

Green Technologies for Greener Agriculture

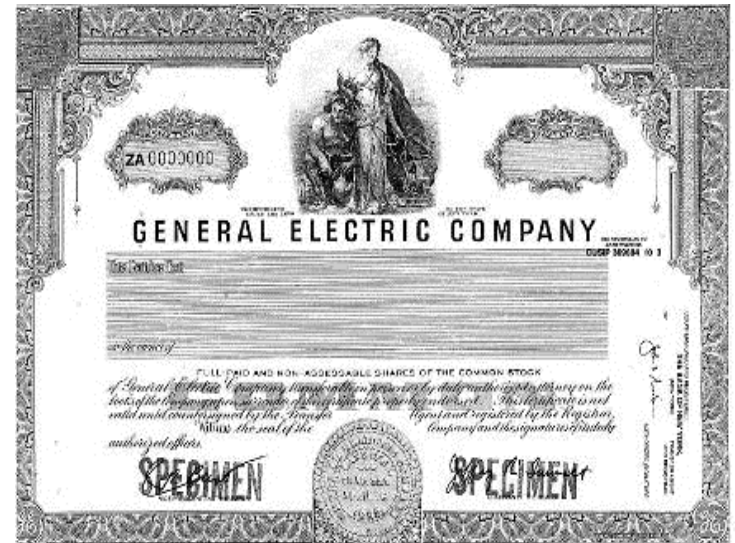
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Budapest
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GE has an outstanding heritage

- Founded by Thomas Edison in 1878
- ~290,000 employees worldwide
- \$147 B annual revenue in 2011
- \$ 5.9 B yearly investment in R&D
- \$ 1 B yearly investment in T&E



One share of GE stock purchased in 1892 for \$ 100 would today, with dividend reinvestment, be worth more than \$ 5,000,000.

GE business portfolio

GE Energy

Power & Water



Oil & Gas



Energy Management



GE Healthcare



GE Aviation



GE Transportation



GE Capital



GE Home &
Business
Solutions



6 businesses operating in more than 100 countries ... 130+ years

ecomagination

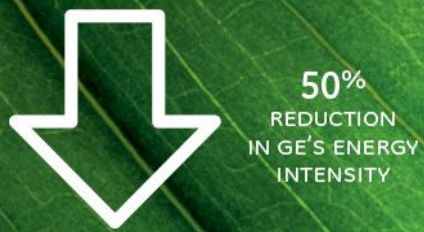
1. Continue to increase revenues from ecomagination products



