



As the world grapples with the need for more and cleaner energy, Duke has committed itself to meeting the challenge. Drawing upon traditions of problem-solving and multidisciplinary education and research, we are embarking on a university-wide Energy Initiative to develop future leaders and inform better energy decisions.

Tackling the key energy challenges of our time will require innovative, integrated education and research efforts across many disciplines—business, engineering, environment, law, policy, and the arts and sciences. It will require breadth and depth, critical thinking and creativity. It will require a commitment to putting knowledge to work to make a difference in the world.

It will require Duke. Our Energy Initiative addresses three overarching areas: meeting growing energy demands to support a competitive economy, reducing the energy

system's environmental footprint, and increasing energy security. With the support of alumni and friends in response to the university's comprehensive campaign, we will educate tomorrow's energy leaders and practitioners, blaze new trails in research, and improve energy decisions through engagement with business and government.

By bridging the gap between theory and practice, Duke can become a recognized national leader in the field of energy within the decade.

Education

Meeting the energy challenge will take a new breed of problem solvers. They need the knowledge to grasp energy's complexities, the ability to think critically across disciplines, the practical skills to devise and implement solutions, and the flexibility to work individually or in teams. With our gifted students and strong, multidisciplinary foundation, Duke can produce leaders and practitioners who will be on the vanguard of this rapidly changing field.

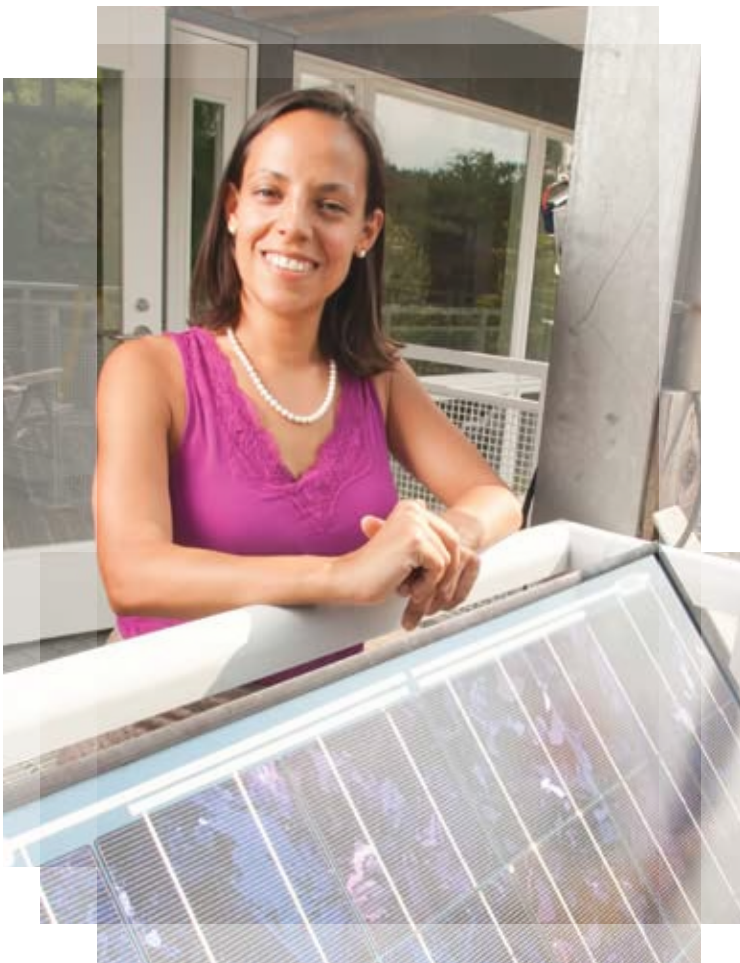
We are creating the energy-specific curriculum necessary to support this educational need. Individual energy courses at Duke cover the spectrum from energy technologies to energy economics and from U.S. environmental policy to international geopolitics and security. We've launched professional programs like the energy concentrations within the Nicholas School of the Environment's Master of Environmental Management program and the Fuqua School of Business MBA program, as well as vibrant joint-degree programs. Many of these professional students engage in year-long projects on concrete problems for specific business, government agency, or nonprofit clients.

