



# Progress

ecomagination Report 2011

What is  
ecomagination?



# Overview

**Mark L. Vachon**

Vice President, ecomagination



**Jeffrey R. Immelt**

Chairman of the Board &  
Chief Executive Officer, GE

## To our investors, customers and other stakeholders:

At GE, we believe that innovation can solve the world's toughest challenges. That belief motivates our people. It is why GE works. It is the basis for ecomagination.

As a business strategy, ecomagination has been a great success. It has helped us become more accountable, get closer to our customers and focus and prioritize our investments—to make sure we're working on things that are both economically and environmentally smart. The ecomagination portfolio includes more than 140 products and solutions. We have generated more than \$105 billion in revenue to date, exceeding our ecomagination growth targets and growing at a faster rate than the rest of GE.

But ecomagination itself is sustainable only because we understand that a lot has changed since we launched the strategy back in 2005. Growing populations, resource scarcity and a volatile economy have all led to new pressures. Whether they are countries, municipalities, companies or individual consumers, our customers put a premium on productivity. They all require solutions that emphasize efficiency. It is the only way to compete.

Put another way, clean energy may go in and out of favor with policy makers. In some parts of the world we operate in a tailwind and in others we face a headwind. But our customers all want the same thing. They want to make their operations more efficient and productive. So our answer is action.

Today, almost eight years after launching ecomagination by declaring "green is green," we are focusing on growth and offering targeted, measurable and game-changing solutions. Taking into account not just our own internal operations but our entire value chain, we are working to maximize resources and improve performance and total impact. We are as committed as ever to renewables and, in fact, we just celebrated 10 years of advancing wind energy. In that time, GE Wind has generated \$30 billion in revenues. By the end of this year, we expect nearly 20,000 wind turbines as part of our installed base.

But, recognizing that our world is 80 percent hydrocarbon-based, we are also hard at work at coal mines, from Pennsylvania to Peru, developing water solutions that allow customers to operate productively while achieving high environmental standards. We are working with our customers in China to tap into the world's largest technically recoverable shale gas reserve. Solving tough problems for customers outside the traditional "green" space is also what ecomagination is about.

So is continuing to invest in advanced technology. From 2010 to 2015, we will have invested \$10 billion in R&D. We see the product of that commitment to innovation in software and data solutions like the RailEdge Movement Planner, which by increasing average train velocity provides customers with diesel fuel savings of 37 million gallons per year. We see it in the FlexEfficiency 50 Combined Cycle Power Plant, which uses the latest in gas turbine technology to provide cleaner, more efficient energy onto the power grid and into people's homes. And we see it in our commitment to electric vehicles (EVs). Last year, we committed to deploying 25,000 EVs in our own fleet. But more than that, we are building an entire infrastructure for alternative fuel vehicles. A vehicle fleet operator that uses GE's CNG In A Box™ for natural gas fueling instead of traditional gasoline fueling can save about 40 percent in fuel costs—more than \$1,500 per vehicle annually. Our Alternative Vehicle Innovation Center allows us to share alternative-fuel vehicle technologies and solutions with our customers, helping create demand that will put more of these vehicles on the road.

With a global customer base as diverse as ours, the resource efficiency that our ecomagination portfolio delivers takes many, game-changing forms.

We will continue to tackle the world's toughest challenges both at GE's businesses and in our Global Research Centers in Niskayuna, Beijing, Bangalore and Munich, and soon in Rio de Janeiro. But we also realize, of course, that GE can't take on all of this alone.

In 2011, we formed new partnerships and engaged in important dialogues globally in places like Australia and China. We also opened GE to outside innovation through the ecomagination Challenge. Collaborating with venture capital firms, we invested more than \$130 million in 22 companies to help bring exciting new energy technologies to life. One of our winners builds prefabricated buildings that are highly efficient and quick to assemble. Another reduces electricity consumption in data centers. All have the potential to transform markets and radically increase resource efficiency. And that is why we are so committed to connecting the best ideas with GE's global scale and our unmatched ability to accelerate the commercialization of these products.

Innovation is a value proposition at GE. When you add it to our scale and expertise, and when you apply it with laserlike focus to global challenges like resource efficiency, it becomes even more valuable for our customers and communities. That's what ecomagination is all about.

Last year, we raised the bar. We produced great products, and our revenue increased. We established more of a global presence while remaining a very local partner for our customers. We further solidified our position as leader in traditional clean-tech areas like EVs and renewables. But we also brought ecomagination to resource-intensive industries like oil and gas production and mining. The world in which we operate has changed dramatically. Ecomagination allows GE and our customers to be ready. It prepares us to compete and win.

