

Economic Development Impacts of Community Wind Projects: A Review and Empirical Evaluation



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Overview

Purpose:

To discuss and clarify the economic development value of community wind projects.

Relevant Questions:

1. What are the impacts from completed projects?
2. How do community wind projects measure up to absentee-owned projects?
3. Why do results vary?

Outline:

1. Definitions and attributes
2. Market Status
3. Background on Economic Development Analysis
4. Review past research
5. Results from new retrospective analysis
6. Making Comparisons
7. Explaining variability
8. Conclusions



Community Wind: What is it and how is it different?

Broad term that can include:

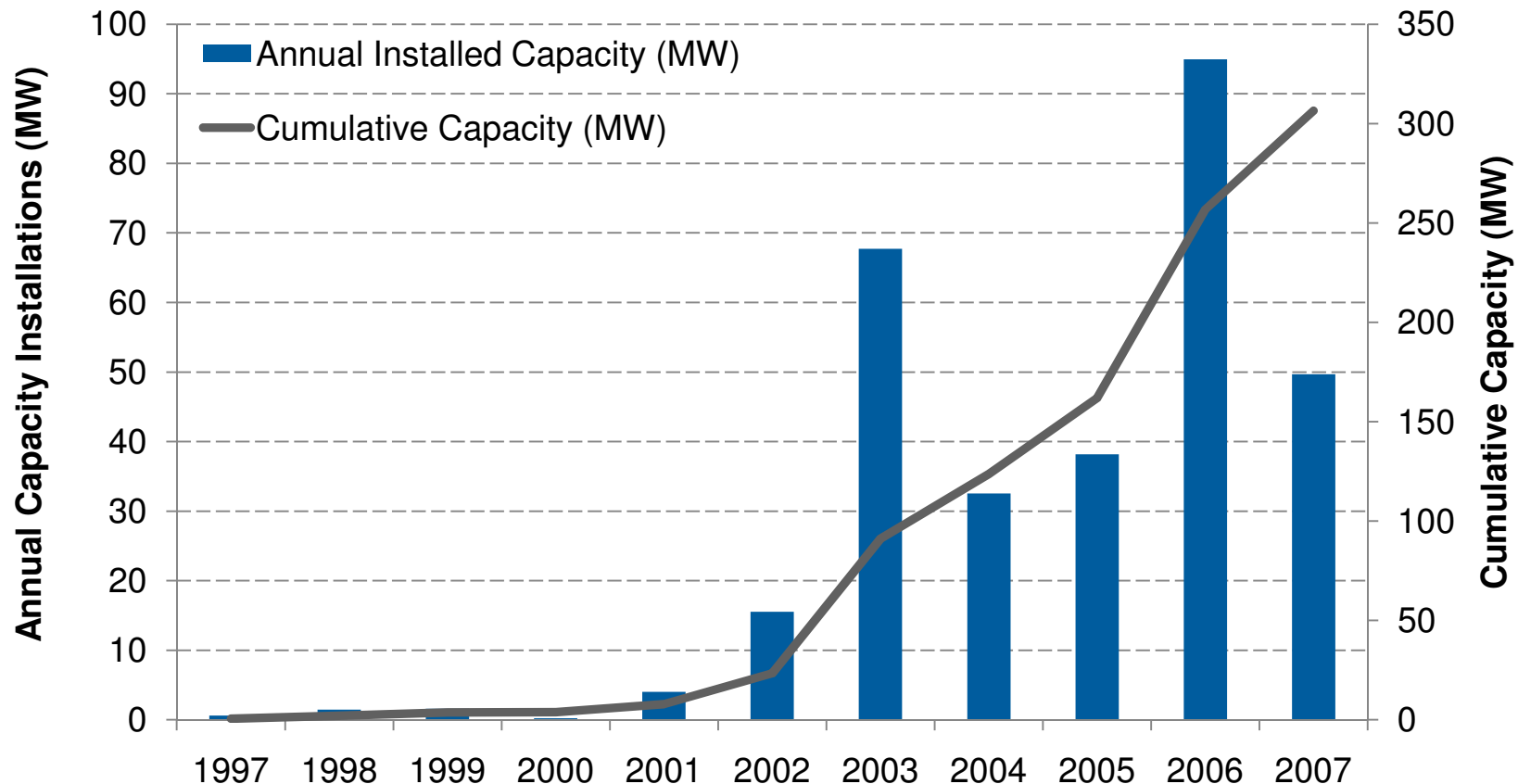
- A project wholly owned by local stakeholders
- Projects utilizing a tax equity partner and local equity (e.g., Flip projects)
- Municipally or Cooperatively owned projects

Potential Attributes:

- *Increased local dispersion of project revenues*
- *Increased local economic development impacts*
- Reduced social opposition



Community Wind Market Status



Source: LBNL 2008

- Completed projects are concentrated in Minnesota and Iowa
- Minnesota alone constitutes 65% of capacity and 35% of projects
- *Broader definitions—including municipal ownership—indicate there are 736 MW of community wind (Windustry 2008)*

