Energy Policy, Green Jobs & the University

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UW Energy Institute

The Energy Institute integrates energy related activities across several centers and departments at UW – Madison.

RESEARCH: Catalyze interdisciplinary research to accelerate improvement and implementation of sustainable energy systems.

EDUCATION: Enhance educational programs and grow the student population studying energy issues.

OUTREACH: Work with industry and government to address state and national issues and raise public energy literacy.

Hard truths about energy

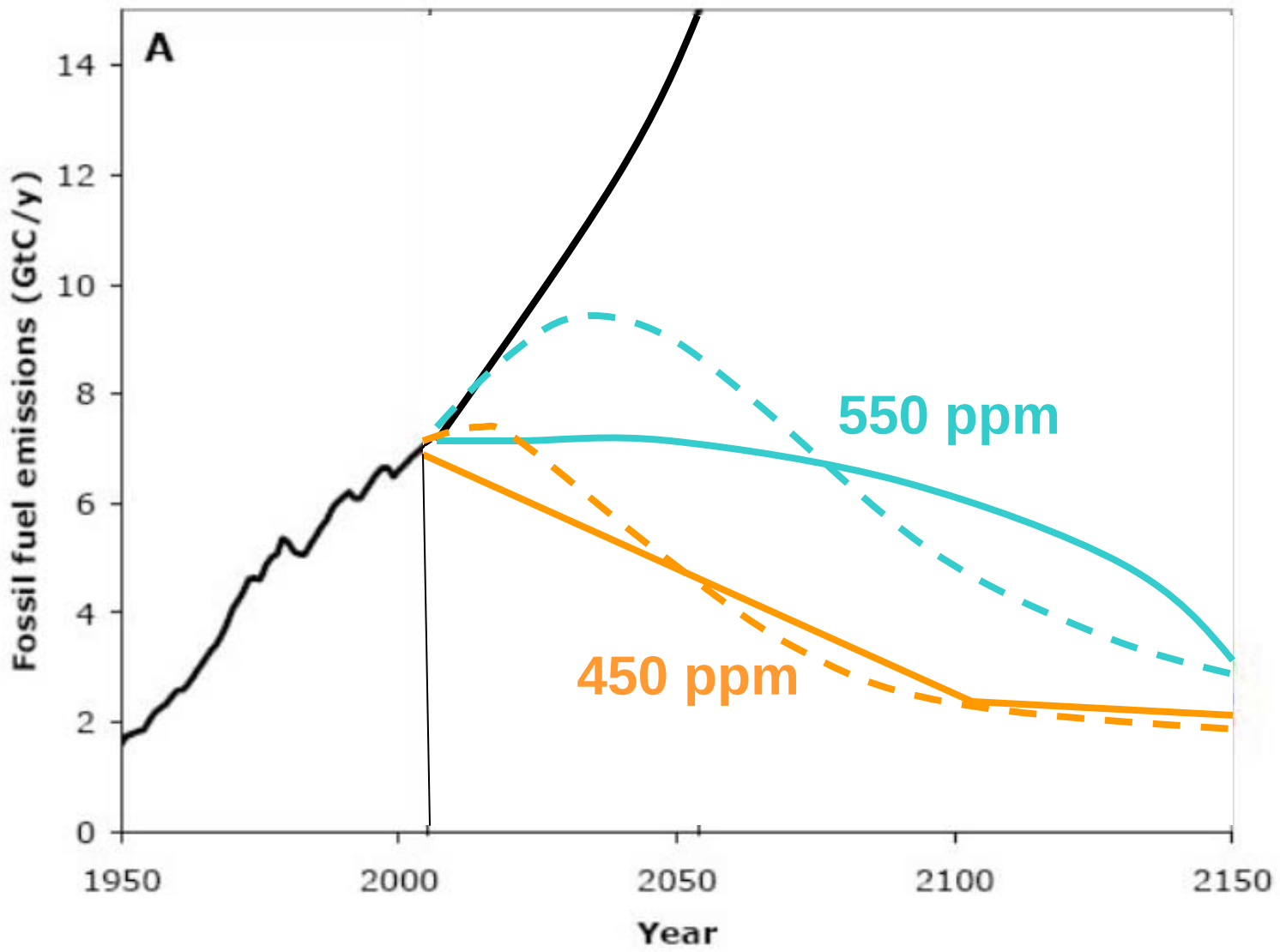
•There is step change in demand for energy driven by growing population and increasing prosperity.

