

THE LABOR INTENSITY OF ENERGY

Andrew Dorn

adorn@kentlaw.edu

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This is a presentation about jobs.

PRESENTATION OVERVIEW

- Motivation
- Methodology
- Corrections to Methodology
- Results
- Halftime
- Long term impacts
- Conclusions



WHY WAS LABOR INTENSITY CALCULATED

- Economic Recession
 - March 2009 Unemployment
 - Illinois: 9.1%
 - National: 8.5%
- Green Jobs
 - Obama: 5 Million Green Collar Jobs

I WOULD PREFER TO BE IN THE LATTER GROUP

The Opportunity of Wind

- Wind industry jobs jumped to 85,000 in 2008, a 70% increase from the previous year, according to a report released Tuesday from the American Wind Energy Association.
- Wind accounted for 42% of all new electricity generation installed last year in the U.S. Power.

Opportunity in Illinois

Invenergy Wind LLC and GE have teamed up to expand the Grand Ridge Energy Center in Illinois with 74 wind turbines—increasing the total generation capacity by more than 110 megawatts. That's enough to power 30,000 homes on purely renewable energy.

No word on exactly how many jobs the project will create, but labor will be needed to build and install the turbines. And that's the stimulus at its best: renewable energy project + new green jobs = permanent sustainable energy generation. Illinois's wind farm is just the latest example: in Wisconsin Rapids, a wind turbine blade factory just opened up, and will provide 400 jobs to the city.

Michigan Jumps in

- Michigan's renewable portfolio standard may be starting a shift in the state's manufacturing sector from the automotive industry to clean tech. According to the story, Global Wind Systems Inc. will add 250 wind turbine manufacturing jobs this year, with 90% of the new hires coming from the state's growing pool of former auto workers. The state law requires utilities to provide 10% of electricity from renewable sources by 2015.

There are even opportunities in IOWA

- Iowa now has 2,791 megawatts installed versus California's 2,517 megawatts. Wind power now makes up 7.48% of Iowa's electricity mix.
- Minnesota in fourth place with 1,754 megawatts (7.1% of their electricity mix).
- The states with the fastest growth rate are Indiana (going from 0 to 131 MW in one year), followed by Michigan (48%), Utah (21%), New Hampshire (17%) and Wisconsin (6%).

Wind Could Replace Coal

- Windmills off the East Coast could generate the same amount of electricity as 3,000 coal-fired power plants, but oil and natural gas drilling will continue to be part of the nation's energy equation, Interior Secretary Ken Salazar said today.
- The secretary spoke at a public hearing in Atlantic City on how the nation's offshore areas can be tapped to meet America's energy needs now that a moratorium on offshore oil drilling has expired. A decision on whether to allow drilling for oil and gas off the East Coast still has to be made.

WHAT IS LABOR INTENSITY?

- Labor Intensity is the amount of People that it takes to generate one TWh in one year.
- This presentation will discuss the labor intensity of both coal generation and wind generation.
- And answer the question of whether we can create green jobs by switching from coal to wind power.

HOW IS LABOR INTENSITY CALCULATED

Number of Jobs in
the Industry

Number of TWh
Generated by
the Industry



LABOR INTENSITY: WIND

- 85,000 people employed by the wind industry
- 48 TWh generated by wind turbines
- $85,000/48 = \text{Labor Intensity}$



LABOR INTENSITY: COAL

- Found 4 midwestern power plants: Homer City, Powerton, Fisk and Crawford
- Take annual output at each plant.
- Divide by number of employees at each plant.
- Average by plant.
- Correct to include management (1.2)
- Back Calculate total Jobs (about 250,000)
- Divide calculated Jobs by calculated energy