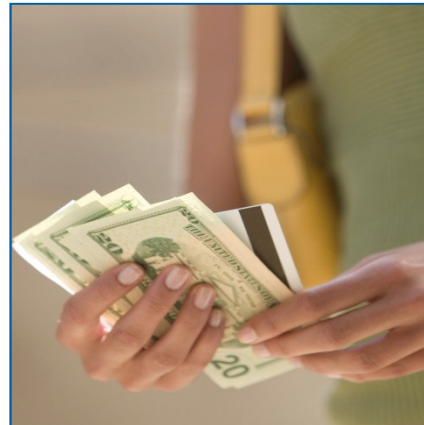
Defining Economic Development Impacts



1. On-site Labor and Professional services



2. Turbine Production and Supply Chain Impacts



3. Induced Impacts
(Household purchases due to injection of income)

Economic Development Impacts Wind Energy

1,000 MW of Wind Power in Colorado:

- 1,700 full-time-equivalent jobs from construction; total payroll of more than \$70 million
- 300 permanent jobs; total annual payroll of more than \$14 million
- \$226 million in economic activity from the construction period
- \$35 million in annual economic activity
- More than \$4 million in annual property tax payments
- More than \$2.5 million annually in income for farmers and ranchers who lease their land to developers



Economic Development Impacts from Community Wind: A Review

Study	Analysis Details			Employment Impacts (Jobs per MW)		
	Year of Publication	Area covered by analysis	Analysis perspective	Construction Period (short-term jobs)	Operations Period	Ratio of Impacts (Operations Period Only)
Southwest Minnesota	1996	six county area	projection	0.8	1.3	2.4 - 6.8 : 1
GAO	2004	County	projection	0.15 - 2.58	0.8 - 1.3	2.0 - 3.0 : 1
Big Stone County, MN	2006	County	projection	n/a	0.8 - 1.4	1.9 - 3.4 : 1
Umatilla County, OR	2006	County	projection	n/a	0.5	2.1 : 1
Lantz and Tegen	2008	State	projection	3	0.63 - 0.92	1.7 - 2.5 : 1
Lantz	2008	State	projection	2.8 - 4.2	0.45 - 0.52	1.5 - 1.7 : 1

General conclusions from prior work

- Impacts vary depending on the level of the analysis as well as the structure and size of the economy.
- There is no inherent economic development advantage to community wind projects during the construction period.
- Operations period impacts are generally 1.5 to 3.4 times higher for community wind projects
 - A ratio of 6.8 : 1 does appear but compared with other analyses this appears to be an outlier

New Analysis: Projects Overview

Hull Wind I & II

- Total of 2.46 MW
- Turbines purchased on a turnkey basis by Hull Municipal Power & Light
- Hull I Completed in 2001
- Hull II Completed in 2006

Minwind I-IX

- 1 and 2 turbine projects constituting 15.4 MW total
- Financed by a pool of local equity and local debt
- Individual projects completed between 2002 -2004



New Analysis: Projects Overview

Minnesota Flip

- 15 MW developed as single turbine projects
- Financed with tax equity and local investors
- Completed in 2007

