

Estimating the Economic Impacts of Wind Farms

A presentation to the
REMI Annual Users Meeting

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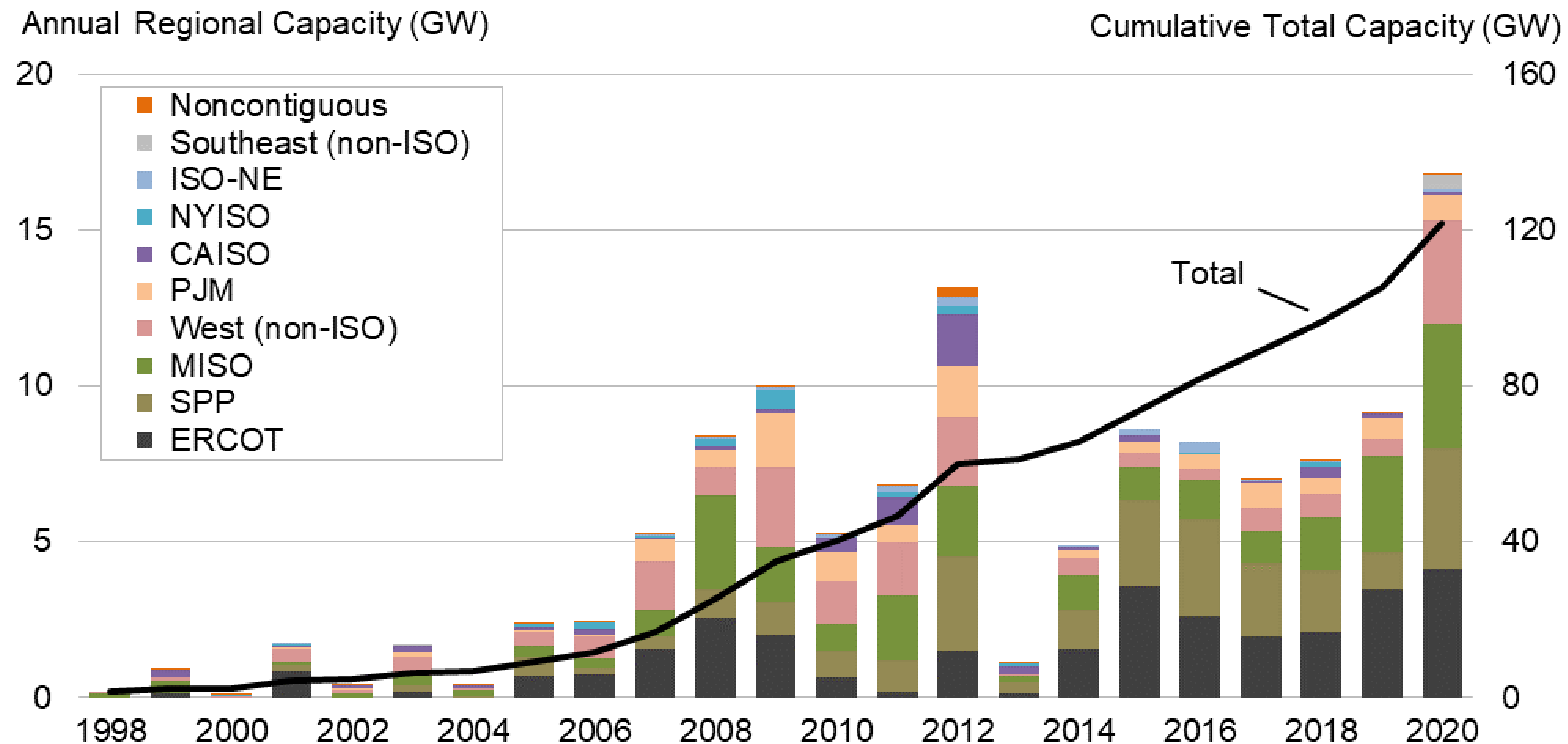
About the Study

- Client is a county-based economic development organization
- Funding is from the developer through the EDO
- Data are supplied by the funder
- Assumptions of the study:
 - Build out in year 1
 - Other economic activities in years 2 through 31

Why REMI?

- National Renewable Energy Labs (NREL) offers a free model:
 - Jobs and Economic Development Impact (JEDI)
 - Based in Implan and is simplistic
- What REMI does better:
 - Custom configured for this study
 - More current data
 - Dynamic modeling
 - Time series over the event horizon
 - Quality support included with the models

Why this Type of Study Matters



Sources: ACP and Department of Energy

Components to the Analysis

- Four separate impacts were estimated and then added together:
 - Build out of the project
 - Operations and maintenance
 - Lease payments
 - Personal property tax collections

