

ECONOMIC IMPACTS OF COVID-19 ON ELECTRIC & NATURAL GAS UTILITIES



**REMI Webinar
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Agenda



- COVID-19 & Utilities
- REMI Model: E3+
- REMI Example Utilities Study
- REMI Model Demonstration

Declining Demand for Utilities



- During 2/1-3/31, electric load declined by 3-11% across most of U.S.
 - ▣ ~50% likely driven by COVID-19 (warm winter)
- Decline in electric, NG prices lowering revenues
 - ▣ Daily LMP's fell between 7-25% across several ISO's
 - ▣ Demand-region spot prices for gas have decreased by roughly 20% over the past two months

Regulation & Mitigation

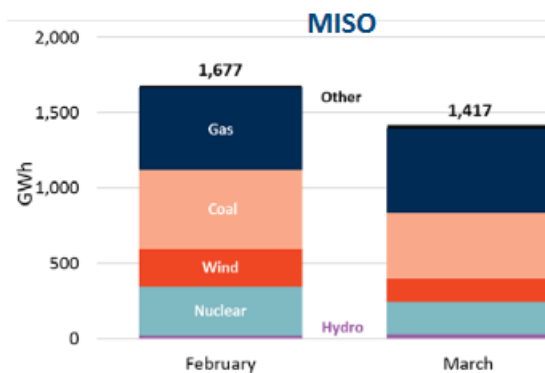
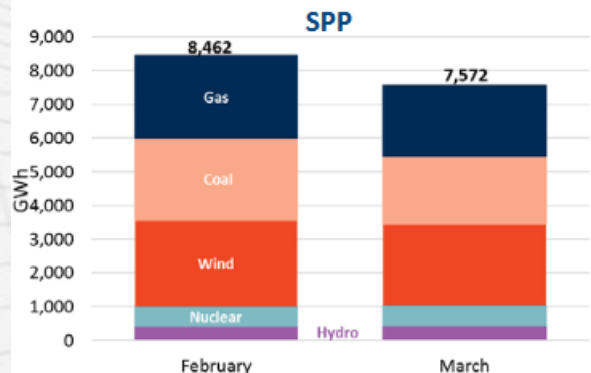
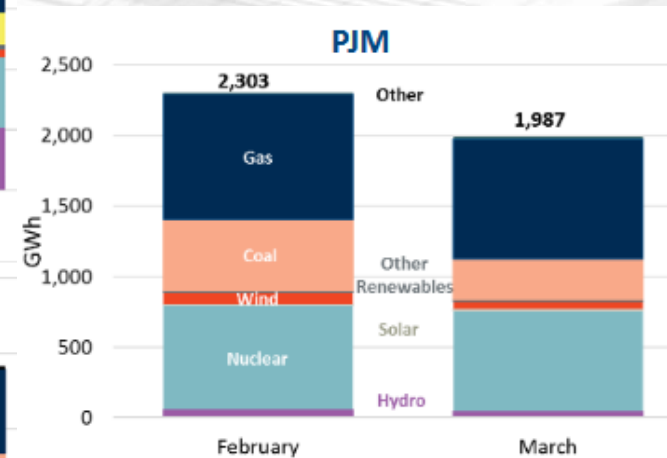
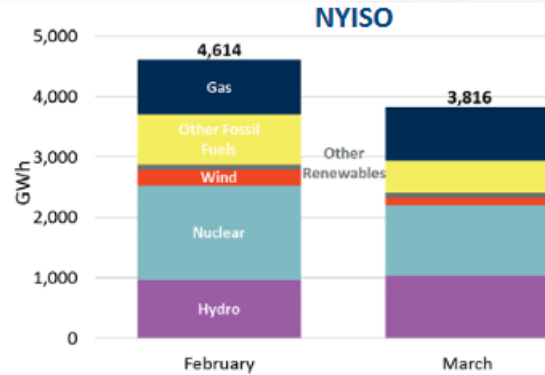
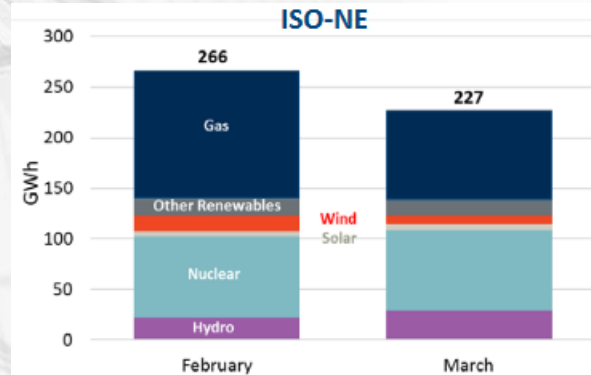


