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# Job and Economic Development Impact (JEDI) Model: A User-Friendly Tool to Calculate Economic Impacts from Wind Projects

*The economic impacts from wind energy project development can be significant to both the rural counties and the state in which the project is located. The benefits that are generated by the expenditures, both during the construction and the operations phases of wind plants, depend on the extent to which those expenditures are spent locally, as well as the structure of the local and state economy. JEDI, the National Renewable Energy Laboratory's economic development model, is an easy-to-use tool that provides an approximation of the economic impacts to the local county and the state that can be generated from wind project development, during the construction phase of the project and throughout the 20- to 30-year life of the project.*

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## How Does JEDI Work?

### Inputs

The user enters data specific to the project or group of projects, including:

- Year of installation
- Size of project
- Location
- Cost (\$/kW)
- Any other available site-specific information.

When specific data are unavailable, the model uses default values based on data from actual wind projects.

### Outputs

JEDI provides direct, indirect, and induced economic impacts for the construction and operating periods of any size project. The three summary categories in the model are:

- Jobs
- Earnings
- Output (economic activity).





The model evaluates and sums the various impacts, including direct, indirect, and induced effects. State-specific multipliers and personal expenditure patterns are used to derive the results.

In its default form, state-specific analyses can be conducted. County or regional analyses require revisions to the multipliers.

### **Who Should Use JEDI?**

JEDI should be used by anyone interested in identifying local economic impacts associated with constructing and operating wind power plants.

The model is designed in a user-friendly format that can be easily modified to accommodate varying levels of project-specific information and user skill. The tool is designed for those who have basic or detailed information about a wind project.

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where energy is clean, abundant,  
reliable, and affordable

# Example of a County-Specific Analysis (Weld County, CO)

Other Parameters		Local Share
<b>Financial Parameters</b>		
<b>Debt Financing</b>		
Percentage financed	80%	0%
Years financed (Term)	10	
Interest rate	10%	
<b>Equity Financing/Repayment</b>		
Percentage equity	20%	
Individual investors (percent of total equity)	0%	100%

Wind Plant Annual Operating and Maintenance Costs				
	Cost	Cost Per KW	Percent of Total Cost	Local Share
<b>Personnel</b>				
Field Salaries	\$193,878	\$4.85	38.8%	100%
Administrative	\$51,020	\$1.28	10.2%	100%
Management	\$153,061	\$3.83	30.8%	100%
Personnel Subtotal	\$397,959	\$9.95	79.8%	
<b>Materials and Services</b>				
Vehicles	\$7,143	\$0.18	1.4%	100%
Misc. Services	\$20,408	\$0.51	4.1%	80%
Fees, Permits, Licenses	\$7,143	\$0.18	1.4%	100%
Utilities	\$20,408	\$0.51	4.1%	100%

Input

Project Cost Data				
	Cost	Cost Per KW	Percent of Total Cost	Local Share
<b>Construction Costs</b>				
<b>Materials</b>				
Construction (concrete, rebar, equip, roads and site prep)	\$2,101,457	\$53	5.3%	90%
Transformer	\$530,856	\$13	1.3%	0%
Electrical (drop cable, wire, )	\$248,953	\$6	0.6%	100%
HV line extension	\$457,634	\$11	1.1%	100%
Materials Subtotal	\$3,338,900	\$83	8.3%	
<b>Labor</b>				
Foundation	\$183,054	\$5	0.5%	100%
Erection	\$183,054	\$5	0.5%	75%
Electrical	\$201,359	\$5	0.5%	75%
Management/supervision	\$109,832	\$3	0.3%	0%
Labor Subtotal	\$677,299	\$17	1.7%	
Construction Subtotal	\$4,016,199	\$100	10.0%	

Project Descriptive Data		MY COUNTY
Project Location		2004
Year of Construction		40
Project Size - Nameplate Capacity (MW)		1,500
Turbine Size (KW)		27
Number of Turbines		\$1,000
Construction Cost (\$/KW)		\$12.50
Annual Direct Operations and Maintenance Cost (\$/kW)		2004
Money Value - Current or Constant (Dollar Year)		n
Utilize Model Default Values (below)? (Y or N)		Review/Enter Data below

Output

Wind Plant - Project Data Summary	
Year of Construction	2004
Project Location	Weld, CO
Project Size - Nameplate Capacity (MW)	40.0
Turbine Size (KW)	1500
Number of Turbines	27
Construction Cost (\$/KW)	\$1,000
Annual Direct O&M Cost (\$/KW)	\$12.50
Money Value (Dollar Year)	2004
Project Construction Cost	\$40,000,000
Local Spending	\$5,090,463
Total Annual Operational Expenses	\$7,024,000
Direct Operating and Maintenance Costs	\$500,000
Local Spending	\$312,648
Other Annual Costs	\$6,524,000
Local Spending	\$508,000
Debt and Equity Payments	\$0
Property Taxes	\$400,000
Land Lease	\$108,000

# County-Specific Multipliers

**Multipliers For Economic Input-Output Analysis** **Personal Consumption Expenditures**

MyCounty (name)   
 MyRegion (included)

**Jobs Per Million Dollars Change in Final Demand**

Jobs Direct Multipliers	MyCounty	MyRegion
Agriculture	0.000	0.000
Mining	0.000	0.000
Construction	8.356	0.000
Manufacturing		
Fabricated Metals		
Machinery		
Electrical Equipment		
TCPU		
Wholesale Trade		
Retail Trade		
FIRE		
Misc. Services		
Professional Services		
Government		

