

# Solutions for the World's Toughest Challenges

**ecomagination**

2010 Annual Report



imagination at work



# OVERVIEW

Ecomagination is a competitive force for growth across GE's businesses. With more than \$85 billion in sales and services through 2010, ecomagination is a business strategy that represents an area of continued strength for the company. GE is committed to continuing that success.

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*In this section*

Strategic Overview, Letter to Stakeholders, Advisory Board, Our Progress, Commitments and Product Portfolio

# Our Mission

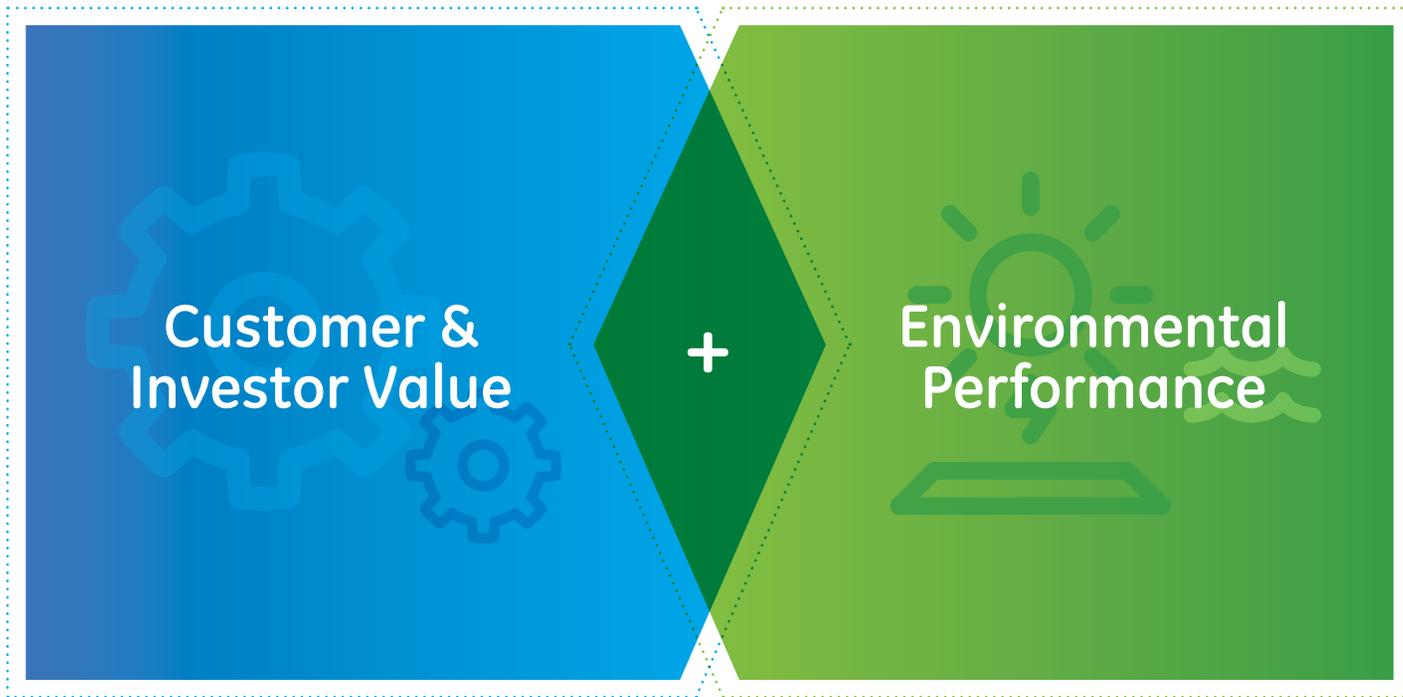
In 2005, GE launched ecomagination to address critical challenges, including the need for **cleaner and more-efficient sources of energy**, **reduced emissions** and **abundant sources of clean water**. Since then, we've been using our unique energy, technology, manufacturing and infrastructure capabilities to develop solutions.

More than  
**\$85 billion**  
generated  
from ecomagination  
products and services  
through 2010



## Our Products

To qualify for the ecomagination portfolio, offerings must significantly and measurably improve customers' **operating performance or value proposition** and **environmental performance**. These offerings also provide value to our investors:



**22** new ecomagination products and solutions introduced in 2010

= ecomagination product

The **ecomagination Product Review (EPR)** process ensures that:

- offerings meet necessary criteria
- associated marketing claims are clear, compelling and substantiated

GreenOrder, an LRN advisory group focused on sustainability strategy, verifies the offerings' claims.

## Our Strategy

To bring exceptional value to our investors and other stakeholders, our strategy includes: partnering with local organizations around the globe to meet local needs; creating full-service solutions; and going beyond our four walls to find and fund the best ideas.



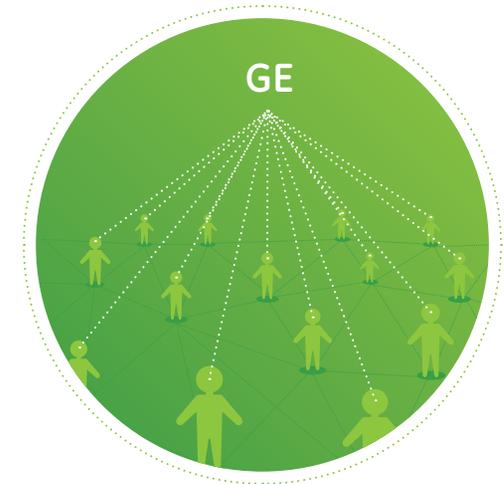
### THINK MULTI-LOCAL

We expect ecomagination sales to grow two times faster than the rest of the company, and for GE's efforts to be **more external and more global**. Customers in emerging countries are demanding affordable, efficient and environmentally responsible products. To identify and understand local needs, we must partner with local organizations and institutions.



### THINK FULL-SERVICE

To increase sales, GE is creating **full-service solutions** through a network of partners. We are in a **unique position to create product ecosystems**, such as finding partners to supply power infrastructure, batteries and financing to support electric vehicle development and use.



### THINK BEYOND OUR FOUR WALLS

GE is reaching beyond our four walls to **find the best ideas, and is funding them** through GE Capital and our venture capital partners. In 2010, we started the ecomagination challenge through a Web-based platform to crowdsource ideas for a smarter electric grid. In 10 weeks, we received nearly **4,000 ideas** and created a community of **74,000 people** across **150 countries**.

To our investors, customers and other stakeholders:

A new global industrial revolution is transforming how we create, connect to and use power and water.



**Mark L. Vachon**  
Vice President,  
ecomagination

**Jeffrey R. Immelt**  
Chairman of the Board  
& Chief Executive Officer, GE

**At GE, we are well positioned to take on the world's most important problems.**

Through the company's business strategy, ecomagination, we are answering the important question—how will we grow the economy and GE, and manage finite resources while improving life for an expanding global population?

Ecomagination is GE's business strategy to create new value for customers, investors and society by solving energy, efficiency and water challenges—today. It is the belief and commitment that we have been presented

with a false choice—great economics or great environmental performance...the real answer is that through innovation we can design and deliver both. And as a result, GE will grow faster and win. And it's working.

We believe we can lead in this era. We have deep and practical technical knowledge honed by more than a century of experience; expertise across the entire energy and water value chain; capital to invest; and strong channels to market.

In 2010, we both looked back over the five years of ecomagination and looked ahead.

Since our launch, ecomagination has met or exceeded every goal we set:

- ➔ \$5 billion of clean-tech research and development
- ➔ \$85 billion in revenue from ecomagination products and solutions
- ➔ 22 percent reduction in greenhouse gas emissions
- ➔ 30 percent reduction in water use
- ➔ \$130 million in energy efficiency savings

**"Ecomagination is GE's business strategy to create new value for customers, investors and society by solving energy, efficiency and water challenges—today."**



View this story online:  
<http://www.ecomagination.com/progress/overview/letter/>

In 2010, we paused, and although we had every opportunity to set modest goals given the global recession, we accelerated our ambitions for the next five years:

- ➔ Double clean-tech research and development to \$10 billion
- ➔ Grow ecomagination revenue at twice the rate of overall GE revenues
- ➔ Reduce energy intensity by 50 percent and greenhouse gas (GHG) emissions by 25 percent
- ➔ Reduce water use by 25 percent

But we also committed to a greater role for partnerships in this global transformation with the view that partnerships are an accelerator.

In 2010 specifically, we:

- ➔ Continued to lead in clean-tech innovation by committing nearly \$2 billion to research and development and by launching the ecomagination Challenge, a record-breaking \$200 million partnership with top venture capital firms to drive and fund open innovation for clean tech
- ➔ Helped drive adoption of electric vehicles (EVs) by purchasing 25,000 EVs, the largest single commitment ever; launching the user-friendly WattStation charging solution; and building total EV systems for customers, from the battery to the grid

- ➔ Kept our ecomagination portfolio focused on only GE's most innovative technologies, such as: the first FAA-approved Required Navigation Performance (RNP) solution, which helps reduce fuel costs and emissions for flights, and Nucleus, a smart meter technology that helps homeowners manage energy use
- ➔ Launched 22 new ecomagination products and solutions, bringing the total portfolio to 110
- ➔ Reduced GHG emissions by 24 percent compared to 2004, ahead of our goal, and water use by 22 percent compared to 2006

In 2011, we'll drive innovations that increase profitability, create new markets and deliver greater competitiveness to GE, customers, investors and consumers.

We will deploy the most efficient and flexible gas turbines on the market, allowing power plant operators to deliver cleaner energy to homes and businesses. We'll make solar energy more affordable and accessible with the most efficient thin film solar panel of its kind, to be produced at the largest solar panel plant in the United States.