- Most states have suspended utility shutoffs
 - As of 3/31, 20 mandatory, 29 voluntary
- Biggest load reductions likely from C&I customers
 - Decoupling: Electric utilities (44%), gas utilities (54%)
 - C&I losses can't be passed on to residential customers
 - Caps on how completely or rapidly utilities can recover lost revenues through rate hikes
- Reduced upstream costs will offset some losses
 - Lower charges for fuel, market electricity

Planned Generation Capacity



- EIA projects 4.9 GW delay or cancellation of planned capacity expansions through September



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Source: The Brattle Group

Energy & Environment



- Distributed, renewable energy targets may get lower priority
 - ▣ Less money for new investments
 - ▣ Lower energy prices with current fossil fuel mix
- Public policies like ZEC's may get temporary hold
 - ▣ States facing large budget shortfalls
 - ▣ However, could be used as driver for job creation
- Electrification growth (e.g., EV's) may be delayed
 - ▣ Reduced gas prices (14-20% during 2/1-3/31)
 - ▣ Reduced consumer wealth

About REMI



REMI's 40-year history of rigorous academic research and software development has led to the development of the state of the art model in macroeconomic research methodology:

Input-Output

Close analysis of inter-industry relationships

General Equilibrium

Estimate of long-run stability of the economy allows for analysis of policy decisions

Econometrics

Advanced statistical analyses underpinning the model

Economic Geography

Effects of geographic concentration of labor and industry



**Integrated REMI
economic modelling
approach**



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Introduction to E3+

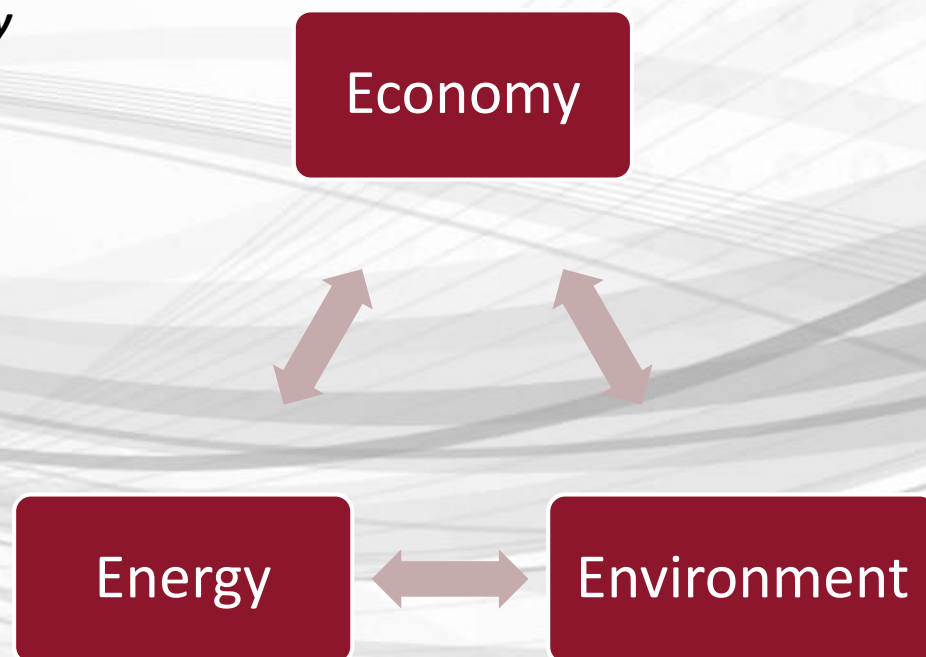


REMI E3+ was designed to capture a more complete set of the linkages between the energy sector, the environment, and the broader economy