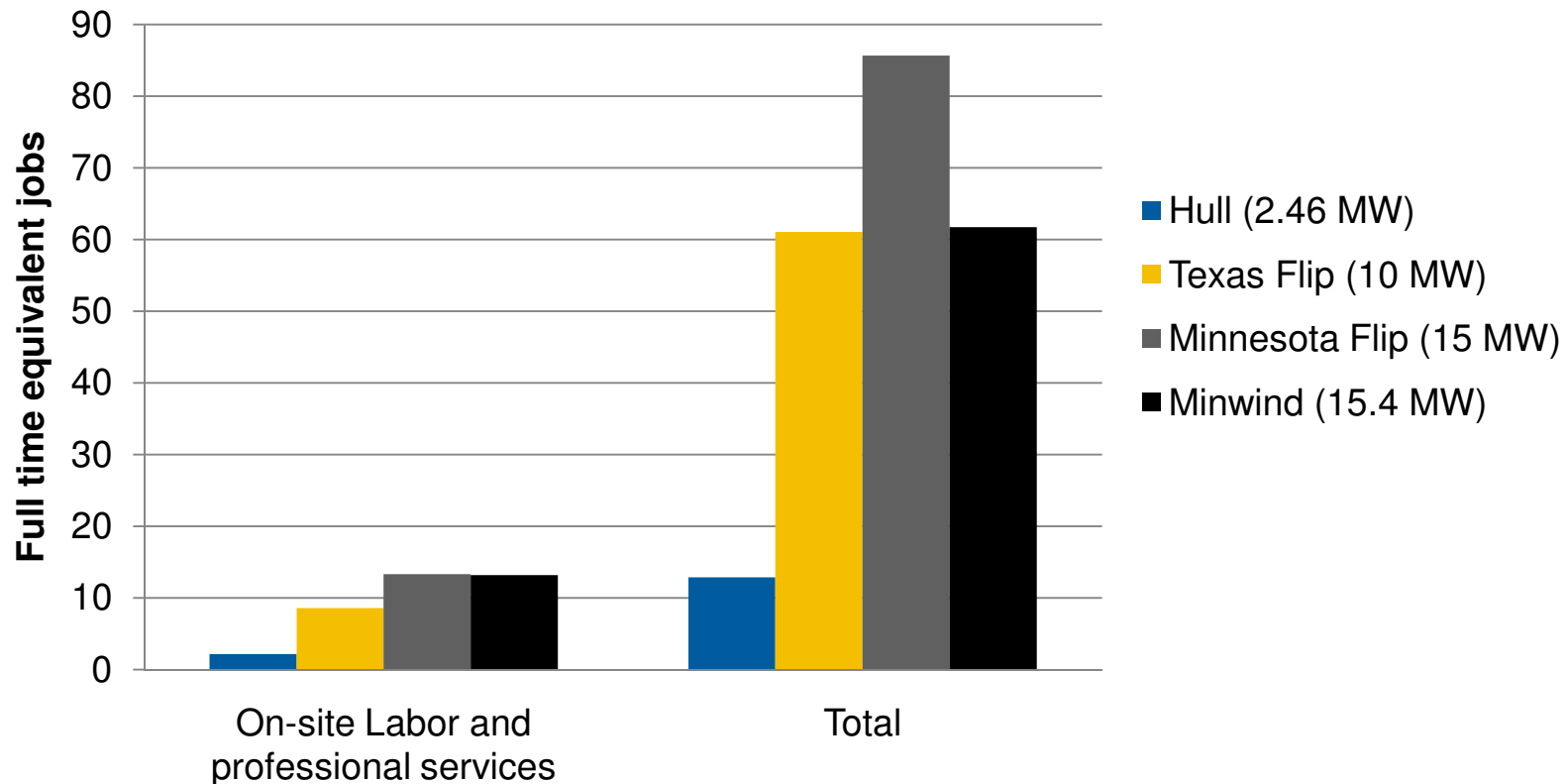
Texas Flip

- Series of 10 MW Facilities
- Financed with tax equity and local investors
- Completed in 2007



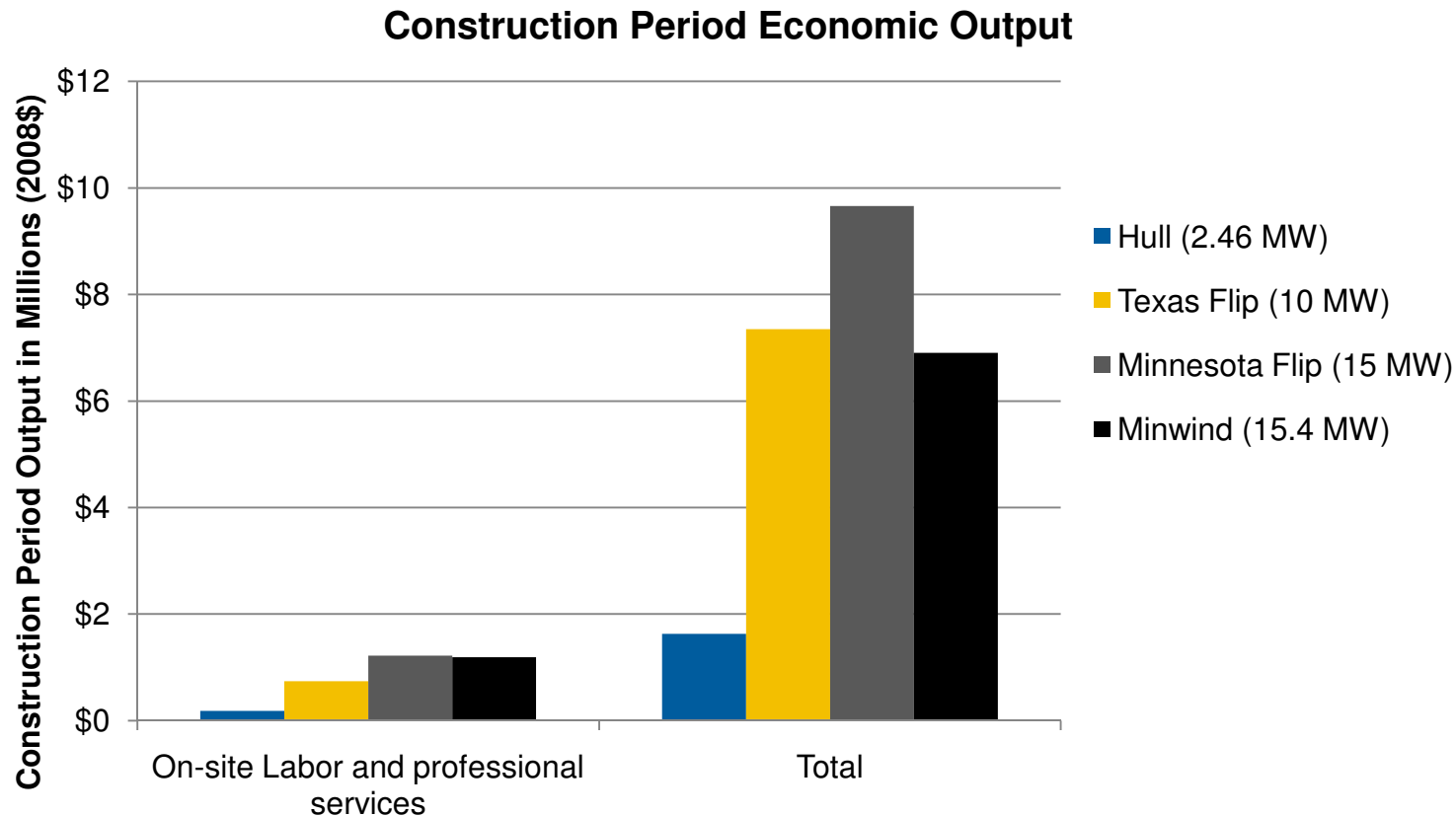
Employment Impacts during Construction

Construction Period Employment (Short-term)



- One full time equivalent is equivalent to 2,080 hours (one full time job for one year); most projects rely on a higher number of workers for a shorter period, often 3-4 months.
- Construction period impacts from Hull are relatively low because of the small project size
- The impact of the Texas Flip project is noteworthy relative to the Minwind project. However, much of this results from price increases (higher than the rate of inflation) across the array of goods and services used in project development.