Undergraduates with an interest in these issues can pursue an energy certificate jointly organized between Trinity College of Arts & Sciences and the Pratt School of Engineering. The experience culminates with a capstone course that brings together undergraduates from different disciplines to work in design teams, each assigned to develop a new product. They analyze its costs, feasibility, environmental impact, and marketing, and then actually create it. One recent team of engineering, economics, computer science, and public policy majors developed a working prototype of an innovative solar heat collector.

To fully realize our goal of becoming a sought-after educator in this sphere, we must grow our energy-related curricular and co-curricular programs. Private support during the Duke Forward campaign will help us create a set of "gateway" courses designed to introduce the sector to students outside the realms of engineering and the environment. It will also help us to expand the number of immersive, hands-on experiences we offer—like faculty-mentored research project opportunities—and create programmatic links between energy and other areas of focus at Duke, such as entrepreneurship.

YOUR EXPENDABLE GIFT OF \$100,000 OR MORE

can build an Energy Education Fund to support valuable learning opportunities like "gateway" courses or to provide committed undergraduate and graduate students the opportunity to conduct energy research and connect with mentors.



How can large companies motivate employees to reduce their energy use? Ask Duke graduate student Christina Yagjian. She examined this challenge for Ingersoll Rand as part of a pilot consulting practicum through the Fuqua School of Business. Ingersoll Rand intends to use her report to inform industry partners about energy-saving opportunities. Yagjian, who is earning a joint MBA and Master of Environmental Management, also serves as events chair for the MBA Energy Club, and coordinated a workshop on energy in emerging markets. "Energy is at a nexus of issues I'm really passionate about, including economic development," she says. "As societies gain access to energy, quality of life improves."

Faculty

ENERGY EDUCATION, UP CLOSE AND PERSONAL

How do you help students grasp the complex web of resources, technology, infrastructure and economics that characterizes our energy system? Professor **Lincoln Pratson**, the Truman and Nellie Semans/Alex Brown and Sons Professor of Earth and Ocean Sciences, takes his class right to the source—literally.

Every year over fall break, the noted energy researcher leads a group of environmental management master's students on an intensive "Hydrocarbons in Houston" tour of America's oil and gas industry, complete with a visit to an oil field. The class also gets first-hand exposure to a research lab, refinery, power plant, and energy trading floor. Along the way, they meet with experts and investors from the industry's largest and smallest players.

"Students learn that in oil and gas, as well as renewables, people want the best for communities and society," says Pratson, who recently co-published a study on creating an efficient, large-scale infrastructure for carbon capture and storage. It could significantly reduce emissions from coal-fired power plants.

In the spring, Pratson leads a complementary "Clean Energy in California" trip focused on solar, wind, and geothermal power. "Whatever your opinion about how we should address our energy needs," he says, "it should be an educated opinion."

It takes leaders to create leaders. Recruiting, retaining, and supporting distinguished faculty is critical to the Energy Initiative's success. In addition to mentoring talented students as they prepare to launch their careers in this exciting field, professors are the backbone of our growing research program. Their groundbreaking work will drive our reputation in the energy arena.

That's why we not only need to leverage the expertise of Duke's outstanding professors across the university, but we also must strategically expand our energy faculty. We must have the ability to compete effectively for the top talent in the field—both the established voices who can drive headlines and the most promising young talent. And we must have the ability to bring to campus professors of the practice who have distinguished professional experience in the energy sector.