- Who it's meant for:
 - ▣ Utilities
 - ▣ State energy research departments
 - ▣ Consultants
 - ▣ Environmental regulators

- What it's meant for:
 - ▣ Integrated resource planning/energy policy
 - ▣ Energy efficiency/technology regulation
 - ▣ Air quality planning

Energy, Environment, and the Economy: E3+



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Introduction to E3+

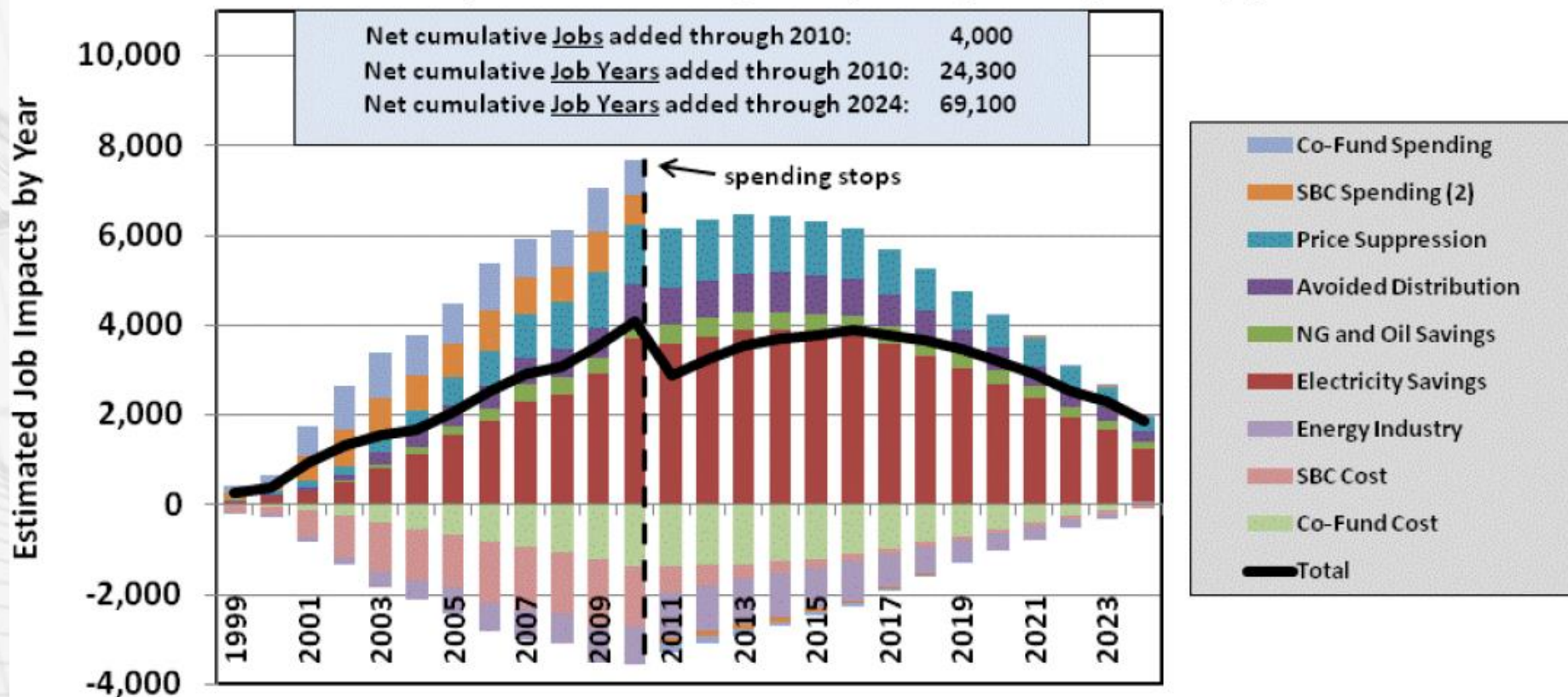


REMI E3+ includes functionality to make energy and environmental analyses more comprehensive and more accessible to non-energy or environmental users

