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**National Renewable Energy Laboratory**

*Innovation for Our Energy Future*

# **Green Jobs and Economic Development from Wind Power**

Suzanne Tegen

April 15, 2009

10am – 12pm MDT

# Panel & Agenda

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- Introductions
- Jobs and Economic Development from Wind – **Suzanne Tegen**, NREL
- Wind Power Jobs in the U.S. – **George Sterzinger**, Renewable Energy Policy Project
- Rural and Regional Benefits – **Ken Starcher**, Alternative Energy Institute
- ARRA and Clean Energy – **Ted James**, Strategic Energy Analysis Center, NREL
- Q&A



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# Jobs and Economic Development Impacts (JEDI) from Wind Power



**Suzanne Tegen**  
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**April 15, 2009**



“It seems only natural for rural utilities to do everything they can to advance both farm-based renewable energy development and rural economic development in a cost-effective way. In my opinion, wind energy is the **next great chapter in the rural electrification** story.”

*Aaron Jones, Washington Rural Electric Cooperative Association;  
Olympia, WA*



“Wind is a **homegrown energy** that we can harvest right along side our corn or soybeans or other crops. We can use the energy in our local communities or we can export it to other markets. We need to look carefully at wind energy as a source of **economic growth** for our region”

*David Benson, Farmer and County Commissioner, Nobles County, Minnesota*

# Major Economic Impacts

Near the project (usually rural):

- **Jobs**
- **Landowner revenues**
- **Property tax revenues**

Other :

- **Manufacturing**



# The JEDI model

## Jobs and Economic Development Impacts

JEDI estimates jobs and economic impacts to a local community where wind energy is developed.

JEDI traces linkages in the economy: what are economic impacts from dollars spent on the wind project?

JEDI results include short and long-term **jobs, wages and salaries earned, and increases in overall economic activity.**

JEDI uses data from MIG's IMPLAN (Impact Analysis for Planning) based on state spending patterns.

# Wind Energy's Economic impacts

## *Wind energy's economic "ripple effect"*

### On-site & Proj. Development Labor



Construction workers  
Management  
Administrative support  
Cement truck drivers  
Road crews  
Maintenance workers  
Legal and siting

### Off-site and Supply Chain

Blades, towers, gear boxes  
  
Boom truck & management, gas and gas station workers  
  
Supporting businesses, such as bankers financing the construction, contractor, manufacturers and equipment suppliers. Utilities.  
  
Hardware store purchases and workers, spare parts and their suppliers

### Induced Impacts

Jobs and earnings result from the spending supported by the project, including benefits to grocery store clerks, retail salespeople and child care providers.

# On-site & project development labor - construction



Truck drivers, crane operators



Earth moving, cement pouring



Management and support

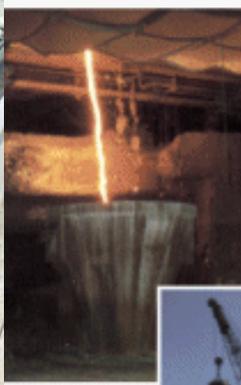


Construction

# Off-site and supply chain jobs, services, materials



Blade and tower manufacturers



Steel mill jobs, parts, services  
Photos: E.C.Levy, Inc, Detroit, MI



Property taxes



Financing, banking, accounting



Equipment manufacturing and sales



# Induced jobs, services, materials

Money spent on local area goods and services: sandwich shops, child care, grocery stores, clothing, other retail, public transit, new cars, restaurants, medical services.



# JEDI based on actual projects: Iowa

## 240-MW Iowa wind project

- \$640,000/yr in lease payments to farmers
- \$2M/yr in property tax revenues
- \$5.5M/yr in O&M income
- **40 long-term jobs**
- **200 short-term construction jobs**
- **Manufacturing**