RESULTS

ORIGINAL			
	ELEC. GEN	JOBS	JOBS/TWh
	TWh		
WIND	48	85,000	1,771
COAL	2,000	240,000	120
		RATIO	14.76

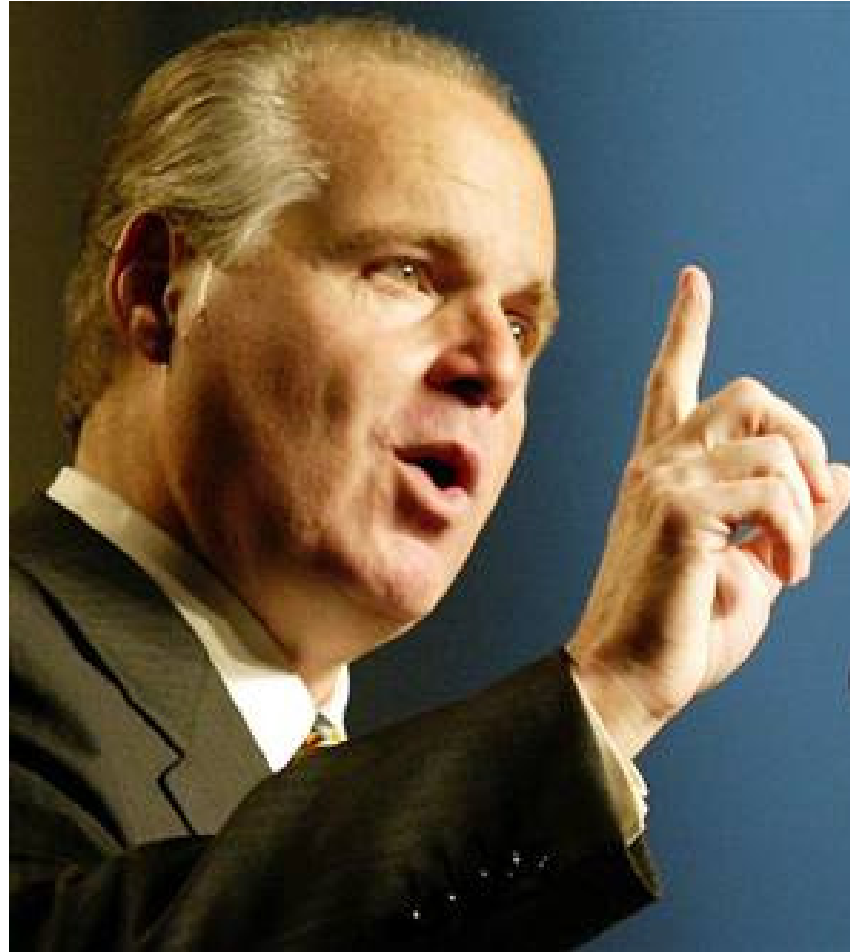
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**WE CAN REPLACE EVERY COAL JOB
WITH 15 GREEN JOBS**

HEADLINE NEWS

- **“Wind jobs outstrip coal”**
 - Wind industry jobs jumped to 85,000 in 2008, a 70% increase from the previous year, according to a report released Tuesday from the American Wind Energy Association. In contrast, the coal industry employs about 81,000 workers.
 - Fortune, Green Wombat, January 28, 2009

This sounds like a left wing conspiracy



I MAY HAVE MADE A MISTAKE; SOMETIMES I'M WRONG

REVISED HEADLINE

- **“Wind jobs outstrip coal mining”**
 - Wind industry jobs jumped to 85,000 in 2008, a 70% increase from the previous year, according to a report released Tuesday from the American Wind Energy Association. In contrast, the coal industry mining employs about 81,000 workers.
 - Fortune, Green Wombat, a few hours later.

TAKING ANOTHER LOOK AT WIND

- 15,000 of wind jobs are manufacturing
- 8,000 more are short term installation.
- Revised:
 - Green Jobs REDUCED from 85,000 to 62,000
 - Labor Intensity REDUCED from to 1,771 to 1,292 Jobs/TWh

TAKING ANOTHER LOOK AT COAL

- Maybe choosing the oldest dirtiest plants was not the best idea.
- Introduced data from Sources.
- I also forgot those coal miners.
- Revised:
 - Dirty Jobs INCREASED from 250,000 to 350,000
 - Labor intensity INCREASED from 120 to 175 Jobs/TWh



NOW COMPARE

REVISED			
	ELEC. GEN	JOBS	JOBS/TWh
	TWh		
WIND	48	62,000	1,292
COAL	2,000	350,000	175
		RATIO	7.62

HALFTIME CONCLUSIONS

- Shifting to Wind electricity generation will create significant green jobs.
- I would recommend building as many wind farms as possible.
- But what happens when we can't build anymore?



GROWTH INDUSTRY

- Wind power generation was up 50 percent in the U.S. last year, according to an [industry report](#) released today.
- The [American Wind Energy Association](#) said 8,545 megawatts of wind power were added in 2008, up from 5,249 MW added in 2007.

Coal is not expanding

- Since the beginning of 2007, 95 proposed coal-fired power plants have been canceled or postponed in the United States--59 in 2007, 24 in 2008, and at least 12 in the first three months of 2009. This covers nearly half of the 200 or so U.S. coal-fired power plants that have been proposed for construction since 2000.
- The vast majority of the remaining proposals are essentially on hold, awaiting word on whether the Environmental Protection Agency (EPA) is going to impose limits on carbon dioxide (CO₂) emissions.

WHAT COULD POSSIBLY HAPPEN?