1. Energy Consumption and Carbon Dioxide Emissions Module
2. Resilience Module
3. Emissions Cost
4. Carbon Tax Scenario
5. Construction and O&M Profiles for Natural Gas, Solar, Wind, Coal, Nuclear
6. Allows for integration with third-party energy models

Program Evaluation

Employment Impacts of New York Energy \$martSM Estimated Job Impacts due to Program Spending through 2010 (1)



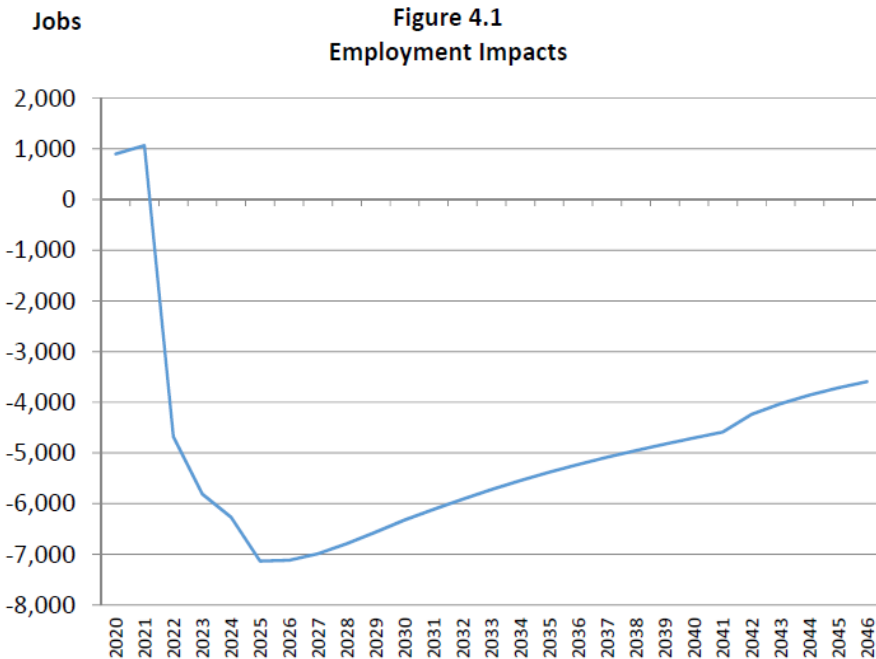
Notes:

- (1) Efficiency measures are assumed to carry a 15 year life. Results are truncated to end within 15 years after program spending stops.
- (2) Includes program spending for the the full portfolio of New YorkEnergy \$martSM programs but does not take account for all possible program benefits.

Regulation Impacts



Figure 4.1
Employment Impacts



Category	Impacts by Year		
	2025	2035	2045
Clothing and footwear	-17.9	-20.2	-17.1
Food and beverage	-28.1	-35.5	-29.7
Fuel oil and other fuels	-0.3	-0.3	-0.3
Furnishings and household durables	-17.9	-18.2	-16.7
Healthcare	-80.8	-101.0	-106.9
Household utilities	-35.9	-38.5	-23.7
Housing	-64.5	-84.2	-71.8
Motor vehicle fuels, lubricants, etc.	-12.9	-17.8	-15.2
Motor vehicles and parts	-25.9	-25.1	-21.9
Other nondurable goods	-48.2	-53.0	-55.4
Recreation and other services	-170.0	-164.6	-145.5
Recreational goods	-44.8	-44.6	-41.5
Transportation services	-19.0	-14.9	-12.6
TOTAL	-566.1	-617.9	-558.3

Source: The Economic Implications of Implementing the EPA Clean Power Plan in Montana - Conducted for Northwestern Energy using REMI, 2015, by Bureau of Business and Economic Research University of Montana

