

JEDI II: JOBS AND ECONOMIC DEVELOPMENT IMPACTS FROM COAL, NATURAL GAS, AND WIND POWER

Suzanne Tegen

National Renewable Energy Laboratory
Golden, Colorado

Marshall Goldberg

MRG & Associates
Nevada City, California

Michael Milligan, Consultant

National Renewable Energy Laboratory
Golden, Colorado

How does JEDI II work?

The user enters data specific to the new coal, gas, or wind plant:

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



To download this user-friendly free tool, go to www.windpoweringamerica.gov

Please see the paper accompanying this poster in the AWEA conference proceedings for more information and sample results.

The more information the user provides, the more localized the results will be. When specific data are not available, the model uses default values.

Features

Approach

- JEDI II is for all levels of users — no experience with economic modeling or spreadsheets is necessary.
- JEDI II comes with on-line instructions.
- Default data is available if users do not have area-specific information.
- The output from JEDI II provides detailed construction and O&M expenditure information, as well as the portion spent locally.
- The model identifies local spending on debt and equity payments, property taxes and land-lease payments.
- The user may add in county or regional data to make the model more useful for their needs.
- JEDI II calculates direct, indirect, and induced impacts.

- Using economic multipliers, JEDI II measures the potential employment (jobs and earnings) and economic development impacts (output) from new power plants by calculating the dollar flow from project construction and annual operations.
- In its default form, JEDI II conducts state-specific analyses. County or regional analyses require additional multipliers.

Sample Input Screen

Sample Output Screen

This is just one example of the input screens JEDI II calculates for new power plants.

Annual Operating and Maintenance Costs			
	Cost	Cost Per KW	Percent of Total Cost
Fixed Costs			
Labor	\$2,273,446	\$8	4.7%
Materials	\$1,964,877	\$7	4.1%
Services	\$1,361,677	\$5	2.8%
Fixed Subtotal	\$5,600,000	\$20	11.6%
Variable Costs			
Ash/sludge disposal	\$1,882,315	\$0.90	3.9%
Water	\$212,645	\$0.10	0.4%
Catalysts & chemicals	\$1,563,580	\$0.75	3.2%
Variable Subtotal	\$3,648,540	\$1.75	7.6%
Fuel Cost	\$39,024,784	\$18.72	80.8%
Total	\$48,273,324		100.0%

