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# **XCEL ENERGY—MINNESOTA UTILITY ECONOMIC IMPACT STUDY**

**Economic Impact of Utility Scenarios on Host Communities**

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**A consulting research study conducted by the:**

**Business Research Division**  
Leeds School of Business  
University of Colorado Boulder

**Final Report**

**April 2020**



**Leeds** School of Business  
UNIVERSITY OF COLORADO **BOULDER**

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## DEFINITIONS

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**Employment:** Includes the number of full-time and part-time jobs (headcount) by business physical location.

**Deflators:** Measure of price changes within an industry.

**Gross Domestic Product (GDP):** Total value of final goods and services produced each year within a country or region.

**Leakage:** Economic activity that occurs outside the area of study but is driven by activity within the study area.

**Metropolitan Statistical Area (MSA):** Geographic areas with 50,000 or more population.<sup>1</sup>

**Multiplier:** Change in total economic activity driven by a change in direct economic activity.

**Output:** Total production value of goods and services, including intermediate goods purchased and value added.

**Personal Income:** Includes all sources of income, including employee compensation, proprietors' income, rental income, capital income, and transfer payments.

**Collective:** The Center for Energy and Environment (CEE), Minnesota Power, Xcel Energy, and five communities with operating utilities.

**Rates:** Change in revenue requirements in order to accommodate changes in utility operations and capital expenditures.

**Construction:** Capital expenditures.

**Operations:** Operating expenditures.

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<sup>1</sup>For more information, visit: <https://www.census.gov/programs-surveys/metro-micro/about.html>, retrieved June 13, 2019.

## EXECUTIVE SUMMARY

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Xcel Energy, a major electric utility in Minnesota, has analyzed various alternative scenarios in its resource plan to deliver electricity from cleaner sources compared to its existing baseload retirement plans. This report examines the economic impact of alternative generation plans in four Minnesota communities and the state overall. Generally, these plans include the retirement of coal-fired generating facilities, replaced with a mix of natural gas, wind, and solar power, as well as the extension of nuclear generating facilities.

This report presents the results of an analysis prepared by the Leeds School of Business to quantify the net economic impacts of five scenarios presented by Xcel Energy in its July 1, 2019 resource plan filing. The study areas include the state of Minnesota and four counties within the state: Goodhue, Sherburne, Washington, and Wright. The study period extends from 2020 through 2045 for the state of Minnesota. This period was selected to capture the near-term economic activity from changes in capital investments, as well as the long-term effects of changes in operating expenses and electricity rates. The study period for the host communities intersect with their respective deviations from the currently planned retirement dates.

Xcel Energy was forthcoming with available data on the current resource plans and the alternative scenarios. The utility provided operating expenditures (including property taxes) and capital expenditures for the reference case and the five alternative scenarios:

- Early King Retirement
- Early Coal Retirement
- Early Coal Retirement and Monticello Extension
- Early King Retirement and Monticello Extension
- Early Coal Retirement and Nuclear Extension

This data was provided for the state of Minnesota and for Goodhue, Sherburne, Washington, and Wright counties, as well as the change in revenue requirements necessary to accommodate such changes in the resource plan. Resource expansion plans and costs are based on the Strategist modeling included in Xcel's July 1, 2019 resource plan filing.

The research team used the REMI model for the analysis, which was constructed using national and local economic and demographic data specifically for the state of Minnesota and the five counties with current generating facilities. The REMI model used for this analysis is a six-region, E3+ model 2.3 specifically designed for energy analysis.

To frame the analysis of this report, an increase in capital expenditures in Minnesota increases economic activity in Minnesota, while a decrease in operating expenditures reduces economic activity in Minnesota. Conversely, a decrease in revenue requirements is a reduction in costs for utility customers, thus resulting in additional spending in other industries. The data are analyzed collectively to consider if

the project provides a *net* economic benefit to Minnesota. Given that Minnesota lacks native coal production, out-of-state coal mines bear the decrease in coal purchases, while Minnesota potentially gains from in-state solar installations.

Note that for the scenarios examined, the percentage change in jobs, GDP, and personal income tended to have negligible impacts on the state economy, but the scenario registered more significant impacts (positive and negative) on the local economies.

### **Early Coal and Nuclear Extension**

The Early Coal and Nuclear Extension scenario includes the early retirement of the King Generating Plant in Washington County, the early retirement of the Sherco Generating Plant in Sherburne County, the extension of the Monticello Nuclear Generating Plant in Wright County, the extension of Prairie Island Nuclear Generating Station in Goodhue County, as well as less installed wind and more solar generation. The King Generating Plant, a coal-fired power plant, is modeled to retire in 2028 in this scenario versus 2037 in the resource plan. Sherco 3, a coal-fired power plant, is modeled to retire in 2030 in this scenario versus 2040 in the resource plan. Monticello, a nuclear power plant, is modeled to be extended from 2030 to 2040. Prairie Island units 1 and 2 are extended until 2043 and 2044, respectively. A combined cycle unit is assumed to be added in Sherburne County in 2027, after the retirement of Sherco 2. More solar will be added to the system, notably, after 2037, and Xcel will add less wind relative to the reference case. The solar changes were modeled outside of Sherburne County, but 75% were modeled in Minnesota. Other operating facilities will undergo minor operating adjustments to balance the system. This scenario results in modest net changes to the Minnesota economy, with a net average increase of 3,330 jobs from 2020-2045 (0.1% change), and a net average increase of \$234 million in GDP (0.0% change). The increases in the statewide economy stem from decreased utility rates that offset the decrease in in-state plant operations. Consumer rate decreases increase consumption by households and businesses on other goods and services. Compared to the reference case, the extensions of Monticello and Prairie Island result in net economic benefits for both Wright County (average increase of 2,049 jobs, 3%; \$222 million in GDP, 3.5%, from 2031-2040) and Goodhue County (average increase of 2,543 jobs, 8.1%; \$298 million in GDP, 8%, from 2035-2045). However, the early retirement of King and Sherco 3 result in net economic losses for both Washington County (average decrease of 221 jobs, 0.2%; \$19 million in GDP, 0.1%, from 2028-2037) and Sherburne County (average decrease of 133 jobs, 0.3%; \$12 million in GDP, 0.2% from 2031-2040).

### **Early King**

The Early King scenario includes the early retirement of the King Generating Plant in Washington County and the early addition of solar, as well as less installed wind generation. The King Generating Plant, a coal-fired power plant, is modeled to retire in 2028 in this scenario versus 2037 in the reference case, a combined cycle unit is assumed to be added in Sherburne County in 2027, and solar will be added to the system six years earlier than in the reference case (2026 versus 2032). The solar additions were modeled outside of Washington County but 75% were modeled in Minnesota. Other operating facilities will undergo minor operating adjustments to balance the system. This scenario results in modest net changes to the Minnesota economy, with a net average decrease of 112 jobs (0.0% change) from 2020-2045, and a net average increase of \$129 million in GDP (0.0% change). However, the early retirement of

King results in a net economic loss for Washington County (average decrease of 253 jobs, 0.2%; \$23 million in GDP, 0.2%, from 2028-2037).

### **Early Coal**

The Early Coal scenario includes the early retirement of the King Generating Plant in Washington County, the early retirement of the Sherco Generating Plant in Sherburne County, the early addition of solar, as well as less installed wind generation relative to the reference case. The King Generating Plant, a coal-fired power plant, is modeled to retire in 2028 in this scenario versus 2037 in the reference case. Sherco 3, a coal-fired power plant, is modeled to retire in 2030 in this scenario versus 2040 in the reference case, and a combined cycle unit is assumed to be added in Sherburne County in 2027. Additional solar will be added to the system five years earlier than in the reference case (2026 versus 2031), and less wind is added than currently projected. The solar additions were modeled outside of host communities but 75% were modeled in Minnesota. Other operating facilities will undergo minor operating adjustments to balance the system. This scenario results in modest net changes to the Minnesota economy, with a net average decrease of 144 jobs (0.0% change) from 2020-2045, and a net average decrease of \$141 million in GDP (0.0% change). However, the early retirement of King and Sherco 3 result in net economic losses for both Washington County (average decrease of 258 jobs, 0.2%; \$23 million in GDP, 0.2%, from 2028-2037) and Sherburne County (average decrease of 249 jobs, 0.6%; \$25 million in GDP, 0.5% from 2031-2040).

### **Early Coal and Monticello Extension**

The Early Coal and Monticello Extension scenario is Xcel's preferred plan as provided in the July 1, 2019 resource plan filing. This scenario includes the early retirement of the King Generating Plant in Washington County, the early retirement of the Sherco 3 (coal) Generating Plant in Sherburne County, additional gas generation in Sherburne County, the extension of the Monticello Nuclear Generating Plant in Wright County, the early addition of solar, as well as less installed wind generation. The King Generating Plant, a coal-fired power plant, is modeled to retire in 2028 in this scenario versus 2037 in the reference case. Sherco 3, a coal-fired power plant, is modeled to retire in 2030 in this scenario versus 2040 in the reference case, and a combined cycle unit is assumed to be added in Sherburne County in 2027. Monticello, a nuclear power plant, is modeled to be extended from 2030 to 2040. Additional solar will be added to the system five years earlier (2026 versus 2031), and less wind is added relative to the reference case. The solar additions were modeled outside of the host communities but 75% were modeled in Minnesota. Other operating facilities will undergo minor operating adjustments to balance the system. This scenario results in modest net changes to the Minnesota economy, with a net average increase of 1,401 jobs (0.0% change) from 2020-2045, and a net average increase of \$24 million in GDP (0.0% change). Compared to the reference case, the extension of Monticello results in net economic benefits for Wright County (average increase of 2,085 jobs, 3.1%; \$226 million, 3.5% in GDP from 2031-2040). However, the early retirement of King and Sherco 3 result in net economic losses for both Washington County (average decrease of 283 jobs, 0.2%; \$26 million in GDP, 0.2%, from 2028-2037) and Sherburne County (average decrease of 140 jobs, 0.3%; \$14 million in GDP, 0.3% from 2031-2040).

### **Early King and Monticello Extension**

The Early King and Monticello Extension scenario includes the early retirement of the King Generating Plant in Washington County, the extension of the Monticello Nuclear Generating Plant in Wright County, the early addition of solar, as well as less installed wind generation relative to the reference case. The King Generating Plant, a coal-fired power plant, is modeled to retire in 2028 in this scenario versus 2037 in the resource plan. Monticello, a nuclear power plant, is modeled to be extended from 2030 to 2040. A combined cycle unit is assumed to be added in Sherburne County in 2027. Additional solar will be added to the system five years earlier (2026 versus 2031), and less wind is added relative to the reference case. The solar additions were modeled outside of Goodhue County but 75% were modeled in Minnesota. Other operating facilities will undergo minor operating adjustments to balance the system. This scenario results in modest net changes to the Minnesota economy, with a net average increase of 1,904 jobs (0.0% change) from 2020-2045, and a net average increase of \$72 million in GDP (0.0% change). Compared to the reference case, the extension of Monticello results in net economic benefits for Wright County (average increase of 2,106 jobs, 3.1%; \$229 million in GDP, 3.5%, from 2031-2040). However, the early retirement of King results in net economic losses for Washington County (average decrease of 251 jobs, 0.2%; \$22 million in GDP, 0.2%, from 2028-2037).

### **Mock Shutdown**

The Mock Shutdown scenario was generated to illustrate the economic contributions of plants in the host communities, and inform communities of the potential economic impact of plant closures. The Mock Shutdown scenario shows the impact in 2018 based on observed plant expenditures. This scenario removes the economic activity driven by utility spending in each of the four counties with operations (i.e., Goodhue, Sherburne, Washington, and Wright counties). In addition to spending on operations, Xcel reported substantial capital expenditures for the facilities in 2018, compounding the economic impact of the utility. This scenario differs from the economic impact of the other extension/retirement scenarios because this only assumes a shutdown of operating activity in the county without replacement generation and without rate adjustments; whereas, the other scenarios present the economic impact compared to the reference case. As well, plants still incur operating and capital expenses during early retirement (e.g., decommissioning costs). The economic impacts in a single year can also be impacted by major capital improvements (or lack of). These mock plant shutdowns have economic consequences on each of the host communities:

- Mock 2018 shutdown of Monticello in Wright County leads to a loss of 2,528 jobs (3.9%) and \$226 million in GDP (5.3%) in the county.
- Mock 2018 shutdown of Prairie Island in Goodhue County leads to a loss of 2,962 jobs (9.8%) and \$346 million in GDP (13.1%) in the county.
- Mock 2018 shutdown of Sherco in Sherburne County leads to a loss of 1,228 jobs (3.2%) and \$232 million in GDP (6.1%) in the county.
- Mock 2018 shutdown of King in Washington County leads to a loss of 502 jobs (0.4%) and \$60 million in GDP (0.6%) in the county.

## STUDY METHODOLOGY

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The Business Research Division at the University of Colorado Boulder was hired by a consortium of stakeholders, including the Center for Energy and Environment (CEE), Minnesota Power, Xcel Energy, and five communities with operating utilities, to conduct economic impact analyses on the net economic impact of alternative energy scenarios on host communities.

This analysis examined the early retirement of power plants and looked at competing resources (e.g., coal, natural gas, wind, solar, battery, nuclear, etc.). The analysis considered operating expenditures, capital expenditures, and consumer rate costs for the current baseline scenarios identified in the prior resource plans and the alternative scenarios identified by the project consortium. An additional scenario was added for each host community that analyzed a mock shutdown of operations in each county based on 2018 operating data. This scenario was requested by the host communities in order to understand the spillover effects of a plant shutdown on local economies.

This report includes economic impact analysis on four of the host communities, as well as a statewide impact:

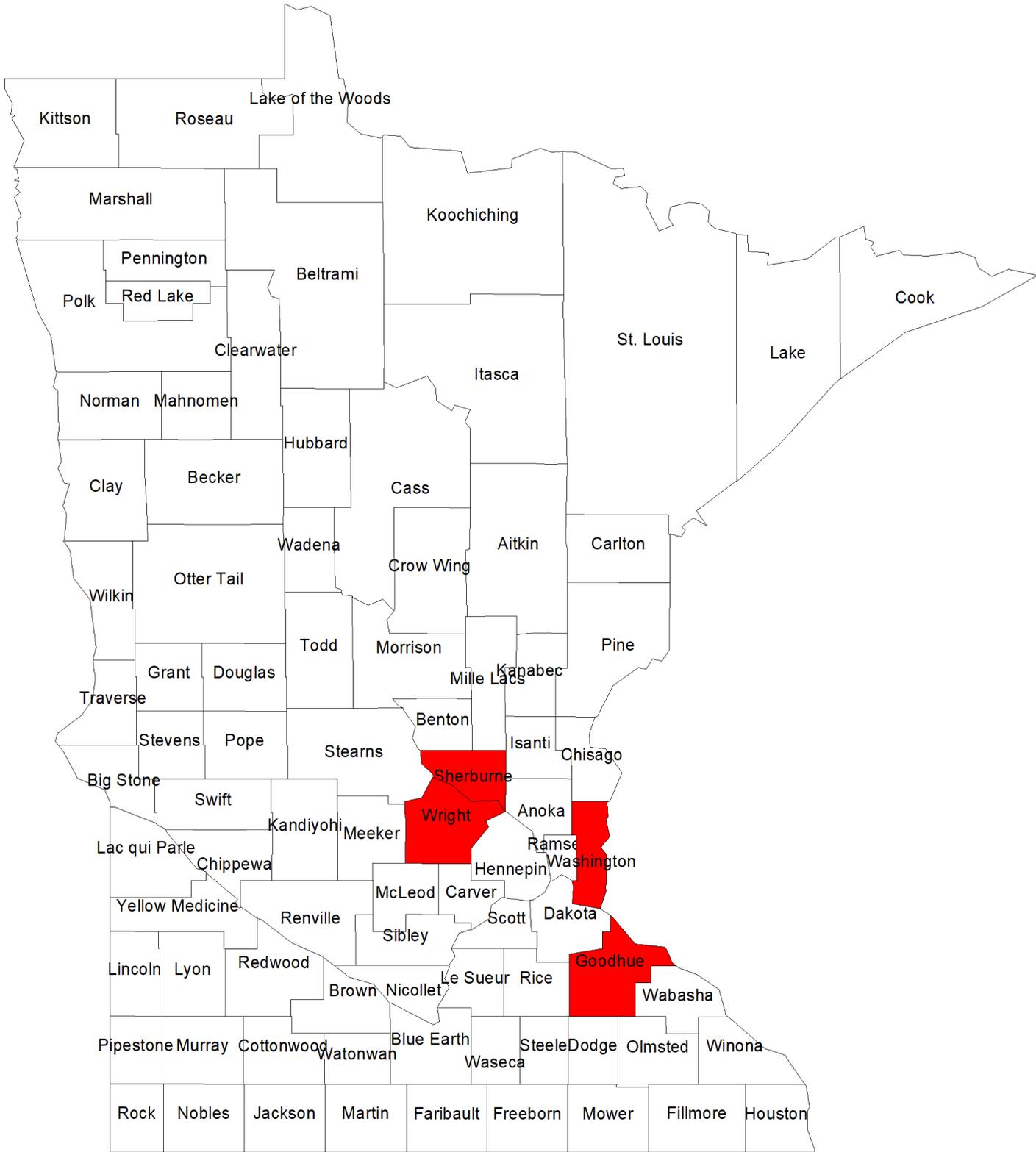
- Goodhue County (Prairie Island Plant)
- Sherburne County (Sherco 3 Plant)
- Washington County (King Plant)
- Wright County (Monticello Plant)
- State of Minnesota

Three of the counties—Sherburne, Washington, and Wright—are in the Minneapolis-St. Paul-Bloomington MSA.<sup>2</sup> Goodhue County is not directly within an MSA, but is directly adjacent to the Minneapolis-St. Paul-Bloomington MSA and the Rochester MSA.

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<sup>2</sup> According to the U.S. Census Bureau, Metropolitan Statistical Areas (MSAs) are, “associated with at least one urbanized area of at least 50,000 population, plus adjacent counties having a high degree of social and economic integration with the core as measured through commuting ties.” <https://www.census.gov/programs-surveys/metro-micro/about.html>, retrieved February 10, 2020.

**FIGURE 1: HOST COMMUNITIES**



Except for the shutdown scenario, analysis of the alternative scenarios compares project expenditures to the current resource plan scenario. These alternative scenarios each present unique plans to retire coal-fired power plants and replace generation with other resources (e.g., natural gas, wind, solar, nuclear). The mock shutdown scenario removes direct utility spending on operations and construction from the local economy in 2018.

**TABLE 1: XCEL ENERGY SCENARIOS**

Scenarios Analyzed in the Host Community Impact Study								
Scenario	Description	Coal Retirements				Nuclear		
		Sherco 1	Sherco 2	Sherco 3	AS King	Monticello	Prairie Island 1	Prairie Island 2
1	Reference	2026	2023	2040	2037	2030	2033	2034
2	Early King	2026	2023	2040	2028	2030	2033	2034
4	Early Coal	2026	2023	2030	2028	2030	2033	2034
9	Early Coal; Extend Monticello	2026	2023	2030	2028	2040	2033	2034
10	Early King; Extend Monticello	2026	2023	2040	2028	2040	2033	2034
12	Early Coal; Extend All Nuclear	2026	2023	2030	2028	2040	2043	2044

For each region, this analysis includes the impacts on the state of Minnesota and on the counties with a primary generating facility impacted by the plant retirement or extension. Guidance on the percentage of wind and solar installations in Minnesota were provided by Xcel Energy. Taking a conservative approach to the economic modeling, no solar or wind installations were assumed to occur within host communities, though, such installations may be viable within host counties.

Economic impact studies include the direct spending that a company or activity has on the area of study, as well as the indirect impact, which is the ripple effect that direct spending has on other businesses in the community. This term is also referred to as the *multiplier effect*, wherein companies utilize the local supply chain. A multiplier is a numeric way of describing the full effects of money changing hands within an economy. For instance, when Xcel Energy purchases coal, this affects the national mining and transportation industries. This is the indirect impact. Additionally, spending by employees has an inherent effect on local communities as they purchase groceries, clothes, and gas; pay rent or a mortgage; get haircuts, etc. This is understood as the induced impact.

The research team used the REMI model E3+ model 2.3 for the analysis.<sup>3</sup> Appendix 1 provides an overview of the REMI model. The REMI model is a dynamic forecasting and policy analysis model that incorporates econometric, input-output, and computable general equilibrium techniques. The model was created by REMI specifically for the state of Minnesota and five individual counties using national and local economic and demographic data. The REMI model used for this analysis is a six-region model for Goodhue, Itasca, Sherburne, Washington, and Wright counties, and the Rest of Minnesota (the agglomerated 82 other counties in the state).