Our 300,000 employees are proud to build this reliable and affordable energy future with the strongest pipeline of total clean energy solutions since the launch of ecomagination. Through our efforts to drive open innovation, we are propelling this vision

with more partners in more countries than ever before—turning global challenges into business opportunities that contribute to a more prosperous world. This is ecomagination. Join us.

Sincerely,

**Jeffrey R. Immelt**  
 Chairman of the Board  
 & Chief Executive Officer, GE

**Mark Vachon**  
 Vice President,  
 ecomagination

June 20, 2011

# Advisory Board

## ECOMAGINATION ADVISORY BOARD

**James Cameron**  
Vice Chairman,  
Climate Change Capital

**Eileen Claussen**  
President,  
Pew Center on Global Climate Change

**Richard Edelman**  
President & CEO,  
Edelman

**Jonathan Lash**  
President,  
World Resources Institute

**Mindy Lubber**  
President,  
Ceres

**Thomas Kuhn**  
President,  
Edison Electric Institute

**Ernest Moniz**  
Professor of Physics,  
MIT

**Orville Schell**  
Arthur Ross Director of Asia Society's  
Center on U.S.-China Relations

### Engaging Stakeholders for a Better World

**Richard Edelman**  
President & CEO,  
Edelman

Over the last decade, companies have experienced a seismic shift in how and where they engage. The marketplace has shifted from a shareholder to a stakeholder model, with new societal expectations of business. The media now operates in a four-leaf clover of Mainstream, New, Social and Owned. Finally, we are in the center of a global economic transformation, where the defining challenge of our time will be to do more with less.

As an Advisory Board member, I have seen how GE is creating innovative technologies that are efficient, reliable and cost-effective. One way GE is accomplishing this is by engaging innovators through an open model of collaboration.

Through the ecomagination Challenge, GE asked for new ideas to solve our global energy problems. GE engaged various stakeholders, from GE's investment partners like Foundation Capital to thought leaders like *Wired's* Chris Anderson to a group of students in India, ultimately generating nearly 4,000 ideas from 150 nations, 80,000 comments and hundreds of media hits.

By embracing the complexity of collaborative ideation, companies like GE are working with ecosystems of innovators to introduce more clean technologies that are helping to create a better, more prosperous world.

### Innovating Energy Despite Political Uncertainty

**Eileen Claussen**  
President,  
Pew Center on Global Climate Change

Energy is essential to human progress. Societies depend on it to maintain and improve quality of life, keep industries competitive and create jobs. But despite energy's importance, we are not moving fast enough to make sure we can meet our future energy needs in ways that are affordable, sustainable and secure.

The status quo is not the answer. We need to move past the policy disputes of today and take bold action to build a clean energy economy for tomorrow.

Fortunately, a handful of leading companies such as GE have committed themselves to doing their part to achieve this goal. But these businesses need more certainty from government. They need to know that their investments are aligned with public policies that influence and shape domestic and world energy markets over time.

I am proud to see GE taking action on these issues despite today's uncertainty and the mixed signals business is receiving from governments around the world. GE knows that transforming how we generate and consume energy is essential to protecting both the environment and our economic competitiveness. It's time for others to follow GE's lead so we can see dramatic growth in new clean energy technologies in the years to come.

### Electrifying Adaptation

**Thomas Kuhn**  
President,  
Edison Electric Institute

Electric transportation has progressed further in the last decade than it has in the last century. Innovation in design, advanced battery technologies and greater consumer interest and education are all making clean technologies an increasingly desirable choice for consumers.

Working closely with manufacturers, technical partners and communities, electric utility companies nationwide are adapting electric vehicles for their own fleets and supporting the development and deployment of infrastructure to put more electric vehicles on the road.

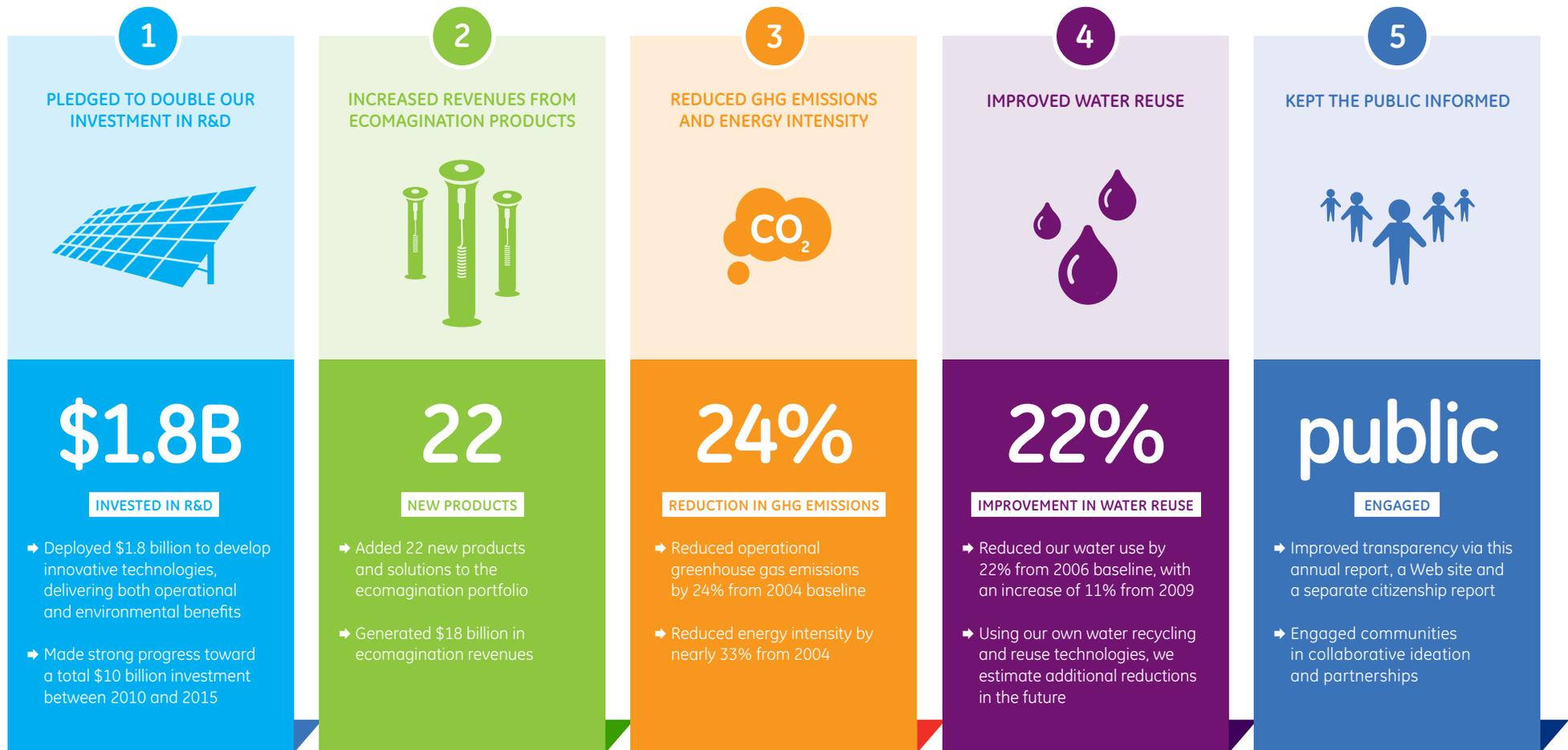
At Edison Electric Institute, we are helping to educate constituents about the need to invest in new generation, transmission and distribution infrastructure enhancements, and we are optimistic about what the future holds.

Like GE, we see electric vehicles as having the potential to redefine transportation, reducing CO<sub>2</sub> emissions significantly as well as our dependence on foreign oil. Even better, they are fun to drive; I, like many of GE's fleet operators, proudly drive an electric vehicle.

These are among some of the most exciting times to be in our industry. The transformation of the way the world thinks about energy will not be a quick or an easy task. But it already has begun.

## Our Progress

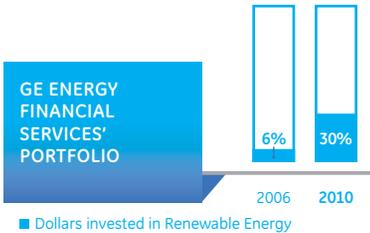
Since the launch of ecomagination in May 2005, GE has **made significant progress** on our commitments. In 2010, we:



# Renewable Energy and Clean Tech Investing

1

Double our investment in R&D



In 2010, GE Energy Financial Services hit its multiyear target of investing \$6 billion in renewable energy. Nearly 30 percent of the business unit's overall portfolio is now in renewable energy, up from about 6 percent in 2006. Over the past two years, the business unit invested, or committed to invest, more than \$1.5 billion in wind farms, closed transactions in solar and hydroelectric power generation, and made venture capital investments in smart grid and renewable energy companies. The investments span 14 countries across a wide spectrum of capital.