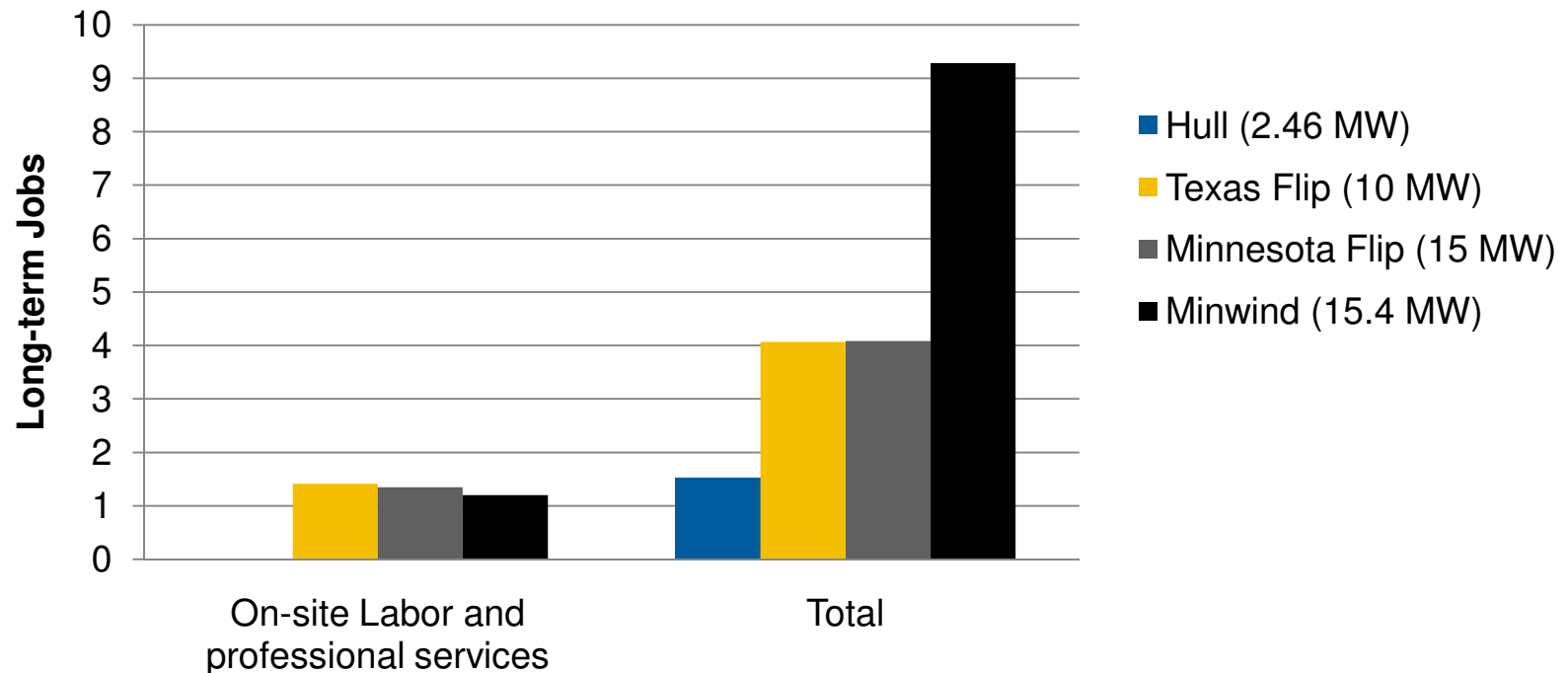
Economic Output during Construction



- Economic activity resulting from construction labor and development is generally on the order of millions of dollars.
- Total economic activity is more likely to be on the order of tens of millions of dollars depending on project size.