Xcel Energy determined the scenarios examined in this study, which are consistent with the scenario provided in its July 1, 2019 resource plan filing. Scenario overviews are described at the beginning of each scenario section. Xcel Energy was forthcoming with available data on the current resource plans and the alternative scenarios. Xcel Energy provided detailed operating expenditures (including property taxes), capital expenditures for the reference case, Scenario 2, Scenario 4, Scenario 9, Scenario 10, and Scenario 12 for Goodhue, Sherburne, Washington, and Wright counties, as well as the change in revenue requirements necessary to accommodate such changes in the resource plan. Additionally, Xcel Energy provided annual expenditures in 2018 for the mock shutdown analysis.

Data were provided in nominal dollars, quantified in the year of expected impact. The impacts are presented in fixed, 2019 dollars and discounted by the model using industry price deflators.

Costs were entered into the REMI model based on total activity expenditures. For expenditures, a negative number reflects a decrease in spending under the alternative scenarios compared to the reference case. For revenue requirements, a negative number reflects lower electricity costs to residential, industrial, commercial, and government customers. The researchers deferred to the model for the industry intermediate inputs and local purchasing coefficients for intermediate inputs, and for the proportion of spending devoted to capital and labor. The local purchasing coefficients within REMI change over time based on changing demand.

Alternative scenarios with the same retirement or extension plan resulted in different magnitudes of impact on the host communities. For example, Monticello in Wright County was extended to 2040 in scenarios 9, 10, and 12. These scenarios are based on the Strategist modeling including in Xcel's July 1,

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<sup>3</sup> Contracted by the University of Colorado from REMI, Inc. in 2019.

2019 IRP filing and include other changes to Xcel’s system in addition to the changes in retirement dates, including additions or extensions of plants in other counties and slightly different forecasted spending at Monticello. Changes to plants in other counties also had an impact on the Wright County economy due to the spillover effects in the supply chain.

The analysis was completed prior to the COVID-19 pandemic. The pandemic has had profound economic impacts on the economy in the first and second quarters of 2020, and the impacts are likely to linger for years. However, this report analyzes changes from the reference case that occur eight or more years into the future—a period beyond the impact from this pandemic.

**THE MINNESOTA ECONOMY**

The Minnesota State Demographic Center estimated Minnesota’s population at 5.6 million in 2018.<sup>4</sup> The four counties included in this study collectively represent 9.5% of total state population, led by Washington County with 262,000 people, or 4.6% of the state total, ranking the county fifth among the 87 counties in the state. Goodhue County, the smallest county represented in this study, with 47,000 people, represents less than 1% of population and ranks 21st in the state.

**TABLE 2: MINNESOTA POPULATION ESTIMATES**

County	2018 Estimate	State Share	State Rank
Goodhue	46,540	0.8%	21
Sherburne	96,208	1.7%	12
Washington	261,512	4.6%	5
Wright	136,510	2.4%	10
Minnesota	5,629,416	100.0%	-

Source: Minnesota State Demographic Center.

Data from the Bureau of Labor Statistics’ Quarterly Census of Employment and Wages (QCEW) show the state recorded 2.9 million total nonfarm covered employees in September 2019; Washington County represented 3%, or 88,238 of the total.<sup>5</sup> Following the last recession (2007–2009), Minnesota has slightly lagged in the employment recovery, as did Goodhue County. However, Sherburne, Washington, and Wright counties have outperformed the state and nation in employment growth post-recession, reflecting the relative strength of the Minneapolis-St. Paul-Bloomington MSA.

<sup>4</sup> The most current data available as of March 2020.

<sup>5</sup> At time of publication, Q3 2019 data were the most current Quarterly Census of Employment and Wages data published by the Bureau of Labor Statistics.

**TABLE 3: MINNESOTA EMPLOYMENT**

County	2019 (Sept.)	State Share	State Rank
Goodhue	21,995	0.8%	21
Sherburne	28,859	0.9%	15
Washington	88,238	3.0%	7
Wright	45,653	1.6%	11
Minnesota	2,917,769	100.0%	-

Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

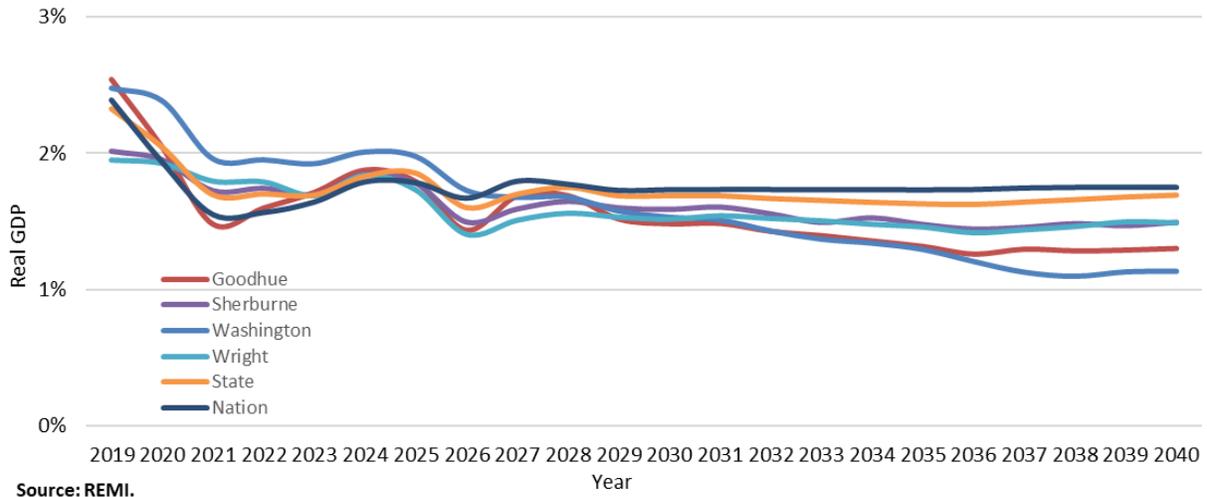
Data from the Bureau of Economic Analysis show Minnesota GDP of \$368.9 billion in 2018, making it the 17th-largest economy in the United States (current dollars). Annual real GDP, adjusting for inflation, grew 2.6% in 2018, ranking the state 16th nationally for growth, and quarterly growth totaled 2.0% in Q3 2019, ranking Minnesota 28th.

Annual real GDP growth in Goodhue and Sherburne Counties outperformed the state, growing at 2.7% and 3.4% from in 2018, respectfully. Washington and Wright Counties underperformed compared to the state and grew at 2.6% and 1.8%, respectively. In terms of GDP (current dollars) in 2018, Washington County ranked 8th among the Minnesota counties (\$10.8 billion), Wright County ranked 12th (\$4.6 billion), Sherburne County ranked 14th (\$3.6 billion), and Goodhue County ranked 15th (\$3 billion). Per capita personal income for the state was \$57,515 in 2018. Per capita personal income varied widely in the individual counties in 2018, with Washington County 18% above the state average, and Sherburne County 18% below. Per capita personal income for Goodhue was \$53,549; Sherburne, \$47,031; Washington, \$67,928; and Wright, \$50,181.

The REMI baseline forecast places the U.S. economy on a growth trajectory throughout the analysis horizon, with faster rates of growth in the short term followed by slower growth (Figure 3). In the REMI model, Minnesota and the nation outperform GDP growth in the individual counties.<sup>6</sup>

<sup>6</sup> Note: the economic forecast was generated prior to the COVID-19 pandemic. While short-term economic trajectories have been negatively impacted by the pandemic, this analysis focuses on economic changes in the medium term (eight or more years into the future).

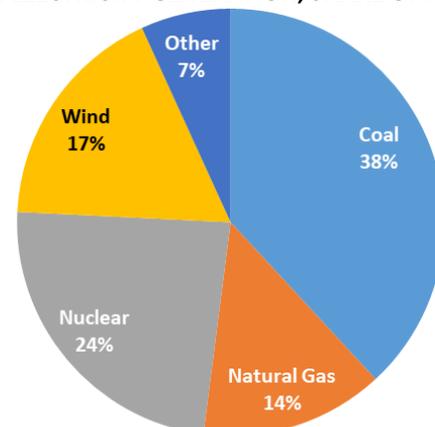
**FIGURE 2: BASELINE GDP FORECAST, 2019–2040**



### MINNESOTA ENERGY PRODUCTION AND CONSUMPTION

Minnesota ranks low in terms of energy production, particularly because of the dearth of natural resource extraction (i.e., coal, natural gas, crude oil). It ranked 32nd in the nation in total energy production, primarily due to the electricity generation in the state—Minnesota ranked 28th for total net electricity generation, according to data from the Energy Information Administration.<sup>7</sup> The state ranked 18th for total energy consumption per capita.<sup>8</sup> As shown in Figure 3, approximately 38% of energy generated in the state came from coal, and an additional 24% was produced from nuclear in 2018.<sup>9</sup> Minnesota ranked 8th in wind-generated electricity in 2018 and 13th for solar thermal and photovoltaic.

**FIGURE 3: MINNESOTA ELECTRICITY GENERATION, SHARE OF MWH GENERATION, 2018**



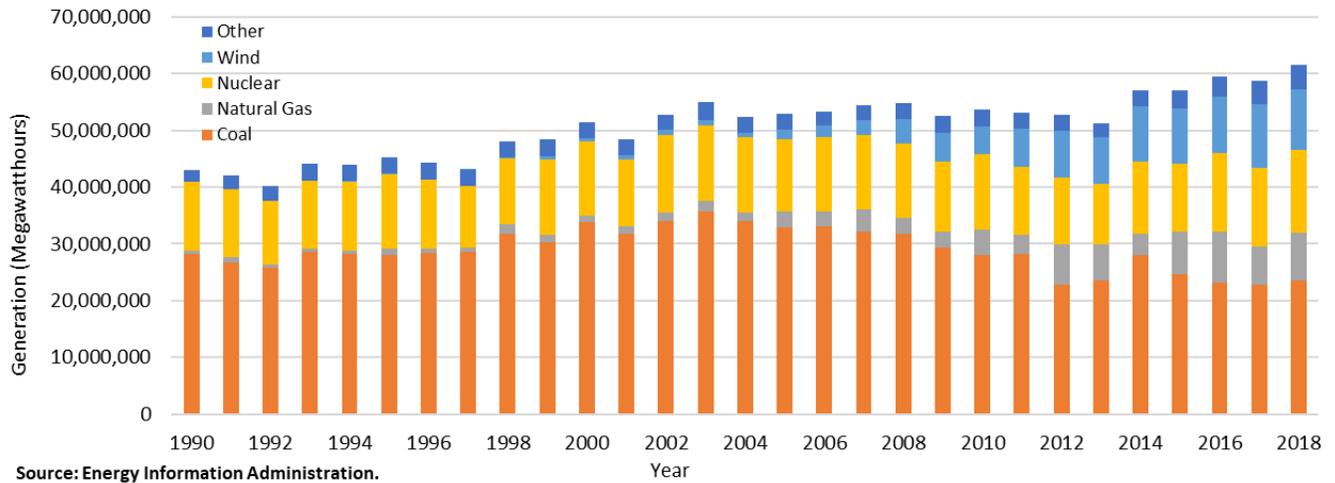
Source: Energy Information Administration.

<sup>7</sup> Total Energy Production, 2017 (trillion Btu) and Total Net Electricity Generation, November 2019 (Thousands MWh).

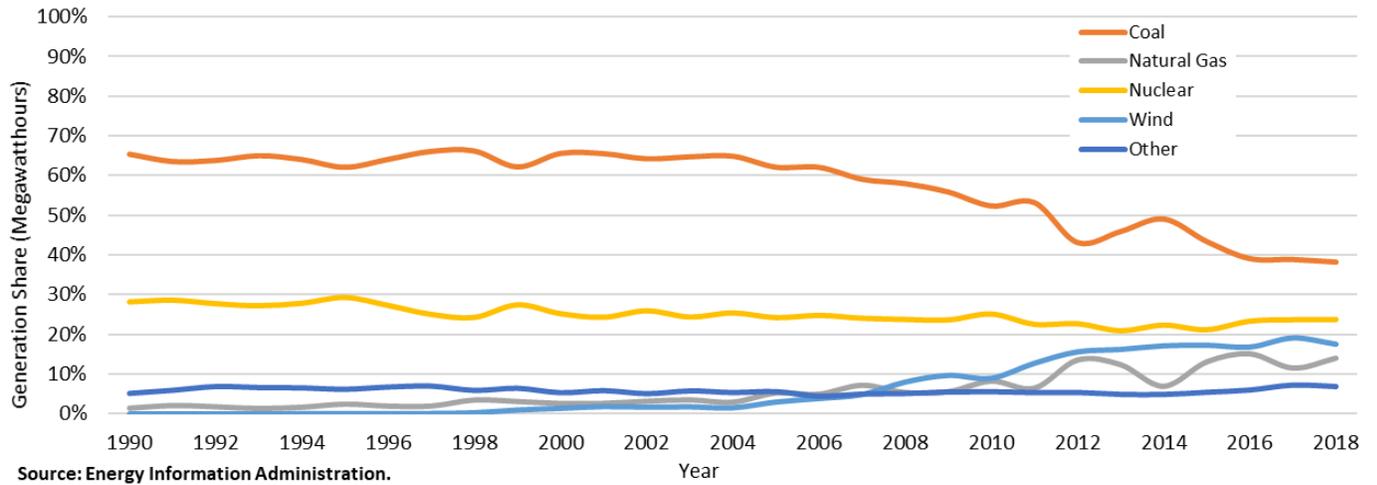
<sup>8</sup> Total Energy Consumed per Capita, 2018 (million Btu).

<sup>9</sup> Net Generation by State by Type of Producer by Energy Source, 1990–2018.

**FIGURE 4: MINNESOTA ELECTRICITY GENERATION, GENERATION, 1990–2018**



**FIGURE 5: MINNESOTA ELECTRICITY GENERATION, SHARE OF GENERATION, 1990–2018**



## EARLY COAL AND NUCLEAR EXTENSION DETAILED IMPACTS

The Early Coal and Nuclear Extension scenario (i.e., Scenario 12) includes the early retirement of the King Generating Plant in Washington County, the early retirement of the Sherco Generating Plant in Sherburne County, the extension of the Monticello Nuclear Generating Plant in Wright County, the extension of Prairie Island Nuclear Generating Station in Goodhue County, as well as less installed wind and more solar generation relative to the reference case. The King Generating Plant, a coal-fired power plant, is modeled to retire in 2028 in this scenario versus 2037 in the reference case. Sherco 3, a coal-fired power plant, is modeled to retire in 2030 in this scenario versus 2040 in the reference case.

Monticello, a nuclear power plant, is modeled to be extended from 2030 to 2040. Prairie Island units 1 and 2 are extended until 2043 and 2044, respectively. More solar will be added to the system, notably,

after 2037, and less wind is added relative to the reference case. The solar changes were modeled outside of Sherburne County but 75% were modeled in Minnesota.

**TABLE 4: EARLY COAL AND NUCLEAR EXTENSION SCENARIO**

Scenarios Analyzed in the Host Community Impact Study								
Scenario	Description	Coal Retirements				Nuclear		
		Sherco 1	Sherco 2	Sherco 3	AS King	Monticello	Prairie Island 1	Prairie Island 2
1	<b>Reference</b>	2026	2023	2040	2037	2030	2033	2034
12	<b>Early Coal; Extend All Nuclear</b>	2026	2023	2030	2028	2040	2043	2044

### *Capital Expenditures*

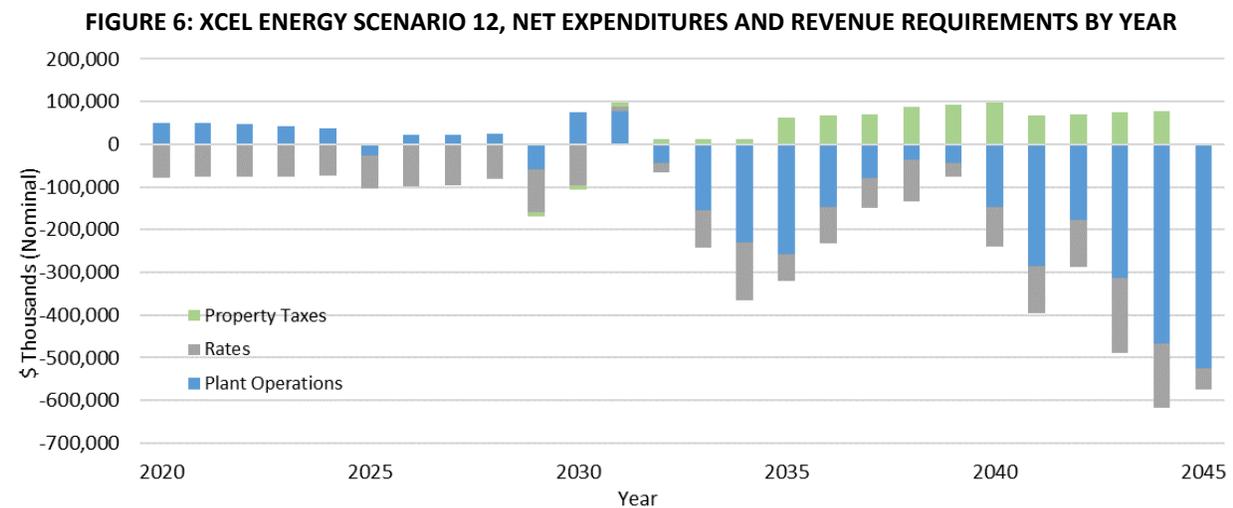
The Early Coal and Nuclear Extension scenario incurs capital expenditures in Minnesota of \$789.4 million above the baseline resource plan scenario from 2020–2045. The capital activities include the decrease in expenditures at the King Generating Plant in Washington County, a decrease in expenditures at Sherco 3 in Sherburne County, an increase in capital spending with the extension of the Monticello nuclear plant in Wright County, and an increase in capital spending with the extension of the Prairie Island nuclear plant in Goodhue County. This scenario projects a decrease in wind generation and an increase in solar generation relative to the reference case, but those transactions are captured in operating expenditures as a fuel purchase.

### *Operating Expenditures*

The Early Coal and Nuclear Extension scenario incurs operating expenditures in Minnesota of \$4.9 billion above the baseline resource plan scenario from 2020–2045 (excluding changes in fuel purchases), driven largely by the extension of nuclear at Prairie Island and Monticello. However, the change in fuel purchases, including coal, natural gas, wind, solar, leads to an overall decline in operating expenditures. Fossil fuel purchases alone (coal and natural gas) decline by \$785.5 million. Given that Minnesota lacks native coal production, out-of-state coal mines bear the decrease in coal purchases. Property taxes are considered an operating expense. The decrease in property taxes is modeled as a decrease in spending on local government services.

### Revenue Requirements

Based on the level of operation and capital expenditures detailed in this report, Xcel Energy estimated the Early Coal and Nuclear Extension scenario will decrease revenue requirements by \$2.2 billion (included in electricity rates for electric customers) when compared to the baseline resource plan. Revenue requirements are not equal to the sum of operating and capital expenditures because capital expenditures are recovered over the life of the asset. Therefore, revenue requirements occur over the life of the asset and include both a return of and a return on capital. The capital and operating expenditure assumptions also reflect spending only in the state of Minnesota. The revenue requirements estimate the change in electric revenues that would be recovered from customers for the Early Coal and Nuclear Extension scenario, despite the location of the supply chain for operating and capital purchases. The reduction in revenue requirements was applied to residential, commercial, and industrial customers in Minnesota based on electricity usage by customer class.



### Early Coal and Nuclear Extension Impact on Goodhue County

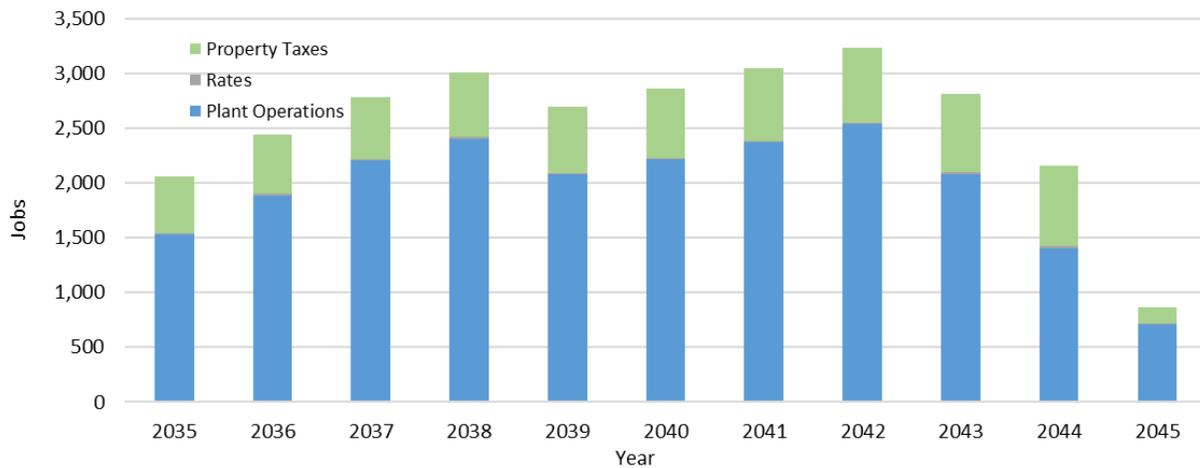
Since this scenario includes the extension of the nuclear Prairie Island power plant, the impact was detailed for Goodhue County from 2035-2045 (i.e., the extension of the plant compared to the resource plan). The extension leads to an increase in plant operations (capital and operating expenditures) compared to the reference case, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this extension yields an additional \$631 million in property taxes. The Early Coal and Nuclear Extension scenario results in a net average increase of 2,500 jobs in the Goodhue County economy over the 10-year horizon, a net average increase of \$298 million in GDP, and a net average increase of \$155 million

in disposable personal income with the extension of the Prairie Island plant beyond the current resource plan.