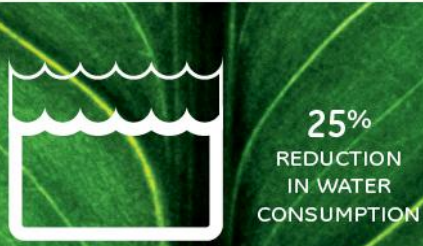
2. Double investment in R&D



3. Reduce greenhouse gas emissions and improve energy efficiency of GE



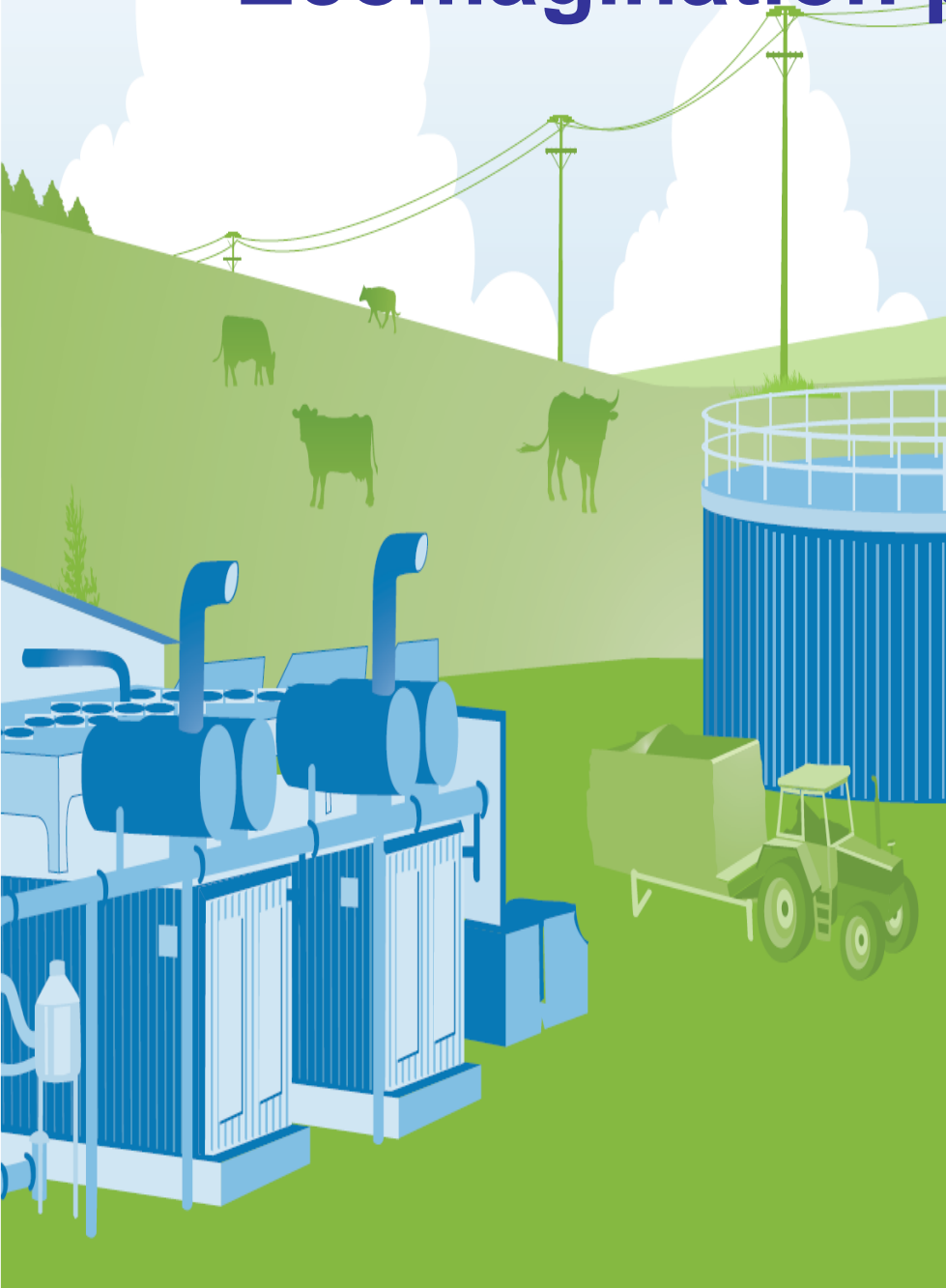
4. Reduce water use and improve water reuse