•Easy oil and gas will not be able to match this pace of growth.

•Environmental stresses, both local pollution and climate change are increasing.

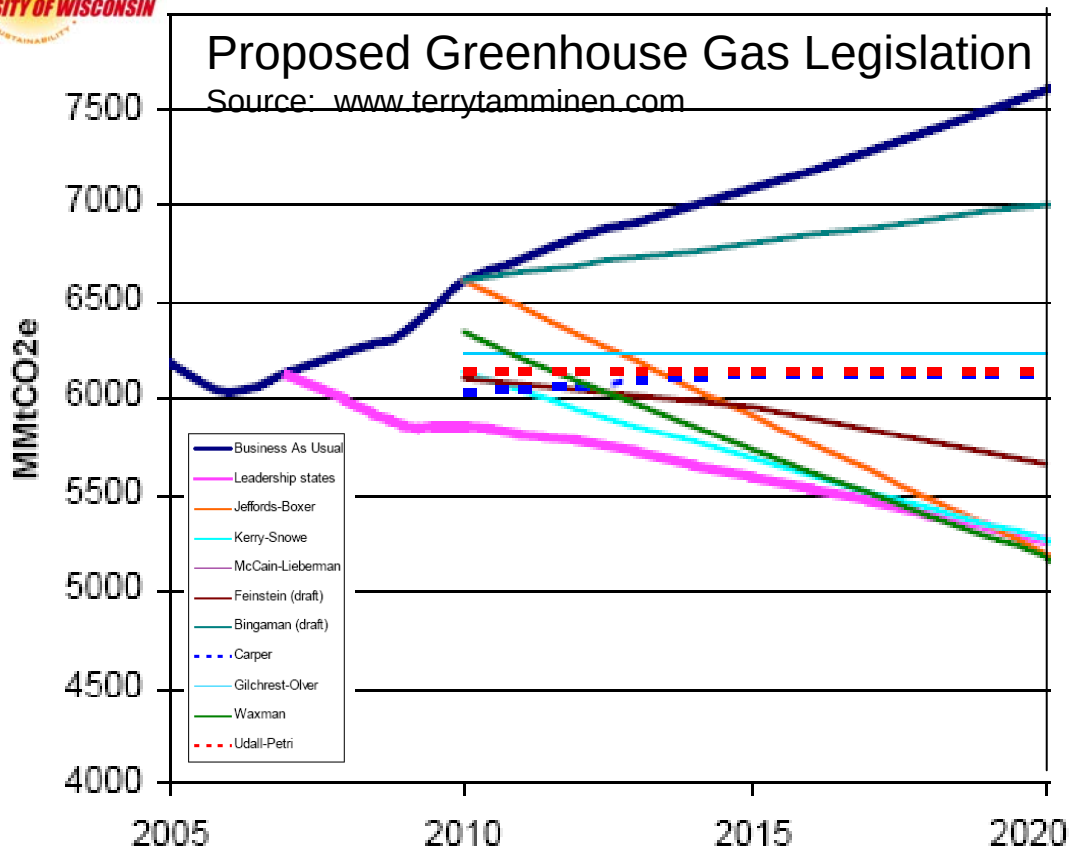
- Source: Shell Energy Scenarios to 2050: "Scramble and Blueprints"

Emission Scenarios for Greenhouse Gas Stabilization



Source: UW-Madison Energy Institute Presentation by Dr. Steve Koonin, Chief Scientist, BP October 17, 2006

Greenhouse gases complicate the already challenging energy supply problem.



<u>There are only three options:</u>
1) use less energy, 2) switch fuels, 3) capture emissions

Current legislation proposes aggressive near-term reductions in CO2 emissions.

Achieving 15% GHG reductions by 2020 is **HIGHLY UNLIKELY** without new "systems approaches" to efficient energy production and use.

This reality is not yet common knowledge.

Jobs and Workforce Development in the Clean Energy Economy

Center on Wisconsin Strategy (COWS)
A national policy center for high-road economic development.
www.cows.org/

Many stirring claims will be made in the name of "green jobs." But it is important to remember that many of these green jobs do not yet exist.

Tricky to determine how many ARE (or could be) employed in the wind industry.

