

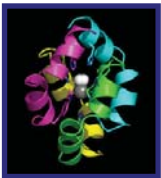


Energy Research at the UW

Energy researchers at the University of Washington are creating positive change through scientific discovery and technological innovation. We are educating the world's future leaders to overcome the global energy and economic challenges of our time. With \$1.4 billion in sponsored research funds, we are a global leader in environmental science research, sustainability, and technology transfer.

Our energy portfolios

UW is a catalyst that will lead to the next generation of less-polluting, more efficient energy generation and technologies. We have energy portfolios in generation, efficiency, storage, and impacts oriented toward sustainability.



Generation

Creating sustainable energy sources from alternative low environmental-impact materials and natural processes

- Energy harvesting: powering small devices from their surroundings
- Bioenergy: energy from, or enabled by living organisms
- Fusion: energy from the stars
- Protein design: designing proteins for use in fuel cells and hydrogen production
- Solar: energy from the sun
- Tidal/hydrokinetics: energy from tidal currents
- Wind: energy from the motion of the wind



Efficiency

Making the most effective use of our world's limited resources and reducing pollution

- Smart grid: moving renewable electricity reliably and efficiently
- Catalysis: greener, cleaner, chemical conversions
- Combustion: energy with less pollution
- Energy auditing: keeping tabs on energy use
- Fuel cells: converting fuels to electricity
- IT and telecommunications: transmitting and processing information
- Lighting and display: illuminating our lives



Storage

Storing and transporting renewable energy at the lowest cost

- Mechanical storage: flywheels, pumped storage, compressed gas
- Batteries and capacitors: direct storage of electrical energy
- Distributed local storage vs. central utility-scale storage: considerations of cost and efficiency



Impacts

Learning how energy use and policy choices affect our society

- Climate impacts: how climate change alters our planet and our society
- Economics and policy: roles government can and should play
- Forest and natural resource management: sustainable resource use for this generation and the next
- Life cycle analysis: cradle-to-grave studies of products and processes

Energy at the UW

UW Energy-Oriented Leadership/Partnerships

- Smart grid: supply-side and demand-side technologies for management and efficiency improvements
- Metropolitan Business Plan: energy-efficient goods and services for the world
- Integration of electric car charging stations with UW Smart Grid grant (UW/DOE/PNNL)
- West Coast Green Highway Program (with WSDOT and industry)
- Mobility hubs (with WSDOT and industry)
- Environmental Innovation Challenge

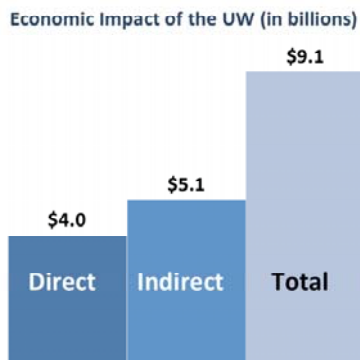
Student Involvement

Energy programs organized for and by students include:

- The Green Coalition
- Sierra Student Coalition
- Students Expressing Environmental Dedication
- UW Earth Club
- The CFL Exchange Project (a student-led energy saving project)

UW Economic Impact: \$9.1 Billion per Year

The UW educates our citizens, grows our economy, is the ultimate workforce provider in the region, and is 61% of the total labor force in Seattle.



- UW research funding creates both UW and Washington community jobs
- \$1.4 billion in sponsored research, supporting more than 22,262 jobs
- 260 companies started by UW students and faculty, or with UW technology
- Energy research translates into jobs in IT, electric vehicles, transportation, IT technologies, manufacturing, displays, LEDs, lighting, and building construction

Major Funded Grants, Centers, and Initiatives

- Ocean Observatories Initiative
- Oceans and Human Health Initiative
- CMDITR: Center for Materials and Devices for Information Technology Research (an NSF-funded Science and Technology Center)
- CLEAN Initiative: Clean, low-cost energy through advanced nanomaterials
- Bio-Resource Based Energy for Sustainable Societies
- JISAO Climate Impacts Group
- Center for Process Analysis and Control
- Program on the Environment
- Electrochemical Materials and Interfaces Laboratory
- Center for Enabling New Technologies Through Catalysis
- Biofuels and Bioproducts Laboratory
- Next City Initiative: Exploration of the critical links between urbanization and environmental sustainability
- Integrated Design Lab

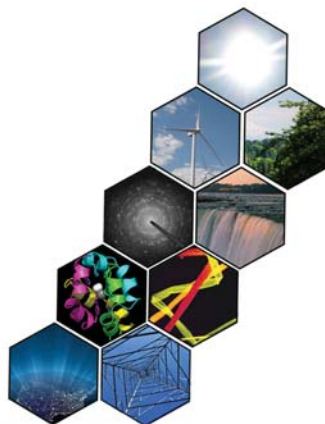
UW Energy Research Impact

The UW has over 125 faculty doing energy research

- The UW received \$90M in funding for energy research (FY10)
- The Ben Hall Building and the Molecular Engineering Building (under construction) house energy labs and faculty offices
- Energy research facilities include solar cell assembly, equipment for solar cell testing, a novel microscopy, and an electron beam lithography machine

Energy and Clean Technology

- Start-up companies: Lumera/GigOptix, Rosetta Software, Arzeda, EnerG2LLC, LivinGreen Materials, Pavia Systems, NIMBUS Technology, Usenso, Inc., FEFF Project Software, Luxel, 3Tier
- Multiple patents that include method and apparatus for assaying wood pulp fibers, unsupported electron transparent metal film and related methods, method for conducting nonlinear impedance spectroscopy, and steady streaming particle traps
- Technology licensing of Stabilized Plasma Light Source for EUV Lithography, WARP Plasma Simulation Code, and Electrochemical micromanufacturing system and method
- The new College of the Environment with the College of Built Environments cultivate communities who work with and learn from each other as they tackle the environmental challenges of the 21st century



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