Our venture capital team offered customers the insights of GE Global Research and GE Energy, along with commercial collaboration opportunities for GE businesses. This two-way flow of innovation, through 2010 investments, included:

- ➔ Ciris Energy, whose biological technology greatly accelerates the conversion of coal to methane for cleaner energy
- ➔ SynapSense Corporation, whose technology improves energy efficiency and cuts power and cooling costs in data centers
- ➔ CoolPlanetBioFuels, whose technology converts low-grade biomass into high-grade fuel at dramatically lower costs than current technologies
- ➔ Soladigm, developer of energy-efficient dynamic glass that switches from clear to tinted on demand in buildings, saving energy and reducing cooling and heating costs

In energy project investing, GE Energy Financial Services has supported thousands of "green collar" jobs worldwide, helped



grow the multibillion-dollar U.S. renewable energy manufacturing industry and—according to U.S. Environmental Protection Agency methodology—avoided more than 23 million tons a year in global greenhouse gas emissions. Project investments and milestones in 2010 included:

- ➔ The Toba-Montrose hydroelectric power project, British Columbia's largest independent run-of-river hydro project
- ➔ The Dokie Wind Project, British Columbia's largest wind farm
- ➔ The 22.5-MW Sares and 10-MW Karadag wind farms, GE Energy Financial Services' first wind energy projects in Turkey
- ➔ Idaho's largest wind power project, a 183-MW cluster of wind farms using GE Energy's turbines

Investments such as these demonstrate the powerful combination of GE's capital and energy industry expertise, through which we're helping the renewable energy industry continue to grow and innovate.

## LANDMARK PROJECT

**\$2 billion**

Shepherds Flat wind farm now under construction in Oregon



Completed project expected to supply energy to more than 235,000 U.S. homes

**1.5 million tons**

of CO<sub>2</sub> emissions avoided on the U.S. grid per year

# Product Portfolio

2

Increase revenues from ecomagination products

High-Efficiency CT



Jenbacher Associated Petroleum Gas Engine



QL Ultra-Efficient Transformer



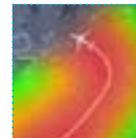
GE Hitachi Nuclear Energy Advanced Recycling Center (ARC)



ArdenACCESS

ARDENACCESS

Required Navigation Performance (RNP) Services



DVS Pumps for Liquid Pipeline Applications



Voluson Compact Ultrasound



Proficy Software Platform



ePTFE Membranes & Preveil Filtration Products



Durathon Battery



JAN '10

DEC '10

- Technology Infrastructure
- Energy
- Capital
- Home and Business Solutions

22

total number of new ecomagination products in 2010



DC Data Centers Inspired by ecomagination



Field Force Automation Software System



PowerHaul Locomotive



WattStation



FuelEx NGL Recovery Skid



L250 6- & 8-Cylinder Engine



Jenbacher J920 Large Gas Engine



Smart Meters



C30-ACi (South African) Locomotive



Fuel & Carbon Solutions



RailEdge Movement Planner

# Lowering Emissions

3

Reduce greenhouse gas emissions and energy intensity

In 2010, GE lowered its GHG emissions to 5.7 million metric tons, a reduction of 24 percent from our adjusted 2004 baseline.\* In addition, our installed base of wind turbines helped avoid GHG emissions of 45.4 million metric tons of CO<sub>2</sub> equivalents in 2010. In other words, the fossil fuel emissions our wind turbines helped to avoid last year represent approximately eight times the amount of the emissions from our business operations.

In 2010, our GHG emissions intensity reduction was 37.4 percent better than in 2004. (Although we exceeded our goal of 30 percent GHG emissions intensity from an earlier year—measured as CO<sub>2</sub>-equivalent emissions/revenue in millions of U.S. dollars—we continue to track this metric.)

In 2010, GE's energy use was 50.8 million MMBtu, an 18 percent reduction from the 2004 baseline year. This reduction is attributable to

our focus on improving our energy efficiency, and to improving economic conditions throughout 2010.

GE's energy intensity (measured as MMBtu/revenue in millions of U.S. dollars) in 2010 improved by 32.8 percent since 2004.

In 2010, GE recognized 35 of its facilities as CO<sub>2</sub>e award winners. These sites had at least a 5 percent reduction in GHG emissions versus the baseline year, independent of changes in production levels. In the aggregate, the sites reduced their emissions by more than 200,000 metric tons of CO<sub>2</sub> equivalents since 2004. In addition, several sites in the U.K. were recognized by the Carbon Trust for their progress on carbon emissions reduction efforts.

\* Each year GE adjusts its 2004 baseline to account for divestments and acquisitions. We measure our progress toward our commitments against this adjusted baseline.

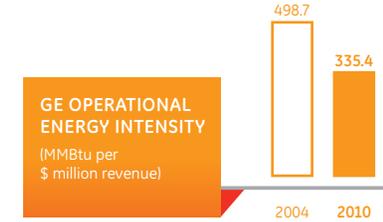
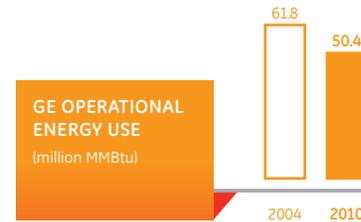
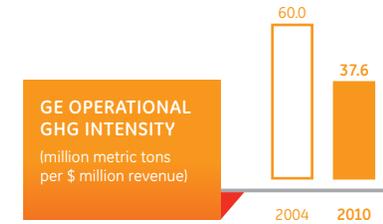
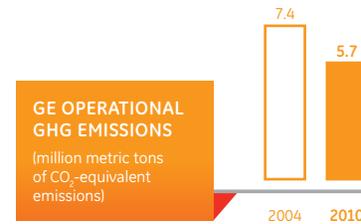
200,000

metric ton reduction  
of CO<sub>2</sub> equivalents since 2004

35

award-winner facilities

In 2010, GE recognized 35 of its sites as CO<sub>2</sub>e award winners, all of which had at least a 5% reduction in GHG emissions.



For more information, available in the online GE 2010 Citizenship Report to be released July 2011, please visit [www.ge.com/citizenship/ghginventory/](http://www.ge.com/citizenship/ghginventory/).

# Saving Water

4

Reduce water use and improve water reuse



Factors contributing to the increase over last year's results:

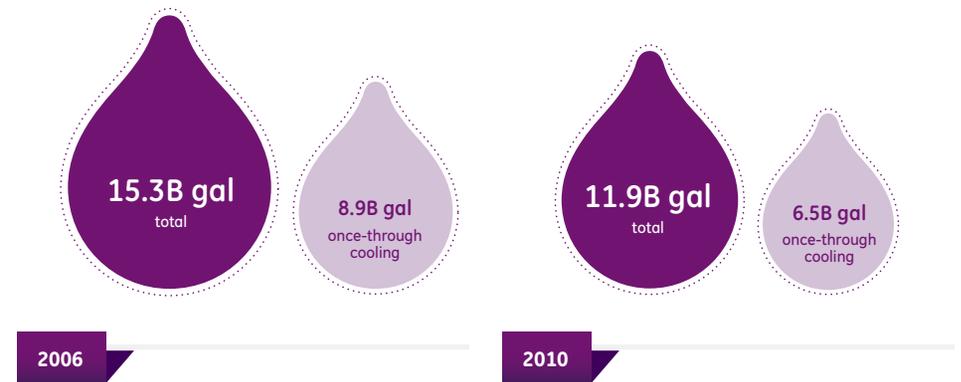
- ➔ Increased attendance at our NBC Universal (NBCU) theme parks in the United States (increase in potable water use)
- ➔ Product-testing campaigns (increase in once-through cooling water use)

Our original goal was to reduce our fresh-water consumption by 20 percent in 2012 from our 2006 baseline. In early 2009, we modified the goal to a 25 percent reduction

by 2015. (GE annually collects water data for those sites consuming more than 15 million gallons a year.)

GE also anticipates an additional 5 percent reduction in our water use by using our own Water & Process technology equipment to recycle and reuse water. We anticipate the new U.S. plant, where this technology will be installed, to be operational by 2015.

In 2010, GE's water use was 11.9 billion gallons, a 22 percent reduction from our 2006 water baseline.



# Ecomagination Challenge

By Tore Land  
Director, ecomagination Challenge

Last July, GE announced its \$200 million ecomagination Challenge: Powering the Grid, an open call for the best ideas to transform how we create, connect and use power. Knowing we could not tackle these challenges alone, GE partnered with four leading venture capital firms—RockPort Capital, Foundation Capital, Kleiner Perkins Caufield & Byers (KPCB) and Emerald Technology Ventures—to find and fund promising technologies. In 10 weeks, the Challenge emerged as one of the largest initiatives of its kind, generating nearly 4,000 ideas and creating a community of 74,000 people across more than 150 countries.

To date, we have:

- ➔ Announced 12 strategic partnerships
- ➔ Presented five \$100,000 Innovation Awards



- ➔ Invested \$85 million with our VC partners to develop and commercialize breakthroughs in energy storage, utility security, energy management software and electric vehicle charging services

For GE, this Challenge was more than a “contest”—it was real business, backed by significant commitments through investments and partnerships in a combined market worth \$20 billion.

The strategic partnerships chosen through the Challenge are well positioned to yield significant returns on investment in the future. For instance, energy storage and intelligent sensor technologies will both play critical roles in building the grid of the future. With investments in Sentient Energy and SustainX, GE will help commercialize advanced technologies that solve our digital energy challenges—today.

Additionally, Challenge partner Consert Inc. recently announced that it had signed

a commercialization agreement with Wake Electric Membership Corporation to provide the company’s Energy Management Solution. Consert’s innovation will help to improve the efficiency, reliability and safety of electricity delivery and use for Wake Electric’s members.

In January, we announced the second phase of the Challenge—Powering Your Home—to find the best home-energy-management technologies. GE and its partners believe this space is ripe with opportunities for growth and innovation; **the energy-efficient home-improvement market is forecast to increase from \$38.3 billion in 2009 to \$50.2 billion by 2014.**

The ideas and technology exist today. Investing in innovation has helped us uncover them, and that’s not just good business for GE, it’s good business for the global energy economy.

## A Process Perspective

### Networking Ideas



Chris Anderson  
Editor-in-Chief, *Wired*,  
and ecomagination  
Challenge Advisor

Every now and then, the right mix of ideas, people and passion comes together—and magic happens. New thinking comes forward, sparking real action.