5. Keep the public informed

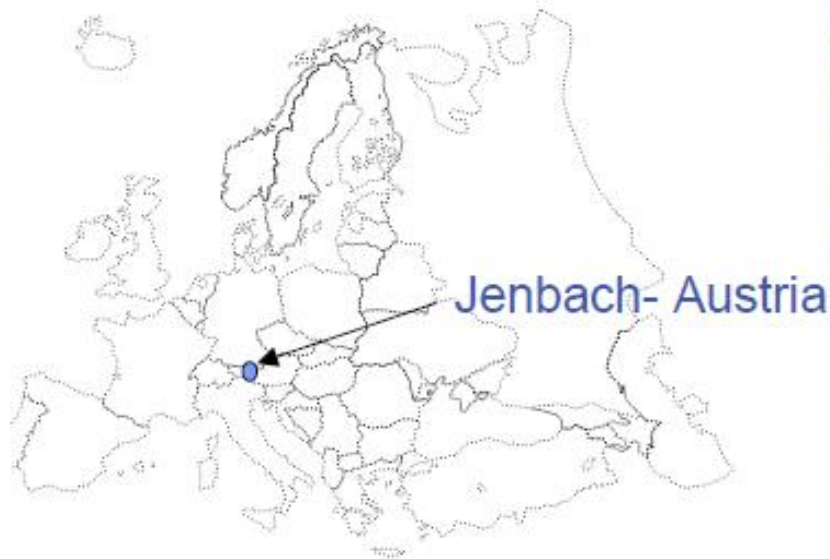


Ecomagination products for **greener** Agriculture



- **Jenbacher biogas engines**
- **Advanced membrane technology**

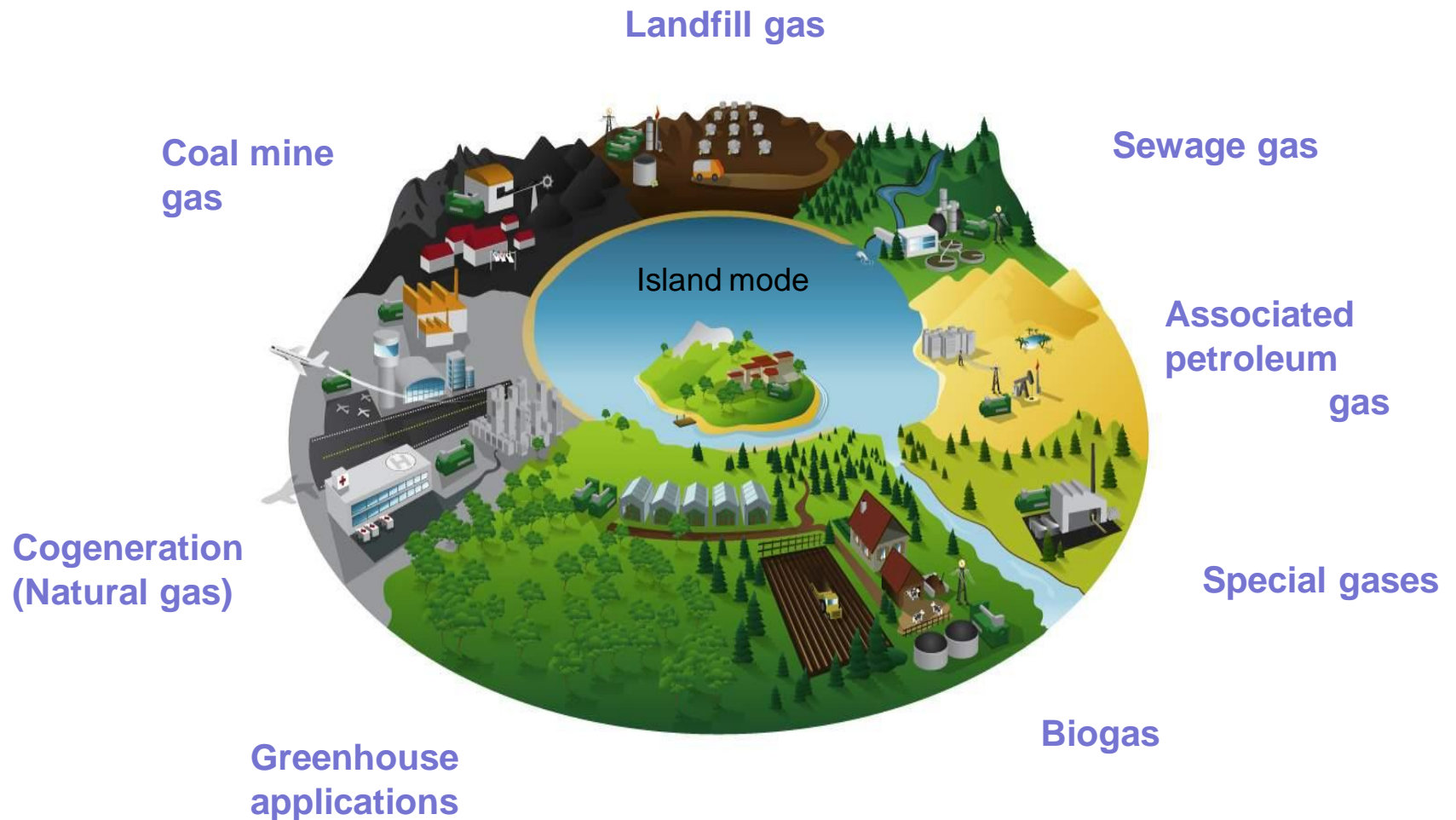
Jenbacher gas engines



- GE Energy's Jenbacher product team has its headquarters in Jenbach, Austria
- Worldwide network of sales and service offices
- Nearly 5 decades of experience in the development and production of gas engines for efficient power supply
- Worldwide installed base: 4 GW

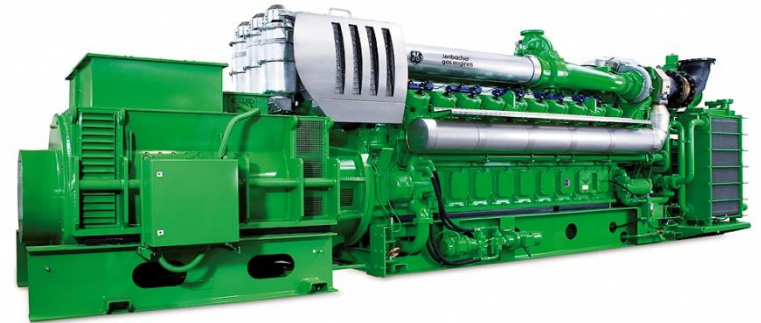


Fuel flexibility and tailor-made solutions



Jenbacher biogas engines - details

- Use the biogas from agricultural waste, foodstuff or feed industries
