

The NREL logo consists of a blue square containing a white circular icon with a grid pattern, followed by the letters "NREL" in a bold, white, sans-serif font.

NREL

A photograph of four people smiling. From left to right: a man in a brown jacket, a man in a red shirt and glasses, a man in a white shirt, and a woman in a white shirt and grey jacket. They are standing in an office or laboratory setting.

Transforming ENERGY



At the National Renewable Energy Laboratory (NREL), we are transforming today's energy challenges into tomorrow's solutions.

For more than 40 years, NREL's world-class research staff has devised solutions to transform the way we generate, consume, store, and distribute energy. And now, our work is more important than ever.

As the population grows and new technologies and devices are added to the grid, we must examine the effects on the grid and enhance security within our most critical systems.

As environmental threats expand and human demands on urban centers increase, we need more sustainable and efficient ways of generating energy that consider resource competition worldwide.

NREL continues to anticipate these challenges, offering solutions through research, innovation, analysis, partners, and people. We are building the foundation of tomorrow's energy landscape and inspiring the economic growth of the future.



NREL's vision focuses on critical research areas that respond to existing energy challenges and will increase our global impact.



We are advanced energy **leaders.**

From the start, NREL's leadership in energy efficiency and renewable energy science and technology has set us apart. We are focused on creating the technical foundation that will support the continued evolution of an advanced energy ecosystem. Researching energy systems and technologies—and the science behind them—for a future powered by advanced integrated systems is what we are known for and what we do best.

Our scientific excellence shines bright. We are proud that, during our 40-plus years, NREL scientists have been awarded more than 60 R&D 100 Awards, known as the "Oscars of Innovation." Our groundbreaking energy research has contributed to transformational scientific advancements, exponential decreases in costs, and more renewable installed capacity than ever before.



Our R&D Programs



Foundational Science

- Biological Systems Science
- Materials Science
- Computational Science and Visualization



Renewable Power

- Geothermal
- Solar
- Water
- Wind



Sustainable Transportation

- Bioenergy
- Hydrogen and Fuel Cells
- Vehicles and Transportation Systems



Energy Efficiency

- Advanced Manufacturing
- Buildings



Energy Systems Integration

- Multipathway Systems Integration
- Grid Modernization
- Energy Storage





Research conducted at NREL will provide both the power and raw materials needed to support a continually expanding global population while stewarding essential planetary resources for future generations.

We are transforming energy through **science**.

We are focusing our expertise and resources on research to accelerate the transformation of traditionally fossil-based products, practices, and industries. With an eye toward emerging megatrends and evolving fields, our thought leaders have identified three distinct research areas to help guide our discoveries:

Circular economy for energy materials

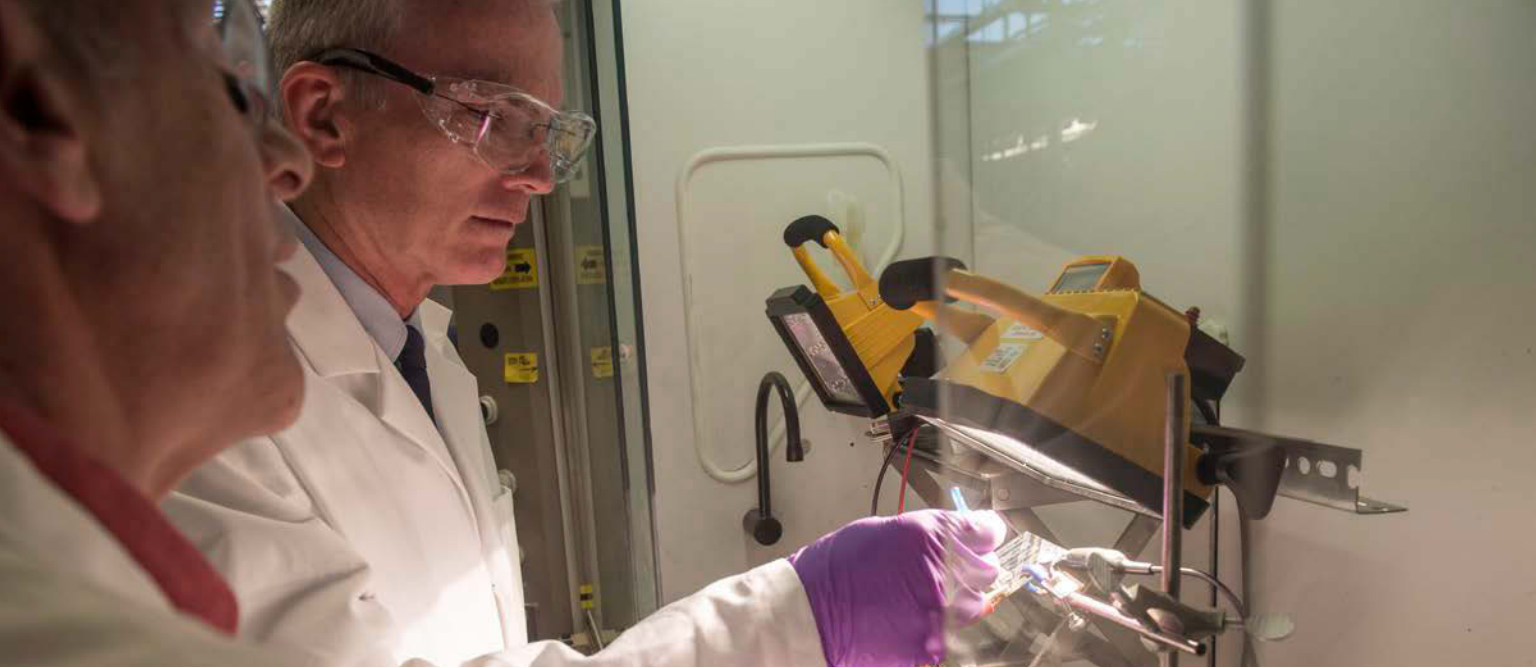
NREL is dedicating resources to research that will underpin a circular economy—designing materials with reducing, reusing, and upcycling in mind for energy-relevant and energy-intensive materials, processes, and technologies. This effort will help mitigate supply issues, promote upcycling, reduce waste, and add value to end-of-life materials.