2010 was a year of action. As an advisor and judge for GE’s ecomagination Challenge, I was able to witness firsthand the new ideas born through collaborative ideation. The Challenge connected a global network of innovators and revealed that, when you bring great thinkers together, you think bigger. When you cross-pollinate good ideas, they become better. And when you put rigor and scale behind those ideas, you unleash thinking that is both transcendent and grounded in real business.

The value derived from problem solving with a “network of ideas” is undeniable. This has shown us a clear path forward, where industry collaborates with academia, venture capital and entrepreneurs around the world, in an open environment.

## Job Creation

Through our continued investment in R&D and manufacturing, GE is helping to make **our company, our people and our economies** more competitive. These investments deliver sustainable growth and spur job creation.

In 2010, we accelerated our efforts to drive innovation, manufacturing and productivity in a number of ways, **and over the past two years, we announced the creation of nearly 7,000 new U.S. manufacturing and related-engineering jobs:**



➔ At a GE manufacturing facility in Bloomington, Indiana, that was once slated for closure, we're investing \$161 million, designating it a refrigeration design and manufacturing Center of Excellence, and creating 200 new jobs. Most of the new products at the Bloomington factory will be smart-grid enabled to save energy and cut costs.



➔ In Bucyrus, Ohio, we have invested more than \$60 million to expand the town's lighting factory, designating it a GE Center of Excellence, and doubling its workforce by adding 130 new jobs.



➔ In Atlanta, Georgia, we have created a new Smart Grid Technology Center of Excellence that will create more than 400 new jobs over the next three years. Our new facility will serve as a smart grid customer experience center, a smart grid live testing laboratory and worldwide headquarters of GE's Digital Energy business.



➔ Across the United States, an estimated 2,650 jobs will be supported by a \$750 million deal with Reliance Power Ltd. in India for turbines, as GE purchases equipment from 240 domestic suppliers—an estimated 14 percent of which are small- and medium-sized enterprises.



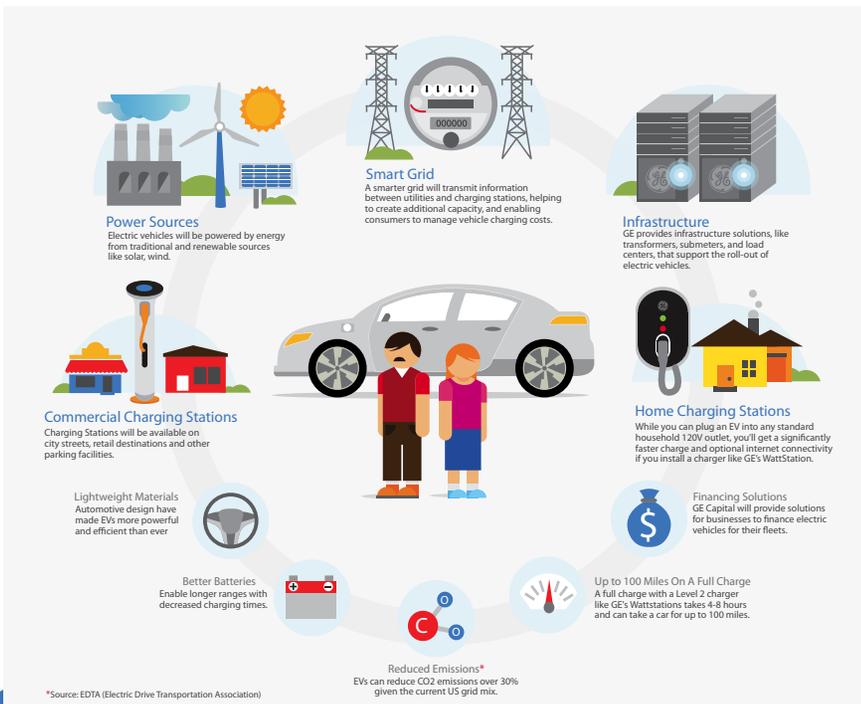
# INNOVATION

Ecomagination is GE's strategy to help tackle the world's biggest energy, environmental and economic challenges.

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*In this section*

Examples of our latest developments in innovation, renewables, clean power generation, water purification, smart homes, electric vehicles, efficiency and digital energy.



## WattStation Driving Progress with Electric Vehicle Charging Stations

Convenient, user-friendly charging stations are designed to accelerate the adoption of plug-in electric vehicles.

With the increasing interest in electric vehicles, consumers need to know they can drive from point A to point B without running out of power. GE is working with utilities and municipalities in the United States and abroad to address the need for a widely distributed network of electric vehicle (EV) charging stations.

In 2010, GE introduced the WattStation electric vehicle charging station, a fast, easy-to-use, award-winning charging solution for the new electric vehicles now hitting the nation's streets and highways. WattStation is designed to help enable an electric vehicle owner to charge an EV faster compared to standard (level 1) plug-in charging. By enabling faster charging, GE's WattStation (level 2) offers EV owners greater convenience and flexibility in managing their daily schedules. For example, an EV with a 24 kWh battery will take between four and eight hours to charge by using GE's WattStation, instead of approximately 12 to 18 hours with standard plug-in charging for a full charge.

Its functional, user-friendly design will allow WattStation to be installed in a wide range of convenient locations—retail stores, offices, parking lots—anywhere a driver might park a vehicle while engaging in shopping, work or recreational activities. WattStation can also help utilities manage the impact of EVs on the local and regional grids.

WattStation is part of GE's commitment to help build a total EV ecosystem, including circuit protection equipment, transformers and charging stations. With more than 100 years of experience in electrical distribution products, GE is uniquely positioned to



improve and upgrade the entire back-end electric system to support charging—from the power plant, to the electric outlet, to the car charger.

GE is also helping to develop cutting-edge technology for EVs themselves. In fact, more than 70 percent of the hybrid electric vehicles on the road today rely on GE innovations. Working with industry partners, we are developing both more-efficient battery technology and smarter battery financing. For example, through a partnership with Better Place, we are pioneering a battery financing program, starting with a pilot project to finance 10,000 car batteries in Israel and Denmark.

With WattStation, complementary grid technologies, better EV batteries and financing solutions, GE is providing a clear road map for the large-scale deployment of electric vehicles.



View this story online:

<http://www.ecomagination.com/progress/innovation/electric-vehicle/wattstation/>



## RNP Services A Flight Path to Fuel Savings

Innovative GE technology enables a more fuel-efficient approach to aircraft navigation and landing.



View this story online:  
<http://www.ecomagination.com/progress/innovation/efficiency/rnp-services/>

Qantas Airways, Australia's largest airline, is committed to operating in an environmentally responsible manner. Because 95 percent of Qantas' carbon emissions are due to fuel consumption during normal flight operations, the airline needed a solution to reduce fuel burn, CO<sub>2</sub> emissions and noise, as well as a reliable way to access weather-challenged airports.

GE Aviation's PBN Services group was enlisted by Qantas to implement Required Navigation Performance (RNP) systems that would deliver significant environmental and economic benefits. RNP technology allows aircraft to fly extremely precise, curved flight paths without relying on ground-based radio-navigation signals. This accuracy helps to reduce track miles, CO<sub>2</sub> emissions and aircraft noise, while conserving fuel and

**QANTAS AIRWAYS**

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**120 RNP/day**  
 approximate number of RNP procedures by Qantas a day

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**22 million+ passengers**  
 carried as of April 2011 on RNP flights

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**50,000+**  
 RNP departures performed as of April 2011

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**80,000+**  
 RNP approaches performed as of April 2011

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**\$20 million+**  
 estimated savings in fuel and other costs per year with RNP deployed

increasing airspace capacity. Because of RNP's precision and reliability, it can help air traffic controllers reduce flight delays and ease air traffic congestion.

Qantas implemented its first RNP procedure in 2004 in Queenstown, New Zealand, an airport that is highly vulnerable to flight delays and diversions due to challenging weather and terrain conditions. The RNP procedures improved Qantas' operations into Queenstown, significantly reducing fuel burn and emissions from flight diversions, and increased safety in navigating the airport's mountainous terrain.

GE has since partnered with Qantas and Airservices Australia, an air navigation service provider, to deploy RNP at 17 Australian airports.

## \$200 million

estimated savings in capital and operating expenses annually with RailEdge Movement Planner



If freight-moving trains were able to increase their velocity by two miles per hour, a railroad with 20,000 miles of track could potentially save approximately \$200 million in capital and operating expenses annually. And when trains move faster and more efficiently, fuel use, emissions and environmental impact are all reduced.

GE's RailEdge Movement Planner software makes it possible for trains to move more freight faster and more efficiently on existing rails, increasing capacity without laying a single new track. Norfolk Southern, the first U.S. railroad to implement Movement Planner, is seeing dramatic improvements in rail corridors where the software is being used.

RailEdge is like an air traffic control system for trains. The software takes into account train schedules, traffic control systems and train movements relative to one another across an entire network. The result is an optimized operating plan for any given day, down to the optimal speed at which a particular train should travel. With Movement Planner, railroads can expect velocity increases of approximately 10 percent. That is typically equal to three or four miles per hour in increased speed.

As with automobiles, a train traveling faster with fewer stops and starts consumes less fuel. Unlike automobiles, however, a train can move a ton of freight an average of 480 miles on a single gallon of fuel.

GE and Norfolk Southern have implemented Movement Planner in six of the company's 11 divisions, and expect to have it running on all 21,000 miles of Norfolk Southern track by the end of 2012.

"[The RailEdge Movement Planner] is a great example of how ecomagination helps our customers improve their operations while reducing their environmental impact."