- This fuel can substitute fossil fuels
- Global installed base - 1,300 GE Jenbacher gas engines
- Capacity to generate more than 6.8 million MWh of electricity / year



Equiv. to the annual electricity demands

- over 617,000 US households
- over 1.6 million European households



Benefits of using biogas

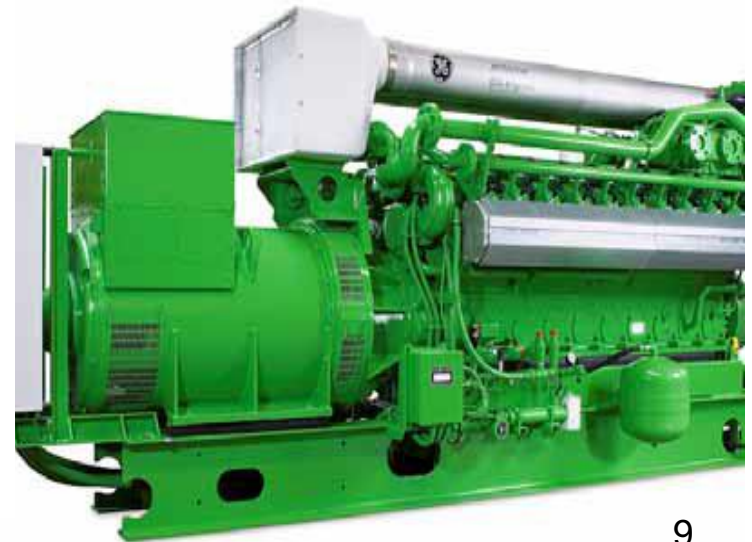
For farmers, the agricultural & food industry:

- improvement of manure properties: odor reduction, elimination of acid components, viscosity decrease, mineralization of organic nitrogen, reduction of pathogenic germs and weed seeds
- additional incomings from heat and power production
- waste water treatment without costly sewer connection