# Typical results from U.S. wind projects

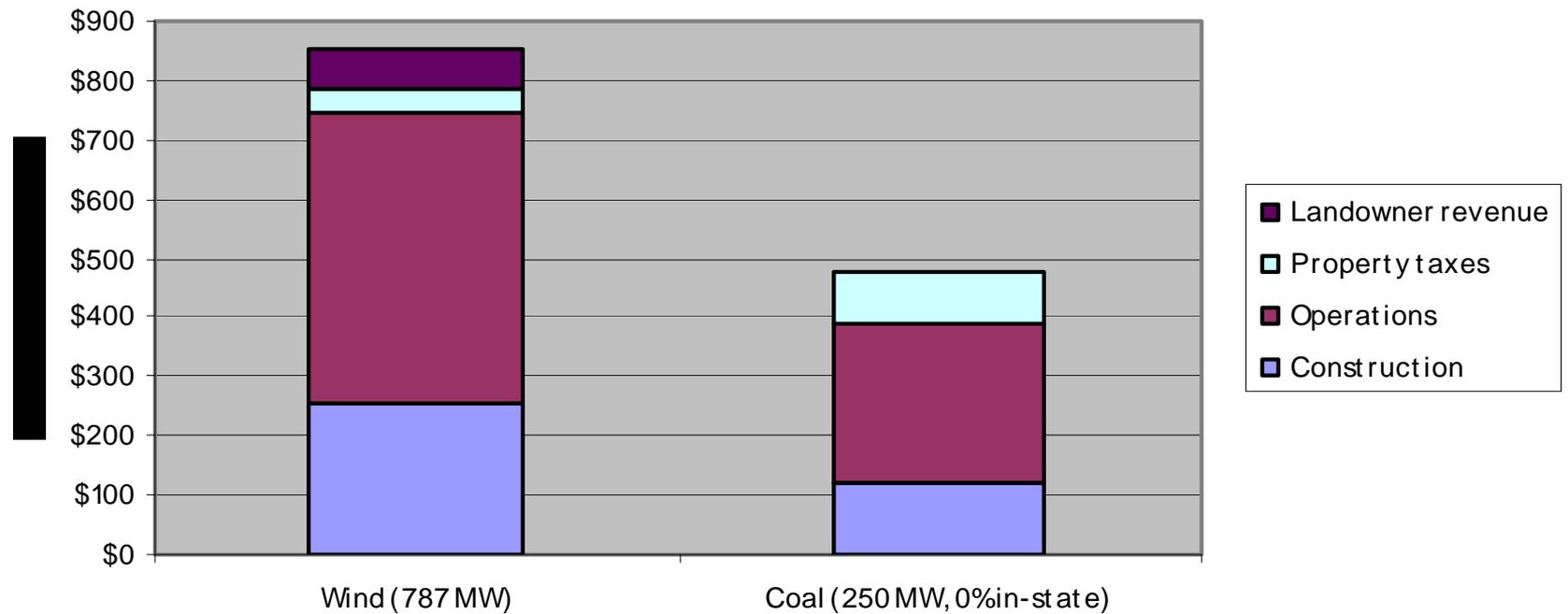
Land Lease revenue	3-6% of gross project revenue or <b>\$3,500-5,000/MW per year</b>
Local property tax revenue	<b>\$500,000 - \$1million/year</b> for a 100-MW project
Construction jobs	<b>100 jobs</b> for 100 MW
O&M jobs	<b>6+ jobs</b> for a 100-MW project
Local industry (concrete, roads, environmental, siting)	
Local manufacturing	



\*Jobs are listed as full-time equivalents

# Wind and Coal Economic Impacts

**Total Economic Impacts from energy equivalent new wind and new coal**



2007 inputs

# Download the JEDI Model

www.windpoweringamerica.gov



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Economic Development

- JEDI Model
  - Economic Impact Studies
  - Resource & Tools
- Policy  
Siting

### Wind Economic Development

This page provides software applications for developers, local governments, and utilities about wind power. The page also provides and articles about economic development from wind projects.

Projecting costs and benefits of new installations, economic development impacts created, is looking at potential wind applications. Con regions, jobs (i.e., construction, operation the tax base, tax revenues, and others ca affected. These benefits are in addition to owner or developer.

### Job and Economic Development In

The Job and Economic Development Impact user-friendly tool that calculates economic projects. It allows you to easily identify th impacts associated with constructing and power plants. JEDI is for wind developers, advocates, government officials, decision



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Energy Analysis

### JEDI Job and Economic Development Impact Models

About JEDI

Help

The Job and Economic Development Impact, or JEDI, models are easy-to-use models that analyze the economic impacts of constructing and operating power generation and biofuel plants at the local and state level. First developed to model wind energy development impacts, JEDI has expanded. We now offer models to analyze the job and economic impacts of biofuel plants and concentrating solar power, coal and natural gas power plants.

On this site, you can learn more [about JEDI](#), download the models for free, and get [help](#).