Lorenzo Simonelli  
GE Transportation President and CEO



## RailEdge Movement Planner Enabling More-Efficient Freight Trains and Reducing Emissions

GE's RailEdge Movement Planner software enables trains to move more freight more efficiently, similar to an air traffic control system, thereby saving costs and reducing emissions.



View this story online:

<http://www.ecomagination.com/progress/innovation/efficiency/railedge-movement-planner/>

In December 2010, GE researchers set a world record of 12.8 percent for thin film solar panel efficiency. This achievement was made possible in a short time by our global team of technologists, working around the clock across three continents.

We were fortunate to start from a great foundation. In 2007, GE Energy invested in a small thin film solar start-up, Primestar Solar, Inc. Primestar's cadmium telluride (CdTe) technology matched up well with GE's diverse research capabilities.

By 2010, our research activities were in full swing. While scientists and engineers in GE's Global Research headquarters in Upstate New York slept, their colleagues in China and India were performing in-depth research to find the right material configuration.

As the Asian workday came to a close, GE scientists and engineers in Munich, Germany, the heart of the solar industry, were just getting started. Using state-of-the-art solar testing facilities, they assessed the overall system performance of our panels to see if what we had was scalable into a best-in-class product.

As the sun reached its peak in Munich, researchers at GE's Global Research headquarters in Upstate New York made their way to work. In the lab, they developed cell sample after cell sample. They tested thousands of different configurations, with each one telling them how to push efficiency and performance ever higher. Throughout the process, the Upstate New York team

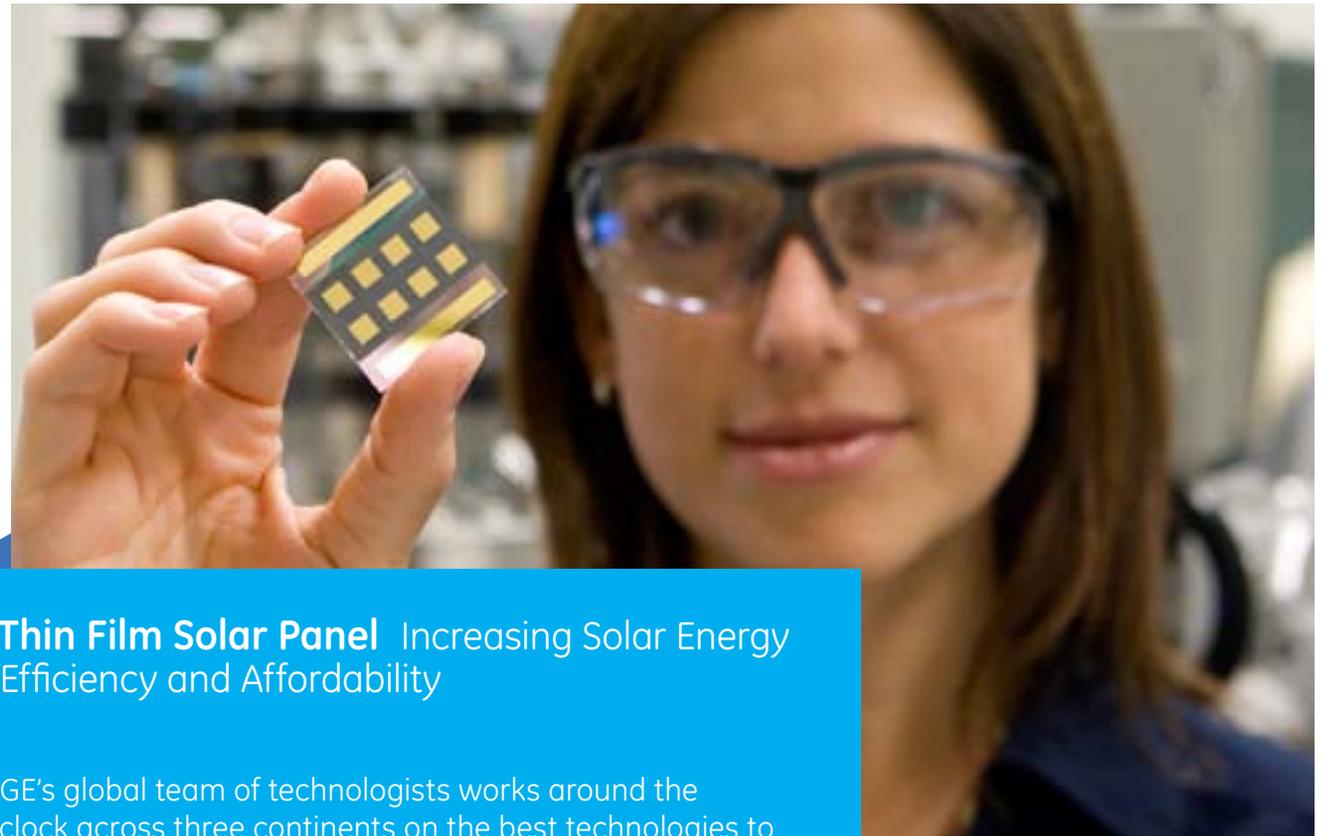
worked seamlessly with Primestar's team as cell designs were replicated in modules on their 30MW pilot manufacturing facility in Colorado.

GE's record-setting solar panel was a fitting close to the chapter of research in 2010, but the work goes on. With ambitious commercialization plans and the solar

industry more competitive than ever, GE researchers already have second, third, even fourth generations of solar panels in their sights. The sun never sets. The research never stops.



**View this story online:**  
<http://www.ecomagination.com/progress/innovation/renewables/thin-film-solar-panels/>



## Thin Film Solar Panel Increasing Solar Energy Efficiency and Affordability

GE's global team of technologists works around the clock across three continents on the best technologies to increase solar energy efficiency and affordability.



## Proficy Software Unlocks Data to Optimize Operations

GE Intelligent Platforms' Proficy Software Solution helps companies improve efficiency and competitiveness through data visualization, tracking and optimizing manufacturing processes.

Proficy software is an ecomagination technology platform for measuring and managing the efficiency of manufacturing operations. It enables companies to reduce costs and manufacturing waste and to drive continuous improvement outcomes. Optimizing manufacturing processes is essential in the food industry, which faces the constant challenges of balancing limited resources and maximizing production output.

Cliffstar Corporation, a division of Cott Corporation, is one of the largest producers of private-label juice products in the United States—with more than 145 blends and a customer base that includes prominent national and regional retailers. Based on its continuous-improvement philosophy, which values data-driven decisions, Cliffstar implemented GE Intelligent Platforms' Proficy production software suite in 2010. Cliffstar believed there were significant opportunities to improve their operational performance and profitability by focusing on product quality, production efficiency and material usage, and to gain visibility into real-time operations management through Proficy software.

"The goal of the tool is to have greater insight into the process," said Don Enstrom, Senior Director, Manufacturing & Engineering Services for Cliffstar. "There are a lot of people who believe they know the process, but they don't really know it. They have learned a lot by looking at real data."

In a few short months, Proficy software enabled rapid gains in production efficiency in its packaging operations by highlighting areas where equipment tuning, procedural changes and training could be used to address the underlying causes of all aspects of inefficient resource usage—including equipment, materials and labor. As a result, other Cliffstar plants are considering using this software so that they can achieve these kinds of results.

The use of manufacturing information to drive rapid beneficial change in methods, machinery and manpower is critical to maintaining Cliffstar's competitive advantage. In fact, the company is using the efficiency gains delivered by Proficy software as a sales tool. By relaying their measurements to potential customers, they demonstrate their commitment to being an efficient operator in the beverage industry, and therefore a more cost-effective supplier.



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<http://www.ecomagination.com/progress/innovation/efficiency/proficy-software/>



## Smart City San Diego Prepares to Plug In

California's second-largest city is taking the lead on the mass adoption of electric vehicles.



“This is the first of many initiatives that our partners throughout the region will undertake to make San Diego the foremost resource-conscious community in the United States.”

Jerry Sanders  
Mayor of San Diego

Smart City San Diego's partners are working to solve issues of energy efficiency and reliability, and to find sustainable energy solutions for their community.

GE has teamed up with the City of San Diego, San Diego Gas & Electric (SDG&E), CleanTech San Diego and University of California–San Diego to launch the initiative to move the city toward greater sustainability.

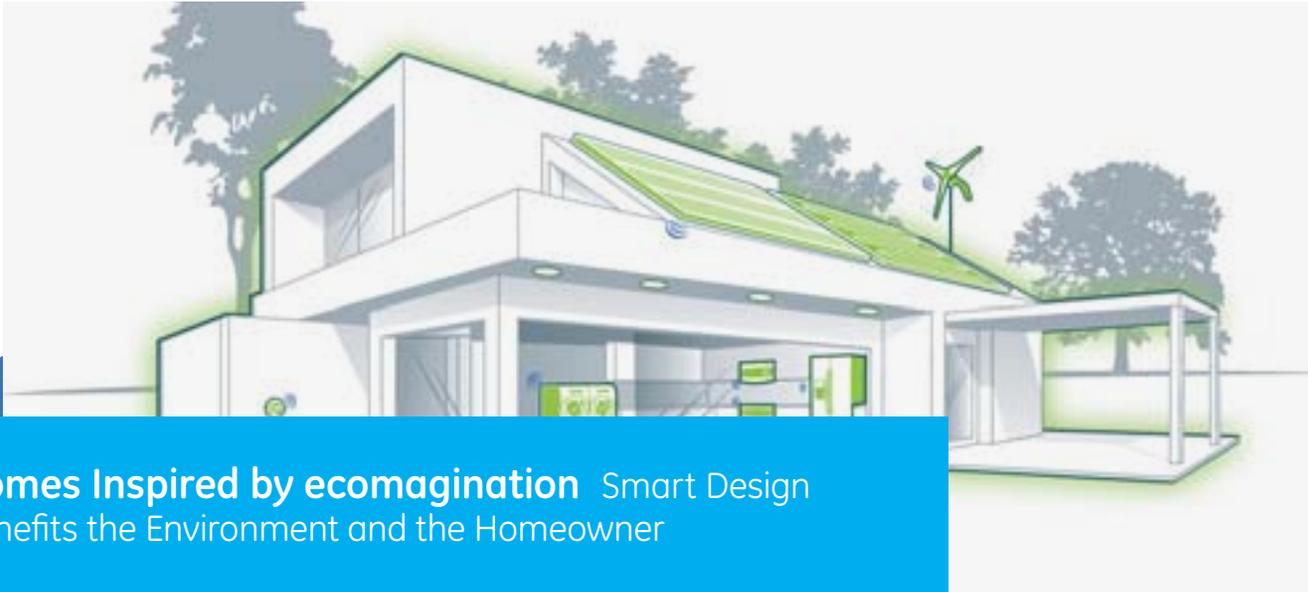
Smart City San Diego's first project is to oversee one of the largest early deployments of electric vehicles in the United States. The rapid rollout is expected to serve as an economic boon for the city.