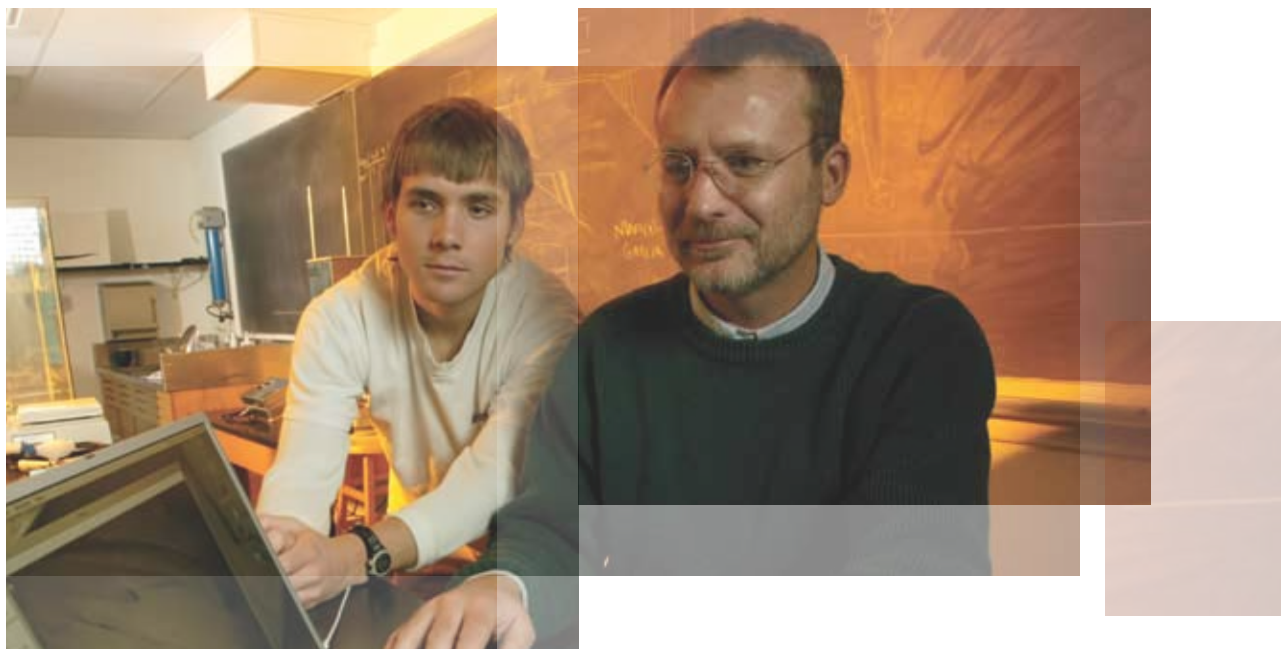
Endowed professorships are a crucial form of support that will help us build the depth of our energy "bench." Creating a named, endowed faculty position during the campaign is one of the most significant ways that a donor can make a lasting investment in the future of energy education and research at Duke.

YOUR GIFT OF \$2.5 MILLION

can establish an endowed professorship that will help us attract and retain world-class energy faculty.

YOUR GIFT OF \$1.5 MILLION

can create an endowed assistant/associate professorship fund to help us hire rising stars in the energy field, or an endowed professorship of practice for faculty who bring practical industry and policy expertise into the classroom.



Research

Can we integrate different forms of renewable energy generation and storage into the electricity delivery system? How can companies make long-term projections and investments under uncertain energy conditions? From investigating what compels consumers to buy more efficient vehicles to discovering ways to increase the yield from a promising source of biofuel, Duke scholars are exploring the technologies and amassing the information that can inform smarter decisions about energy development and use.

Private support during the Duke Forward campaign will enable us to launch an ambitious, targeted research agenda. We will create widely accepted measures for complex issues like energy investment and energy security, as well as develop recommendations for improving energy forecasts.

We'll also encourage collaborative work by offering small grants to fund exceptionally innovative projects that include researchers from multiple fields. In a rapidly evolving field like energy, small seed grants are often necessary to help researchers get their projects off the ground. By supporting cross-disciplinary projects, we will promote creative new approaches to problems that transcend traditional boundaries. And that initial proof-of-concept research can help attract additional private investment or grant funding to build ideas out.

YOUR GIFT OF \$100,000 OR MORE

can support an Energy Research Seed Fund to seed potentially groundbreaking research projects.