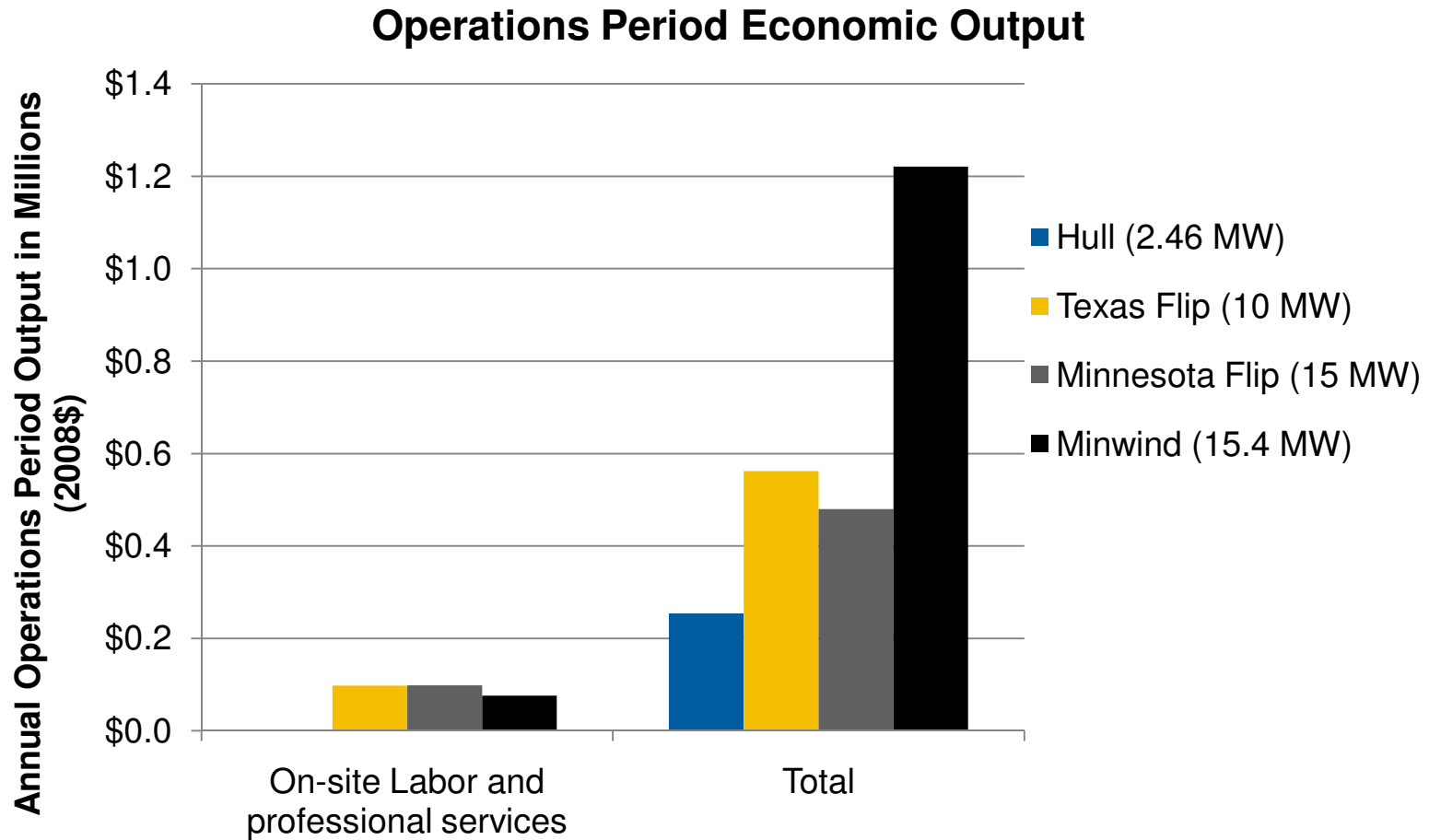
Employment Impacts during Operations

Operations Period Employment (Long-term)

