation system for your processing facility.

## Compressors

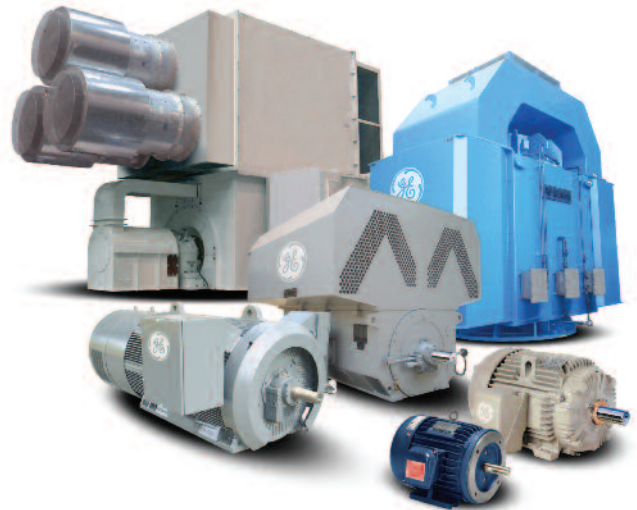
GE's complete collection of compressors range from small, rotary vane compression units to equipment for the highest power, pressure and flow, operating in the most difficult environments and with all types of fluids.

## Lighting

The first name in illumination is still lighting the way. From halogens to hybrids, GE Lighting has the experience and options for your lighting needs.

## Motors

GE is a world-class manufacturer of electric motors and generators with more than 125 years of experience. We offer a full range of products, from fractional to 100,000 horsepower units, and can design to any global standard and certification due to extensive motor engineering and manufacturing experience.





# Power Distribution

A properly configured electrical distribution system and its regular maintenance are vital to ensuring safety of plant personnel, reliability of process equipment, and lower operating costs.

## Drives

GE offers a wide range of drives, from our AF-6 Series AC Drives to low and medium voltage drives, DC drives and Coordinated Drive Systems & Controls.

## Motor Control Centers

GE's motor control centers serve many applications. Our low voltage and medium voltage motor control centers are suitable for applications such as pulp and paper, mining and metals, utility, chemical, oil and gas, mass-production manufacturing, water and wastewater.

## Switchgear

With an assortment of low and medium voltage, paralleling and previous generation switchgear, GE has the technology to tackle your projects.

## Transformers

GE's supply of transformers can solve a host of needs, including those for bushing potential devices, control power, distribution, dry type systems, instruments, power and secondary substations.



# Boiler Management

GE offers products and services to maximize the life of the boiler and improve thermal efficiency while complying with the most stringent regulations.

## Boiler Maintenance

GE's first goal with boilers is to optimize the combustion process through reliable instrumentation, boiler balancing and combustion diagnostics. We also offer a growing portfolio of products that effectively measure, monitor and reduce air emissions, and our software solutions are designed to improve plant profitability.

## Boiler Water Treatment

GE brings you an unmatched track record in all aspects of boiler feed water treatment. From routine service contracts to comprehensive water-by-the-gallon agreements, GE's program gives you the flexibility to choose as much or as little service as you need.

## Environmental Technologies

Drawing on a comprehensive portfolio of technology offerings and more than 100 years of power generation experience, GE is dedicated to helping you reach environmental goals while simultaneously improving performance through a unique pollution prevention approach.

# Case Study

## Cheese processor reduces water and waste treatment costs, which saves \$269,292

### Challenge

This Iowa cheese and cheese food processor was experiencing poor performance from its wastewater treatment plant. Excessive biological oxidation demand (BOD) when the treated effluent entered a small creek was resulting in violations of state discharge permit limits.

### Solution

GE identified several key problem areas. A competitive supplier's scale inhibitor was reducing the biological population on biosolids, inhibiting BOD reduction. The polymers used were not appropriate, and the application process reduced their effectiveness even more.

Effluent flow also exceeded the plant's design capacity. To overcome these difficulties, a new flow pattern was recommended that added an activated sludge basin and increased dissolved aeration levels. Entec 911 and 618 polymers were also introduced, improving floc formation in the clarifiers. In addition, a program was implemented to reduce bacteria counts in the clean-in-place cow water used to wash down the insides of incoming milk delivery trucks. Instead of using well water for cleaning purposes, the plant was able to reuse approximately 191,000 gallons (723 m<sup>3</sup>) per day of cow water, reducing the load on the wastewater plant.

### Result

The improved effluent could now meet permit limits most of the time, while the recovery of reusable cow water reduced the cost of wastewater treatment from US\$114 to US\$38 per 1,000 gallons (3.8/m<sup>3</sup>). Chemical usage costs also decreased, bringing the net annual savings to US\$269,292. In addition, the company gained time in which to build a new wastewater plant with increased capacity.



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GE imagination at work

For more information, please visit [www.ge.com/foodandbeverages](http://www.ge.com/foodandbeverages) or contact your GE representative.

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