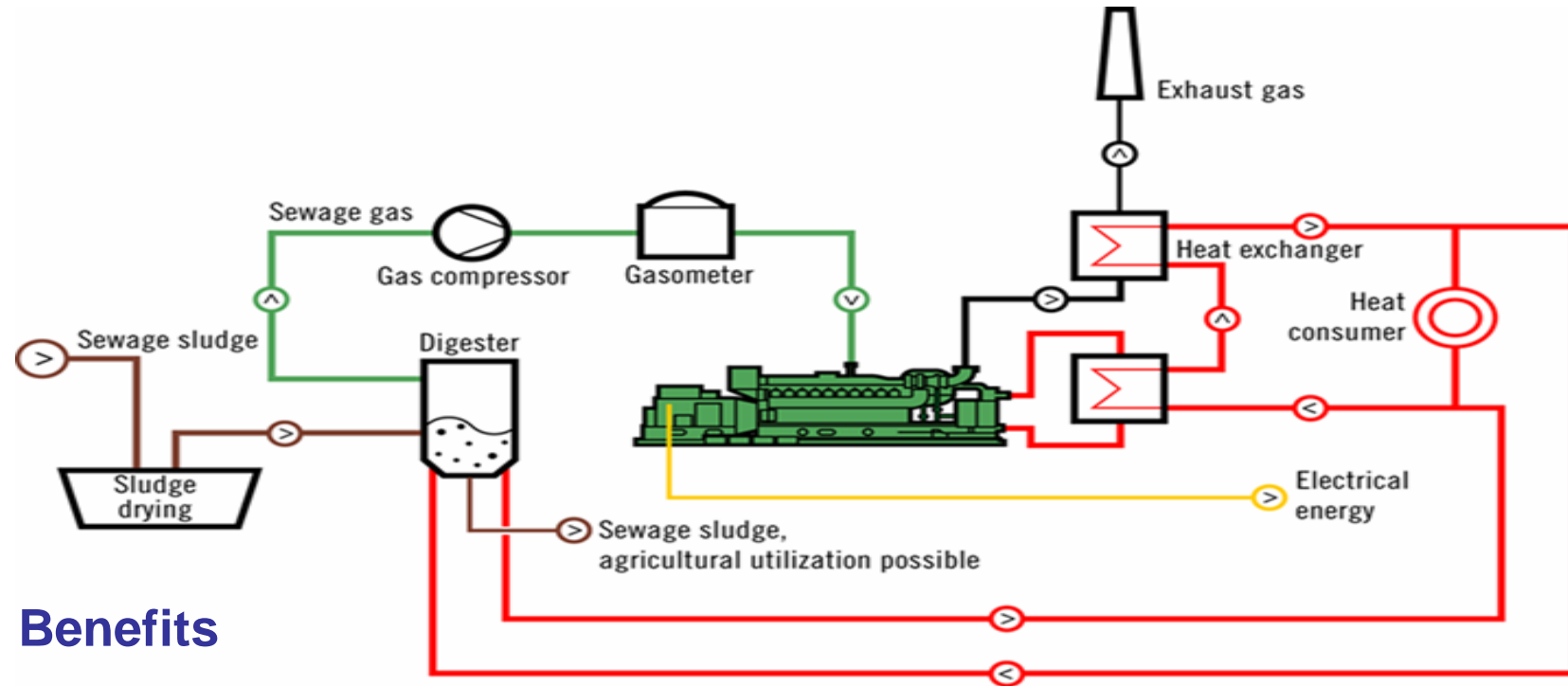


For the environment:

- reduction of methane and ammonia emissions from manure
- reduction of nitrate wash-out into groundwater
- recycling of fertilizer compounds from organic wastes
- reduction of carbon dioxide emissions by substitution of fossil resources