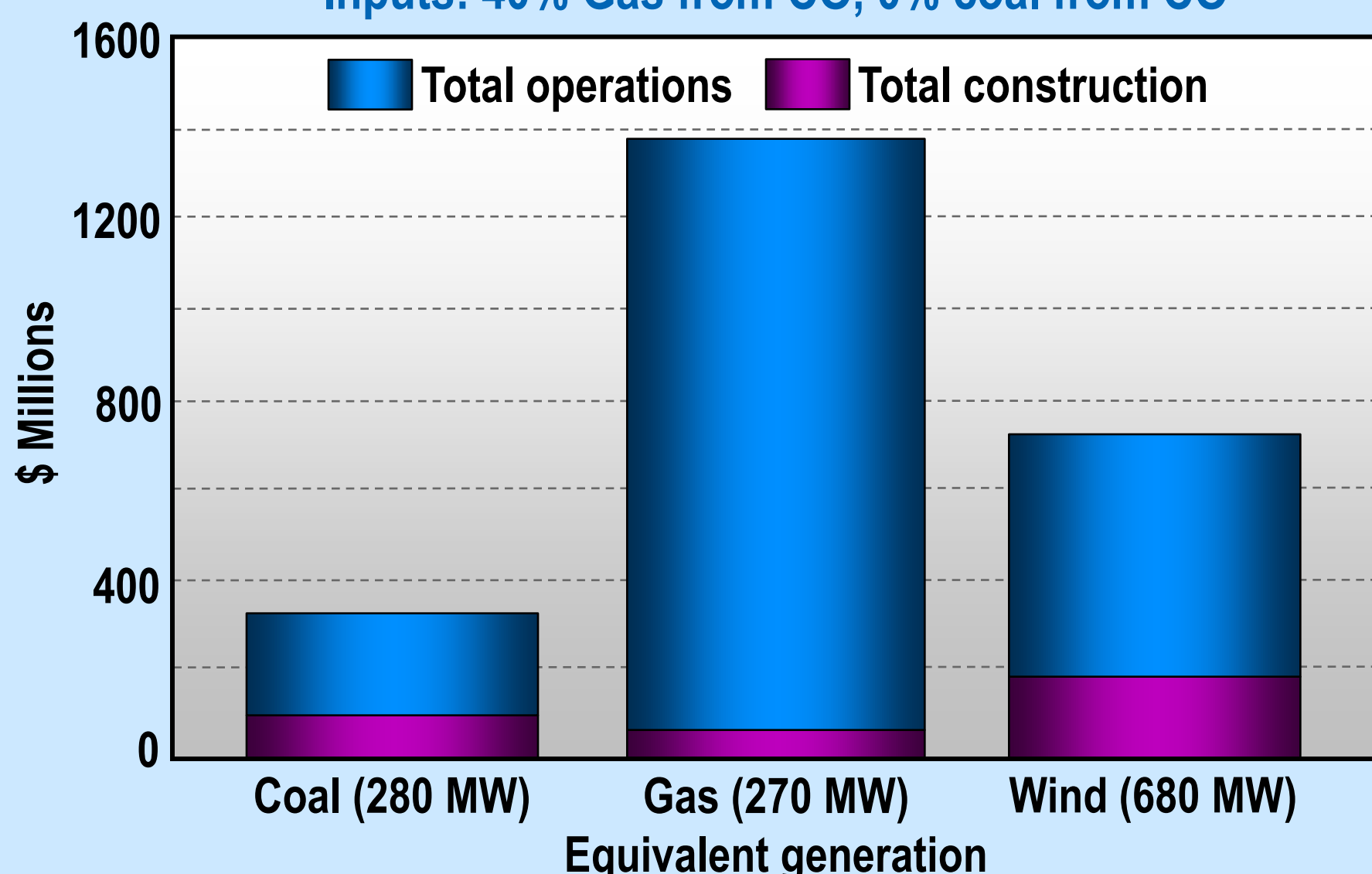
Other Parameters		
Financial Parameters		
Debt Financing		
Percentage financed	80%	0%
Years financed (term)	20	
Interest rate	10%	
Equity Financing/Repayment		
Percentage equity	20%	
Individual Investors (percent of equity)	0%	100%
Corporate Investors (percent of equity)	100%	0%
Return on equity	16%	
Repayment term (years)	10	
Tax Parameters		
Local Property/Other Tax Rate (percent of taxable value)	1.0%	
Assessed Value (percent of construction cost)	90%	
Taxable Value (percent of assessed value)	90%	
Taxable Value	\$349,272,000	
Local Taxes	\$3,492,720	100%
Land Lease Parameters		
Land Lease (total cost)	\$0	
Lease Payment Recipient (F = farmer/household, O = Other)	O	100%
Payroll Parameters		
Base Wage per Hour Annual Wage	\$27.85	\$57.938
Labor (average for all plant workers)		

Coal Plant - Project Data Summary			
Project Location	VIRGINIA		
Year Construction Starts	2006		
Project Size - Nameplate Capacity (MW)	280		
Capacity Factor (Percentage)	85%		
Heat Rate (Btu per kWh)	9550		
Construction Period (Months)	48		
Plant Construction Cost (\$/KW)	\$1,540		
Cost of Fuel (\$/mmBtu)	\$1.96		
Produced Locally (Percent)	40%		
Fixed Operations and Maintenance Cost (\$/KW)	\$20.00		
Variable Operations and Maintenance Cost (\$/MWh)	\$1.75		
Money Value - Current or Constant (Dollar Year)	2005		
Project Construction Cost	\$738,000,000		
Local Spending	\$16,016,297		
Total Annual Operational Expenses	\$324,368		
Direct Operating and Maintenance Costs	\$973		
Local Spending	\$1,221,733		
Other Annual Costs	\$0		
Local Spending	\$1,221,733		
Debt and Equity Payments	\$0		
Property Taxes	\$1,221,733		
Local Economic Impacts - Summary Results			
During construction period			
Direct Impacts	935	\$32.78	\$107.73
Construction Sector Only	934	\$32.75	\$107.60
Indirect Impacts	344	\$12.83	\$31.61
Induced Impacts	413	\$14.21	\$40.73
Total Impacts (Direct, Indirect, Induced)	1,692	\$59.82	\$180.07
During operating years (annual)			
Direct Impacts	136	\$7.45	\$22.31
Plant Workers Only	29	\$2.11	\$6.39
Indirect Impacts	57	\$2.37	\$6.39
Induced Impacts	83	\$2.86	\$8.21
Total Impacts (Direct, Indirect, Induced)	276	\$12.68	\$36.92