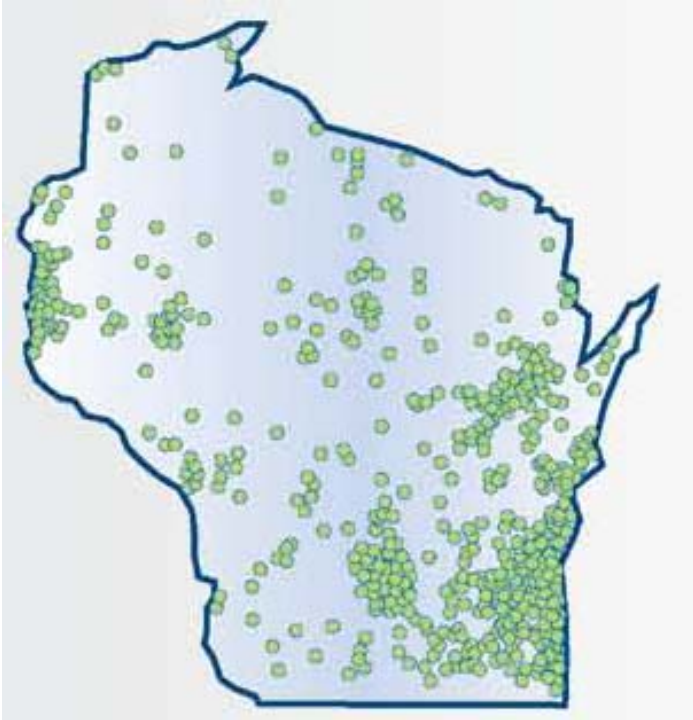
The wind industry will create work for scientists and engineers; analysts and forecasters; lawyers, financial analysts and marketing gurus.

Middle-skill jobs will be found in wind power installation (construction and transportation), wind farm maintenance and operations, and, above all, in wind turbine manufacturing.

Source: Sarah White, Senior Associate Center on Wisconsin Strategy

With continued growth, the American wind industry can be a tremendous jobs driver.

Wind Component Manufacturing
25,000 New Jobs
Source: REPP & Blue-Green Alliance



Wind manufacturing jobs look a lot like traditional manufacturing jobs. Close to 500 firms in Wisconsin that could participate. www.cows.org/

Source: COWS/DOL/BLS

	$/yr
Team assemblers*	26,640
Laborers and freight, stock, and material movers, hand*	26,940
Computer-controlled machine tool operators, metal and plastic	32,320
Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	29,830
Drilling and boring machine tool setters, operators, and tenders, metal and plastic	36,290
Customer service representatives*	34,970
Welders, cutters, solderers, and brazers*	36,080
Production, planning, and expediting clerks*	40,370
Machinists*	36,870
Maintenance and repair workers, general	40,330

Source: Sarah White, Senior Associate, COWS

If you put two green jobs together, will they make 6 more green jobs?

A green job is a good job: higher than poverty wages, paid sick leave, health care benefits, job security, safe working conditions. www.cows.org/

Much hype on green jobs – caution!

Do green jobs breed more green jobs?
Not necessarily. Economic models that project job creation typically count indirect and induced jobs...including a lot of low-wage jobs neither green in environmental effect nor good in quality.

Good news: Local Ownership Matters
Local ownership increases the jobs multiplier. Actual impact depends on depends on local economy, labor market etc. (cf Swensen and Farrell)

Source: Sarah White, Senior Associate Center on Wisconsin Strategy

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ENERGY INSTITUTE
UNIVERSITY OF WISCONSIN

Three Roles for the University

Research in the areas of energy technology, energy policy, energy systems and environmental assessment, business and economics

Student education & professional training

Assistance to state and federal decision-makers and industry stakeholders through objective data and analysis and a neutral forum to exchange ideas.