“An emphasis on student education, decision-focused research, and engaging on-the-ground energy practitioners in developing solutions is what sets our Energy Initiative apart.”

Professor Richard Newell, director of the Duke University Energy Initiative and former head of the U.S. Energy Information Administration

Dalia Patino-Echeverri's research is helping energy system policymakers see the future. The Gendell Assistant Professor of Energy Systems and Public Policy developed simulation models that predict how various policy designs will affect electric power companies' capital investment decisions. For example, how can emissions regulations be structured without discouraging investment in new power plants? By reducing the risks arising from uncertainty, her model can inform better decisions by policymakers and utilities alike—all with the goal of making cleaner electricity affordable and reliable. On campus, Patino-Echeverri is helping to launch a new, campus-wide case competition, in which interdisciplinary teams of undergraduate and graduate students will work to develop the best proposal for addressing challenging energy problems like these.



UNDERGRADUATES POUR ENERGY INTO RESEARCH

Engineering major **Logan Shoop** is testing a unique, heat-driven engine he designed and built by hand. It uses mirrors to focus the sun's energy on a single point, heating a cylinder to create a rise in internal pressure that ultimately moves a shaft and piston. He hopes his work could lead to a new, supplementary home energy source, more efficient and less costly than traditional solar panels.

Shoop is participating in the Pratt Undergraduate Research Fellows program, which gives outstanding students the opportunity to pursue intensive research for course credit. And many other undergraduates and graduates avail themselves of the hands-on opportunities Duke provides to take a lead role in an exciting energy-related project. In the Pratt School alone, students are pursuing research projects related to biodiesel in the developing world, energy harvesting from waste streams on swine farms, and a solar-powered sustainable water system.

Because the Energy Initiative draws students and faculty from every corner of campus, a physical space for learning, working, and gathering is essential. That focal point was created in 2011 by transforming space within Gross Hall into the Duke Energy Hub. It now provides classrooms and laboratories, plus ample meeting and event space.



Engagement

Duke wants to serve as a trusted resource in the debates over energy, bringing together different interest groups to find constructive solutions. We have the potential to be recognized globally as a platform for serious energy thinkers to present and develop their ideas, to help elevate the national and global dialogue on energy, and to help a range of sometimes competing stakeholders find new solutions. But to have this kind of impact, we must intensify our engagement in the arenas of business, policy, markets, and practice, both through programs here on campus and opportunities to send our students, researchers, and ideas out into the world.

Duke has begun connecting outside experts and companies with Duke students and faculty around energy issues. The Duke Smart Home Program, for instance, originally launched by Home Depot and the Pratt School, creates a live-in laboratory for sustainable living by teams of undergraduates. And the energy club's annual energy conference and visits to start-ups in Silicon Valley deliver the kind of immersion into the industry that helps bring course content to life.

Still, to be a leader in this arena, we must pull in a broader range of voices, including policymakers, engineers, finance experts, entrepreneurs, and analysts. We have created a robust speaker series and envision a visiting energy fellows program that attracts senior practitioners. At the same time, a structured program of internships, externships, and site visits in the U.S. and abroad can provide our students with direct exposure to the energy sector and help Duke build ongoing partnerships with energy firms and institutions hungry for qualified talent.

Philanthropic support during the Duke Forward campaign will help seed and sustain programs that will transform Duke into a discussion forum for all sides of the many important issues related to energy. It will also give our students the insight and professional exposure they need to launch successful careers in this important field.

YOUR EXPENDABLE GIFT OF \$100,000 OR MORE

can support an Energy Engagement Fund to convene energy experts and leaders, sponsor speakers, workshops, student internships, and field trips, and bring Duke expertise into practice.

YOUR EXPENDABLE GIFT OF \$250,000

can provide five years of funding to bring prominent practitioners and faculty from other institutions to campus to teach and mentor our students and engage with our energy scholars.



Explore dukeforward.duke.edu

HOW WILL
YOU MOVE
DUKE FORWARD?