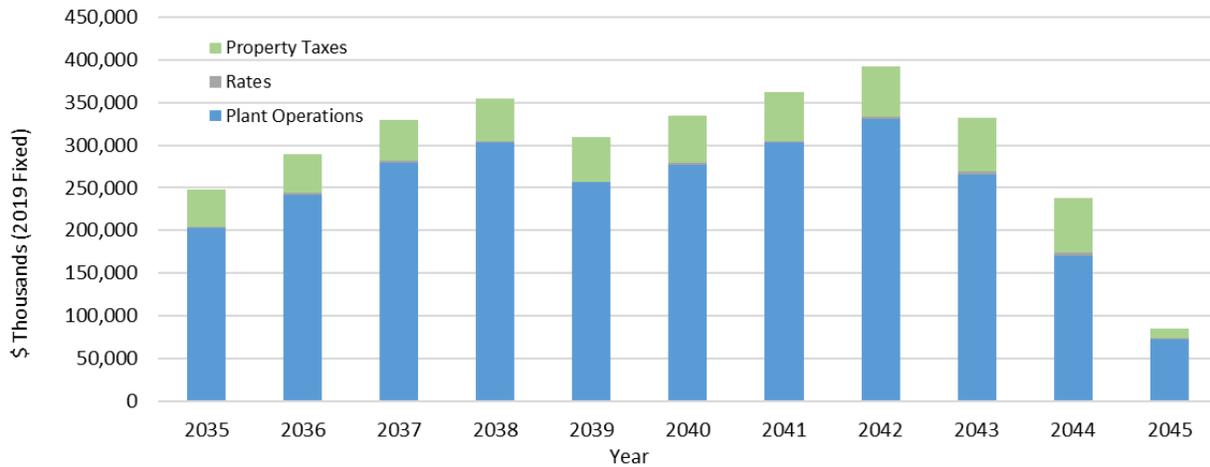
**TABLE 5: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION NET ECONOMIC IMPACT ON GOODHUE COUNTY, 2035–2045**

Category	Units	Average Change		
		Years 2035-2039	Years 2040-2044	2035-2045
Total Employment	Jobs	2,596	2,825	2,543
	<i>Percentage Change</i>	8.2%	9.0%	8.1%
Gross Domestic Product	Dollars (Real 2019, Thousands)	306,066	331,647	297,624
	<i>Percentage Change</i>	8.6%	9.2%	8.0%
Disposable Personal Income	Dollars (Real 2019, Thousands)	131,442	186,177	155,260
	<i>Percentage Change</i>	4.4%	6.2%	5.0%

**FIGURE 7: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON GOODHUE COUNTY EMPLOYMENT**



**FIGURE 8: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON GOODHUE COUNTY GDP**



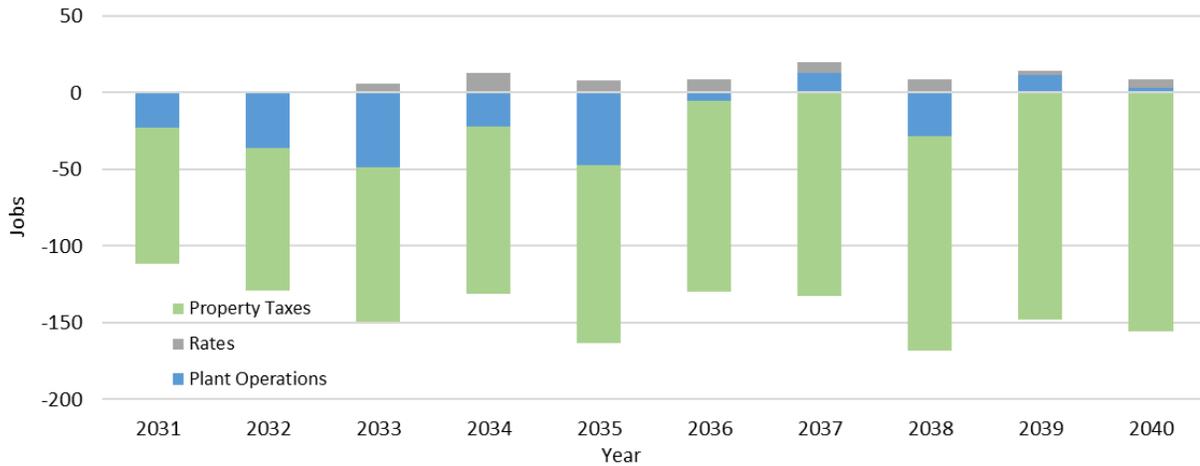
*Early Coal and Nuclear Extension Impact on Sherburne County*

Since this scenario includes early retirement of Sherco 3, the impact was detailed for Sherburne County from 2031-2040 (i.e., the early retirement of the plant compared to the resource plan). The retirement leads to a decrease plant operations (capital and operating expenditures) compared to the reference case, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this retirement yields a decrease of \$137 million in property taxes. The Early Coal and Nuclear Extension scenario results in a net average decrease of 133 jobs in the Sherburne County economy over the 10-year horizon, an average annual decrease in GDP of \$11.8 million, and an average annual increase in disposable personal income of \$6.7 million (driven in part by the decrease in electricity rates).

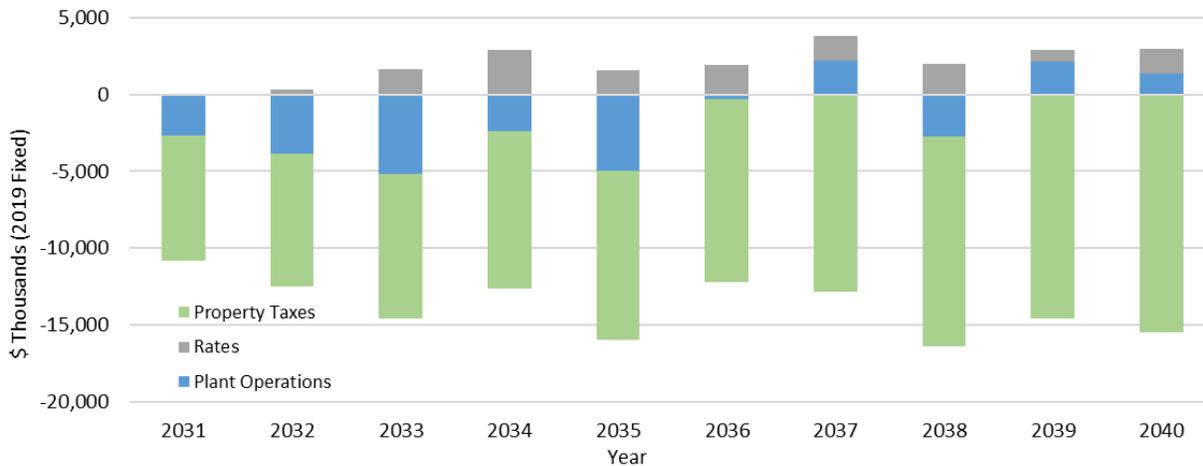
**TABLE 6: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION NET ECONOMIC IMPACT ON SHERBURNE COUNTY, 2031-2040**

Category	Units	Average Change		
		Year 2031-2035	Year 2036-2040	2031-2040
Total Employment	Jobs	-131	-135	-133
	<i>Percentage Change</i>	-0.3%	-0.3%	-0.3%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-11,982	-11,592	-11,787
	<i>Percentage Change</i>	-0.2%	-0.2%	-0.2%
Disposable Personal Income	Dollars (Real 2019, Thousands)	5,452	7,923	6,687
	<i>Percentage Change</i>	0.1%	0.1%	0.1%

**FIGURE 9: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON SHERBURNE COUNTY EMPLOYMENT**



**FIGURE 10: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON SHERBURNE COUNTY GDP**



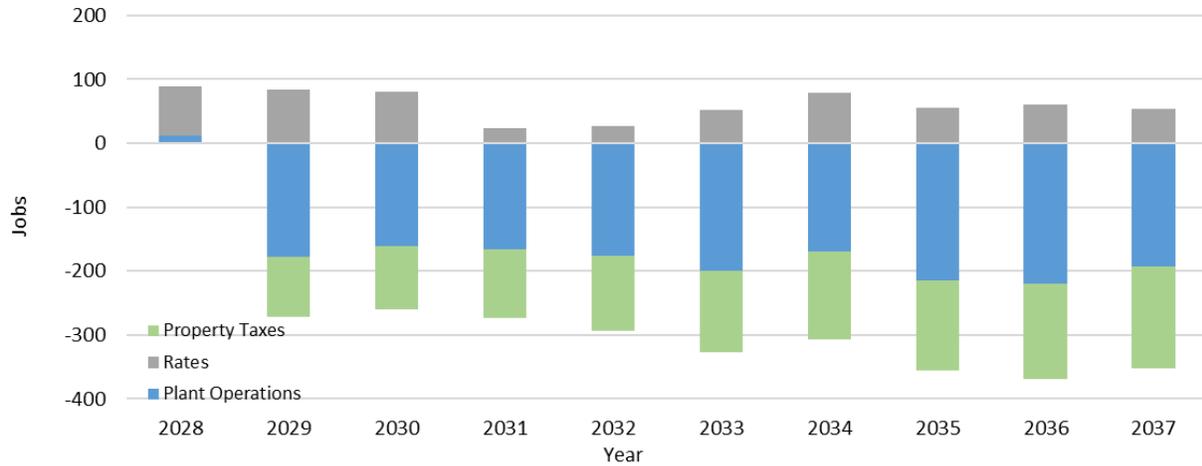
*Early Coal and Nuclear Extension Impact on Washington County*

Since this scenario includes early retirement of the King Generating Plant, the impact was detailed for Washington County from 2028-2037 (i.e., the early retirement of the plant compared to the reference case). The retirement leads to a decrease of plant operations (capital and operating expenditures) compared to the reference case, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this retirement yields a decrease of \$109 million in property taxes. The Early Coal and Nuclear Extension scenario results in a net average decrease of 221 jobs in the Washington County economy over the 10-year horizon, a net average annual decrease of \$19.1 million in GDP, and an average annual increase of \$646,000 in disposable personal income (largely due to the decrease in rates).

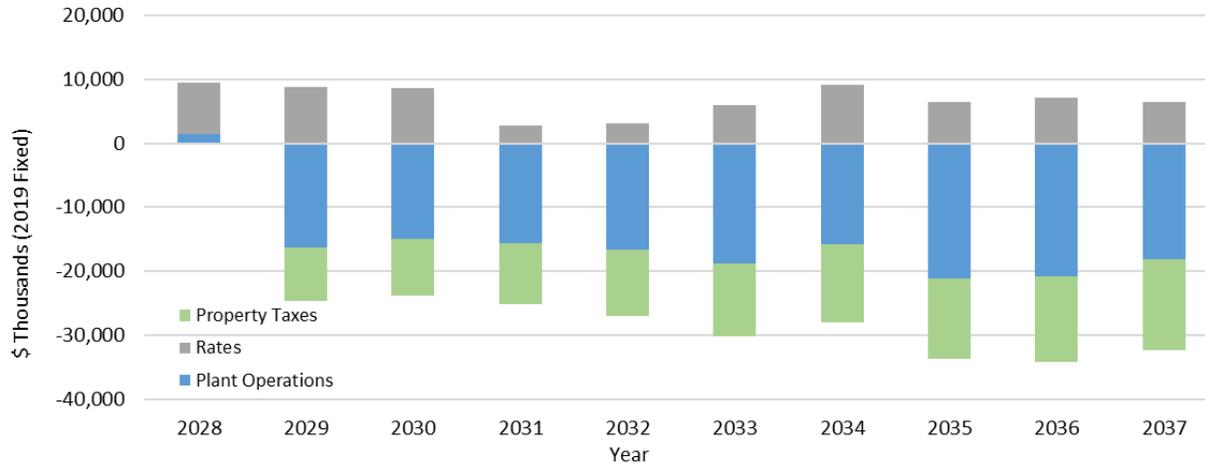
**TABLE 7: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION NET ECONOMIC IMPACT ON WASHINGTON COUNTY, 2028–2037**

Category	Units	Average Change		
		Year 2028-2032	Year 2033-2037	2028- 2037
Total Employment	Jobs	-159	-282	-221
	<i>Percentage Change</i>	-0.1%	-0.2%	-0.2%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-13,571	-24,651	-19,111
	<i>Percentage Change</i>	-0.1%	-0.2%	-0.1%
Disposable Personal Income	Dollars (Real 2019, Thousands)	5,581	-4,289	646
	<i>Percentage Change</i>	0.0%	0.0%	0.0%

**FIGURE 11: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON WASHINGTON COUNTY EMPLOYMENT**



**FIGURE 12: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON WASHINGTON COUNTY GDP**



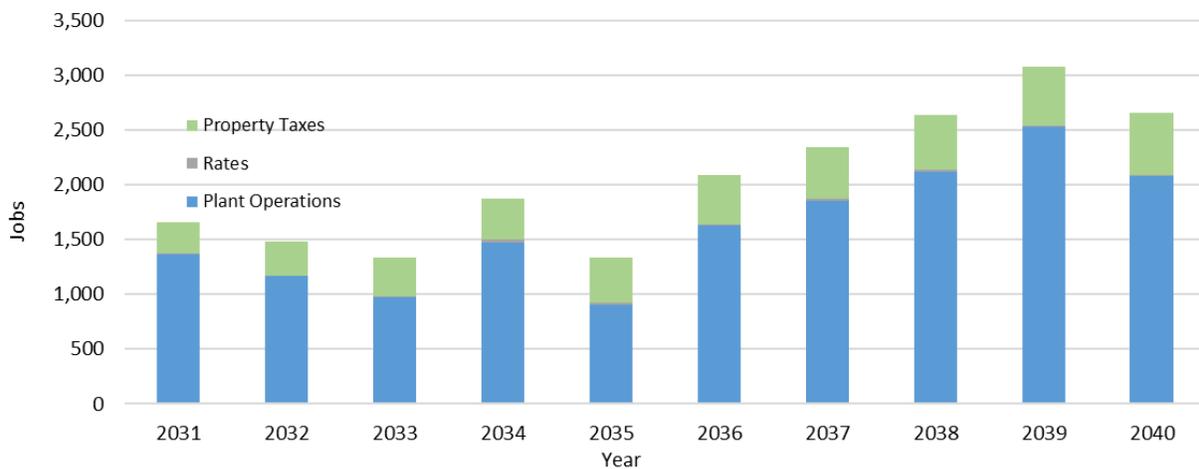
### Early Coal and Nuclear Extension Impact on Wright County

Since this scenario includes the extension of the nuclear power plant in Monticello, the impact was detailed for Wright County from 2031-2040 (i.e., the extension of the plant compared to the resource plan). The extension leads to an increase in plant operations (capital and operating expenditures) compared to the reference case, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this extension yields an additional \$412 million in property taxes. This scenario results in a net average increase of 2,049 jobs in the Wright County economy over the 10-year horizon, and a net average increase of \$222.4 million in GDP and \$127.8 million in disposable personal income coinciding with the extension of the Monticello plant beyond the current end of license.

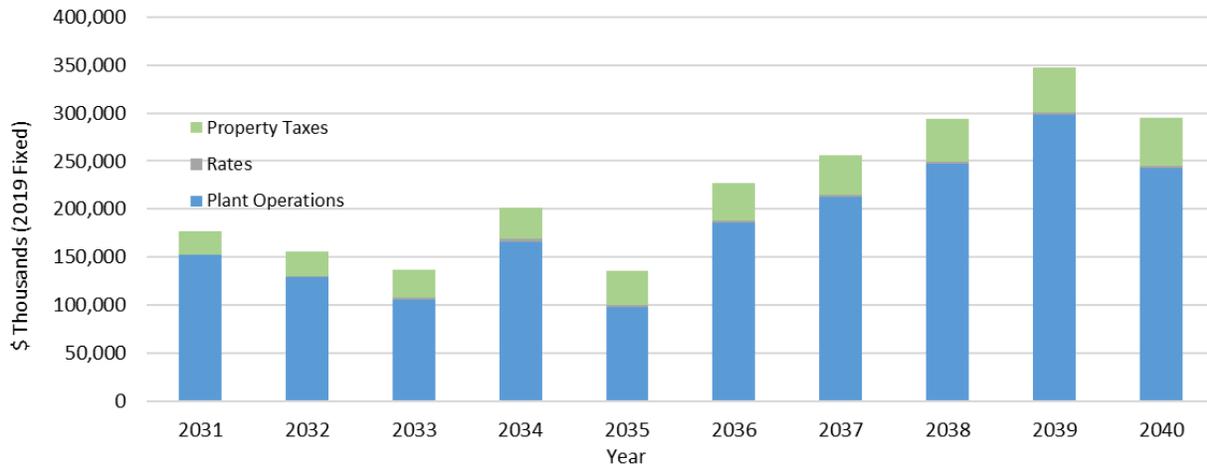
**TABLE 8: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION NET ECONOMIC IMPACT ON WRIGHT COUNTY, 2031–2040**

Category	Units	Average Change		
		Year 2031-2035	Year 2036-2040	2031-2040
Total Employment	Jobs	1,538	2,561	2,049
	<i>Percentage Change</i>	2.3%	3.8%	3.0%
Gross Domestic Product	Dollars (Real 2019, Thousands)	161,010	283,871	222,440
	<i>Percentage Change</i>	2.6%	4.3%	3.5%
Disposable Personal Income	Dollars (Real 2019, Thousands)	82,474	173,170	127,822
	<i>Percentage Change</i>	1.0%	1.9%	1.5%

**FIGURE 13: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON WRIGHT COUNTY EMPLOYMENT**



**FIGURE 14: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON WRIGHT COUNTY GDP**



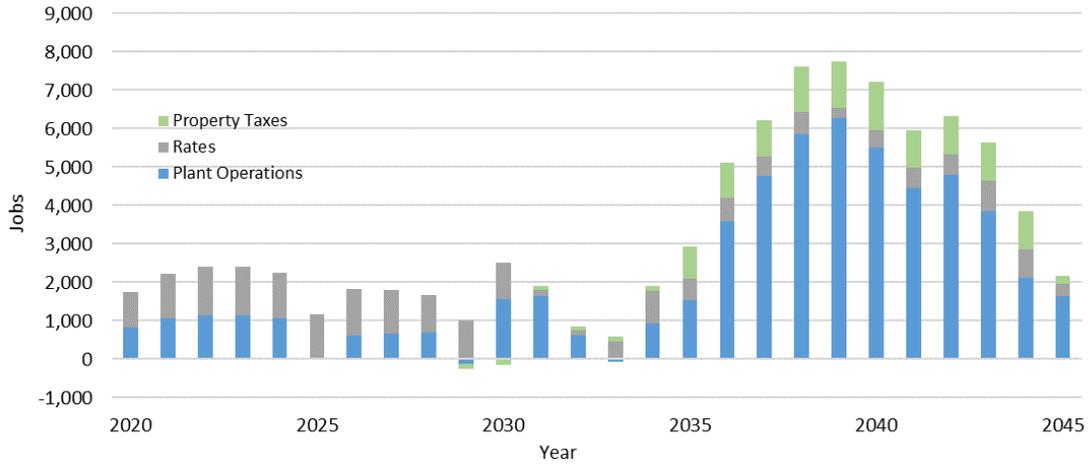
*Early Coal and Nuclear Extension Impact on Minnesota*

The Early Coal and Nuclear Extension scenario results in modest net changes to the Minnesota economy, with a net average increase of 3,330 jobs over the 25-year horizon, and a net average increase of \$234.1 million in GDP and \$318.5 million in disposable personal income. The largest impacts occur during the last 10 years, coinciding with the extension of Prairie Island and Monticello. Note that the percentage change in jobs, GDP, and personal income round to 0%, thus, indicating negligible change in the overall Minnesota economy.