In the short term, the initiative will spur significant investments in home and public charging outlets, clean energy sources and rigorous studies in consumer behavior. Down the road, electric vehicles stand to save drivers 25 to 30 percent per mile in overall operating costs.

By banding together, the group looks to overcome many of the challenges the mass-scale adoption of electric vehicles has faced in the past and to ensure smooth, efficient integration. “We are working together with our customers and the community to create an innovative and sustainable energy future with the utility as the platform for reliability and customer information,” said Jessie Knight Jr., chairman & CEO of SDG&E. “By doing this, we provide our customers with the ability to use new technologies that will help them save energy while providing environmental benefits for all.”



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<http://www.ecomagination.com/progress/innovation/electric-vehicle/smart-city-san-diego/>



## Homes Inspired by ecomagination Smart Design Benefits the Environment and the Homeowner

By combining building science with high-performance appliances and products, new home construction can significantly reduce a home's environmental footprint and a homeowner's expenses.

**GE has partnered with Land Tejas Companies to provide building technologies and high-performance products and appliances, creating an entire community of homes that promote energy and cost efficiency.**

Discovery at Spring Trails, located in Houston, Texas, is a master-planned residential community of more than 1,000 homes being developed by Land Tejas. GE worked with Land Tejas to design a communitywide standard that requires home builders to use ultra-energy-efficient construction and

appliances, plus a minimum of 1 kW of rooftop solar panel. Land Tejas estimates that this combination will make it possible to reduce energy consumption by approximately 40 percent versus comparable new code-built homes.

The new community is just one example of GE's "Homes Inspired by ecomagination" initiative, which is designed to lower overall household energy, emissions and indoor water consumption. A key to lowering energy consumption is better use monitoring, which

can be accomplished with GE's Nucleus energy manager system in conjunction with a smart meter and in coordination with one's local utility service. Research has proven that when consumers have more information about their energy use, consumption is reduced by an average of 10 percent.

"Homes Inspired by ecomagination" has earned two industry classifications—the Environments For Living "Certified Green" classification from Masco, and the ENERGY STAR Qualified New Home



designation from the U.S. Environmental Protection Agency.

GE's partnership with Land Tejas Companies is one initiative among many that benefit the environment and provide homeowners with energy and cost advantages.



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## Nucleus Energy Manager Helping Homeowners Monitor Energy Use

GE smart grid technologies help Martha's Vineyard achieve greater energy independence.



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<http://www.ecomagination.com/progress/innovation/grid/nucleus-energy-manager/>

On Martha's Vineyard, the Vineyard Energy Project (VEP) and Vineyard Power Co-Op turned to GE for help with their long-term vision: to provide 100 percent of the community's power with wind and solar energy during the off-season, when the destination is home to 16,000 residents. During the summer, when approximately 110,000 people might be on the island at a given time, Martha's Vineyard would purchase power to supplement wind and solar. Smart grid and demand-response-enabled technologies could help the island balance its energy supply and demand, and maximize the benefit of its sustainable energy resources.

In a pilot program, GE outfitted more than three dozen households on Martha's Vineyard with GE's Nucleus energy manager and GE Profile appliances equipped with Brillion technology to help them more

efficiently manage their energy use and costs. VEP, a nonprofit organization that promotes the use of clean and sustainable energy, received nearly \$800,000 from the U.S. Department of Energy to implement smart grid technologies—including smart appliances.

Nucleus, when used with a smart meter, provides a wireless home energy monitor

that plugs into any standard electrical outlet. Once installed, Nucleus energy manager communicates with the smart meter to collect and store household electricity consumption and estimated pricing data.

To help utilities manage peak demand, the Nucleus and Brillion technologies can receive and respond to price and "demand-response" signals from power companies to lower or

delay power consumption of enabled devices and appliances during certain hours of the day. Demand-response programs also can help utilities avoid building more power plants by incentivizing consumers to lower their demand during "peak" hours. Reducing energy use during peak hours also reduces the community's need to purchase backup power to meet demand during energy spikes.

"Demand-response programs and technologies have proven effective in helping utilities maximize the resources they currently have. As we look to create a more self-sustained and energy-independent island, GE's Profile appliances, equipped with Brillion technology and Nucleus energy manager, could play a critical role in helping us achieve a more sustainable electric grid."

Ted Bayne  
Vineyard Energy Project

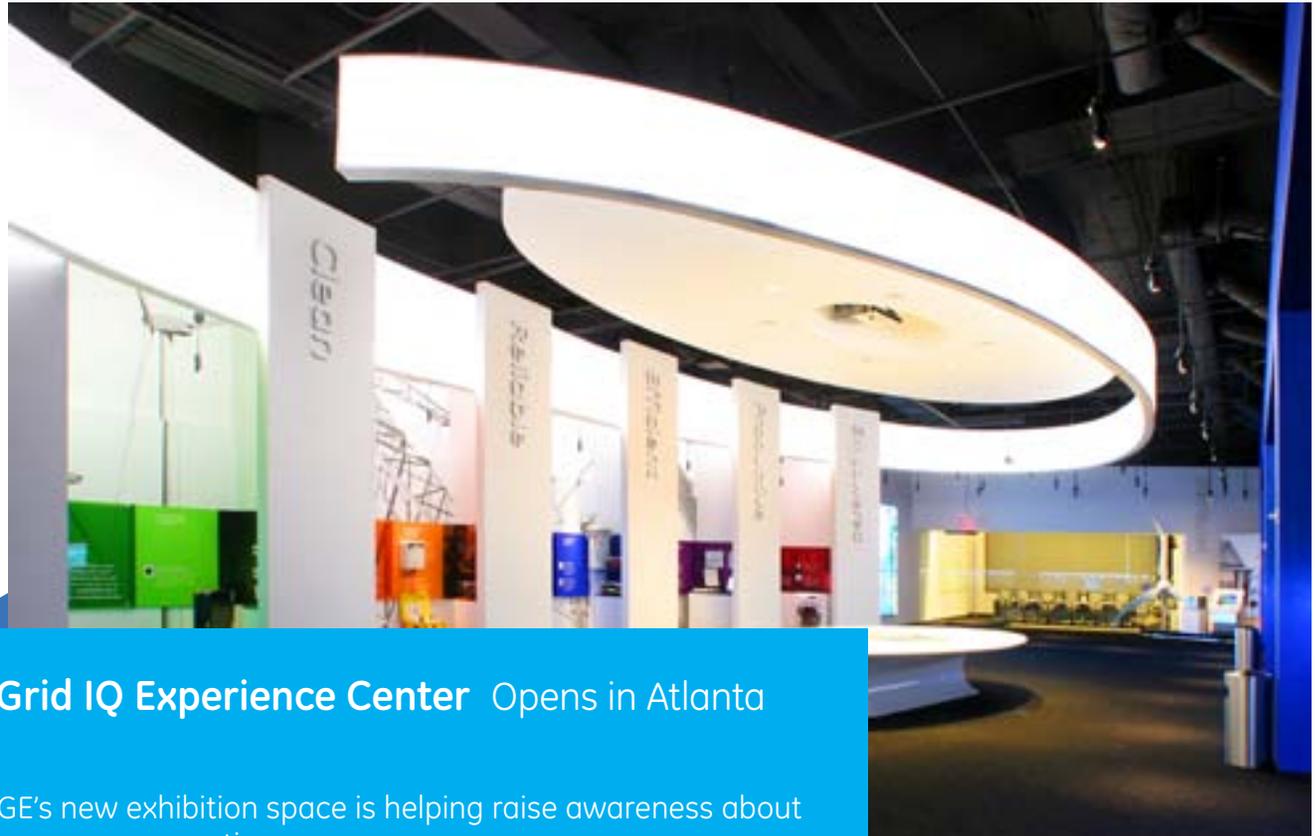
**In July 2010, GE opened its Grid IQ Experience Center in Atlanta.**

The Center provides perspective on current energy consumption habits and potential strains of projected demand. Tours of the Center introduce visitors to new technologies that can modernize our electrical grid, and educate them on how to integrate good decisions about energy use into their lifestyles. The Experience Center also features in-depth technical demonstrations so utility engineers can learn about GE's proven energy solutions for increasing efficiency and reliability.

"Global electricity demand is expected to increase 75 percent by 2030," said Bob Gilligan, vice president, Digital Energy for GE Energy Services. "We must take action to modernize the grid to meet our growing capacity, environmental and security needs."