Technology Research

Renewable Technologies

Solar Energy Applications - Solar Energy Laboratory, Mechanical Engineering
Advanced PV Materials - Chemistry Department
Cellulosic Bioenergy - Great Lakes Bioenergy Research Center
Biodiesel conversion processes – Dep. Chemical & Biological Engineering
Global Bioenergy Issues - Center for Sustainability and Global Environment
Grid Integration of Wind – Dep. Electrical & Computer Engineering
Renewable Energy - Building Integration – Several Departments and Centers

Other Technologies

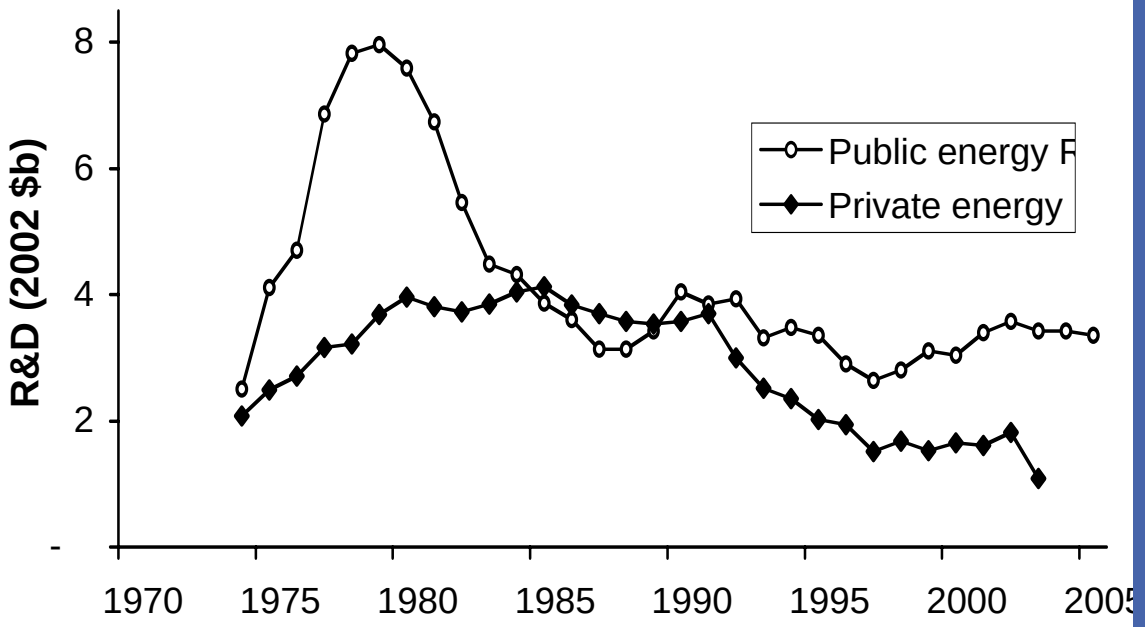
What is Green?

Some Realities

Scientific breakthroughs will occur and will lower cost, but impossible to predict what, where, or when.
Energy is bound by physical laws -- There will be no magic bullets.
Total R&D funding has declined historically.