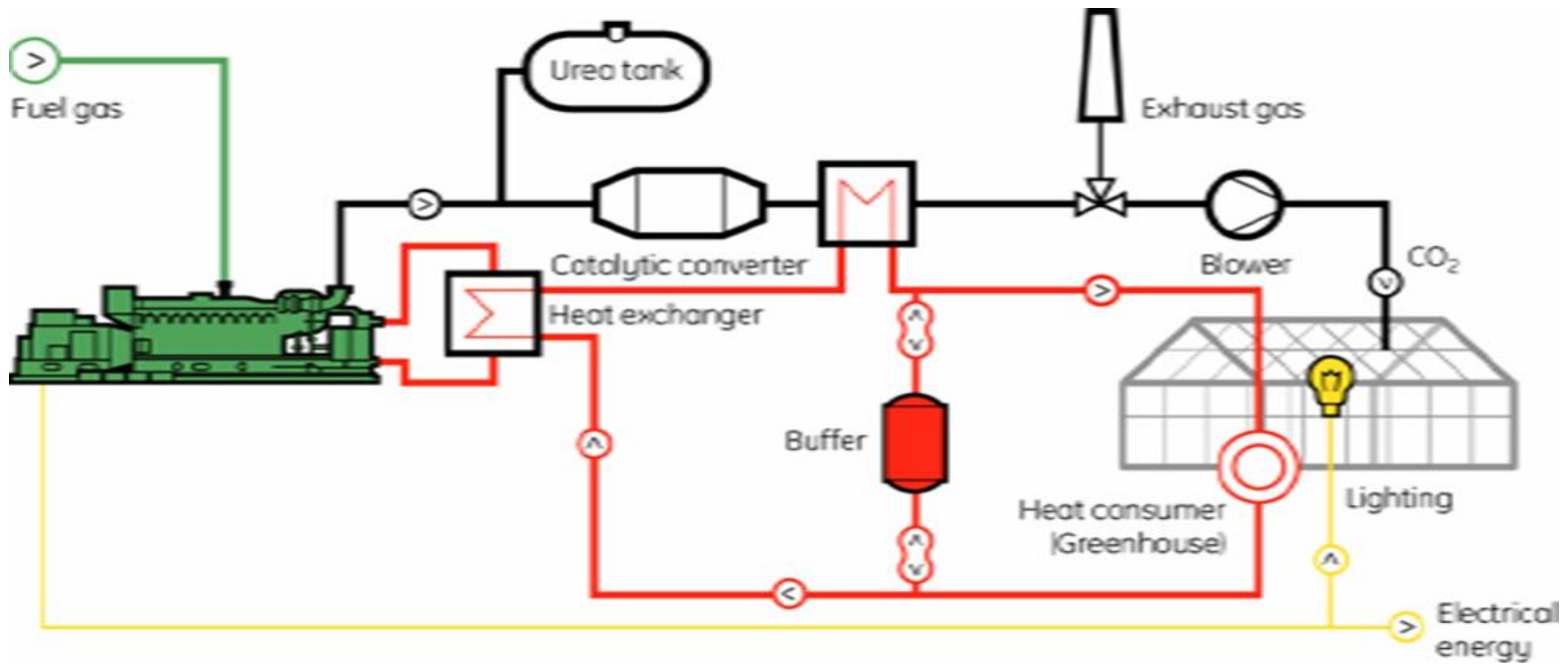
Project schema for agricultural waste



Benefits

- Reduction of emissions naturally resulted from dejections
- Reduction of energy costs
- Production of agricultural fertilizers
- Reduction of greenhouse-effect gasses
- Generation of green certificates
- Negotiation and sale of greenhouse-effect gas emission rights

Project schema for greenhouses



Heat, power and CO₂ supply to greenhouses

- CO₂ is separated from the exhaust gas and put into the greenhouse
- Heat is used to maintain a proper temperature inside
- Power supply for lighting system to accelerate development

Implemented projects



Cogeneration

- **Petrom platforms, Black Sea (crude oil drilling)**
 - 2 x JMS 620 having $P_e = 2204$ kW and $P_t = 1995$ kW