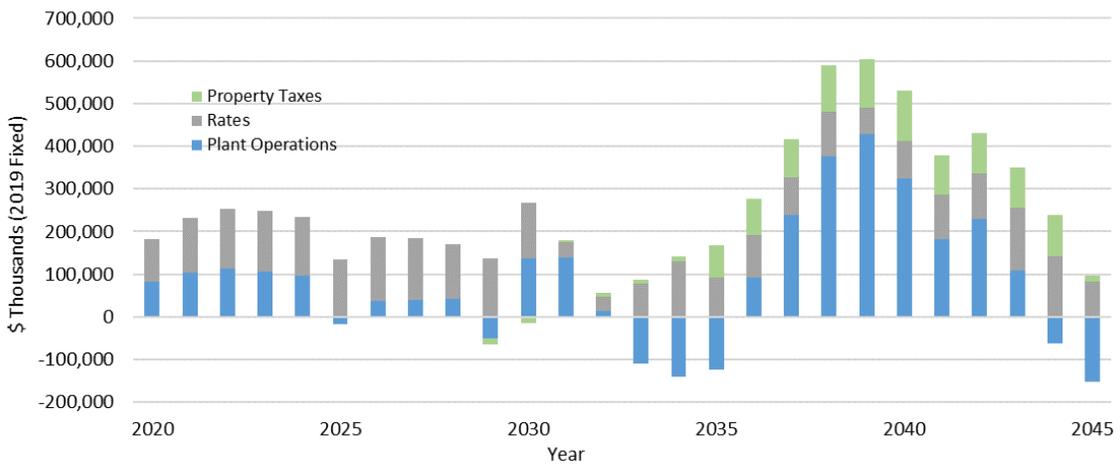
**TABLE 9: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION NET ECONOMIC IMPACT ON MINNESOTA, 2020–2045**

Category	Units	Average Change					2020-2045
		Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	
Total Employment	Jobs	2,204	1,445	1,513	5,927	5,793	3,330
	<i>Percentage Change</i>	0.1%	0.0%	0.0%	0.1%	0.1%	0.1%
Gross Domestic Product	Dollars (Real 2019, Thousands)	229,425	146,368	93,186	385,848	373,278	234,067
	<i>Percentage Change</i>	0.1%	0.0%	0.0%	0.1%	0.1%	0.0%
Disposable Personal Income	Dollars (Real 2019, Thousands)	192,686	177,507	178,310	486,156	562,368	318,546
	<i>Percentage Change</i>	0.1%	0.1%	0.0%	0.1%	0.1%	0.1%

**FIGURE 15: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON MINNESOTA EMPLOYMENT**



**FIGURE 16: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON MINNESOTA GDP**



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## EARLY KING DETAILED IMPACTS

The Early King scenario (i.e., Scenario 2) includes the early retirement of the King Generating Plant in Washington County and the early addition of solar, as well as less installed wind generation relative to the reference case. The King Generating Plant, a coal-fired power plant, is modeled to retire in 2028 in this scenario versus 2037 in the reference case, and solar will be added to the system six years earlier than scheduled in the reference case (2026 versus 2032). The solar additions were modeled outside of Washington County but 75% were modeled in Minnesota. Other operating facilities will undergo minor operating adjustments to balance the system.

**TABLE 10: EARLY KING SCENARIO**

Scenarios Analyzed in the Host Community Impact Study								
Scenario	Description	Coal Retirements				Nuclear		
		Sherco 1	Sherco 2	Sherco 3	AS King	Monticello	Prairie Island 1	Prairie Island 2
1	Reference	2026	2023	2040	2037	2030	2033	2034
2	Early King	2026	2023	2040	2028	2030	2033	2034

### *Capital Expenditures*

The Early King scenario incurs capital expenditures in Minnesota of \$163.4 million below the baseline resource plan scenario from 2020–2045. The capital activities include the decrease in expenditures at the King Generating Plant in Washington County. While this scenario projects an increase in solar generation and a decrease in wind generation relative to the reference case, those transactions are captured in operating expenditures as fuel purchases.

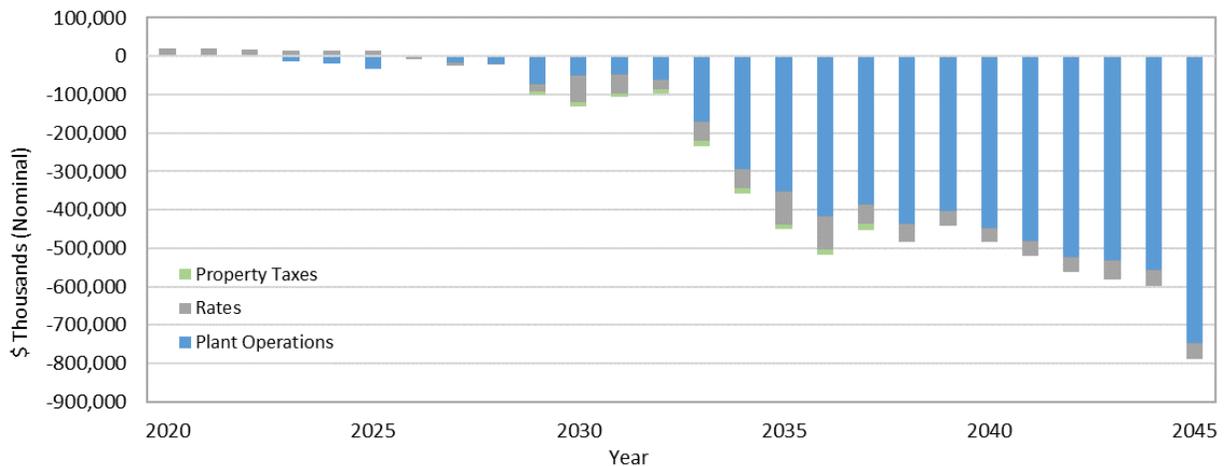
### *Operating Expenditures*

The Early King scenario incurs operating expenditures of \$678.3 million below the baseline resource plan scenario from 2020–2045 (excluding changes in fuel purchases), driven in part by the early retirement of coal generation at the King plant in Washington County. Given that Minnesota lacks native coal production, out-of-state coal mines bear the decrease in coal purchases, while Minnesota potentially gains from in-state solar installations. However, purchases of natural gas, also not native to Minnesota, increase in this scenario. Property taxes are considered an operating expense. The decrease in property taxes is modeled as a decrease in spending on local government services.

### Revenue Requirements

Based on the level of operating and capital expenditures detailed in this report, Xcel Energy estimated the Early King scenario will decrease revenue requirements by \$738.3 million (included in electricity rates for electric customers) when compared to the baseline resource plan. Revenue requirements are not equal to the sum of operation and capital expenditures because capital expenditures are recovered over the life of the asset. Therefore, revenue requirements occur over the life of the asset and include both a return of and a return on capital. The capital and operating expenditure assumptions also reflect spending only in the state of Minnesota. The revenue requirements estimate the change in electric revenues that would be recovered from customers for Scenario 2, despite the location of the supply chain for operating and capital purchases. The reduction in revenue requirements was applied to residential, commercial, and industrial customers in Minnesota based on electricity usage by customer class.

**FIGURE 17: XCEL ENERGY SCENARIO 2, NET EXPENDITURES AND REVENUE REQUIREMENTS BY YEAR**



### Early King Impact on Washington County

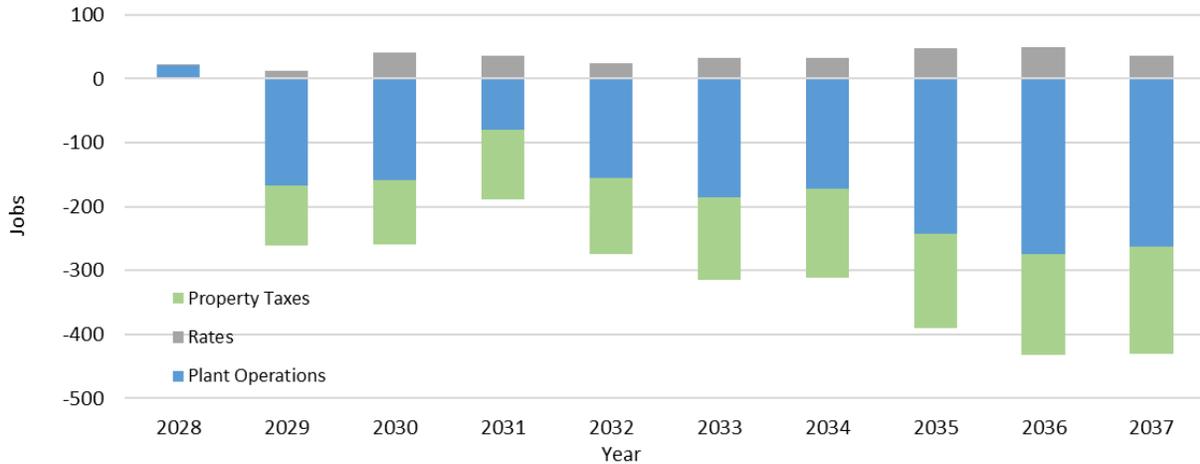
Since this scenario includes early retirement of the King Generating Plant, the impact was detailed for Washington County. The retirement leads to a decrease in plant operations (capital and operating expenditures) compared to the reference case, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this retirement results in a decrease of \$109 million in property taxes. The Early King scenario results in a net average decrease of 253 jobs in the Washington County economy over the 10-year horizon from 2028-2037, and a net average decrease of \$23 million in GDP and \$10 million in disposable personal income. The largest negative impacts occur during the final years of the forecast

horizon, driven down by the negative shock of decreased operating (particularly property taxes) and capital expenditures within the county, modestly offset by lower revenue requirements.

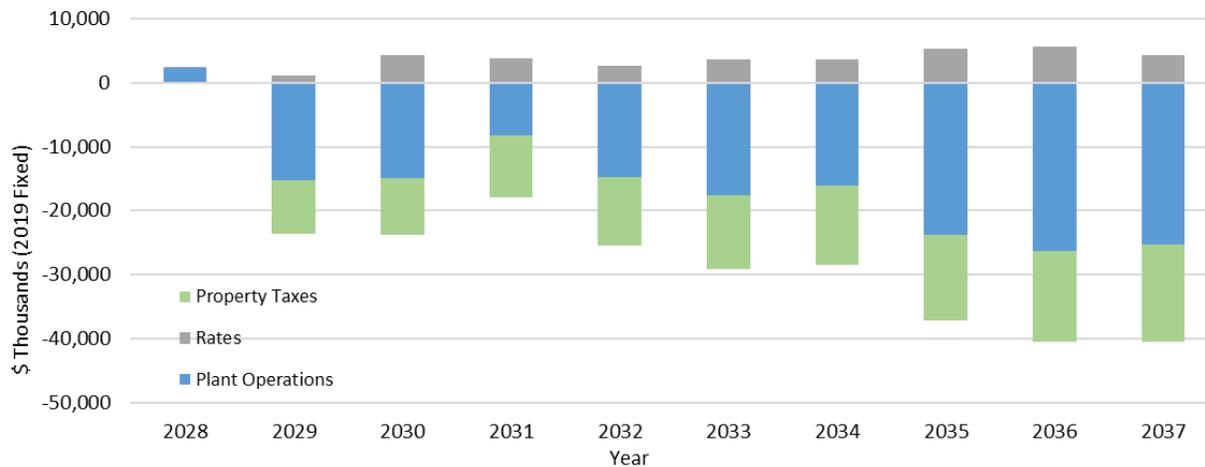
**TABLE 11: XCEL ENERGY EARLY KING NET ECONOMIC IMPACT ON WASHINGTON COUNTY, 2028–2037**

Category	Units	Average Change		
		Year 2028-2032	Year 2033-2037	2028- 2037
Total Employment	Jobs	-169	-336	-253
	<i>Percentage Change</i>	-0.1%	-0.3%	-0.2%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-15,296	-30,696	-22,996
	<i>Percentage Change</i>	-0.1%	-0.2%	-0.2%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-2,577	-17,406	-9,992
	<i>Percentage Change</i>	0.0%	-0.1%	0.0%

**FIGURE 18: XCEL ENERGY EARLY KING IMPACT ON WASHINGTON COUNTY EMPLOYMENT**



**FIGURE 19: XCEL ENERGY EARLY KING IMPACT ON WASHINGTON COUNTY GDP**

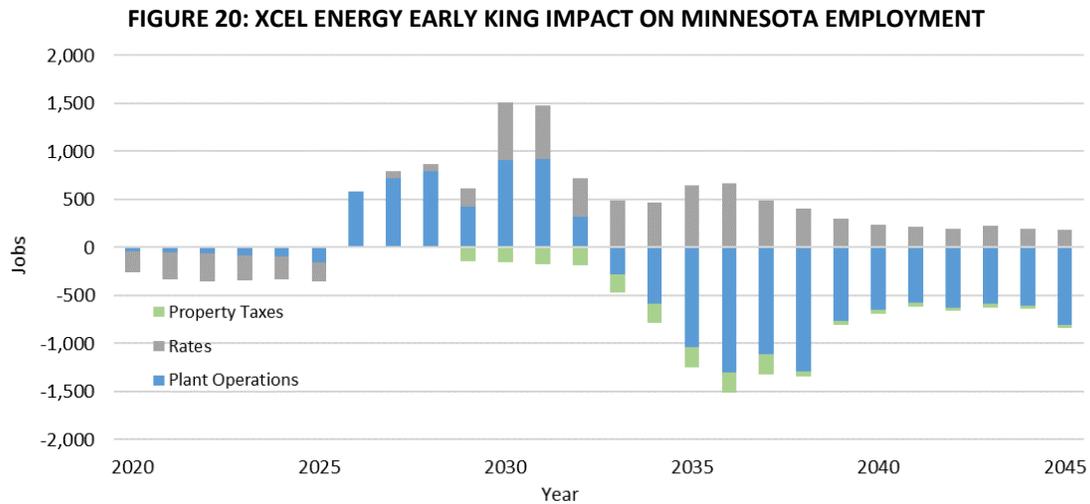


### Early King Impact on Minnesota

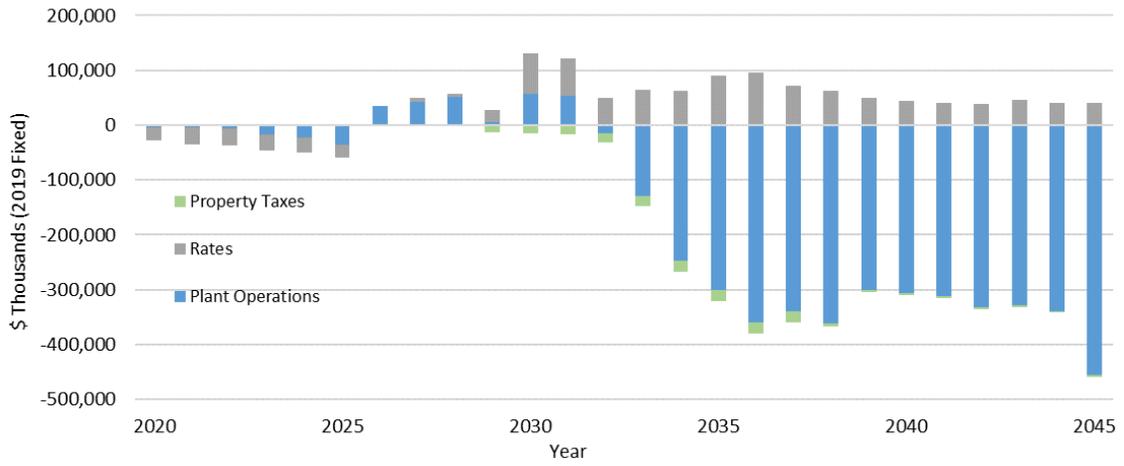
The Early King scenario results in modest net changes to the Minnesota economy, with a net average decrease of 112 jobs over the 25-year horizon, a net average decrease of \$129.2 million in GDP, and an average annual increase of \$15.8 million in disposable personal income (largely due to the decreased rates). The largest negative impacts occur during the final 10 years during the early retirement of the King facility, driven down by the negative shock from decreased operating expenditures (including decreased property taxes), with economic dividends coming from a decrease in revenue requirements partially offsetting capital and operating changes. Note that the percentage change in jobs, GDP, and personal income round to 0.0%, thus, indicating negligible change in the economy.

**TABLE 12: XCEL ENERGY EARLY KING NET ECONOMIC IMPACT ON MINNESOTA, 2020–2045**

Category	Units	Average Change					2020-2045
		Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	
Total Employment	Jobs	-326	471	578	-745	-430	-112
	Percentage Change	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-39,550	19,017	-9,764	-272,747	-284,889	-129,163
	Percentage Change	0.0%	0.0%	0.0%	-0.1%	-0.1%	0.0%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-32,852	30,360	77,986	5,314	4,004	15,803
	Percentage Change	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%



**FIGURE 21: XCEL ENERGY EARLY KING IMPACT ON MINNESOTA GDP**



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## EARLY COAL DETAILED IMPACTS

The Early Coal scenario (i.e., Scenario 4) includes the early retirement of the King Generating Plant in Washington County, the early retirement of the Sherco Generating Plant in Sherburne County, the early addition of solar, as well as less installed wind generation relative to the reference case. The King Generating Plant, a coal-fired power plant, is modeled to retire in 2028 in this scenario versus 2037 in the reference case. Sherco 3, a coal-fired power plant, is modeled to retire in 2030 in this scenario versus 2040 in the reference case. Additional solar will be added to the system five years earlier (2026 versus 2031), and less wind is added relative to the reference case. The solar additions were modeled outside of host communities but 75% were modeled in Minnesota. Other operating facilities will undergo minor operating adjustments to balance the system.

**TABLE 13: EARLY COAL SCENARIO**

Scenarios Analyzed in the Host Community Impact Study								
Scenario	Description	Coal Retirements				Nuclear		
		Sherco 1	Sherco 2	Sherco 3	AS King	Monticello	Prairie Island 1	Prairie Island 2
1	Reference	2026	2023	2040	2037	2030	2033	2034
4	Early Coal	2026	2023	2030	2028	2030	2033	2034

### *Capital Expenditures*

The Early Coal scenario incurs capital expenditures of \$318.8 million below the baseline resource plan scenario from 2020–2045. The capital activities include the decrease in expenditures at the King Generating Plant in Washington County and at Sherco 3 in Sherburne County. While this scenario projects an increase in solar generation and a decrease in wind generation relative to the reference case, those transactions are captured in operating expenditures as a fuel purchase.

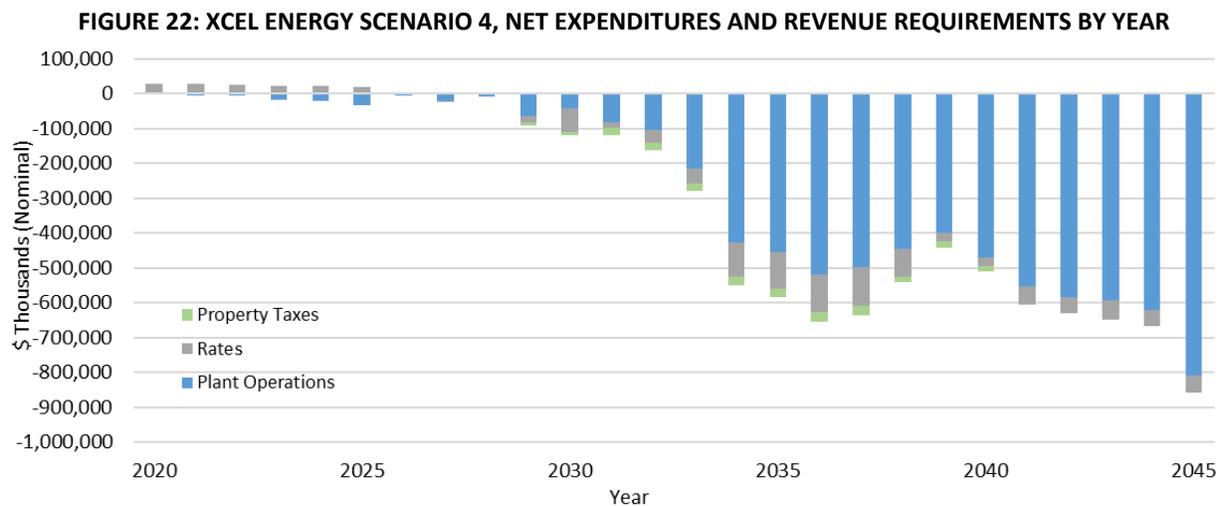
### *Operating Expenditures*

The Early Coal scenario incurs operating expenditures of \$1.2 billion below the baseline resource plan scenario from 2020–2045 (excluding changes in fuel purchases), driven in part by the early retirement of coal generation at the King plant in Washington County. The decrease in fuel purchases (i.e., greater solar and natural gas expenditures, smaller coal and wind expenditures) further decreases operating expenditures, in addition to the decrease in local property taxes. Given that Minnesota lacks native coal

production, out-of-state coal mines bear the decrease in coal purchases, while Minnesota potentially gains from in-state solar installations. However, increased purchases of natural gas are also not native to Minnesota. Property taxes are considered an operating expense. The decrease in property taxes is modeled as a decrease in spending on local government services.