**Jobs Indirect Multipliers** MyCounty MyRegion

Agriculture	0.000	0.000
Mining	0.000	0.000
Construction	0.000	0.000
Manufacturing		
Fabricated Metals		
Machinery		
Electrical Equipment		
TCPU		
Wholesale Trade		
Retail Trade		
FIRE		
Misc. Services		
Professional Services		
Government		

**Jobs Induced Multipliers** MyCounty MyRegion

Agriculture	5.170	0.000
Mining	4.447	0.000
Construction	7.258	0.000
Manufacturing	6.172	0.000
Fabricated Metals	6.176	0.000
Machinery	6.577	0.000
Electrical Equipment	5.425	0.000
TCPU	6.454	0.000
Wholesale Trade	7.194	0.000
Retail Trade	7.451	0.000
FIRE	3.685	0.000
Misc. Services	8.972	0.000
Professional Services	8.301	0.000
Government	11.480	0.000

**Earnings Per Million Dollars Change in Final Demand**

**Earnings Direct Multipliers** MyCounty MyRegion

Agriculture	0.046	0.000
Mining	0.000	0.000
Construction		
Manufacturing		
Fabricated Metals		
Machinery		
Electrical Equipment		
TCPU		
Wholesale Trade		
Retail Trade		
FIRE		
Misc. Services		
Professional Services		
Government		

**Earnings Indirect Multipliers** MyCounty MyRegion

Agriculture	0.222	0.000
Mining	0.144	0.000
Construction		
Manufacturing		
Fabricated Metals		
Machinery		
Electrical Equipment		
TCPU		
Wholesale Trade		
Retail Trade		
FIRE		
Misc. Services		
Professional Services		
Government		

**Earnings Induced Multipliers** MyCounty MyRegion

Agriculture	0.124	0.000
Mining	0.105	0.000
Construction	0.172	0.000
Manufacturing	0.147	0.000
Fabricated Metals	0.147	0.000
Machinery	0.157	0.000
Electrical Equipment	0.129	0.000
TCPU	0.153	0.000
Wholesale Trade	0.171	0.000
Retail Trade	0.177	0.000
FIRE	0.089	0.000
Misc. Services	0.213	0.000
Professional Services	0.198	0.000
Government	0.270	0.000

**Output Per Million Dollars Change in Final Demand**

**Output Direct Multipliers** MyCounty MyRegion

Agriculture	1.000	0.000
Mining	1.000	0.000
Construction		
Manufacturing		
Fabricated Metals		
Machinery		
Electrical Equipment		
TCPU		
Wholesale Trade		
Retail Trade		
FIRE		
Misc. Services		
Professional Services		
Government		

**Output Indirect Multipliers** MyCounty MyRegion

Agriculture	1.296	0.000
Mining	0.000	0.000
Construction		
Manufacturing		
Fabricated Metals		
Machinery		
Electrical Equipment		
TCPU		
Wholesale Trade		
Retail Trade		
FIRE		
Misc. Services		
Professional Services		
Government		

**Output Induced Multipliers** MyCounty MyRegion

Agriculture	0.430	0.000
Mining	0.373	0.000
Construction	0.613	0.000
Manufacturing	0.514	0.000
Fabricated Metals	0.517	0.000
Machinery	0.549	0.000
Electrical Equipment	0.452	0.000
TCPU	0.536	0.000
Wholesale Trade	0.605	0.000
Retail Trade	0.631	0.000
FIRE	0.306	0.000
Misc. Services	0.756	0.000
Professional Services	0.696	0.000
Government	0.982	0.000

# Output

**Local Economic Impacts - Summary Results**

	Jobs	Earnings	Output
<b>During construction period</b>			
Direct Impacts	42	\$1.37	\$5.09
Construction Sector Only	32	\$1.08	\$4.28
Indirect Impacts	27	\$0.86	\$3.54
Induced Impacts	34	\$0.89	\$3.19
<b>Total Impacts (Direct, Indirect, Induced)</b>	<b>103</b>	<b>\$3.12</b>	<b>\$11.81</b>
<b>During operating years (annual)</b>			
Direct Impacts	11	\$0.31	\$0.53
Plant Workers Only	8	\$0.25	\$0.25
Indirect Impacts	2	\$0.06	\$0.26
Induced Impacts	8	\$0.20	\$0.71
<b>Total Impacts (Direct, Indirect, Induced)</b>	<b>20</b>	<b>\$0.57</b>	<b>\$1.51</b>

Note: Totals may not add up due to independent rounding.



## Features

- JEDI is designed for all levels of users; experience with spreadsheets and background in economic modeling are not required to use this tool.
  - Online instructions for entering data are included.
  - Detailed information is included to help users understand the type of data required for specific cells.
  - Default data include state-specific multipliers.
  - JEDI features flexible input options – users can enter as much or as little project-specific information as is available, including expenditures and local share of spending.
  - JEDI provides detailed construction spending and annual O&M expenditures, as well as the portion of local spending.
  - JEDI identifies local spending on debt and equity payments, property taxes, and land lease payments.
  - JEDI analyzes local jobs, earnings, and output (economic activity), including one-time impacts from the construction phase and annual or ongoing impacts from operations.
  - User Add-In Location feature allows user to model county or regional impacts.
  - Model includes economic data through 2000.
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## For More Information and to Access JEDI

<http://www.windpoweringamerica.gov>

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**Wind and Hydropower Technologies**

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