Statewide Economic Impacts from New Electricity

Generation in Colorado

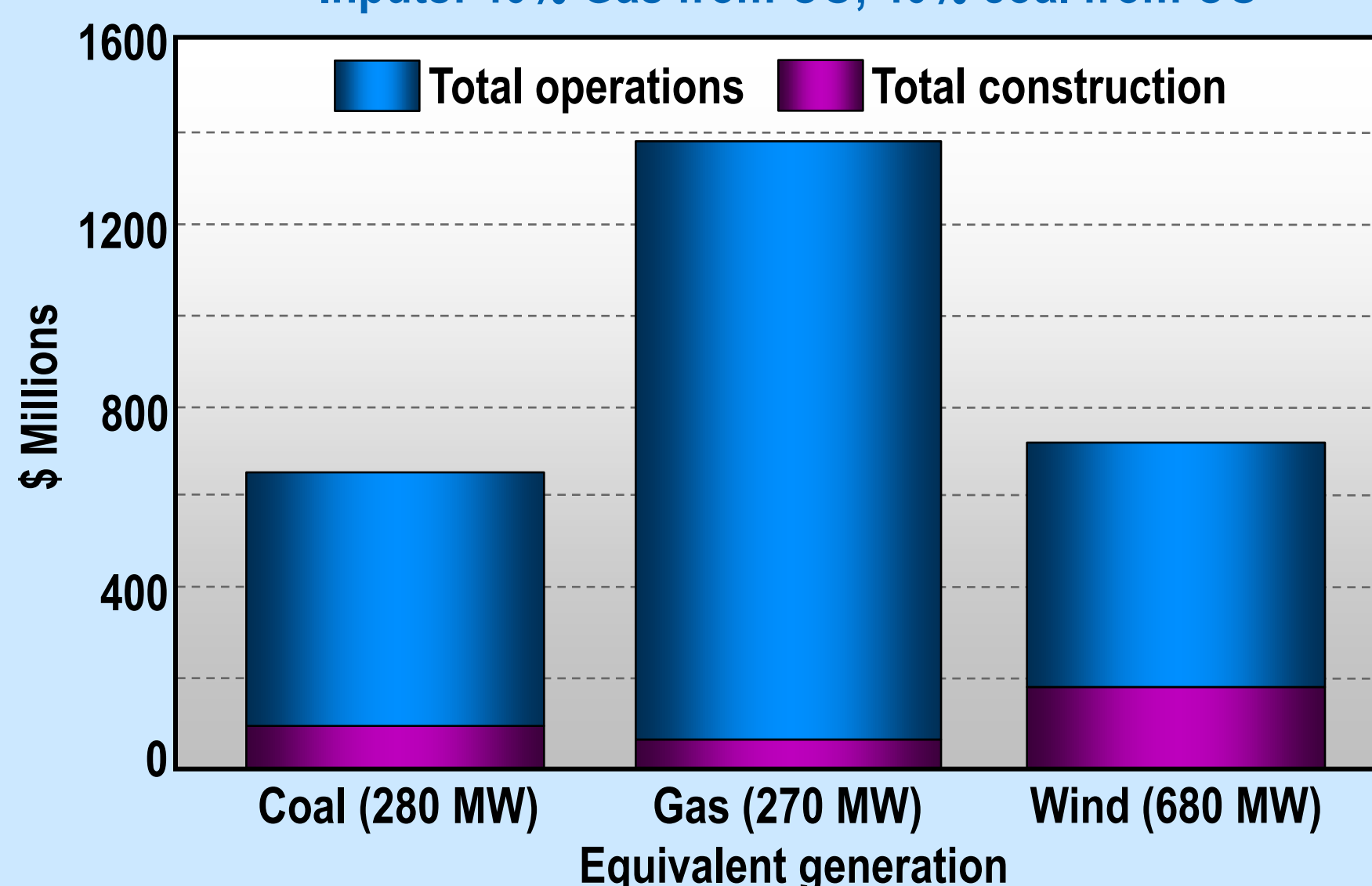
Construction + 20 years of operation (\$2005)
Inputs: 40% Gas from CO, 0% coal from CO