### Revenue Requirements

Based on the level of operation and capital expenditures detailed in this report, Xcel Energy estimated the Early Coal scenario will decrease revenue requirements by \$838 million (included in electricity rates for electric customers) when compared to the resource plan reference case. Revenue requirements are not equal to the sum of operation and capital expenditures because capital expenditures are recovered over the life of the asset. Therefore, revenue requirements occur over the life of the asset and include both a return of and a return on capital. The capital and operating expenditure assumptions also reflect spending only in the state of Minnesota. The revenue requirements estimate the change in electric revenues would be recovered from customers for Scenario 4, despite the location of the supply chain for operating and capital purchases. The reduction in revenue requirements was applied to residential, commercial, and industrial customers in Minnesota based on electricity usage by customer class.



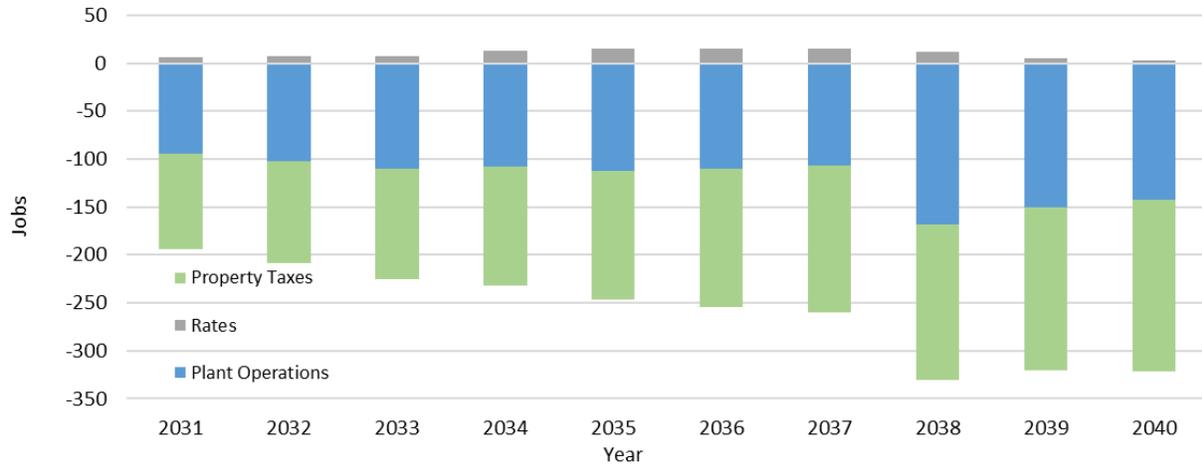
### Impact on Sherburne County

Since this scenario includes early retirement of Sherco 3, the impact was detailed for Sherburne County. The retirement leads to a decrease in plant operations (capital and operating expenditures) compared to the resource plan, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this retirement results in a decrease of \$137 million in property taxes. The Early Coal scenario results in a net average decrease of 249 jobs in the Sherburne County economy over the 10-year horizon from 2031 to 2040, and a net average decrease of \$24.7 million in GDP and \$14.6 million in disposable personal income.

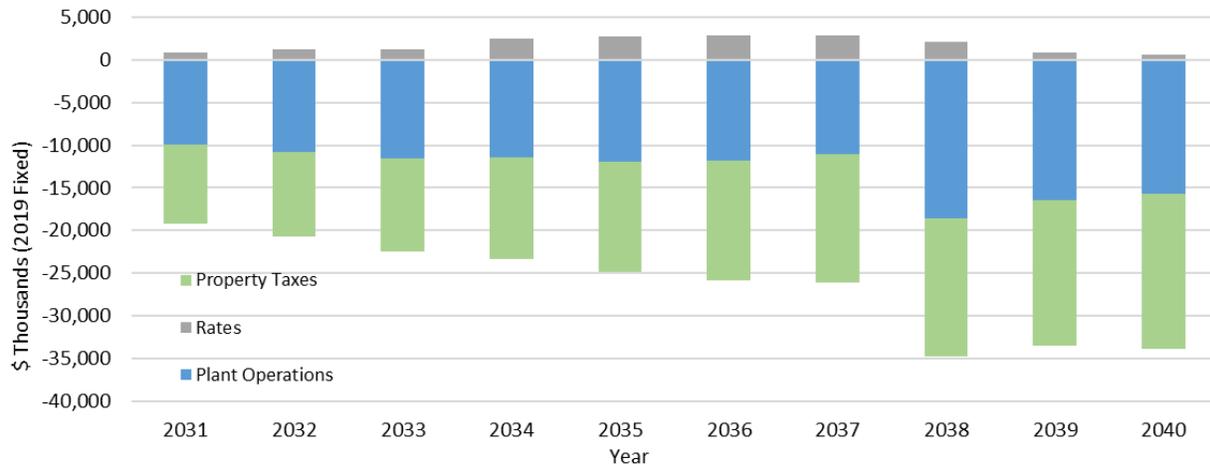
**TABLE 14: XCEL ENERGY EARLY COAL NET ECONOMIC IMPACT ON SHERBURNE COUNTY, 2031–2040**

Category	Units	Average Change		
		Year 2031-2035	Year 2036-2040	2031-2040
Total Employment	Jobs	-212	-287	-249
	<i>Percentage Change</i>	-0.5%	-0.7%	-0.6%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-20,404	-28,980	-24,692
	<i>Percentage Change</i>	-0.4%	-0.6%	-0.5%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-8,922	-20,352	-14,637
	<i>Percentage Change</i>	-0.2%	-0.3%	-0.3%

**FIGURE 23: XCEL ENERGY EARLY COAL IMPACT ON SHERBURNE COUNTY EMPLOYMENT**



**FIGURE 24: XCEL ENERGY EARLY COAL IMPACT ON SHERBURNE COUNTY GDP**



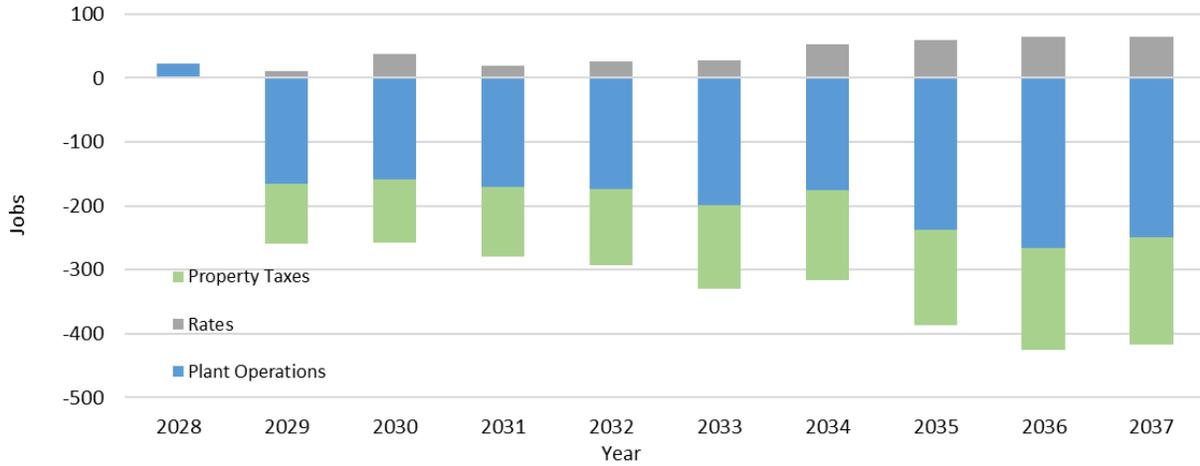
*Early Coal Impact on Washington County*

Since this scenario also includes early retirement of the King Generating Plant, the impact was detailed for Washington County. The retirement leads to a decrease in plant operations (capital and operating expenditures) compared to the reference case, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this retirement results in a decrease of \$109 million in property taxes. The Early Coal scenario results in a net average decrease of 258 jobs in the Washington County economy over the 10-year horizon from 2028-2037, and a net average decrease of \$23.3 million in GDP and \$9.5 million in disposable personal income. The largest negative impacts occur during the final years of the forecast horizon, driven down by the negative shock of decreased operating and capital expenditures within the county, modestly offset by lower revenue requirements.

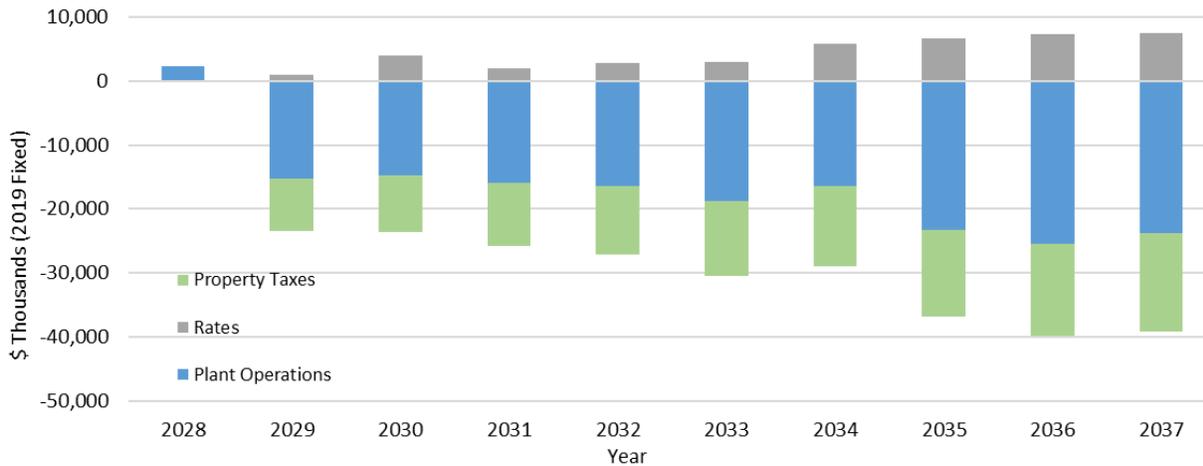
**TABLE 15: XCEL ENERGY EARLY COAL NET ECONOMIC IMPACT ON WASHINGTON COUNTY, 2028–2037**

Category	Units	Average Change		
		Year 2028-2032	Year 2033-2037	2028-2037
Total Employment	Jobs	-196	-321	-258
	<i>Percentage Change</i>	-0.1%	-0.2%	-0.2%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-17,676	-29,010	-23,343
	<i>Percentage Change</i>	-0.1%	-0.2%	-0.2%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-4,953	-14,000	-9,477
	<i>Percentage Change</i>	0.0%	-0.1%	0.0%

**FIGURE 25: XCEL ENERGY EARLY COAL IMPACT ON WASHINGTON COUNTY EMPLOYMENT**



**FIGURE 26: XCEL ENERGY EARLY COAL IMPACT ON WASHINGTON COUNTY GDP**



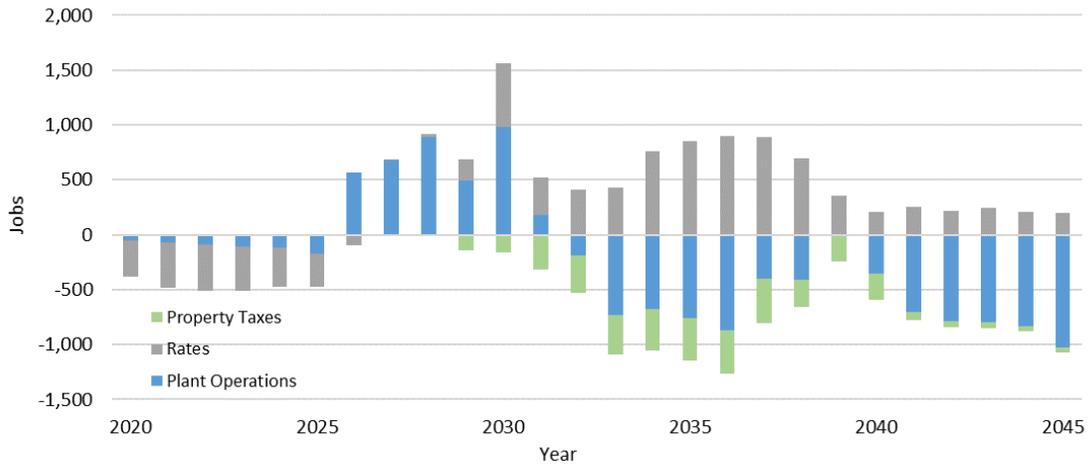
*Early Coal Impact on Minnesota*

The Early Coal scenario results in modest net changes to the Minnesota economy, with a net average decrease of 144 jobs over the 25-year horizon, and a net average decrease of \$141.4 million in GDP and an increase of \$17.3 million in disposable personal income. The largest negative impacts occur during the final 10 years of the horizon, driven down by the decrease in capital and operating expenditures (including property taxes) coinciding with the early retirement of King and Sherco 3. Note that the percentage change in jobs, GDP, and personal income round to 0.0%, thus, indicating negligible change in the economy.

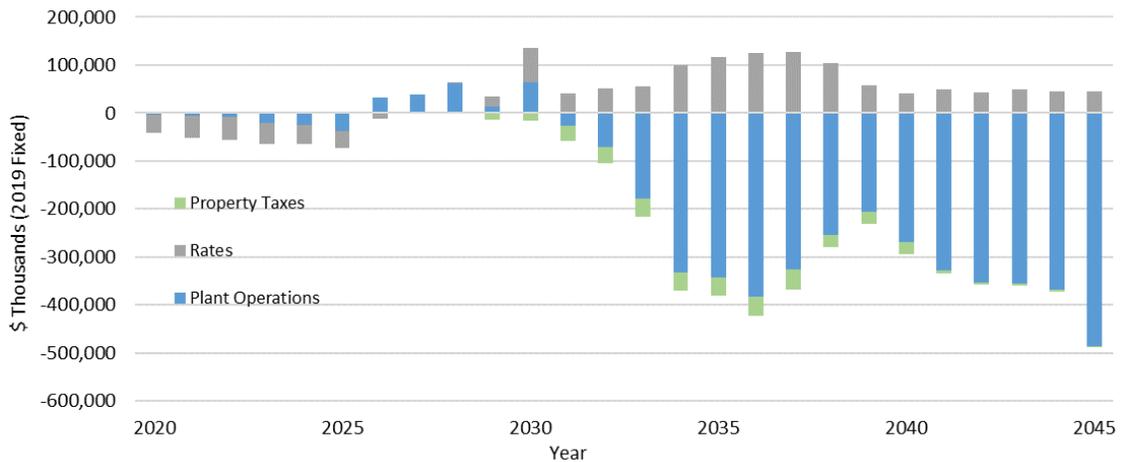
**TABLE 16: XCEL ENERGY EARLY COAL NET ECONOMIC IMPACT ON MINNESOTA, 2020–2045**

Category	Units	Average Change					2020-2045
		Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	
Total Employment	Jobs	-472	431	107	-84	-560	-144
	<i>Percentage Change</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-55,452	13,333	-76,024	-230,536	-298,017	-141,433
	<i>Percentage Change</i>	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-48,001	23,111	50,054	64,773	3,805	17,257
	<i>Percentage Change</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

**FIGURE 27: XCEL ENERGY EARLY COAL IMPACT ON MINNESOTA EMPLOYMENT**



**FIGURE 28: XCEL ENERGY EARLY COAL IMPACT ON MINNESOTA GDP**



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## EARLY COAL AND MONTICELLO EXTENSION DETAILED IMPACTS

The Early Coal and Monticello Extension scenario (i.e., Scenario 9) is the preferred plan as presented in Xcel's July 1, 2019 resource plan filing. This scenario includes the early retirement of the King Generating Plant in Washington County, the early retirement of the Sherco 3 (coal) Generating Plant in Sherburne County, additional gas generation in Sherburne County, the extension of the Monticello Nuclear Generating Plant in Wright County, the early addition of solar, as well as less installed wind generation relative to the reference case. The King Generating Plant, a coal-fired power plant, is modeled to retire in 2028 in this scenario versus 2037 in the resource plan. Sherco 3, a coal-fired power plant, is modeled to retire in 2030 in this scenario versus 2040 in the resource plan. Monticello, a nuclear power plant, is modeled to be extended from 2030 to 2040. Additional solar will be added to the system five years earlier (2026 versus 2031), and less wind is added relative to the reference case. The solar additions were modeled outside of the host communities but 75% were modeled in Minnesota. Other operating facilities will undergo minor operating adjustments to balance the system.

**TABLE 17: EARLY COAL AND MONTICELLO EXTENSION SCENARIO**

Scenarios Analyzed in the Host Community Impact Study								
Scenario	Description	Coal Retirements				Nuclear		
		Sherco 1	Sherco 2	Sherco 3	AS King	Monticello	Prairie Island 1	Prairie Island 2
1	Reference	2026	2023	2040	2037	2030	2033	2034
9	Early Coal; Extend Monticello	2026	2023	2030	2028	2040	2033	2034

### *Capital Expenditures*

The Early Coal and Monticello Extension scenario incurs capital expenditures of \$47.3 million above the baseline resource plan scenario from 2020–2045. The capital activities include the decrease in expenditures at the King Generating Plant in Washington County and at Sherco 3 in Sherburne County, and an increase in the Monticello nuclear plant in Wright County. While this scenario projects an increase in solar generation and a decrease in wind generation relative to the reference case, those transactions are captured in operating expenditures as a fuel purchase.

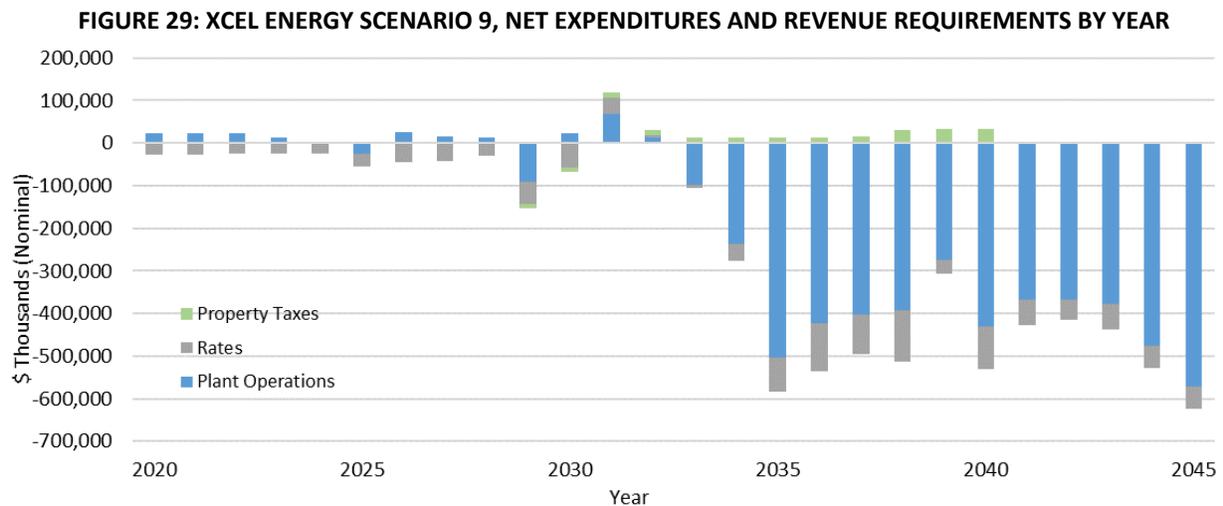
### *Operating Expenditures*

The Early Coal and Monticello Extension scenario incurs operating expenditures of \$1.9 billion above the baseline resource plan scenario from 2020–2045 (excluding changes in fuel purchases), driven largely by

the extension of Monticello. The decrease in fuel purchases (i.e., greater solar and natural gas expenditures offset by smaller coal and wind expenditures) further decreases operating expenditures, in addition to the decrease in local property taxes. Given that Minnesota lacks native coal production, out-of-state coal mines bear the decrease in coal purchases, while Minnesota potentially gains from in-state solar installations. However, increased purchases of natural gas are also not native to Minnesota. Property taxes are considered an operating expense. The decrease in property taxes is modeled as a decrease in spending on local government services.