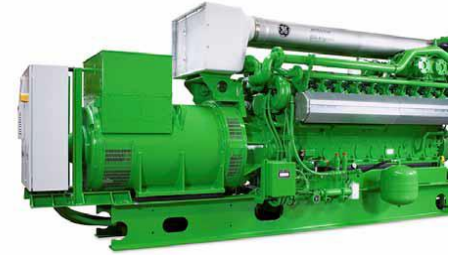
- **Caroli, Pitesti (food industry, financed by TEB in BOOT system)**
 - 1 x JMC 312 having $P_e = 601$ kW and $P_t = 734$ kW

- **Polytechnic University, Bucharest (Cogeneration)**
 - 2 x JMS 316 having $P_e = 801$ kW and $P_t = 967$ kW

- **Angst (food industry, financed by TEB in BOOT system)**
 - 1 x JMS 208 having $P_e = 313$ kW and $P_t = 191$ kW (heat as hot water and steam)

- **Petrocart, Piatra Neamt (paper industry)**
 - 1 x JMS 612 having $P_e = 1822$ kW (electricity used to power the plant's internal customers) and $P_t = 1774$ kW (heat as hot water and steam is used in technological processes and space heating)

Implemented projects



- **Glina - Water treatment plant (Bucharest municipality)**
 - **2 x JMS 616** having **$P_e = 1942$ kW and $P_t = 2196$ kW**; electricity and heat produced by the two engines that will run on biogas will be used for domestic consumption of the wastewater treatment plant)

- **Ecogen Energy, Buzau (district heating)**
 - **2 x JMS 620** having **$P_e = 3045$ kW and $P_t = 3042$ kW**; Electricity produced by the two engines is delivered in SEN and heat and hot water is delivered to the city's population)

- **Vest Energo I & II, Bucharest (district heating)**
 - **2 x JMS 620** having **$P_e = 3045$ kW and $P_t = 3042$ kW**; electricity produced by the two engines is delivered in SEN and heat and hot water is delivered to R.A.D.E.T)
 - **2 x JMS 624** having **$P_e = 4034$ kW and $P_t = 3682$ kW**; electricity produced by the two engines is delivered in SEN and heat and hot water is delivered to R.A.D.E.T)

- **Global Arm, Oradea (biogas)**
 - **2 x JMS 420** having **$P_e=1415$ kWe and $P_t=1405$ kWt** Electricity produced by the two engines is delivered in National Energy System and hot water it's used for biogas power plant

Advanced solutions for water treatment

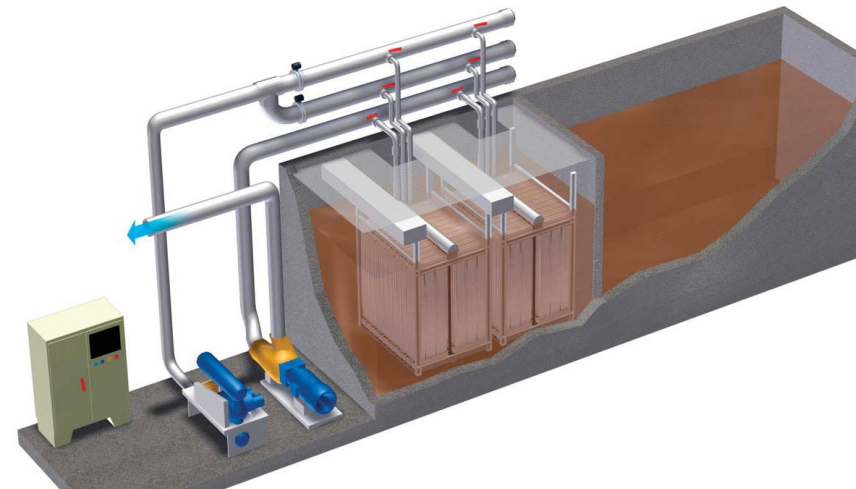
MBR - Efficient, cost-effective wastewater treatment

ZeeWeed membrane bioreactor systems combine:

- proven ultrafiltration technology
- with biological treatment for municipal, commercial and industrial wastewater treatment
- and water reuse applications

Membrane bioreactor systems:

- replace conventional treatment
- combine clarification, aeration and filtration into a simple and cost-effective process that reduces capital and operating costs



ZeeWeed Tertiary Filtration for Water Reuse

UF systems..