Component 1: Build Out

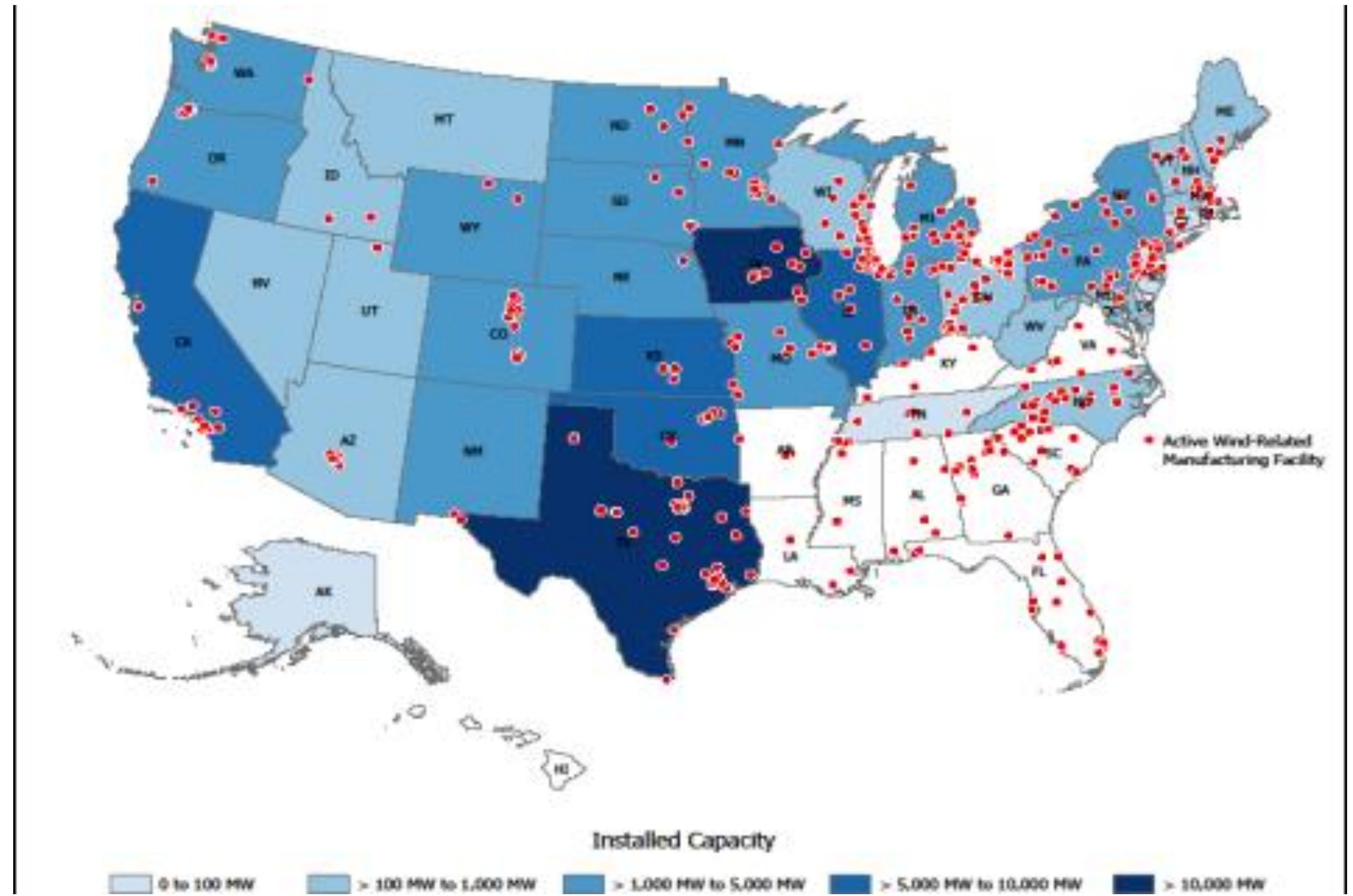
- Client had experience in the state, as well as across the country, in these type of projects
- Based on experience, the client could allocate spending for materials and labor to three REMI regions:
 - Target county
 - Rest of state (use spreader here for multi-region models)
 - Rest of the United States