SLOWDOWN

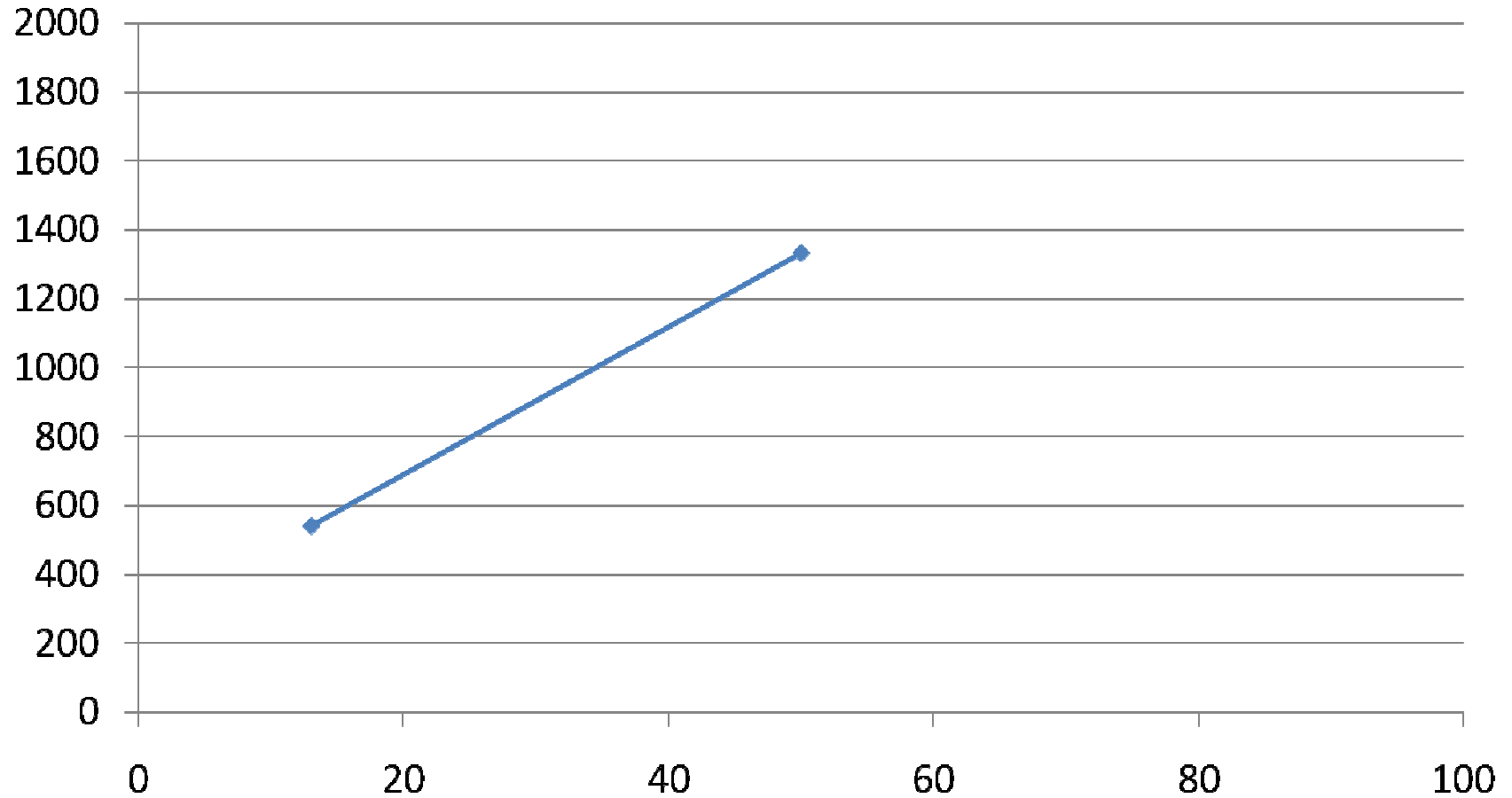
“Following record growth in 2008 . . . the U.S. wind industry has slammed on the brakes, scrambling to adjust production and staffing to slowing demand. In early January, about **180 workers lost their jobs at Madrid-based turbine maker Gamesa’s** eastern Pennsylvania facility, and **North Dakota’s DMI Industries announced plans to lay off 20 percent of its workforce.** A few weeks later **Clipper Windpower laid off 90 workers** at its Ceder Rapids, Iowa plant. These latest cuts . . . suggest the storm has yet to blow over.”

HISTORICAL DATA (1991)

- WIND LABOR INTENSITY = 542 Jobs/TWh.
- WIND GROWTH RATE = 13 %
- WIND Labor Intensity appears to be heavily dependant on growth.



Labor Intensity vs. Growth Rate



FINDING A LONG TERM ANSWER

MATURE			
	ELEC. GEN	JOBS	JOBS/TWh
	TWh		
WIND	500	150,000	300
COAL	2,000	350,000	175
		RATIO	1.71

CONCLUSIONS

- Increasing the use of wind will create Green Jobs long term
- Many Jobs will be short term manufacturing and construction heavily dependant of growth

THE END