GE and the Grid IQ Experience Center have been good for the local economy, employing upwards of 200 people, a number that is expected to double by 2012.

The Smart Grid Center of Excellence was made possible through a public-private partnership consisting of Georgia government, energy industries and academia.



## Grid IQ Experience Center Opens in Atlanta

GE's new exhibition space is helping raise awareness about energy consumption.

**"As a source for energy education and innovation, the Experience Center will have a positive impact on the city and our state for years to come."**

Governor Nathan Deal  
Georgia



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<http://www.ecomagination.com/progress/innovation/grid/grid-iq-experience-center/>

“The normally high costs of outdoor lighting can be turned into an energy-efficiency bellwether for the company and the industry as a whole.”

Charles Zimmerman

Vice President of International Design and Construction, Walmart

Walmart understands that maximizing the efficiency of lighting systems is a sure path to reducing high energy and maintenance costs. Their reputation as a retail industry innovator—in areas such as operational efficiency and sustainability—is based on the ability to adopt and deploy technology solutions. Lighting is an area of particular focus, given that nearly one-third of a Walmart store’s energy consumption is attributed to lighting.

Over the past several years, Walmart has engaged GE around the world for LED lighting systems that have transformed how retailers light their stores—from refrigerated display cases to outdoor signage and parking lot lighting.

In Puerto Rico, Walmart has made a 22-store, islandwide move to GE Evolve LED Area Lights for its parking lots. Because the LED lights consume less energy, the completed project is expected to save up to 48 percent of the electricity traditionally required to light the parking lots. In addition, the long-lasting LED lights cut maintenance

costs approximately 75 percent by providing an estimated 10-year service life (50,000-hour rated life), which is four times the recommended service interval of a traditional high-intensity discharge (HID) lighting system such as metal halide.

Consuming from 97 to 220 watts, the GE Evolve LED Area Light system replaces traditional 400-watt to 1,000-watt HID systems that can spill and waste light. Light-level uniformity improves significantly with the LEDs because they more effectively throw light where it is intended, reducing hot spots and dark spots. The result is less reflected light and glare at all viewing angles, and improved utilization for a positive impact on property appearance, security and pedestrian visibility.



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<http://www.ecomagination.com/progress/innovation/appliances/ge-evolve-led-area-lights/>

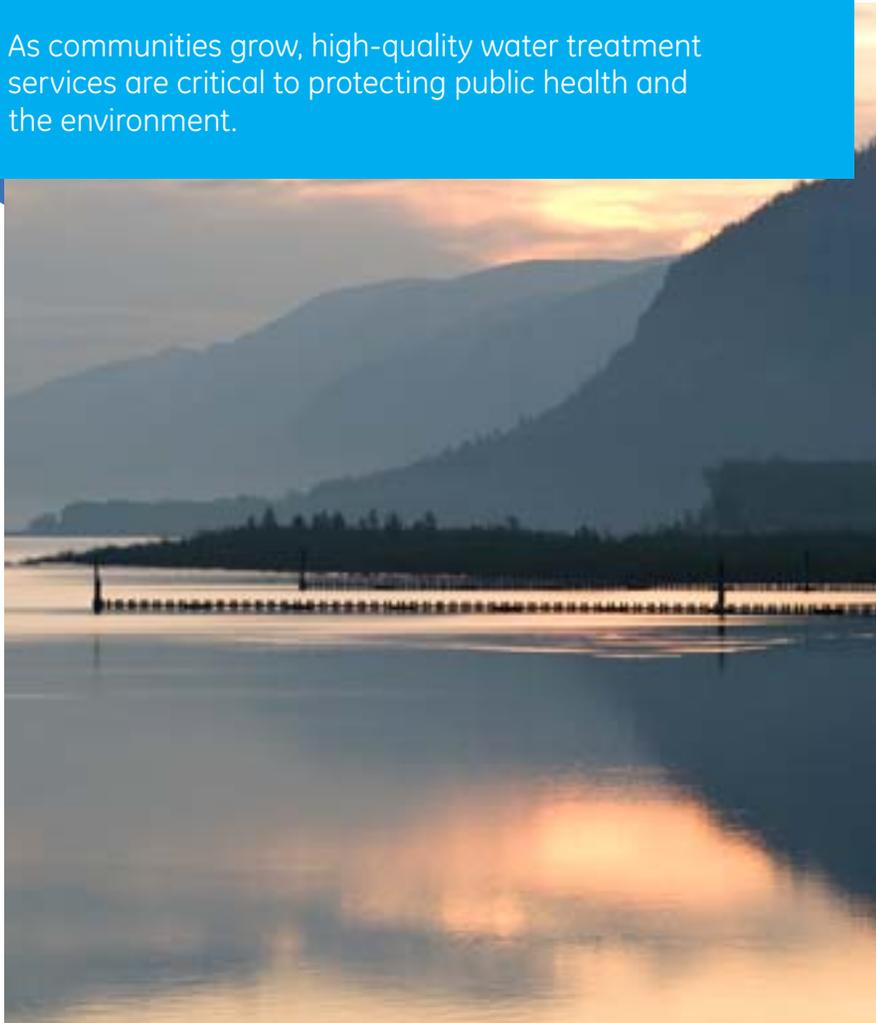


## GE Evolve LED Area Lights Walmart Puerto Rico Improves Visibility and Efficiency

LED area lights, which provide an estimated 10-year service life, are rolling back energy and maintenance costs for lighting parking lots.

## ZeeWeed 500 Advanced Wastewater Filtration for Growing Communities

As communities grow, high-quality water treatment services are critical to protecting public health and the environment.



Because of its rapidly growing population, Clackamas County in north-central Oregon needed to expand and upgrade its Kellogg Creek Water Pollution Control Plant. In addition to protecting public health and the environment, county officials wanted to ensure that the improvements to the wastewater plant would be aesthetically pleasing and occupy a minimal amount of land in this heavily forested area. The county was also committed to controlling odor from the plant.

GE worked with the county to design a new treatment facility using the ZeeWeed 500 Hollow-fiber Membrane. The ZeeWeed 500 enables an advanced filtration process that would meet Oregon's Class A water reuse standards, which are among the most stringent in the United States.

The ZeeWeed 500's system works by pulling wastewater through reinforced hollow-fiber membranes that separate and remove particulate matter, resulting in clean, high-quality water. This technology has a record of outstanding performance in difficult-to-treat water sources, such as municipal and industrial wastewater. The ZeeWeed membrane fiber has an extremely small pore size so that it acts as a barrier to biomass, bacteria and viruses, and retains these substances in the process tank.



Because the ZeeWeed 500 eliminates the need for other types of filters, the improvements to the Kellogg Creek plant occupied a reduced footprint and required very little high-value land. The new facility is also cost- and energy-efficient.

With the ZeeWeed 500 and other advanced technologies, GE is helping communities achieve consistently high-quality water, reduce the footprint of water treatment facilities and operate more economically.



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<http://www.ecomagination.com/progress/innovation/water/zeeweeds-500/>

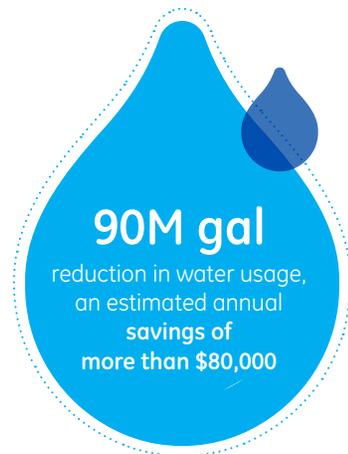
## GenGard 8000 Advanced Water Treatment That Saves Money

A water treatment system designed for high-alkaline conditions helps a Midwestern power plant improve efficiency and realize operational savings.



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<http://www.ecomagination.com/progress/innovation/water/gengard-8000/>



Relying on clarified river water to cool a plant's process equipment can lead to difficulties with fluctuating water quality, as one Midwestern United States company experienced. Productivity stalled because the plant staff constantly adjusted its cooling-water system to manage water-contamination problems. To resolve these operating inefficiencies and cut costs, the company turned to GE.

Industrial facilities consume large volumes of water to cool process equipment, which requires cooling-water systems that can repeatedly use the same water. Corrosion and microbiological contamination must be controlled to ensure safe, reliable and efficient operation of these cooling systems.

Understanding the pressures that rising energy costs and strains on capacity place

on industrial facilities, GE recommended upgrading the plant's chemical program with its GenGard 8000 alkaline technology. An extension of GE's existing GenGard product line, the equipment helps facilities improve efficiency and reduce operating costs by providing greater production output and the ability to use alternative water resources.

With GenGard 8000, customers can treat low-quality water. In many cases, the technology can also eliminate the need for sulfuric acid in pH control. Incorporating the most advanced deposit and corrosion additives available, GenGard 8000 is helping facilities trim acid usage ahead of any industry regulations requiring such a reduction.

The plant was able to resolve its water contamination challenges through the use of GenGard 8000. GE helped the plant control

corrosion and microbiological contamination—ensuring safe, reliable and efficient operation throughout the cooling process.

GE also replaced the plant's chemical feed and control program with a TrueSense Online Integrated Control Center to automatically monitor and adjust water quality, freeing workers from the time-consuming task of making manual adjustments in the cooling process.

By improving operating efficiency, reducing acid use and enabling the use of lower-quality water, GE helped the power plant achieve responsible, cost-effective water management practices and provided substantial savings in both water consumption and operating costs.

IN ONE YEAR:



**25 million liters**  
of water saved



**50%**  
reduction of particulate  
matter emissions



**150 million**  
metric-ton reduction of aldehyde  
emissions during the trial period

Petrobras, Brazil's national energy company, sought GE's help in diversifying its energy sources, while allowing greater flexibility in power plants and building a foundation for future technology and innovation.