### Revenue Requirements

Based on the level of operation and capital expenditures detailed in this report, Xcel Energy estimated Scenario 9 will decrease revenue requirements by \$1.2 billion (included in electricity rates for electric customers) when compared to the baseline resource plan. Revenue requirements are not equal to the sum of operation and capital expenditures because capital expenditures are recovered over the life of the asset. Therefore, revenue requirements occur over the life of the asset and include both a return of and a return on capital. The capital and operating expenditure assumptions also reflect spending only in the state of Minnesota. The revenue requirements estimate the change in electric revenues that would be recovered from customers for Scenario 9, despite the location of the supply chain for operating and capital purchases. The reduction in revenue requirements was applied to residential, commercial, and industrial customers in Minnesota based on electricity usage by customer class.



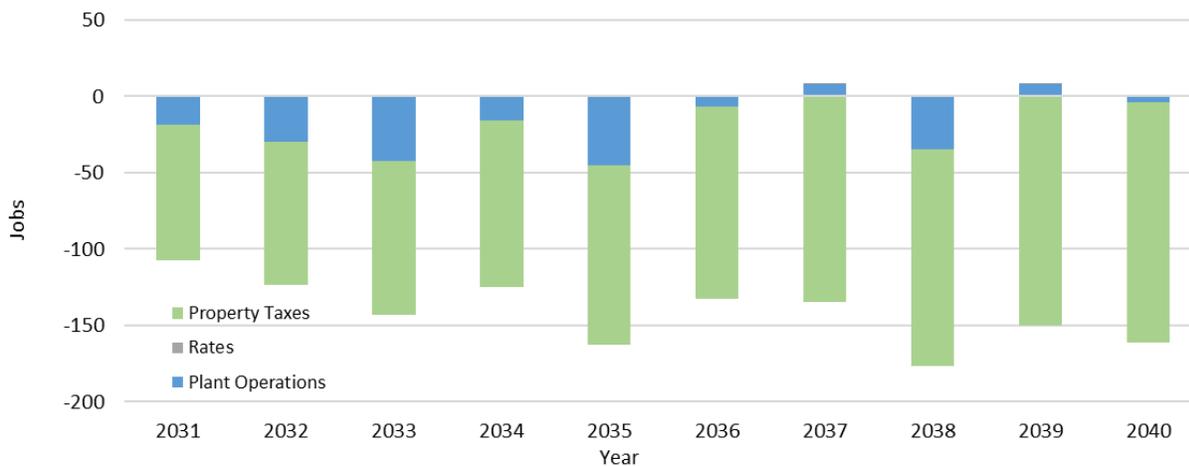
### Early Coal and Monticello Extension Impact on Sherburne County

Since this scenario includes early retirement of Sherco 3, the impact was detailed for Sherburne County. The retirement leads to a decrease in plant operations (capital and operating expenditures) compared to the resource plan, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this retirement results in a decrease of \$137 million in property taxes. This scenario also includes additional gas-fired generation in Sherburne County. The Early Coal and Monticello Extension results in a net average decrease of 140 jobs in the Sherburne County economy over the 10-year period from 2031 through 2040, and a net average decrease of \$13.5 million in GDP and an average increase of \$6.1 million in disposable personal income.

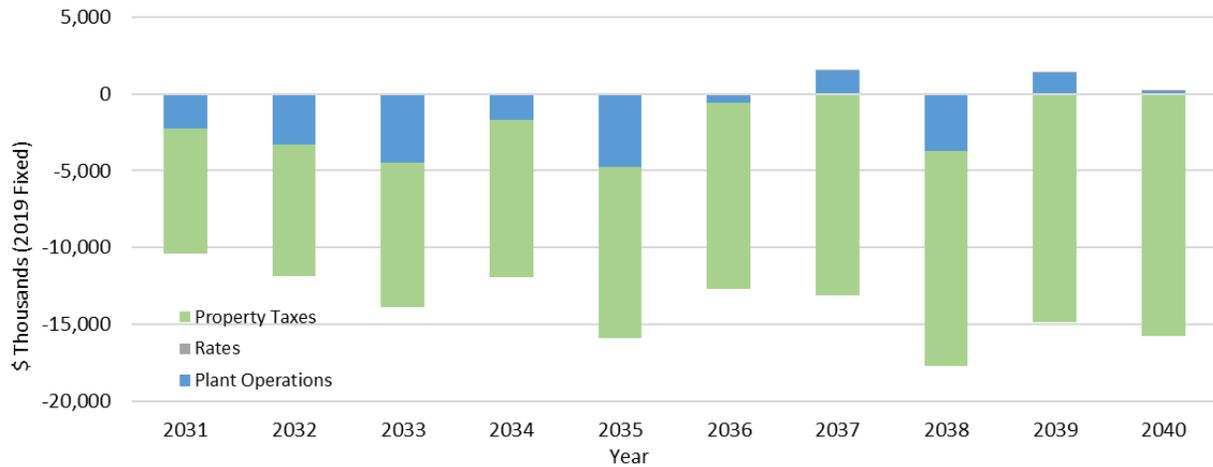
**TABLE 18: XCEL ENERGY EARLY COAL AND MONTICELLO EXTENSION NET ECONOMIC IMPACT ON SHERBURNE COUNTY, 2031–2040**

Category	Units	Average Change		
		Year 2031-2035	Year 2036-2040	2031-2040
Total Employment	Jobs	-132	-148	-140
	<i>Percentage Change</i>	-0.3%	-0.4%	-0.3%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-12,809	-14,212	-13,510
	<i>Percentage Change</i>	-0.3%	-0.3%	-0.3%
Disposable Personal Income	Dollars (Real 2019, Thousands)	5,299	6,829	6,064
	<i>Percentage Change</i>	0.1%	0.1%	0.1%

**FIGURE 30: XCEL ENERGY EARLY COAL AND MONTICELLO EXTENSION IMPACT ON SHERBURNE COUNTY EMPLOYMENT**



**FIGURE 31: XCEL ENERGY EARLY COAL AND MONTICELLO EXTENSION IMPACT ON SHERBURNE COUNTY GDP**



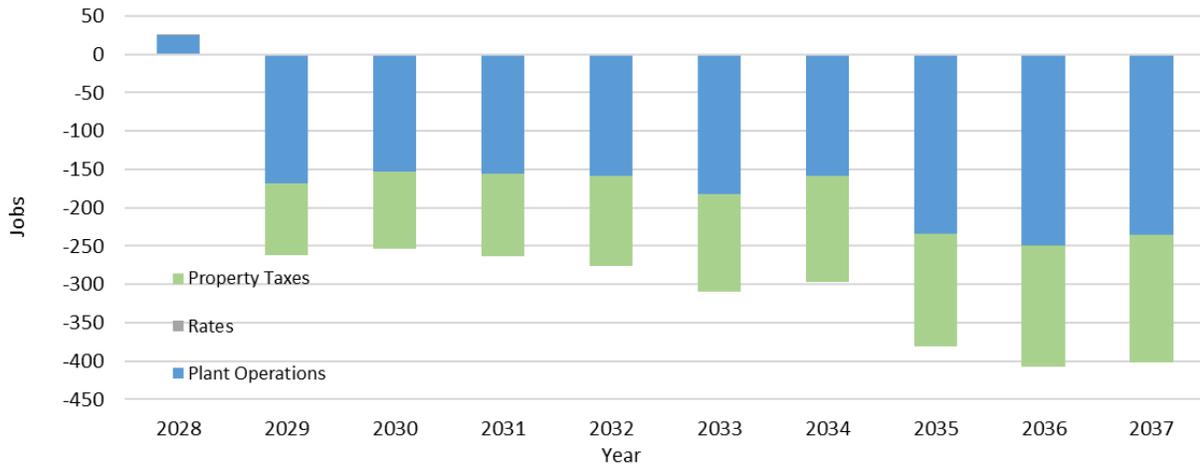
*Early Coal and Monticello Extension Impact on Washington County*

Since this scenario includes early retirement of the King Generating Plant, the impact was also detailed for Washington County. The retirement leads to a decrease in plant operations (capital and operating expenditures) compared to the reference case, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this retirement results in a decrease of \$109 million in property taxes. The Early Coal and Monticello Extension scenario results in a net average decrease of 283 jobs in the Washington County economy over the 10-year horizon from 2028 through 2037, and a net average decrease of \$26.1 million in GDP and \$15.4 million in disposable personal income.

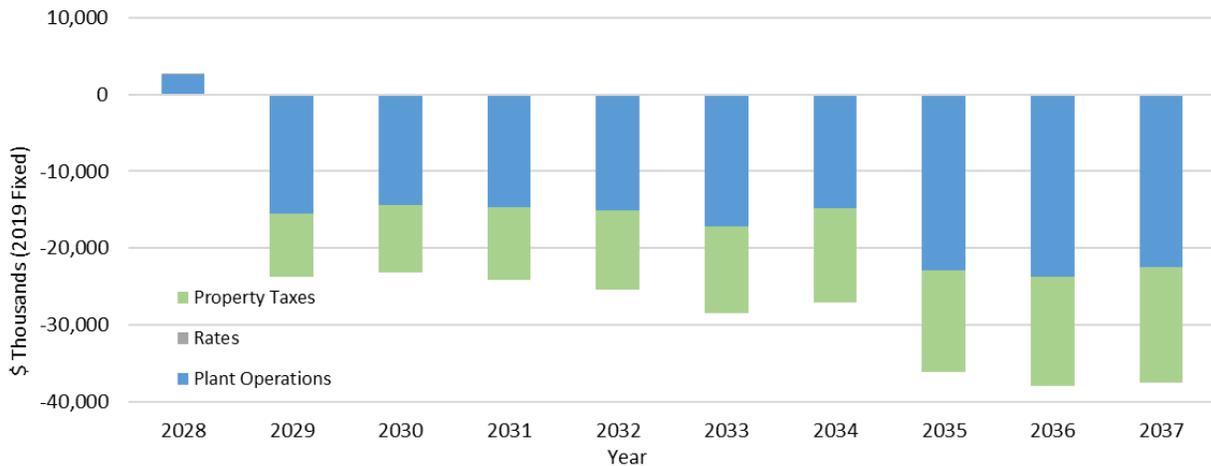
**TABLE 19: XCEL ENERGY EARLY COAL AND MONTICELLO EXTENSION NET ECONOMIC IMPACT ON WASHINGTON COUNTY, 2028–2037**

Category	Units	Average Change		
		Year 2028-2032	Year 2033-2037	2028-2037
Total Employment	Jobs	-206	-359	-283
	<i>Percentage Change</i>	-0.2%	-0.3%	-0.2%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-18,806	-33,433	-26,120
	<i>Percentage Change</i>	-0.1%	-0.2%	-0.2%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-6,691	-24,036	-15,363
	<i>Percentage Change</i>	0.0%	-0.1%	-0.1%

**FIGURE 32: XCEL ENERGY EARLY COAL AND MONTICELLO EXTENSION IMPACT ON WASHINGTON COUNTY EMPLOYMENT**



**FIGURE 33: XCEL ENERGY EARLY COAL AND MONTICELLO EXTENSION IMPACT ON WASHINGTON COUNTY GDP**



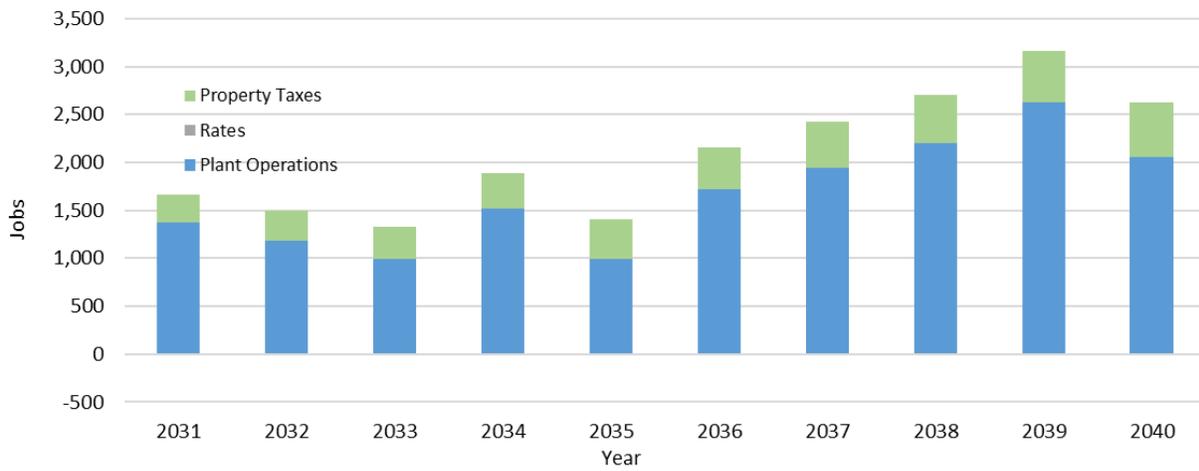
*Early Coal and Monticello Extension Impact on Wright County*

Since this scenario includes the extension of the nuclear power plant in Monticello, the impact was detailed for Wright County from 2031-2040 (i.e., the extension of the plant compared to the resource plan). The extension leads to an increase in plant operations (capital and operating expenditures) compared to the reference case, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this extension yields an additional \$412 million in property taxes. This scenario results in a net average increase of 2,085 jobs in the Wright County economy over the 10-year horizon, and a net average increase of \$226.1 million in GDP and \$127.8 million in disposable personal income coinciding with the extension of the Monticello plant beyond the current end of license.

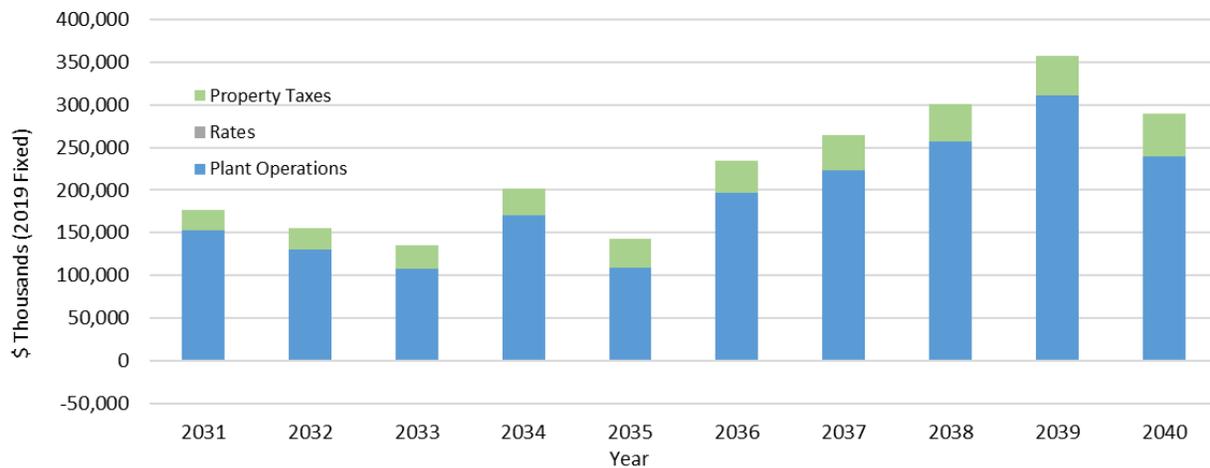
**TABLE 20: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION NET ECONOMIC IMPACT ON WRIGHT COUNTY, 2031–2040**

Category	Units	Average Change		2031-2040
		Year 2031-2035	Year 2036-2040	
Total Employment	Jobs	1,556	2,614	2,085
	<i>Percentage Change</i>	2.3%	3.8%	3.1%
Gross Domestic Product	Dollars (Real 2019, Thousands)	162,669	289,530	226,100
	<i>Percentage Change</i>	2.6%	4.3%	3.5%
Disposable Personal Income	Dollars (Real 2019, Thousands)	81,597	172,519	127,058
	<i>Percentage Change</i>	1.0%	1.9%	1.5%

**FIGURE 34: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON WRIGHT COUNTY EMPLOYMENT**



**FIGURE 35: XCEL ENERGY EARLY COAL AND NUCLEAR EXTENSION IMPACT ON WRIGHT COUNTY GDP**



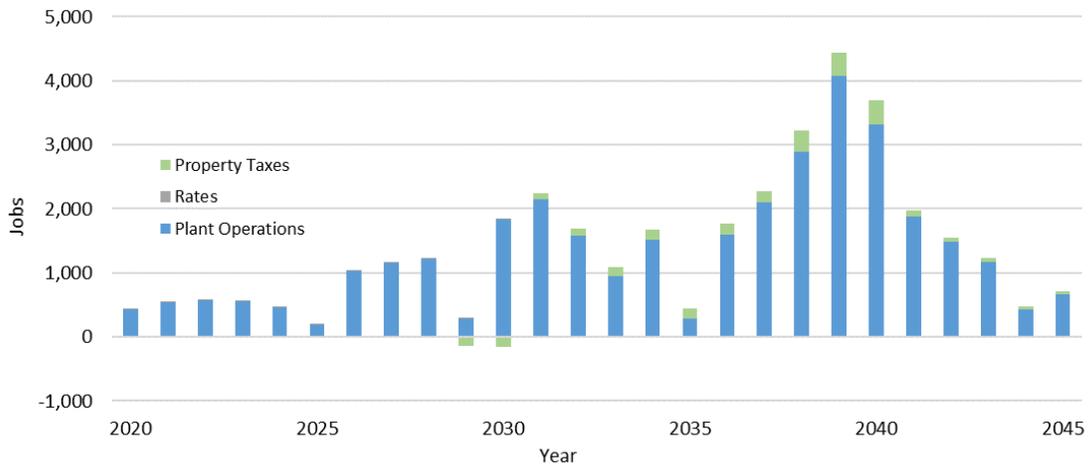
### Early Coal and Monticello Extension Impact on Minnesota

The Early Coal and Monticello Extension scenario results in modest net changes to the Minnesota economy, with a net average increase of 1,401 jobs from 2020-2045, and a net average increase of \$24.4 million in GDP and \$112.4 million in disposable personal income.

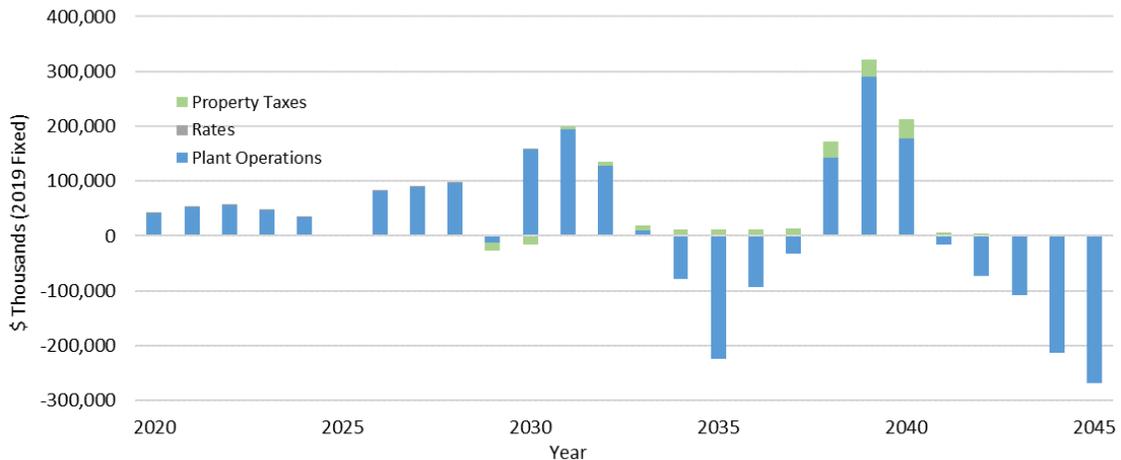
**TABLE 21: XCEL ENERGY EARLY COAL AND MONTICELLO EXTENSION NET ECONOMIC IMPACT ON MINNESOTA, 2020–2045**

Category	Units	Average Change					2020-2045
		Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	
Total Employment	Jobs	510	746	1,673	2,426	1,788	1,401
	Percentage Change	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
Gross Domestic Product	Dollars (Real 2019, Thousands)	45,941	47,986	85,939	36,446	-35,695	24,439
	Percentage Change	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Disposable Personal Income	Dollars (Real 2019, Thousands)	31,020	50,748	123,589	195,198	165,272	112,447
	Percentage Change	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

**FIGURE 36: XCEL ENERGY EARLY COAL AND MONTICELLO EXTENSION IMPACT ON MINNESOTA EMPLOYMENT**



**FIGURE 37: XCEL ENERGY EARLY COAL AND MONTICELLO EXTENSION IMPACT ON MINNESOTA GDP**



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## EARLY KING AND MONTICELLO EXTENSION DETAILED IMPACTS

The Early King and Monticello Extension scenario (i.e., Scenario 10) includes the early retirement of the King Generating Plant in Washington County, the extension of the Monticello Nuclear Generating Plant in Wright County, the early addition of solar, as well as less installed wind generation relative to the reference case. The King Generating Plant, a coal-fired power plant, is modeled to retire in 2028 in this scenario versus 2037 in the resource plan. Monticello, a nuclear power plant, is modeled to be extended from 2030 to 2040. Additional solar will be added to the system five years earlier (2026 versus 2031), and less wind is added relative to the reference case. The solar additions were modeled outside of Goodhue County but 75% was modeled in Minnesota. Other operating facilities will undergo minor operating adjustments to balance the system.