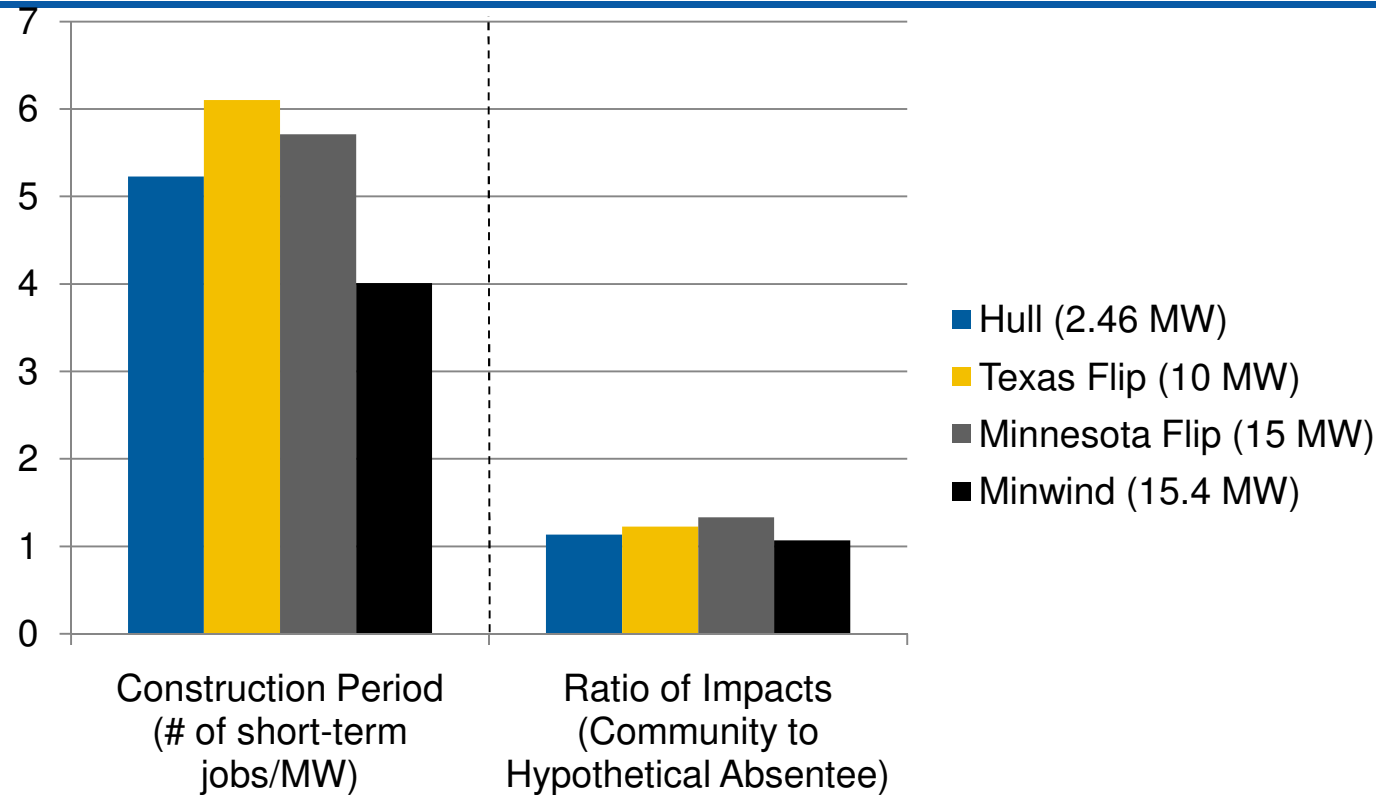


- Minwind operations period impacts are bolstered by the fact that project is completely financed with local resources.
- Impacts from the Texas Flip are high relative to the Minnesota Flip (on a per MW basis) due to higher property tax payments and a slightly more conservative estimate of future O&M Costs
- Individual equity payments may be very large, especially relative to traditional landowner payments. However, if local equity only supports a small fraction of the project the broader community does not benefit to the same degree.
- Aside from management and monitoring, there is no permanent on-site technician for the Hull turbines; as such, there is virtually zero on-site labor attributed to this project.

Economic Output (Annual)



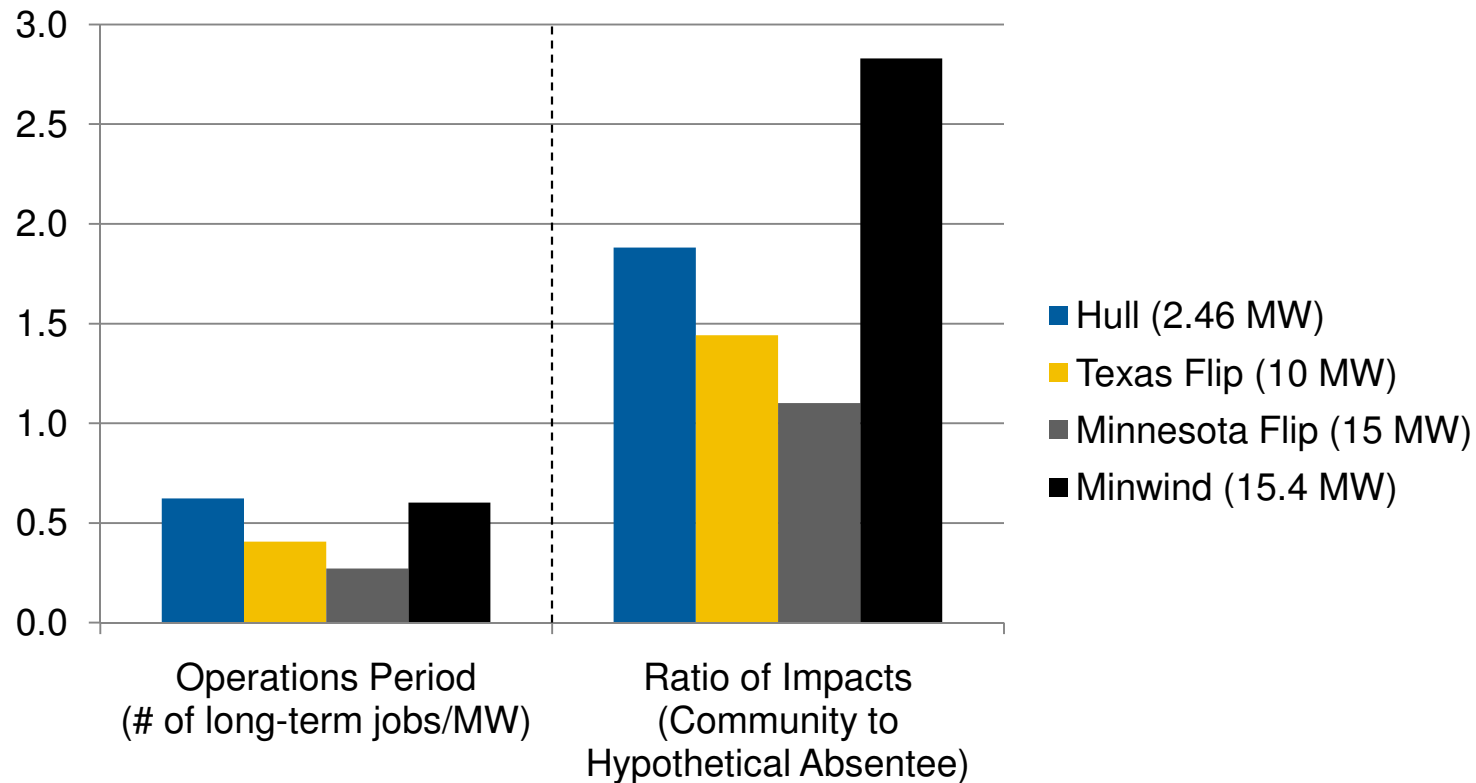
Comparing Construction Period Employment Impacts



Note: Ratio of impacts is interpreted as the value shown to one (e.g., 1.1 : 1).