The result was the world's first sugarcane-based ethanol power plant, powered by GE's LM6000 PC aeroderivative gas turbines. The Juiz de Fora Power Plant, serving 150,000 people in southeastern Brazil, is a simple-cycle, natural gas plant with a total capacity of 87 MW. The plant has two LM6000 PC gas turbines, with GE-modified combustors that enable the use of ethanol as well as natural gas. This dual-fuel capability enhances the plant's energy security and reliability by providing a valuable alternative fuel source.

Petrobras selected the aeroderivative gas turbine for this project because of its demonstrated reliability and high efficiency, and its ability to accommodate alternative fuels, including biodiesel, naphtha and many others.



## LM6000 Gas Turbines Modified for Ethanol Sweet Success for Brazil

World's first sugarcane-based ethanol power plants bring cleaner power to Brazil.



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<http://www.ecomagination.com/progress/innovation/gas-engine/lm6000-gas-turbines-modified-for-ethanol/>

OVERVIEW

INNOVATION

Great Northern Hydroponics began a search for an alternative power source for its 55-acre tomato greenhouse in Kingsville, Ontario, six years ago. Due to changes in the greenhouse industry's economics, as well as rising fossil fuel prices, Great Northern saw the need for a cost-effective and cleaner power source for long-term, optimized energy generation.

After considering alternatives such as coal and biomass, Great Northern opted for a cogeneration solution and selected a GE Jenbacher system that includes a CO<sub>2</sub> fertilization option for greenhouses. Great Northern's decision coincided with an initiative by the Ontario Power Authority (OPA) to expand the local grid with 1,000 MW of cogeneration power. With GE's help, Great Northern prepared an application to OPA for its cogeneration project—and won approval.

The 12-MW power plant, with four Jenbacher JM620 units, began operation in July 2009, and was GE's first North American greenhouse cogeneration installation. The plant is expected to cut Great Northern's greenhouse energy costs by at least 50 percent over a 20-year period and divert 15,000 tons of CO<sub>2</sub> away from the atmosphere and into crop fertilization. It also will supply enough surplus power to the grid to light 12,000–15,000 Canadian homes each year. Last year it was also used to provide cooling to the warehouse at the site.

As a combined heat and power (CHP) plant, the Great Northern facility uses less fuel with the same power output compared to traditional greenhouses. This can lower regional industrial emissions from energy production. Jenbacher



## Jenbacher JM620 Gas Engines Bumper Crops from Greenhouse Cogeneration

GE's Jenbacher gas engines are giving a Canadian greenhouse operator dependable, cost-efficient on-site power and a ready supply of CO<sub>2</sub> to fertilize its tomato crop.

greenhouse CHP plants have efficiency levels of up to 95 percent.

The GE solution was ideal for Great Northern. Greenhouse plants thrive in a CO<sub>2</sub>-enriched atmosphere. Jenbacher cogeneration systems create electricity for lighting that helps plants absorb CO<sub>2</sub>. GE's advanced environmental technology uses special catalytic converters to purify the engine exhaust gas, and then the exhaust CO<sub>2</sub> is recycled as fertilizer. The result is a bumper crop.



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<http://www.ecomagination.com/progress/innovation/gas-engine/jenbacher-jm620-gas-engine/>



## GASCO Partners with GE Technology Solutions for the Natural Gas Industry

GE Oil & Gas partners with Abu Dhabi Gas Industries to meet growing energy needs with more-efficient technology.

Abu Dhabi Gas Industries (GASCO), which manages onshore gas processing and transportation in Abu Dhabi, was committed to an initiative by the United Arab Emirates government to meet the rising demand for energy. At the same time, GASCO sought to maintain the highest-possible standards of environmental stewardship across all aspects of its operations.

GASCO decided to partner with GE Oil & Gas—a natural choice, as GE gas turbines represent more than 70 percent of its installed fleet.

This initiative was launched in 2010 by GASCO CEO Mohammed Sahoo Al Suwaidi and GE Oil & Gas CEO Claudi Santiago. In one of the key activities under the partnership, a technology-sharing seminar was attended by 75 operational and engineering staff at the Habshan natural gas complex in February 2011.

The seminar introduced relevant products and services from across the GE Oil & Gas ecomagination portfolio. Discussion topics included gas turbine emissions management, the potential efficiencies and environmental benefits of GE's Integrated Compressor Line, and the compression and pumping of CO<sub>2</sub> for enhanced oil recovery and carbon capture and storage. The session also explored options for upgrading existing equipment for better availability and fuel efficiency.



GASCO and GE are following up on actions agreed to at the seminar and will reconvene early next year to review progress and to plan the next steps. Among the areas being evaluated are new technologies to improve efficiency and reduce CO<sub>2</sub> emissions per MW generated, and increasing the reliability and MTBT (mean time between trips) of existing machines, thus reducing the occurrence of flaring.



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<http://www.ecomagination.com/progress/innovation/gas-engine/gasco-partners-with-ge/>

## FuelEx NGL Recovery System

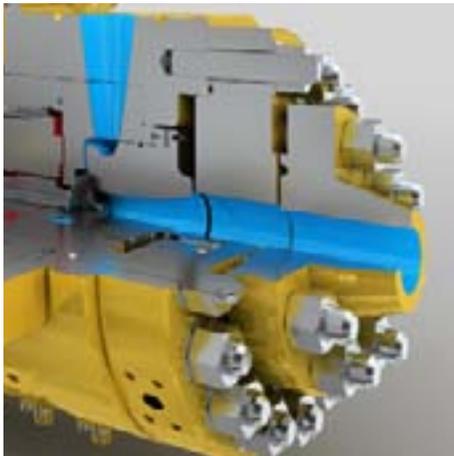
### Recapturing Liquids Reduces Costs and Emissions

GE's pipeline of ideas leads to an innovative approach to recovering valuable natural gas liquids and reducing emissions.



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Alliance Pipeline transports natural gas through a 3,719-km (2,311-mile) pipeline system, delivering more than 1.6 billion cubic feet per day of natural gas to the Chicago market. Alliance is dedicated to being a safe, reliable, competitive and environmentally conscious North American transporter of natural gas.

In 2010, Alliance asked GE to solve the problem of the rich-mix turbine fuel gas, used to power the pipeline's compressor units, consuming high-value natural gas liquids (NGLs) in the process. GE engineers and design teams worked along with Alliance to create a new solution to filter the NGLs and make them available for storage and sale, creating significant financial opportunities while simultaneously reducing greenhouse gas emissions.

The result was GE's FuelEx NGL Recovery System, which separates heavier hydrocarbons from fuel gas, to deliver a predominantly methane-based gas turbine fuel while reducing CO<sub>2</sub> emissions. FuelEx makes available a stream of clean gas for fueling the gas turbine, while the separated NGLs are returned to the pipeline or to a storage facility. The purer gas that travels the length of the pipe as the result of the FuelEx technology also improves the performance of the dry gas seals in the pipeline—reducing even further the chance of CO<sub>2</sub> escaping in transit.

The first installation of the FuelEx system is scheduled to take place in the fall of 2011. Upon successful verification, as many as 14 skids could be installed along the entire Alliance pipeline.

“This technology allows us to enrich the pipeline, providing a direct benefit for the end user of the pipeline. This reduction in greenhouse gases also leads to a direct financial return, as there are incentives in some of the Canadian jurisdictions in which we operate to reduce our overall GHG emissions.”

**Jim Walsh**

Vice President, System Optimization and Effectiveness at Alliance



## Caithness Shepherds Flat Using GE's Advanced Wind Turbine Technology

Proven in Europe and Asia, GE Energy's 2.5-100 wind turbines are now being installed in the United States, where they will power the world's largest wind farm.

**235,000  
U.S. homes**



are projected to receive energy generated from the Shepherds Flat project

**260,000  
vehicles**



About 1.5 million tons of carbon dioxide could potentially be avoided per year—equivalent to the amount produced by roughly 260,000 passenger vehicles

Caithness Energy and GE are building the world's largest wind farm, the 845-MW Shepherds Flat project. Stretching across 30 square miles in north-central Oregon, the project will generate enough energy to supply a projected 235,000 average U.S. homes.

To meet the needs of this expansive project, Shepherds Flat will rely on 338 high-efficiency GE Energy 2.5-100 wind turbines. Representing GE's most advanced wind turbine technology in terms of efficiency, reliability and grid connection capabilities, the 2.5-100 is a 2.5-MW onshore wind turbine. It is designed

to yield the highest annual energy production in its class, and builds on the success of GE's 1.5-MW wind turbine—the world's most widely deployed wind turbine—with more than 16,000 now installed.

Shepherds Flat will be the first large-scale installation of 2.5-100 wind turbines in the United States; however, they have already been proven in projects across Europe and Asia. Currently, 500 of the 2.5-100 wind turbines are operating in countries such as Romania, France, Holland, Turkey, Germany, Belgium, Spain, Italy, Poland, Japan and China. Key components of the 2.5-100 will be manufactured at GE's facility in Pensacola, Florida.

The first phase of the Shepherds Flat wind farm is scheduled to begin operation in 2012. Construction of the project involves not only the installation of wind turbines, but also the development of 95 miles of roads and 167 miles of transmission lines. Shepherds Flat is owned by developer and managing member Caithness Energy, along with GE Energy Financial Services, Google and subsidiaries of ITOCHU and Sumitomo Corporation.



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<http://www.ecomagination.com/progress/innovation/renewables/caithness/>

To learn more about GE's ecomagination strategy and get updates on progress as it relates to products, services and our overall commitment, please visit [www.ecomagination.com](http://www.ecomagination.com).

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