U.S. investment in energy R&D

Prof. Greg Nemet – Lafollette School of Public Affairs



The New York Times

MONDAY, OCTOBER 30, 2006

Global Warming Proves a Tough Enemy as Research Budgets Fall

Decline in private

Stagnation in federal

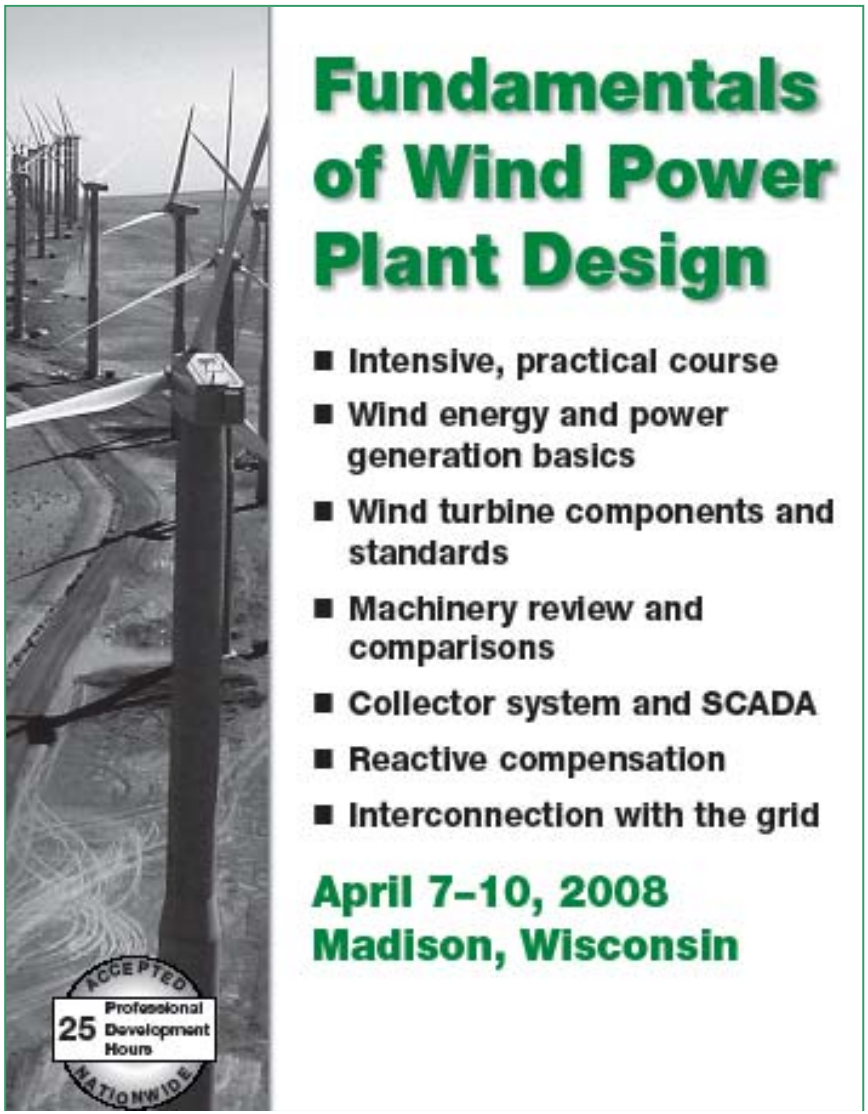
Some modest recent improvement

Still trivial amount of investment relative to size of industry and magnitude of challenges we face

Nemet, G. F. and D. M. Kammen (2007). "U.S. energy research and development: Declining investment, increasing need, and the feasibility of expansion." Energy Policy 35(1): 746-755.

Professional Education & Training

College of Engineering – Dep. of Engineering Professional Development



UW-Madison is the largest provider of continuing engineering education in the world.

In a typical year we train 12,500 professionals, representing 5,400 businesses in 400 courses.

UW-Madison has been delivering customer-focused continuing education for 60 years.
Energy-related topic areas include:
-Electrical Power Systems
-Building Facilities
-Industrial Systems

epdweb.engr.wisc.edu/

Energy Education

Freshman Engineering Design
2007: 24 students, 15 weeks, 2 turbines
Professor Giri V. , Electrical & Computer Engineering

Sample Courses

IES 402 - Energy Resources

Geo/IES 411 Renewable Energy Systems

BSE/IES 367 - Energy Society and Environment

CBE 5XX - Energy and Sustainability

ME/CBE 567 - Solar Engineering of Thermal Processes

NEEP 321 - Energy Conversion Technology

ECE 356 - Electric Power Processing for Alternate Energy Systems

Provide Innovative Outreach
Working with Industry Stakeholders

Institute Lunch

Wind Energy: Prospects for Growth in Wisconsin

February 27, 2008
Room 1003 Tong Auditorium, Engineering Centers Building
1550 Engineering Drive, Madison WI (map)

WPUI and the UW Energy Institutue are Honored to Provide a Preview of AWEA's Report Due Out in Early-March

The Wisconsin Public Utility Institute and the UW Energy Institute are hosting a wind energy event on February 27. This event will provide a pre-release review of the much anticipated American Wind Energy Associations forthcoming national assessment, "20% Wind Energy by 2030". In addition to the economic and technical forecast for wind, permitting, siting, transmission, and supply chain issues, both materials and labor, necessary to achieve this vision will be covered.

All presentations are available for web-streaming: http://www.energy.wisc.edu/presentations/

Preview of 20% Wind Report
Jeff Anthony, AWEA

Transmission Expansion Beth Soholt, Wind on the Wires

Permitting Wind ProjectsMichael Vickerman, RENEW Wisconsin

Limits, Impacts and Costs in the Midwest
Dale Osborn, Midwest ISO

Is the Supply Chain Ready to Meet Demand?
Craig Mataczynski, RES

Implications for Jobs in Wisconsin
Sarah White, Center on Wisconsin Strategy

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