Statewide Economic Impacts from New Electricity

Generation in Colorado

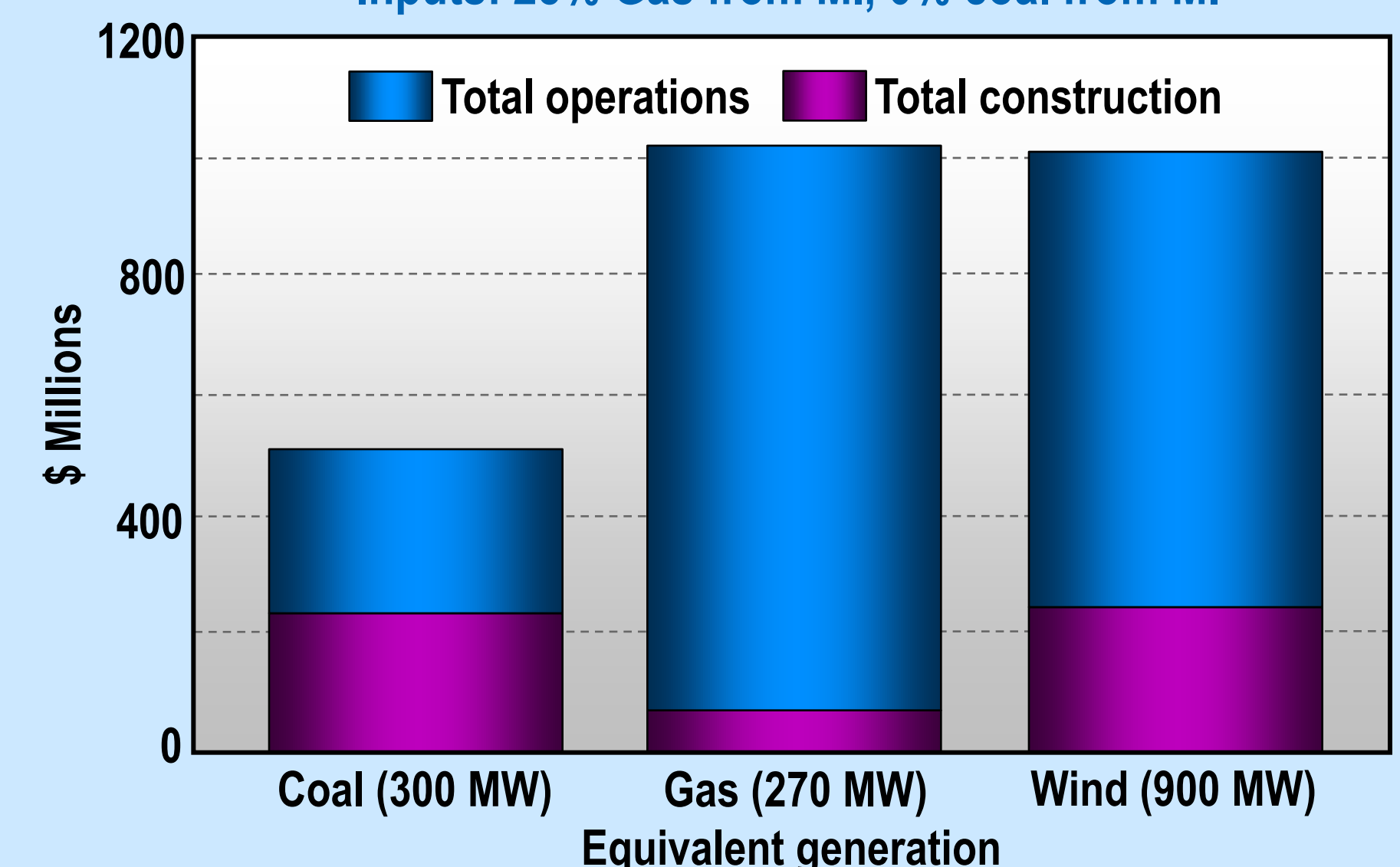
Construction + 20 years of operation (\$2005)
Inputs: 40% Gas from CO, 40% coal from CO



Statewide Economic Impacts from New Electricity

Generation in Michigan

Construction + 20 years of operation (\$2005)
Inputs: 25% Gas from MI, 0% coal from MI



The JEDI model does not factor in costs to consumers. Fluctuations in different technologies (e.g., natural gas prices) may make construction of a new power plant price prohibitive.