- When compared with similar, hypothetical, “average” projects, construction period impacts may only be moderately higher for community wind projects; 1.1 – 1.3 times that of absentee projects
- The hypothetical average project is based on what is reasonable not necessarily what will happen.
- In addition to project cost variability, construction period impacts are subject to developer preferences and the local labor pool.

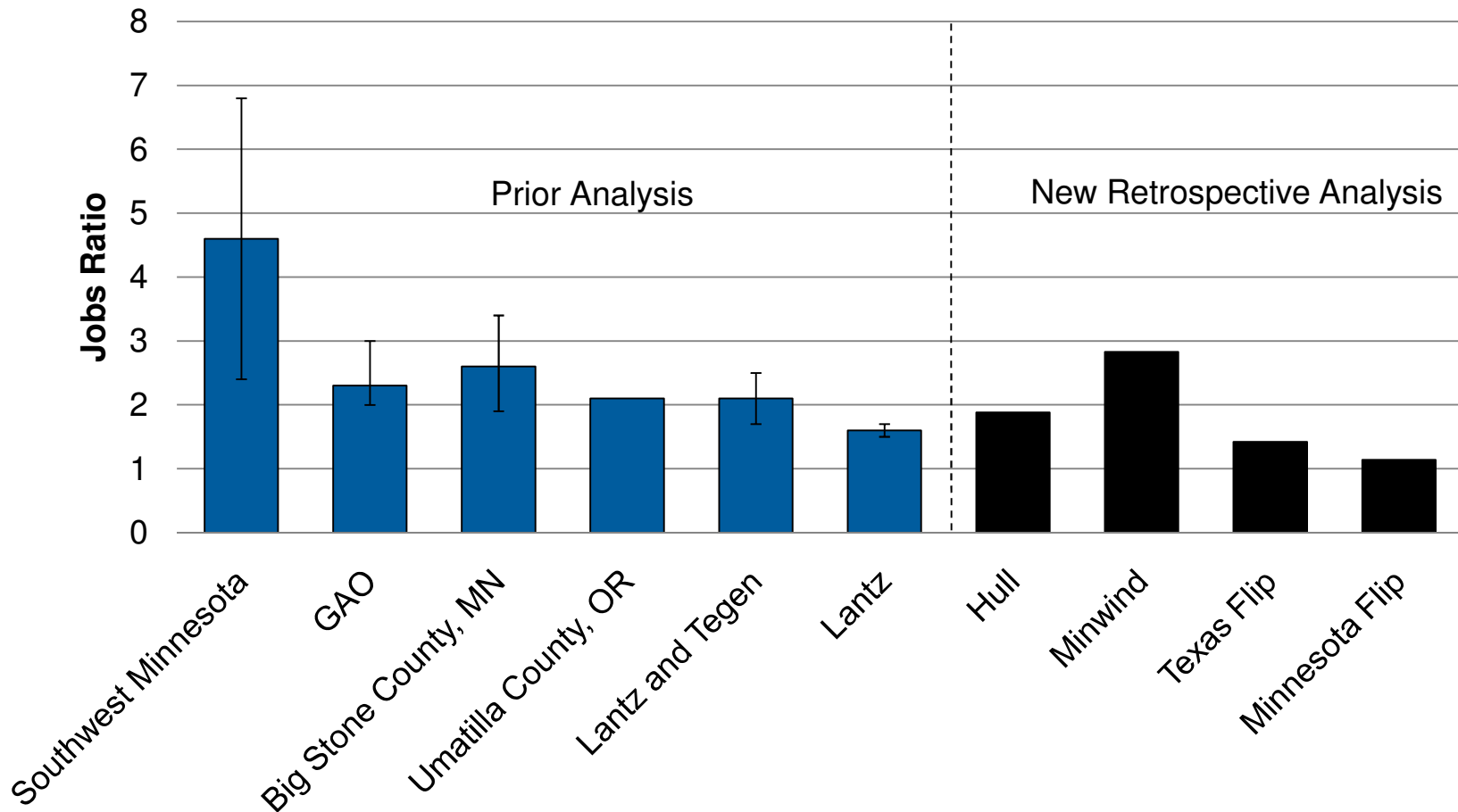
Comparing Operations Period Employment Impacts



Note: Ratio of impacts is interpreted as the value shown to one (e.g., 2.8 : 1).