Build Out: SWOT

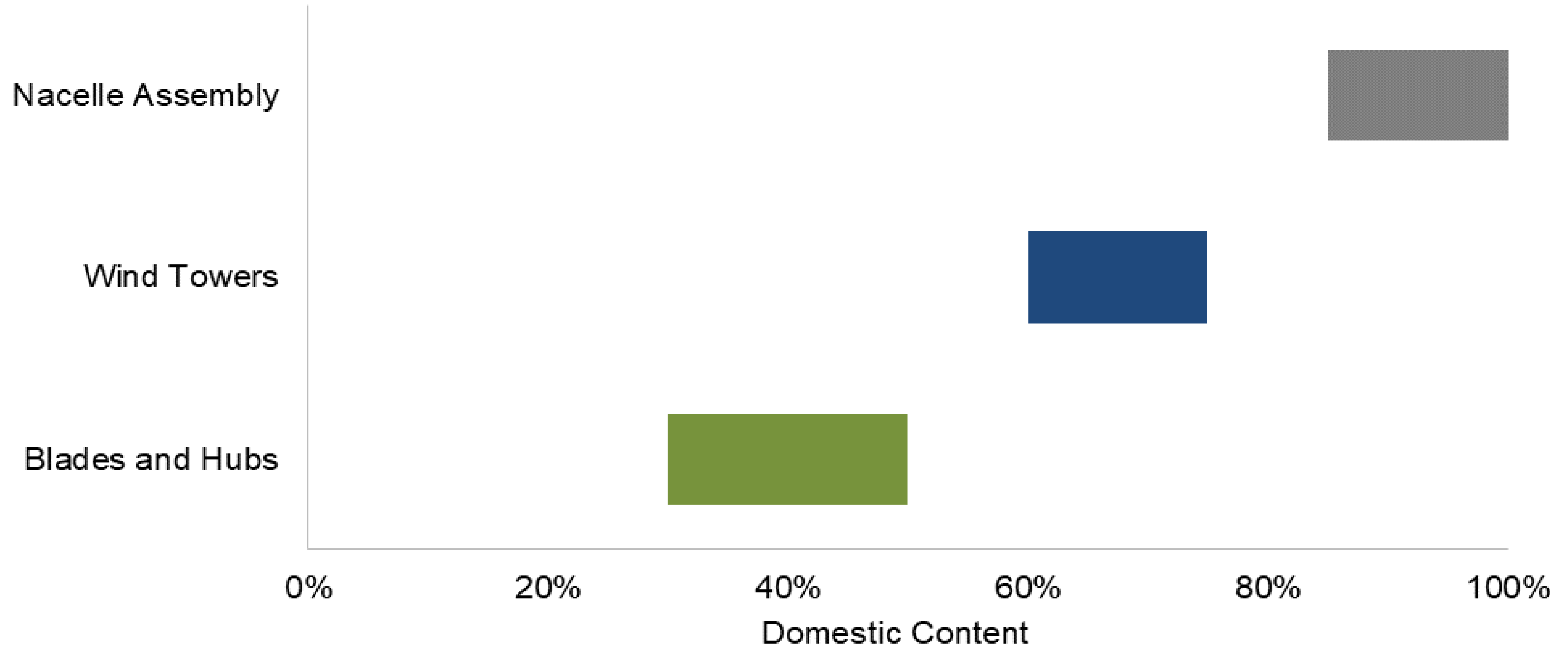
- Strengths
 - The client had a solid pro forma based on experience in the state
 - Based on experience, they could better allocate spending to three regions
 - Recent Department of Energy (DOE) report provided support of state-based and national supply chain

Domestic Sourcing

- Provides support for client pro forma allocations to:
 - Rest of state
 - Rest of United States



2020 Domestic Supply Chain



Sources: Berkeley Labs and Department of Energy

Build Out: SWOT

- Weaknesses
 - Actual sourcing of materials is based on price points at the time of construction
 - REMI does not have an exact fit/plug and play for wind farms
 - Based on detailed inputs and regional allocations from the client:
 - Do a “best fit” of activities
 - Push supply chain (or indirects) into direct

Component 2: Operations and Maintenance

- Begins in year 2 and is estimated for a 30-year event horizon
- Working with client, developed an estimate pro forma of spending:
 - By product and labor allocation
 - Based on the idiosyncrasies of the initial build product
 - Each product base has a different set of costs and schedules for O&M
 - Costs and labor vary over time and by year

Component 3: Lease Payments

- Lease payments are made to:
 - Landowners
 - Others possibly impacted by activities
- Fixed set of payments for a 30-year event horizon (impact of nominals)
- Modeled as transfer payments from corporations
 - Thanks to Don Grimes for the suggestion
 - Large number of families in distribution challenge “windfall” assumption

Component 4: Personal Property Taxes

- Tax structure for personal property tax is a moving target in Michigan
- Used client-supplied tax collections pro forma based on:
 - Current legislation
 - Project experience in other areas of the state
 - Current rates for each taxable entity
- Tax base is quite varied and collection entities supported include county, townships, school districts, community college district, and special districts

Tricks to the Results

- Run and report each component separately
- Used summed rather than single run for combined reporting
 - The shock of the single-year build out reverberates in the out years negatively affecting the 30-year operations horizon
- Results are “bumpy”
 - O&M is cyclical
 - Lease payments interact with model PCEs
 - Personal property tax collections are based on current thinking

More on the Results

- Report, both individually and combined:
 - Jobs as an annual average over the 30 years—excluding build out
 - Output, value added, and personal income reported in table:
 - Build out
 - 30-year horizon
 - Combined

Still More on the Results

- Sourcing for build out assumes that all out-of-state spending is domestic
- Lease payments yield an interesting result in that personal income is significantly larger than value added
- The actual distribution of payments to families is unknown, so how many will treat these dollars is unknown:
 - Normal income
 - Windfall (see Sarah Mills, PhD, at University of Michigan)
- Personal property taxes:
 - Treated as normal revenues in the model
 - May yield “windfall” spending

In the End

- Even with great data, the outcomes from REMI need to be treated as “estimates”
- This event does meet the “but for” standard of economic development
- In 2021, the state of Michigan requires that 15% of energy be produced from renewables—so regulation and policy support the demand for this investment

Comments and Questions?

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