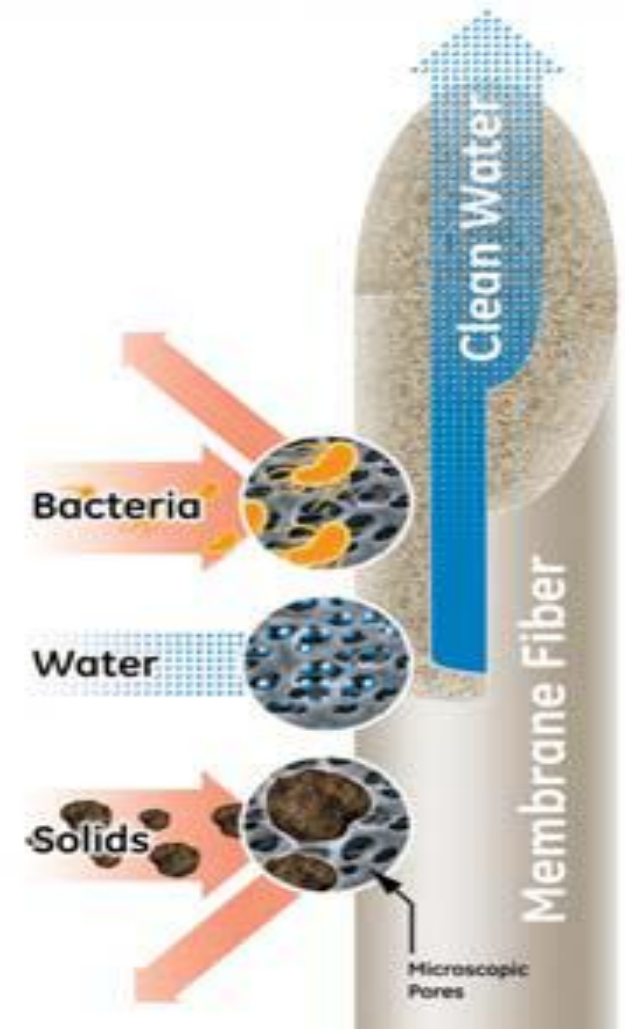
are designed to operate downstream of a conventional activated sludge process, where no further biological treatment is necessary

But..

Where high quality water is required...

ZeeWeed MBR Features & Benefits

- Multiple effective cleaning techniques
- Automated in-site cleaning
- Compact design minimizes land acquisition & costs



ZeeWeed MBR produce effluent for discharge or reuse that far exceeds the world's most stringent regulations



THE WORK GOES ON

... and the American public has profited—for example, by a saving of \$5,000,000 each night in its lighting bills.

Each year new recruits are added to the army of scientists, engineers, and master craftsmen whose work created the modern x-ray tube and contributed so largely to building the vast radio industry. Because of their work, Glyptal, Carboloy, copper brazing, atomic-hydrogen welding, and many other new materials and new methods have helped industry to furnish you with new products—with improved products at a lower cost.

Here, 50 years ago, Edison established the factory which has grown into the Schenectady Works of the General Electric Company. Here Steinmetz conducted his investigations. And here, for more than 35 years, G-E research scientists have been exploring the secrets of nature. Their discoveries have stimulated the growth of new industries, have created new employment, have provided new comforts and conveniences for you. And still the work goes on. The G-E scientists of today are maintaining the traditions of G-E research.

G-E research has saved the public from ten to one hundred dollars
for every dollar it has earned for General Electric

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GENERAL  **ELECTRIC**