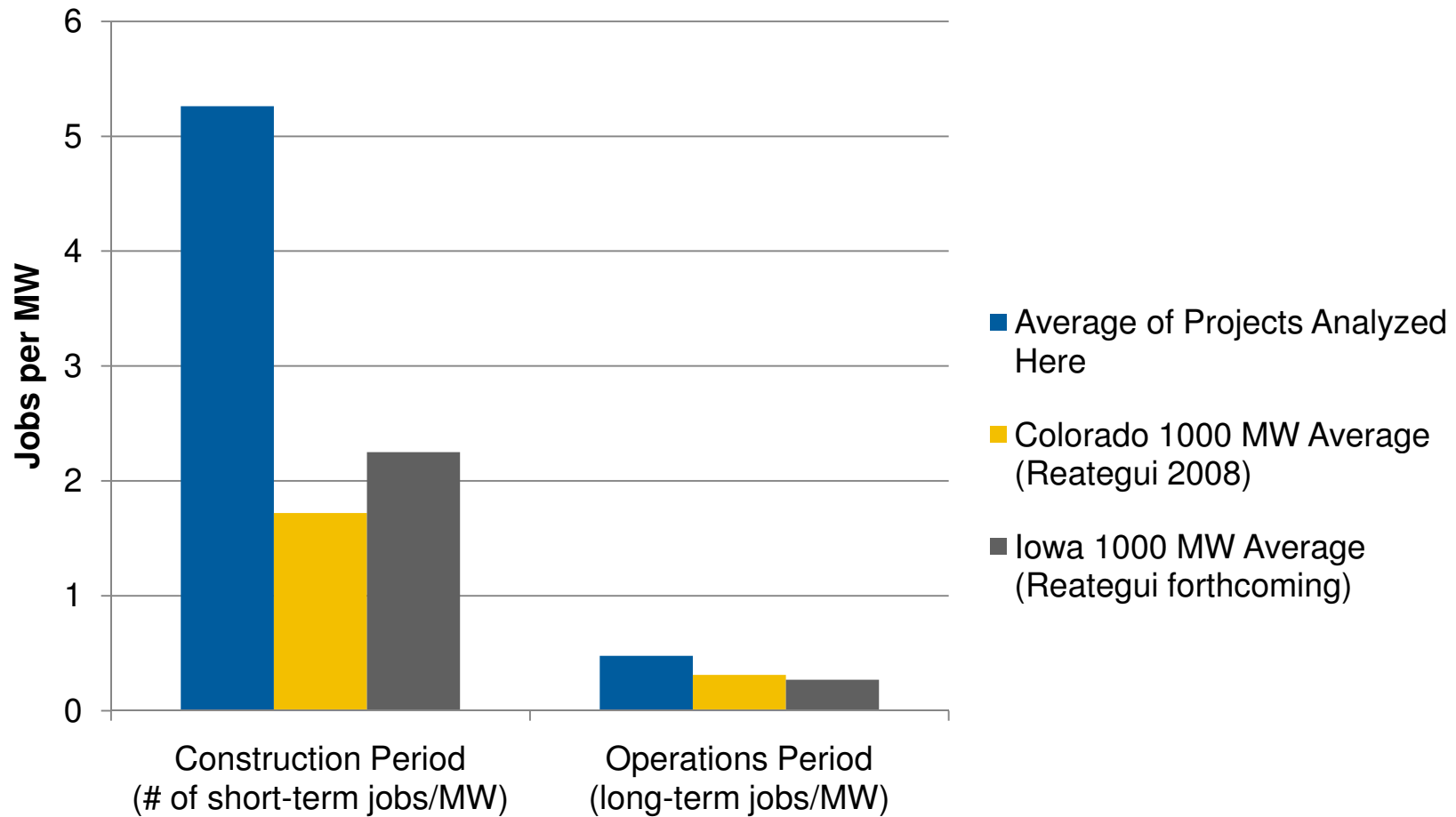
- Revenue streams to local investors during operations period impacts increase operations period economic impacts by 1.1 to 2.8 times relative to absentee owned projects.

Comparing Community Wind to Absentee Wind Operations Period Impacts Across all Studies



Note: Values shown here represent the ratio of community wind to a hypothetical “average” absentee wind project. The ratio of impacts is interpreted as the value shown to one (e.g., 2.8 : 1).

Comparing the Community Wind average with other retrospective analyses



- Ratio of Construction Period Impacts 2.3 – 3.1 : 1
- Ratio of Operations Period Impacts 1.5 – 1.8 : 1
- Based on this sample the average is weighted towards the flip projects

Explaining variability in economic development impacts

- Size and cost of the project
 - Higher costs often results in increased impact for both construction and O&M
- Size and diversity of the local economy
 - Level of analysis
 - Multiplier effect
- Developer preferences
 - Goods and services
 - *Turbine manufacturing*
- Magnitude and allocation of project revenues



Explaining variability in impacts from community wind projects

- Analyses for community wind projects are often conducted at different levels (e.g., county vs. state).
 - *Generally, it is best not to compare analyses conducted at different levels*
- Even community wind developers have different preferences in regards to local labor resources
- Individual labor pools may vary widely
- Differing ownership structures result in different distributions of project revenues
- Variable estimates of projected revenues and expected return on investment
- Changing project costs (construction and O&M)



Summary of Results

- Total employment impacts from completed community wind projects:
 - Construction Period — equivalent to 4 to 6 one-year jobs per MW
 - Operations period — 0.3 to 0.6 long-term jobs per MW
- Community wind relative to hypothetical “average” absentee projects:
 - Construction period employment impacts are 1.1 to 1.3 times higher
 - Operations period impacts are 1.1 to 2.8 times higher
 - *Actual value depends on the ownership structure and ROI.*
- Based on the average of completed projects studied here and retrospective analysis of the first 1,000 MW of wind in Colorado and Iowa:
 - Construction period impacts are as much as 3.1 times higher for Community Wind
 - Operations period impacts are as much as 1.8 times higher for Community Wind

Conclusions

- Community wind projects have greater economic development impacts than absentee owned projects.
- Community wind projects vary in key aspects that affect economic development.
- There is no inherent construction period economic development advantage for community wind projects, but empirical evidence indicates that community wind often generates increased construction period impacts.
- Operations period Economic Development Impacts are largely a function of local ownership.
- Policies that prioritize higher levels of local ownership are likely to result in increased economic development impacts *on a per-MW basis*.

Thank You

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