## We are only getting started.

We are fully committed to doing not only what GE can, but what only GE can. Ecomagination works to deliver value to our customers and investors by ensuring that GE builds, powers, moves and cures the world in the efficient and productive ways our future demands.

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Vice President, ecomagination



# Ecomagination Progress:

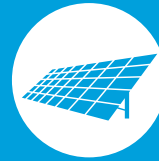
Launched in 2005, ecomagination is more than a typical corporate sustainability program interested only in internal operations. It is core to our business strategy, considers our value chain and delivers solutions to our customers. Ecomagination provides resource efficiency and increased productivity in a volatile world.



**29%**  
reduction in  
greenhouse gas  
(GHG) emissions  
since 2004 adjusted  
baseline.



**13.5%**  
reduction in water  
use since 2010.



**\$2.3B**  
invested in R&D.  
Committed to  
putting \$10 billion  
to work from  
2010 to 2015.



**\$21B**  
in revenues in 2011.



**engaged**  
communities in  
collaborative ideation.

# LCM: Life-Cycle Management

The world's most pressing environmental challenges also present an opportunity to do what we do best: imagine and build innovative solutions that benefit our customers and society.

We have long focused on designing the most efficient products for our customers, creating economic value with reduced impact on the environment.

An emerging focus area, life-cycle management (LCM) helps us to better understand the environmental impacts of our products and solutions in all phases of a product's life cycle.

We are developing a variety of customizable LCM tools that can provide even greater value for our customers by focusing on the most promising opportunities for real change.

- **GE Healthcare's WAVE Bioreactor:** a detailed life-cycle analysis (LCA) revealed that the use of this process technology with a single-use Cellbag has a much lower environmental impact compared with traditional equipment.
- **GE Transportation's Durathon energy storage system:** LCA determined that Durathon offers significant environmental benefits across the entire product life cycle, compared with much of the incumbent technology.



# Ecomagination Challenge

Open Innovation at Work:

Our \$200 million Open Innovation Challenge launched its second phase, "Powering Your Home," in January 2011.



Together with our venture capital partners, we have invested or committed to invest \$134 million in our "Powering Your Home" and "Powering the Grid" Challenge winners.

The Challenge received 5,000 idea submissions from 75,000 innovators in 150 countries. It has produced 22 new commercial partnerships to date and resulted in the acquisition of FMC-Tech, a smart grid technology from the first phase. Key partnerships formed through the Challenge include:

**ember**

**GMZ**  
ENERGY

**Hara**

**NUVENTIX**

**ONRAMP**  
WIRELESS

**projectfrog**

**OBLONG**

Through the Challenge community, young companies and entrepreneurs were able to take their solutions to the next level, receiving additional funds and new customers, as well as industry and commercial recognition.

Expanding on this initiative, we launched a regional Challenge in China in September 2011 and committed \$100 million to find and fund the best gas-based energy ideas to help China meet its large energy requirements.



# Building, Powering, Moving, Curing

Ecomagination products and solutions are at work—building, powering, moving and curing the world. Not just imagining. Doing.

## Building

*Speeding the Adoption of Natural Gas as Transportation Fuel*

GE and Chesapeake Energy Corporation together created a compressed natural gas (CNG) solution for transportation known as CNG In A Box. It compresses natural gas at sites where light/medium-duty vehicles that use CNG can refill their tanks from a traditional fuel dispenser.

## Powering

*FlexEfficiency 50: Powering a New Level of Flexibility and Efficiency*



This new Combined Cycle Power Plant reduces fuel costs, creates revenue sources, improves dispatch capability and reduces carbon emissions by allowing more renewable resources to be integrated into the power grid. It can ramp up when needed to supplement wind/solar power alternatives, and ramp down when these sources are available.

## Moving

*GE TRANSPORTATION & the AC44i South American Locomotive*

The AC44i generates fewer GHG emissions and dramatically lowers operating costs. Two locomotives of this type can replace three of the older models and reduce the volume of annual CO<sub>2</sub> emissions by more than 2,600 tons.



## Curing

*GE Healthcare's ecomagination-qualified LOGIQ™ S8 and LOGIQ E9 general imaging ultrasound imaging systems*

These new ultrasound imaging systems are among the most energy-efficient in the industry—they offer enhanced image acquisition and quality, improved productivity benefits, and excellent user ergonomics.