### Downloading the JEDI Models

Upon acceptance of a required User Agreement, the JEDI models are available to download. To begin downloading a model, select the model below:

#### JEDI Wind Energy Model

- Wind Model rel. W1.08.02a ([Excel 563 KB](#))

#### JEDI Biofuel Model

- Corn Ethanol Model rel. CE1.08.01 ([Excel 667 KB](#))

#### JEDI Solar Model

- CSP Trough Model rel. CSP1.08.01 ([Excel 705 KB](#))

#### JEDI Natural Gas Model

- NGas Model rel. NG1.08.01 ([Excel 604 KB](#))

#### JEDI Coal Model

- Coal Model rel. C1.08.03 ([Excel 605 KB](#))

# 2009 Wind Manufacturing Headlines

## Toledo: Edco Inc. re-tools for wind turbines Machine shop switches industry focus

April 2, 2009

### New plant to create 400 jobs in Wisconsin Rapids

By Nathaniel Shuda

Gannett Wisconsin Media

WISCONSIN RAPIDS -- A Wisconsin Rapids-based company will **create at least 400 jobs** with a manufacturing plant it will build "as soon as practicable," the company's top executive said Tuesday.

Energy Composites Corp., the parent company of Advanced Fiberglass Technologies, will **produce blades for wind turbines as part of its planned \$15 million company expansion**, chief executive officer Sam Fairchild said.

## Story City wind turbine repair plant to break ground

[March 31, 2009](#)

by Pat Powers, Webster City

Next Era Energy of Juno Beach, Florida, will construct the plant that will bring **25 new jobs** to the Story County community, just north of Ames.

## Acciona lays off third of WB plant staff; GM fully expects rebound

by Gregory R. Norfleet · March 19, 2009

The economic downturn prompted Acciona Windpower to announce today, March 19, that it would **lay off about one-third of its workforce from its West Branch assembly plant.**

**The company issued a press release that it would lay off 65 employees**, with 58 of them working at the turbine plant on the south side of the city. The company employs 188 here.

## Laid-off workers return in Aberdeen

*March 14, 2009* ABERDEEN, S.D. (AP) - In January, the Molded Fiber Glass plant in Aberdeen laid off about 30 people. Earlier this week, the company announced **they have been called back to work.**

And Richard Morrison, head of the Ohio-based company, says **Molded Fiber Glass is taking applications to fill more jobs.** More than 200 people work at the plant, which makes wind turbine blades for General Electric.

## Wind turbine plant could bring 335 jobs to Fort Smith

Arkansas: 3/20/09



## Great Lakes Wind Manufacturing Opened and Announced Wind Turbine Component Manufacturers Located Near or In the Great Lakes Region



- 1) Cast Fab Technologies
- 2) Magna Machine Co
- 3) WebCore
- 4) Gamesa
- 5) Minster Wind
- 6) Brevini
- 7) Fairfield Manufacturing
- 8) Trinity Structural Towers
- 9) Canton Drop Forge
- 10) Byrne
- 11) Hodge Foundry
- 12) GE
- 13) Rotek
- 14) ATI Casting
- 15) Kalt Manufacturing
- 16) Avon Bearings
- 17) Advance Manufacturing
- 18) Horsburgh & Scott
- 19) Federal Gear
- 20) Dyson Corp.
- 21) Great Lakes Towers
- 22) Danotek
- 23) Three M Tool & Machine
- 24) Creative Foam
- 25) Dowding Machine
- 26) ETM Enterprises
- 27) Merrill
- 28) ATI Casting
- 29) Carlton Creek Iron Works
- 30) K&M Machine Fabricating
- 31) Cardinal Fasteners
- 32) Centa Corp
- 33) Brad Foote Gear Works
- 34) Siemens
- 35) Winergy
- 36) Wausaukee Composites
- 37) Milwaukee Gear
- 38) Tower Tech
- 39) Bassett Mechanical
- 40) Plexus
- 41) Energy Composites
- 42) Merit Gear
- 43) Wausaukee Composites

# Matchmakers in Ohio

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**Great Lakes WIND Network** connects leaders from manufacturing companies serving the wind industry:

- We help create new business opportunities
- We link buyers with sellers
- We provide assessment and coaching services to manufacturers
- We educate on market needs and trends
- We provide manufacturers with a voice for sound public policy

[www.wire-net.org](http://www.wire-net.org) and look for Great Lakes Wind Network

# Wind Energy Education & Training

Examples of Technical College and University Programs include:

- Iowa Lakes Community College
- University of Texas at Austin
- Kalamazoo Valley Community College
- Columbia Gorge Community College (OR)
- Oklahoma City Community College
- Lansing Community College (MI)
- Mesa Lands Community College (NM)
- Laramie Community College (WY)
- University of Houston Wind Energy Center
- Cerro Coso Community College (CA)
- Wind Applications Centers (ID, CO, KS, MT, NE, SD)



*"We look to the community college for the main source of our folks," Hackett said. "We're going to run out of people and we do need the training for the skilled work force desperately." - Gary Hackett, Manager of PGE's Biglow Canyon wind farm (Oregon)*

**Wind for Schools Project:** turbines and curriculum at schools

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