**TABLE 22: EARLY KING AND MONTICELLO EXTENSION SCENARIO**

Scenarios Analyzed in the Host Community Impact Study								
Scenario	Description	Coal Retirements				Nuclear		
		Sherco 1	Sherco 2	Sherco 3	AS King	Monticello	Prairie Island 1	Prairie Island 2
1	<b>Reference</b>	2026	2023	2040	2037	2030	2033	2034
10	<b>Early King; Extend Monti</b>	2026	2023	2040	2028	2040	2033	2034

### *Capital Expenditures*

Scenario 10 incurs capital expenditures of \$202.7 million above the baseline resource plan scenario from 2020–2045. The capital activities include the decrease in expenditures at the King Generating Plant in Washington County and the extension of the Monticello nuclear plant in Wright County. While this scenario projects an increase in solar generation and a decrease in wind generation relative to the reference case, those transactions are captured in operating expenditures as a fuel purchase.

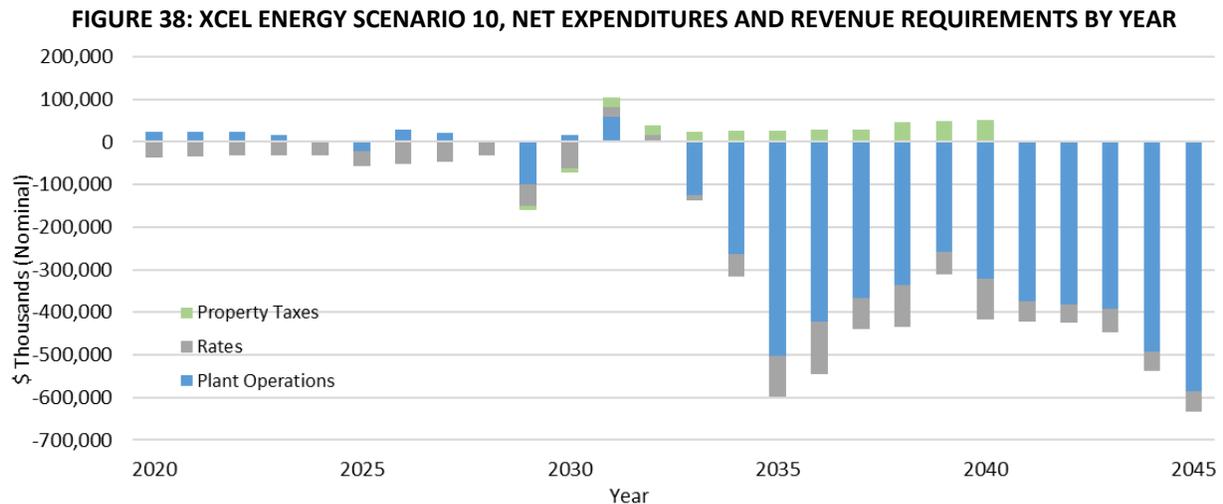
### *Operating Expenditures*

The Early King and Monticello Extension scenario incurs operating expenditures of \$1.5 billion above the baseline resource plan scenario from 2020–2045. The decrease in fuel purchases (i.e., greater solar and smaller natural gas, coal, and wind expenditures) is more than offset by the increase in other operating costs—particularly the extension of the nuclear plant. There is a net decrease in coal and natural gas purchases in this scenario, but given that Minnesota lacks native coal and natural gas production, out-of-state companies bear the decrease in coal and natural gas purchases, while Minnesota potentially gains

from in-state solar installations. Property taxes are considered an operating expense. The decrease in property taxes is modeled as a decrease in spending on local government services.

### Revenue Requirements

Based on the level of operation and capital expenditures detailed in this report, Xcel Energy estimated Scenario 10 will decrease revenue requirements by \$1.3 billion (included in electricity rates for electric customers) when compared to the baseline resource plan. Revenue requirements are not equal to the sum of operation and capital expenditures because capital expenditures are recovered over the life of the asset. Therefore, revenue requirements occur over the life of the asset and include both a return of and a return on capital. The capital and operating expenditure assumptions also reflect spending only in the state of Minnesota. The revenue requirements estimate the change in electric revenues that would be recovered from customers for Scenario 10, despite the location of the supply chain for operating and capital purchases. The reduction in revenue requirements was applied to residential, commercial, and industrial customers in Minnesota based on electricity usage by customer class.



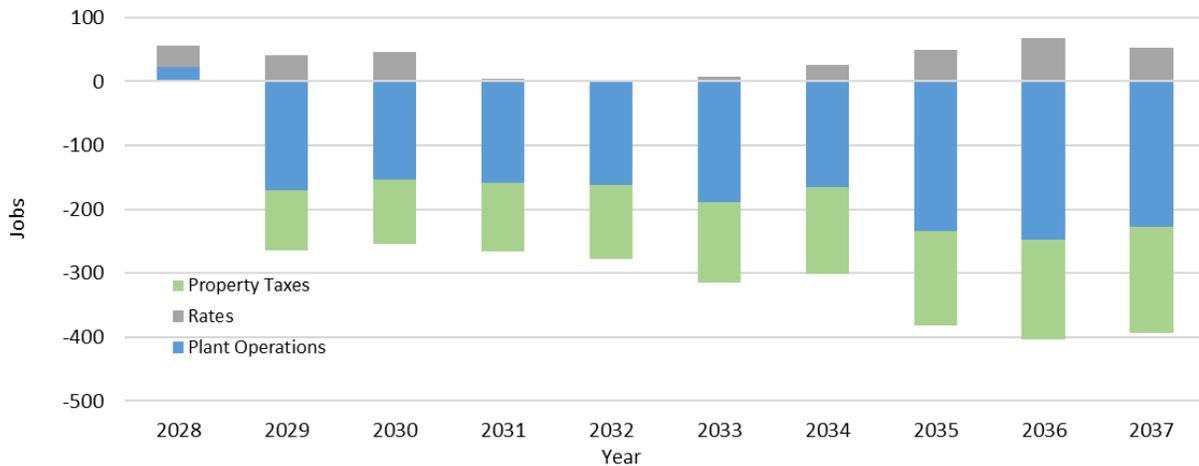
### Early King and Monticello Extension Impact on Washington County

Since this scenario includes early retirement of the King Generating Plant, the impact was detailed for Washington County. The retirement leads to a decrease in plant operations (capital and operating expenditures) compared to the reference case, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this extension results in a decrease of \$109 million in property taxes. The Early King and Monticello Extension scenario results in a net average decrease of 251 jobs in the Washington County economy over the 10-year period from 2028-2037, and a net average decrease of \$22.5 million in GDP and \$6.6 million in disposable personal income.

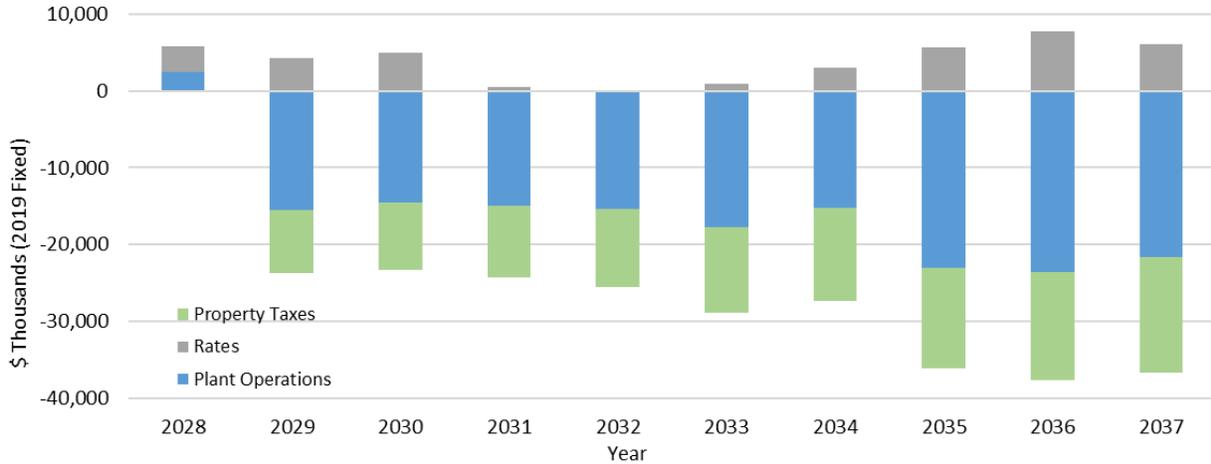
**TABLE 23: XCEL ENERGY EARLY KING AND MONTICELLO EXTENSION NET ECONOMIC IMPACT ON WASHINGTON COUNTY, 2028–2037**

Category	Units	Average Change		
		Year 2028-2032	Year 2033-2037	2028-2037
Total Employment	Jobs	-183	-319	-251
	<i>Percentage Change</i>	-0.1%	-0.2%	-0.2%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-16,253	-28,667	-22,460
	<i>Percentage Change</i>	-0.1%	-0.2%	-0.2%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-809	-12,320	-6,564
	<i>Percentage Change</i>	0.0%	-0.1%	0.0%

**FIGURE 39: XCEL ENERGY EARLY KING AND MONTICELLO EXTENSION IMPACT ON WASHINGTON COUNTY EMPLOYMENT**



**FIGURE 40: XCEL ENERGY EARLY KING AND MONTICELLO EXTENSION IMPACT ON WASHINGTON COUNTY GDP**



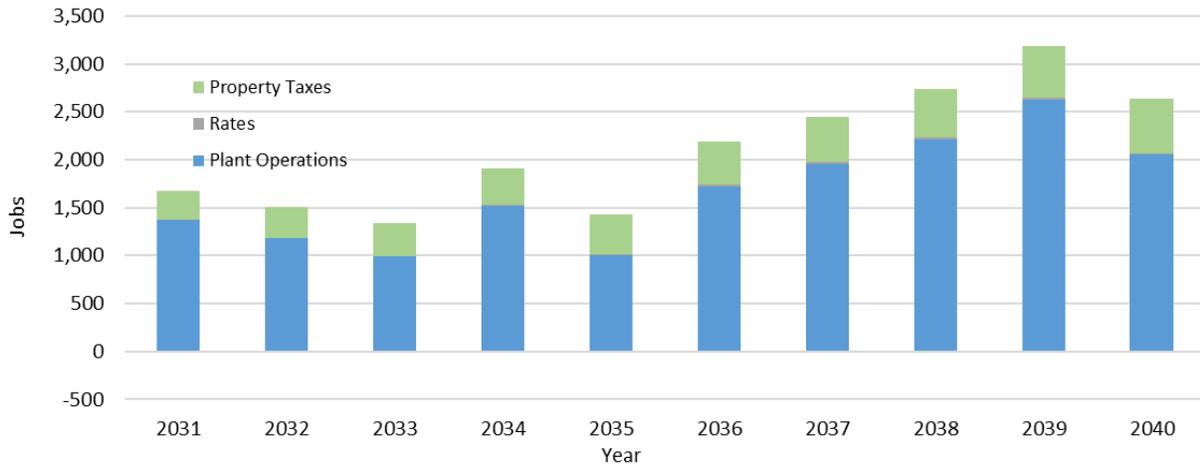
*Early King and Monticello Extension Impact on Wright County*

Since this scenario includes the extension of the nuclear power plant in Monticello, the impact was also detailed for Wright County. The extension leads to an increase in plant operations (capital and operating expenditures) compared to the reference case, which directly impacts the Utility and Construction industries, but extends to the broader economy through supply chain purchases and household spending. As well, this extension yields an additional \$412 million in property taxes. The Early King and Monticello Extension scenario results in a net average increase of 2,106 jobs in the Wright County economy over the 10-year horizon from 2031-2040, and a net average increase of \$228.5 million in GDP and \$130.6 million in disposable personal income.

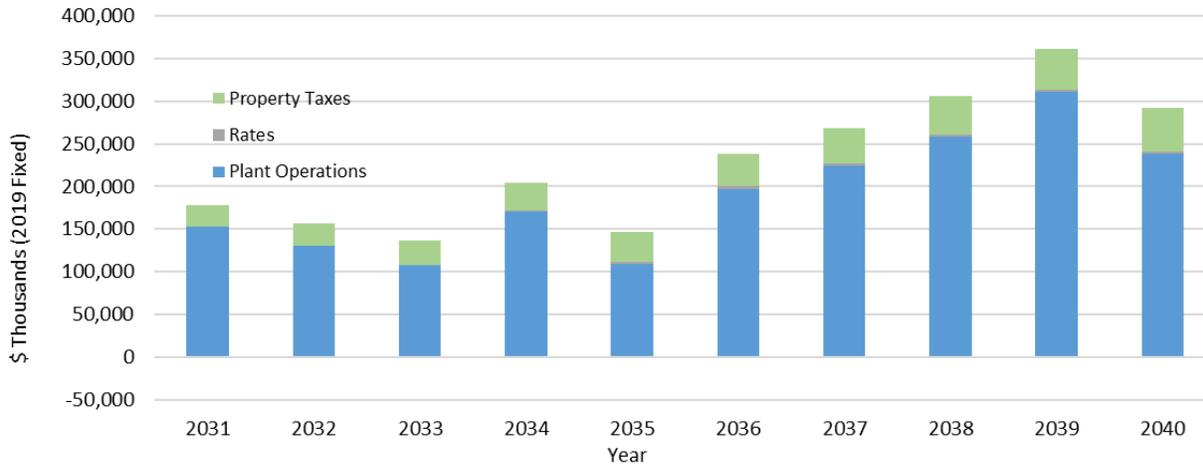
**TABLE 24: XCEL ENERGY EARLY KING AND MONTICELLO EXTENSION NET ECONOMIC IMPACT ON WRIGHT COUNTY, 2031-2040**

Category	Units	Average Change		
		Year 2031-2035	Year 2036-2040	2031-2040
Total Employment	Jobs	1,570	2,642	2,106
	<i>Percentage Change</i>	2.3%	3.9%	3.1%
Gross Domestic Product	Dollars (Real 2019, Thousands)	164,130	292,875	228,502
	<i>Percentage Change</i>	2.6%	4.4%	3.5%
Disposable Personal Income	Dollars (Real 2019, Thousands)	83,923	177,212	130,568
	<i>Percentage Change</i>	1.0%	2.0%	1.5%

**FIGURE 41: XCEL ENERGY EARLY KING AND MONTICELLO EXTENSION IMPACT ON WRIGHT COUNTY EMPLOYMENT**



**FIGURE 42: XCEL ENERGY EARLY KING AND MONTICELLO EXTENSION IMPACT ON WRIGHT COUNTY GDP**



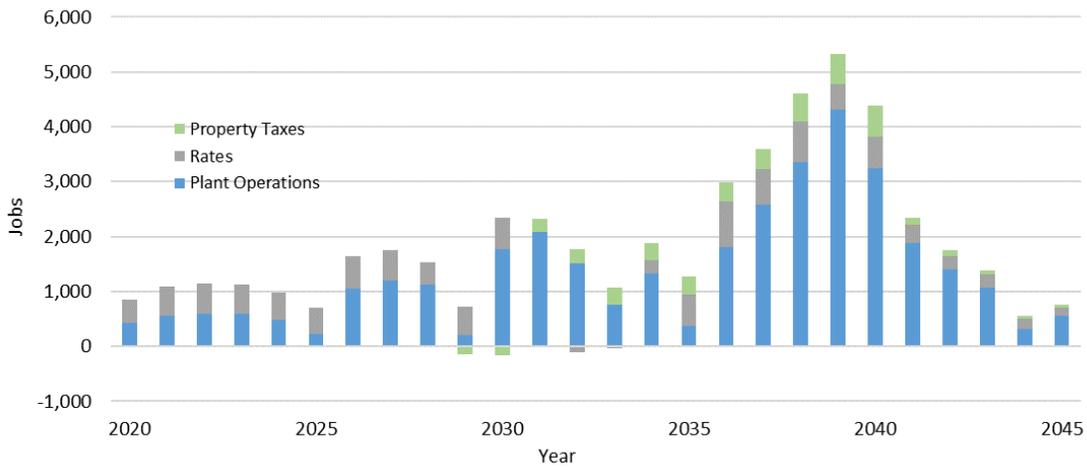
*Early King and Monticello Extension Impact on Minnesota*

The Early King and Monticello Extension scenario results in modest net changes to the Minnesota economy, with a net average increase of 1,904 jobs from 2020-2045, and a net average increase of \$71.7 million in GDP and \$187.7 million in disposable personal income. The largest impacts occur during the last ten years, driven up by the increase in in-state operations. Note that the percentage change in jobs, GDP, and personal income round to 0.0%, thus, indicating negligible change in the economy.

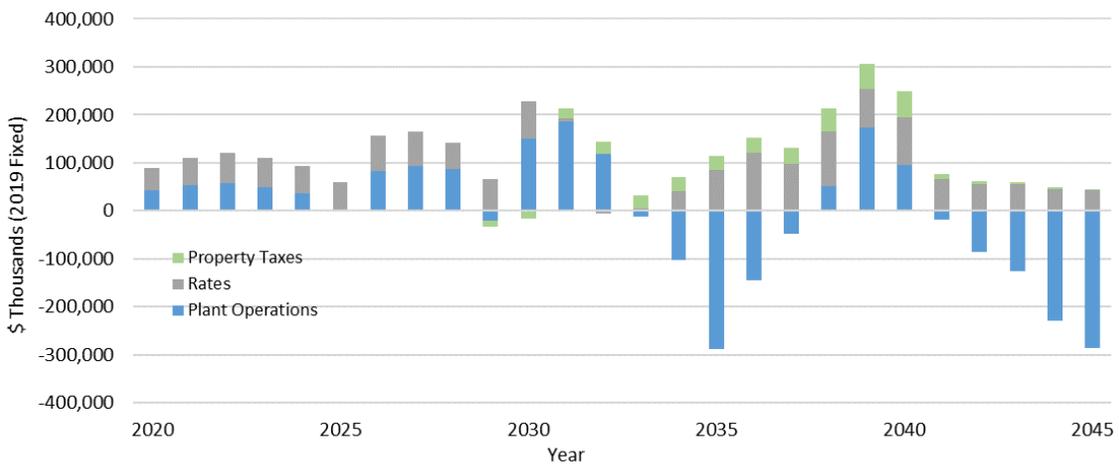
**TABLE 25: XCEL ENERGY EARLY KING AND MONTICELLO EXTENSION NET ECONOMIC IMPACT ON MINNESOTA, 2020–2045**

Category	Units	Average Change					2020-2045
		Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	
Total Employment	Jobs	1,041	1,245	1,820	3,558	2,085	1,904
	<i>Percentage Change</i>	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%
Gross Domestic Product	Dollars (Real 2019, Thousands)	104,709	111,305	109,810	87,563	7,692	71,709
	<i>Percentage Change</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Disposable Personal Income	Dollars (Real 2019, Thousands)	89,702	119,606	155,608	340,283	242,101	187,705
	<i>Percentage Change</i>	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%

**FIGURE 43: XCEL ENERGY EARLY KING AND MONTICELLO EXTENSION IMPACT ON MINNESOTA EMPLOYMENT**



**FIGURE 44: XCEL ENERGY EARLY KING AND MONTICELLO EXTENSION IMPACT ON MINNESOTA GDP**



## **MOCK 2018 SHUTDOWN IMPACT**

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The Mock Shutdown scenario was generated to illustrate the economic contributions of plants in the host communities, and inform communities of the potential economic impact of plant closures. The Mock Shutdown scenario shows the impact in 2018 based on observed plant expenditures. This scenario removes the economic activity driven by utility spending in each of the four counties with operations (i.e., Goodhue, Sherburne, Washington, and Wright counties). In addition to spending on operations, Xcel reported substantial capital expenditures for the facilities in 2018, compounding the economic impact of the utility. This scenario differs from the economic impact of the other extension/retirement scenarios because this only assumes a shutdown of operating activity in the county without replacement generation and without rate adjustments; whereas, the other scenarios present the economic impact compared to the reference case. As well, plants still incur operating and capital expenses during early retirement (e.g., decommissioning costs). The economic impacts in a single year can also be impacted by major capital improvements (or lack of). These mock plant shutdowns have economic consequences on each of the host communities, but the impacts are disproportionate depending on the respective share each plant represents in the local economy.