Electrons to molecules

NREL, along with energy industry partners, is exploring the use of renewable, affordable electricity as the driving force for the conversion of low-energy molecules—such as water and carbon dioxide (CO₂)—to generate other molecules that could be used as chemicals, materials, fuels, or energy storage. Through this research, we will determine the most efficient and cost-effective solutions for energy storage, as well as safer ways to create chemicals and plastics that do not rely solely on fossil fuels.

Integrated energy pathways

As the future grid changes and evolves, it will incorporate more renewables, varied types of loads and energy storage, and many more devices and assets that need to be controlled. NREL will focus on replacing today's outdated grid with a modern, intelligent infrastructure that allows for bidirectional communication between power supply and power use and looks to expand our options for mobility.



We are transforming energy through **partnerships**.

Creating sustainable, transformational change is not an easy job—and we know we cannot do it alone. That is why NREL partners with a diverse range of businesses and organizations. Together, we accelerate the transition of renewable energy and energy efficiency solutions into practical applications. These collaborations are critical to creating a clean energy ecosystem that transforms science into impact.

Our researchers, facilities, tools, and analyses catalyze cutting-edge innovations that create affordable and abundant energy and new business opportunities and greatly reduce risk for new technology investment. By bridging the gap from concept to market, we link R&D with real-world applications.



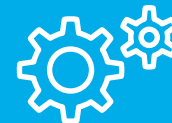
871 active partnerships with industry, universities, foundations, and governments



573 patents for NREL technologies to date



65 R&D 100 Awards



Research investment exceeded **\$491** million in business volume in Fiscal Year 2019

Our campuses boast world-class facilities and other unique laboratory environments that provide our partners with valuable research space and solutions to help speed new approaches to market.

During the past four decades, we have learned a lot about how to get the most out of every research dollar. To ensure our partners get what they need in the most efficient way possible, we have transformed the way we do business. We offer several types of partner agreements and mechanisms that enable us to provide flexible and efficient ways to get the job done.

“The best thing that NREL provides to us is their expertise. Whenever we’re hiring someone to help us with a particular project, we want to have the best in the business. We view NREL as that and a phenomenal partner in helping us accomplish our energy goals.”

Col. Brian K. Wortinger
U.S. Army Garrison Commander





2,700
full- and part-time
employees



25% of staff are early-career researchers and visiting scientists

We are transforming energy through our **people.**

Our passionate people are 100% committed to changing the world every single day. NREL is a rich, cultural melting pot that enables many voices and levels of experience to collaboratively solve problems that come our way. And while passion is one thing, credentials are another. Our academic degrees outnumber our staff, and our researchers typically publish more than 1,700 publications a year. Our scientific innovation and excellence has resulted in more than 570 patents and counting.



We are transforming energy at **home**.

NREL is a living laboratory. We showcase the benefits of energy efficiency and renewable energy technologies by investing in site design and building development across our campus. Many of the high-performance buildings on NREL's main campus in Golden, Colorado, have achieved Leadership in Energy and Environmental Design (LEED) and/or net-zero energy status. NREL's Science and Technology Facility was the first federal laboratory building in the nation to achieve LEED Platinum certification.

Additionally, our Research Support Facility is one of the world's largest energy-efficient office buildings; and what we have learned here has been applied to more than 50 new buildings across the United States. Incorporating cost-effective design approaches that maximize the use of energy efficiency and renewable energy technologies has positioned these buildings as models for energy use and sustainability.



Campus Size

Two campuses totaling **632** acres in Golden and Boulder, Colorado



World-Class Facilities

Open to entrepreneurs, engineers, scientists, and universities



Publications

More than **1,700** scientific and technical materials published annually



Nationwide economic impact exceeded **\$1.4 billion** in 2019

At NREL, we are transforming energy to create a better today...and tomorrow.

NREL is home to the most powerful, high-performance computing system exclusively dedicated to advancing renewable energy and energy efficiency technologies. NREL also offers state-of-the-art immersive, high-resolution visualization capabilities at the Energy Systems Integration Facility's (ESIF's) Insight Center.

The high-performance computing data center at NREL is highly energy efficient, thanks to a warm-water liquid cooling system. The system captures and reuses waste heat as the primary heating source throughout ESIF offices and laboratory space.

Whether it is growing the scientific body of knowledge, developing analyses to help inform policymakers, engineering integrated energy infrastructure, or establishing valuable partnerships to bring the next generation of technologies to market, innovation for positive societal impact is at the core of our work. With programs to advance research and technologies in advanced manufacturing, bioenergy, buildings, computational science, energy analysis, energy security and resilience, energy storage, geothermal, grid modernization, government energy programs, hydrogen and fuel cells, solar, transportation, water, and wind, we stop at nothing to push the boundaries of what is possible.





National Renewable Energy Laboratory
15013 Denver West Parkway, Golden, CO 80401
303-275-3000 • www.nrel.gov

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