### *Shutdown 2018 Impact on Goodhue County*

The Mock 2018 shutdown of Prairie Island in Goodhue County leads to a loss of 2,962 jobs (-9.8%) and \$346 million in GDP (-13.1%) in the county. The lack of direct spending on operations (including employment and wages) and direct spending on capital improvements not only impacts the utility industry, but reverberates throughout the economy without the utility purchasing from suppliers (other businesses) within Goodhue County, and without the consumer spending from the utility's employees. The Construction, Utilities, and local Government industries record the greatest job losses in this Mock 2018 shutdown scenario. Utility employment is negatively impacted by the decrease in direct employment, as well as the decrease in utility consumption from a smaller economy. Construction is impacted by both direct capital spending at the plant, as well as the decrease in commercial and residential construction. There is also a notable direct impact on government through the decrease in utility property taxes (\$23.2 million in 2018).

**TABLE 26: ECONOMIC SUMMARY OF 2018 SHUTDOWN NET ECONOMIC IMPACT ON GOODHUE COUNTY**

Category	Units	2018 Impact
Total Employment	Jobs	-2,962
	<i>Percentage Change</i>	-9.8%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-346,196
	<i>Percentage Change</i>	-13.1%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-113,160
	<i>Percentage Change</i>	-5.5%
Population	Individuals	-934
	<i>Percentage Change</i>	-2.0%
Labor Force	Individuals	-690
	<i>Percentage Change</i>	-2.6%

**TABLE 27: EMPLOYMENT IMPACT OF 2018 SHUTDOWN, NET ECONOMIC IMPACT ON GOODHUE COUNTY**

Industry	Emp. Impact
Forestry, fishing, and hunting	0
Mining	0
Utilities	-617
Construction	-1,140
Manufacturing	-20
Wholesale trade	-17
Retail trade	-190
Transportation and warehousing	-19
Information	0
Finance and insurance	-1
Real estate and rental and leasing	-66
Professional, scientific, and technical services	-50
Management of companies and enterprises	0
Administrative, support, waste management, and remediation services	-100
Educational services; private	-1
Health care and social assistance	-40
Arts, entertainment, and recreation	-30
Accommodation and food services	-78
Other services (except public administration)	-81
State and Local Government	-510
Federal Civilian	0
Federal Military	0
Farm	0
<b>All Industries</b>	<b>-2,962</b>

**TABLE 28: DIRECT AND INDIRECT EMPLOYMENT IMPACT OF 2018 SHUTDOWN ON GOODHUE COUNTY**

Category	Impact
Direct	-616
Indirect	-2,346
<b>Total</b>	<b>-2,962</b>

### *Shutdown 2018 Impact on Sherburne County*

The Mock 2018 shutdown of Sherco in Sherburne County leads to a loss of 1,228 jobs (-3.2%) and \$232 million in GDP (-6.1%) in the county. The lack of direct spending on operations (including employment and wages) and direct spending on capital improvements not only impacts the utility industry, but reverberates throughout the economy without the utility purchasing from suppliers (other businesses) within Sherburne County, and without the consumer spending from the utility’s employees. The Construction, Utilities, and local Government industries record the greatest job losses in this Mock 2018 shutdown scenario. Utility employment is negatively impacted by the decrease in direct employment, as well as the decrease in utility consumption from a smaller economy. Construction is impacted by both direct capital spending at the plant, as well as the decrease in commercial and residential construction. There is also a notable direct impact on government through the decrease in utility property taxes (\$18.1 million in 2018).

**TABLE 29: ECONOMIC SUMMARY OF 2018 SHUTDOWN NET ECONOMIC IMPACT ON SHERBURNE COUNTY**

Category	Units	2018 Impact
Total Employment	Jobs	-1,228
	<i>Percentage Change</i>	-3.2%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-231,540
	<i>Percentage Change</i>	-6.1%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-34,574
	<i>Percentage Change</i>	-0.9%
Population	Individuals	-622
	<i>Percentage Change</i>	-0.7%
Labor Force	Individuals	-422
	<i>Percentage Change</i>	-0.8%

**TABLE 30: EMPLOYMENT IMPACT OF 2018 SHUTDOWN NET ECONOMIC IMPACT ON SHERBURNE COUNTY**

Industry	Emp. Impact
Forestry, fishing, and hunting	0
Mining	0
Utilities	-316
Construction	-268
Manufacturing	-8
Wholesale trade	-10
Retail trade	-47
Transportation and warehousing	-17
Information	0
Finance and insurance	-2
Real estate and rental and leasing	-29
Professional, scientific, and technical services	-89
Management of companies and enterprises	0
Administrative, support, waste management, and remediation services	-83
Educational services; private	-1
Health care and social assistance	-19
Arts, entertainment, and recreation	-8
Accommodation and food services	-50
Other services (except public administration)	-22
State and Local Government	-257
Federal Civilian	0
Federal Military	0
Farm	0
<b>All Industries</b>	<b>-1,228</b>

**TABLE 31: DIRECT AND INDIRECT EMPLOYMENT IMPACT OF 2018 SHUTDOWN ON SHERBURNE COUNTY**

Category	Impact
Direct	-316
Indirect	-912
<b>Total</b>	<b>-1,228</b>

*Shutdown 2018 Impact on Washington County*

Mock 2018 shutdown of King in Washington County leads to a loss of 502 jobs (-0.4%) and \$60 million in GDP (-0.6%) in the county. The lack of direct spending on operations (including employment and wages) and direct spending on capital improvements not only impacts the utility industry, but reverberates throughout the economy without the utility purchasing from suppliers (other businesses) within Washington County, and without the consumer spending from the utility’s employees. The Construction, Utilities, and local Government industries record the greatest job losses in this Mock 2018 shutdown scenario. Utility employment is negatively impacted by the decrease in direct employment, as well as the decrease in utility consumption from a smaller economy. Construction is impacted by both direct capital spending at the plant, as well as the decrease in commercial and residential construction. There

is also a notable direct impact on government through the decrease in utility property taxes (\$6.2 million in 2018).

**TABLE 32: ECONOMIC SUMMARY OF 2018 SHUTDOWN NET ECONOMIC IMPACT ON WASHINGTON COUNTY**

Category	Units	2018 Impact
Total Employment	Jobs	-502
	<i>Percentage Change</i>	-0.4%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-59,822
	<i>Percentage Change</i>	-0.6%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-15,767
	<i>Percentage Change</i>	-0.1%
Population	Individuals	-203
	<i>Percentage Change</i>	-0.1%
Labor Force	Individuals	-138
	<i>Percentage Change</i>	-0.1%

**TABLE 33: EMPLOYMENT IMPACT OF 2018 SHUTDOWN NET ECONOMIC IMPACT ON WASHINGTON COUNTY**

Industry	Emp. Impact
Forestry, fishing, and hunting	0
Mining	-1
Utilities	-102
Construction	-91
Manufacturing	-3
Wholesale trade	-7
Retail trade	-23
Transportation and warehousing	-11
Information	-1
Finance and insurance	-4
Real estate and rental and leasing	-14
Professional, scientific, and technical services	-71
Management of companies and enterprises	0
Administrative, support, waste management, and remediation services	-39
Educational services; private	-1
Health care and social assistance	-10
Arts, entertainment, and recreation	-6
Accommodation and food services	-29
Other services (except public administration)	-9
State and Local Government	-81
Federal Civilian	0
Federal Military	0
Farm	0
<b>All Industries</b>	<b>-502</b>

**TABLE 34: DIRECT AND INDIRECT EMPLOYMENT IMPACT OF 2018 SHUTDOWN ON WASHINGTON COUNTY**

Category	Impact
Direct	-102
Indirect	-400
<b>Total</b>	<b>-502</b>

### *Shutdown 2018 Impact on Wright County*

The Mock 2018 shutdown of Monticello in Wright County leads to a loss of 2,528 jobs (-3.9%) and \$256 million in GDP (-5.3%) in the county. The lack of direct spending on operations (including employment and wages) and direct spending on capital improvements not only impacts the utility industry, but reverberates throughout the economy without the utility purchasing from suppliers (other businesses) within Washington County, and without the consumer spending from the utility's employees. The Construction, Utilities, and local Government industries record the greatest job losses in this Mock 2018 shutdown scenario. Utility employment is negatively impacted by the decrease in direct employment, as well as the decrease in utility consumption from a smaller economy. Construction is impacted by both direct capital spending at the plant, as well as the decrease in commercial and residential construction. There is also a notable direct impact on government through the decrease in utility property taxes (\$18.4 million in 2018).

**TABLE 35: ECONOMIC SUMMARY OF 2018 SHUTDOWN NET ECONOMIC IMPACT ON WRIGHT COUNTY**

<b>Category</b>	<b>Units</b>	<b>2018 Impact</b>
Total Employment	Jobs	-2,528
	<i>Percentage Change</i>	-3.9%
Gross Domestic Product	Dollars (Real 2019, Thousands)	-255,919
	<i>Percentage Change</i>	-5.3%
Disposable Personal Income	Dollars (Real 2019, Thousands)	-92,538
	<i>Percentage Change</i>	-1.6%
Population	Individuals	-912
	<i>Percentage Change</i>	-0.7%
Labor Force	Individuals	-665
	<i>Percentage Change</i>	-0.9%

**TABLE 36: EMPLOYMENT IMPACT OF 2018 SHUTDOWN NET ECONOMIC IMPACT ON WRIGHT COUNTY**

Industry	Emp. Impact
Forestry, fishing, and hunting	0
Mining	-3
Utilities	-473
Construction	-1,001
Manufacturing	-34
Wholesale trade	-24
Retail trade	-172
Transportation and warehousing	-24
Information	-2
Finance and insurance	-2
Real estate and rental and leasing	-56
Professional, scientific, and technical services	-79
Management of companies and enterprises	0
Administrative, support, waste management, and remediation services	-161
Educational services; private	-3
Health care and social assistance	-67
Arts, entertainment, and recreation	-25
Accommodation and food services	-63
Other services (except public administration)	-63
State and Local Government	-277
Federal Civilian	0
Federal Military	0
Farm	0
<b>All Industries</b>	<b>-2,528</b>

**TABLE 37: DIRECT AND INDIRECT EMPLOYMENT IMPACT OF 2018 SHUTDOWN ON WRIGHT COUNTY**

Category	Impact
Direct	-466
Indirect	-2,062
<b>Total</b>	<b>-2,528</b>

## BIBLIOGRAPHY

---

- Bureau of Economic Analysis, Regional Economic Accounts. <http://bea.gov/regional/index.htm>. Accessed March 19, 2020.
- Federal Register (June 28, 2010). 2010 Standards for Delineating Metropolitan and Micropolitan Statistical Areas. <https://www.federalregister.gov/documents/2010/06/28/2010-15605/2010-standards-for-delineating-metropolitan-and-micropolitan-statistical-areas>. Accessed January 13, 2020.
- Minnesota State Demographic Center, Our Estimates. <https://mn.gov/admin/demography/data-by-topic/population-data/our-estimates/>. Retrieved August 30, 2019.
- Northern States Power, Form 10-K, Electric Operating Statistics. <http://www.snl.com/Cache/c396846770.html>. Accessed August 30, 2019.
- Regional Economic Models, Inc. (REMI). Amherst, MA.
- U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, Gross Domestic Product. <http://www.bea.gov/regional/index.htm>. Accessed March 19, 2020.
- United States Census Bureau, Metropolitan and Micropolitan. <https://www.census.gov/programs-surveys/metro-micro/about.html>. Retrieved February 10, 2020.
- United States Department of Labor, Bureau of Labor Statistics, State and County Employment and Wages, Quarterly Census of Employment & Wages – QCEW. <http://www.bls.gov/data/#employment>. Accessed March 19, 2020.
- United States Department of Labor, Bureau of Labor Statistics, Employment, Hours, and Earnings – National (Current Employment Statistics - CES), <http://www.bls.gov/data/#employment>. Accessed March 19, 2020.
- United States Department of Labor, Bureau of Labor Statistics, Employment, Hours, and Earnings - State and Metro Area, Current Employment Statistics – CES. <http://www.bls.gov/data/#employment>. Accessed March 19, 2020.
- U.S. Energy Information Administration, Minnesota State Profile and Energy Estimates. <http://www.eia.gov/state/?sid=MN>. Accessed March 19, 2020.
- U.S. Energy Information Administration, Net Generation by State by Type of Producer by Energy Source. <https://www.eia.gov/electricity/data/state/>. Accessed March 19, 2020.

U.S. Energy Information Administration, Rankings: Total Net Electricity Generation, November 2019 (thousand MWh), <https://www.eia.gov/state/rankings/?sid=MN#series/51>. Accessed March 19, 2020.

U.S. Energy Information Administration, Rankings: Total Energy Production, 2018 (trillion Btu). <http://www.eia.gov/state/rankings/?sid=MN#series/101>. Accessed March 19, 2020.

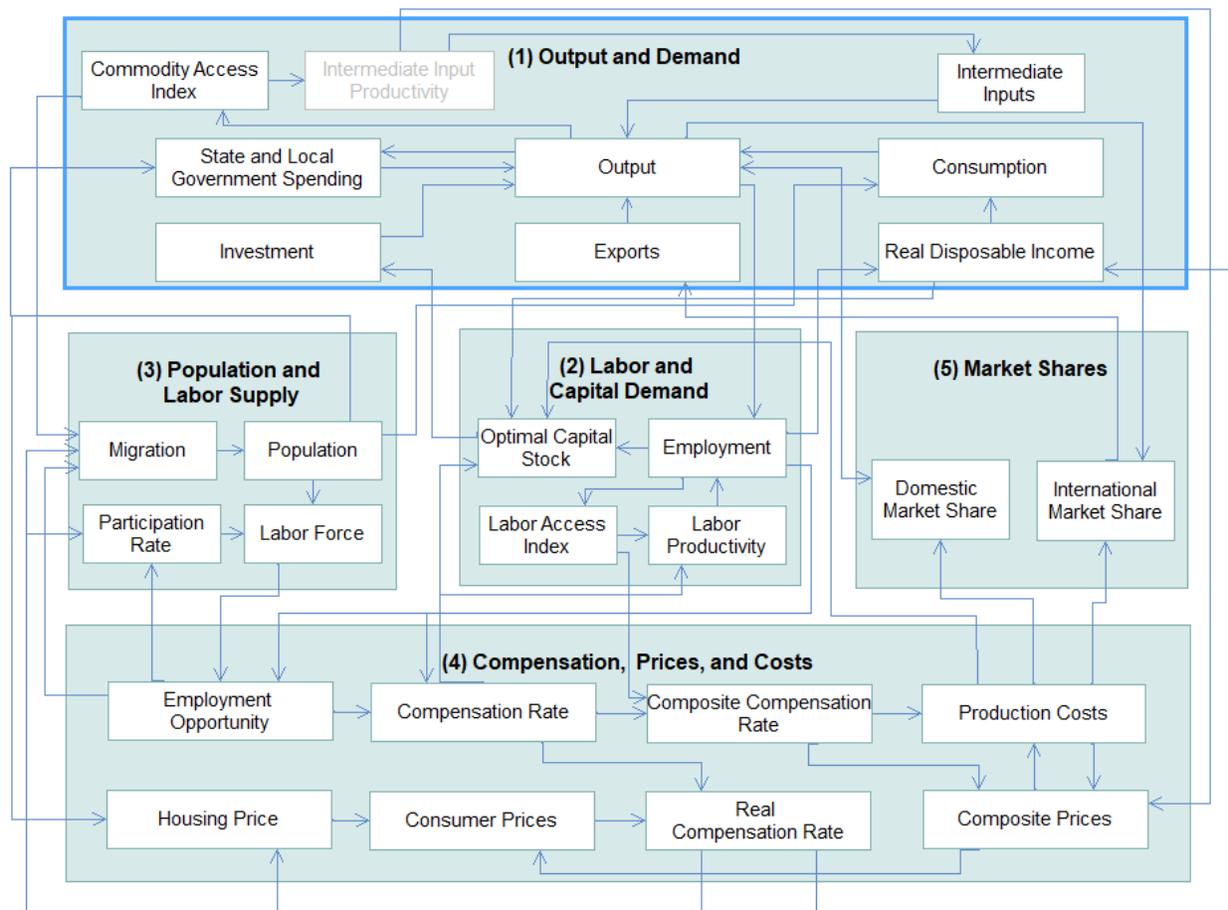
U.S. Energy Information Administration, Rankings: Total Energy Consumed per Capita, 2017 (million Btu). <https://www.eia.gov/STATE/rankings/#/series/12>. Accessed August 20, 2019.

## APPENDIX 1: OVERVIEW OF REMI POLICY INSIGHT

This summary was provided by REMI, Inc.

Policy Insight is a structural economic forecasting and policy analysis model. It integrates input-output, computable general equilibrium, econometric, and economic geography methodologies. The model is dynamic, with forecasts and simulations generated on an annual basis and behavioral responses to wage, price, and other economic factors.

The REMI model consists of thousands of simultaneous equations with a structure that is relatively straightforward. The exact number of equations used varies depending on the extent of industry, demographic, demand, and other detail in the model. The overall structure of the model can be summarized in five major blocks: (1) Output and Demand, (2) Labor and Capital Demand, (3) Population and Labor Supply, (4) Compensation, Prices and Costs, and (5) Market Shares.



### Block 1. Output and Demand

This block includes output, demand, consumption, investment, government spending, import, product access, and export concepts. For each industry, demand is determined by the amount of output,

consumption, investment and capital demand on that industry. Consumption depends on real disposable income per capita, relative prices, differential income elasticities and population. Input productivity depends on access to inputs because the larger the choice set of inputs, the more likely that the input with the specific characteristics required for the job will be formed. In the capital stock adjustment process, investment occurs to fill the difference between optimal and actual capital stock for residential, non-residential, and equipment investment. Government spending changes are determined by changes in the population.

### **Block 2. Labor and Capital Demand**

The Labor and Capital Demand block includes the determination of labor productivity, labor intensity and the optimal capital stocks. Industry-specific labor productivity depends on the availability of workers with differentiated skills for the occupations used in each industry. The occupational labor supply and commuting costs determine firms' access to a specialized labor force.

Labor intensity is determined by the cost of labor relative to the other factor inputs, capital and fuel. Demand for capital is driven by the optimal capital stock equation for both non-residential capital and equipment. Optimal capital stock for each industry depends on the relative cost of labor and capital, and the employment weighted by capital use for each industry. Employment in private industries is determined by the value added and employment per unit of value added in each industry.

### **Block 3. Population and Labor Supply**

The Population and Labor Supply block includes detailed demographic information about the region. Population data is given for age and gender, with birth and survival rates for each group. The size and labor force participation rate of each group determines the labor supply. These participation rates respond to changes in employment relative to the potential labor force and to changes in the real after tax compensation rate. Migration includes retirement, military, international and economic migration. Economic migration is determined by the relative real after tax compensation rate, relative employment opportunity and consumer access to variety.

### **Block 4. Wages, Prices, and Costs**

This block includes delivered prices, production costs, equipment cost, the consumption deflator, consumer prices, the price of housing, and the wage equation. Economic geography concepts account for the productivity and price effects of access to specialized labor, goods and services.

These prices measure the price of the industry output, taking into account the access to production locations. This access is important due to the specialization of production that takes place within each industry, and because transportation and transaction costs of distance are significant. Composite prices for each industry are then calculated based on the production costs of supplying regions, the effective distance to these regions, and the index of access to the variety of output in the industry relative to the access by other uses of the product.

The cost of production for each industry is determined by cost of labor, capital, fuel and intermediate inputs. Labor costs reflect a productivity adjustment to account for access to specialized labor, as well as underlying compensation rates. Capital costs include costs of non-residential structures and equipment, while fuel costs incorporate electricity, natural gas and residual fuels.

The consumption deflator converts industry prices to prices for consumption commodities. For potential migrants, the consumer price is additionally calculated to include housing prices. Housing price changes from their initial level depend on changes in income and population density.

Compensation changes are due to changes in labor demand and supply conditions and changes in the national compensation rate. Changes in employment opportunities relative to the labor force and occupational demand change determine compensation rates by industry.

### **Block 5. Market Shares**

The Market Shares equations measure the proportion of local and export markets that are captured by each industry. These depend on relative production costs, the estimated price elasticity of demand, and effective distance between the home region and each of the other regions. The change in share of a specific area in any region depends on changes in its delivered price and the quantity it produces compared with the same factors for competitors in that market. The share of local and external markets then drives the exports from and imports to the home economy.

The Labor and Capital Demand block includes labor intensity and productivity as well as demand for labor and capital. Labor force participation rate and migration equations are in the Population and Labor Supply block. The Wages, Prices, and Costs block includes composite prices, determinants of production costs, the consumption price deflator, housing prices, and the wage equations. The proportion of local, inter-regional and export markets captured by each region is included in the Market Shares block.