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Disruptive Technologies

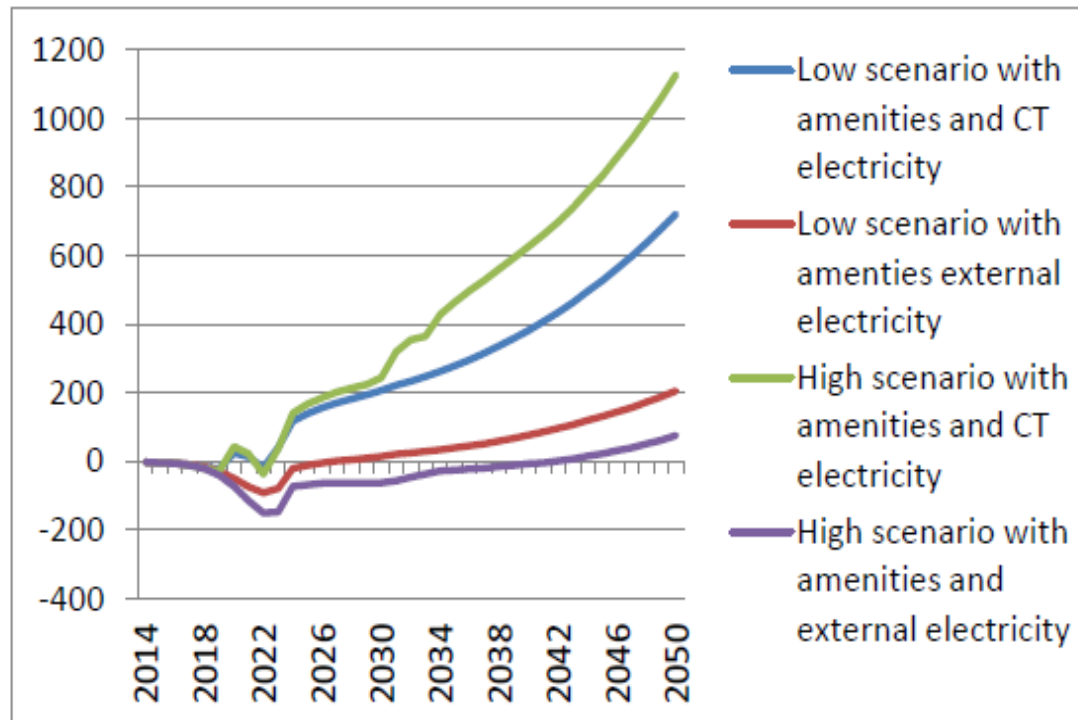


Figure 6. Personal Disposable Income Impacts Utilizing External or Connecticut Generated Electricity (\$M)

Source: Impacts of Hybrids and Electric Vehicles in Connecticut - Retrospective and Prospective, by Connecticut Center for Economic Analysis, 2015

“In contrast with the impact on jobs at least in the low growth scenario, changes in Personal Disposable Income (PDI) turn positive over time when amenity impacts are included as noted in Chart 4. The good performance of PDI relative to job creation arises from improved productivity.”

Section 179D – Energy Efficient Buildings Tax Credit Overview



- Section 179D Energy-Efficiency Commercial Buildings Tax Deduction
 - Deduction to provide incentive for companies to design and build energy-efficient structures
 - Program created through the Energy Policy Act of 2005
 - The provision has never been made permanent
 - Expired and reinstated multiple times over the years
- \$38 billion per year in commercial lighting costs

Mechanisms



- Extending the program could yield economic benefits
 - ▣ Higher investment in services and materials
 - ▣ Lower energy use over time
 - ▣ Upfront investment; high labor use
 - ▣ More efficient use of resources
- Economic analysis did not capture all of the non-economic benefits – environment, energy independence, grid maintenance, etc.

Input Variables



- Energy efficiency – **production cost**
- Industry tax deductions – **production cost**
- Architect/designer deductions – **production cost**
- Equipment purchases – **detailed investment***
- Maintenance and repair – **industry sales**
- Reduced electricity generation – **utilities (output)**

Scenario Impacts

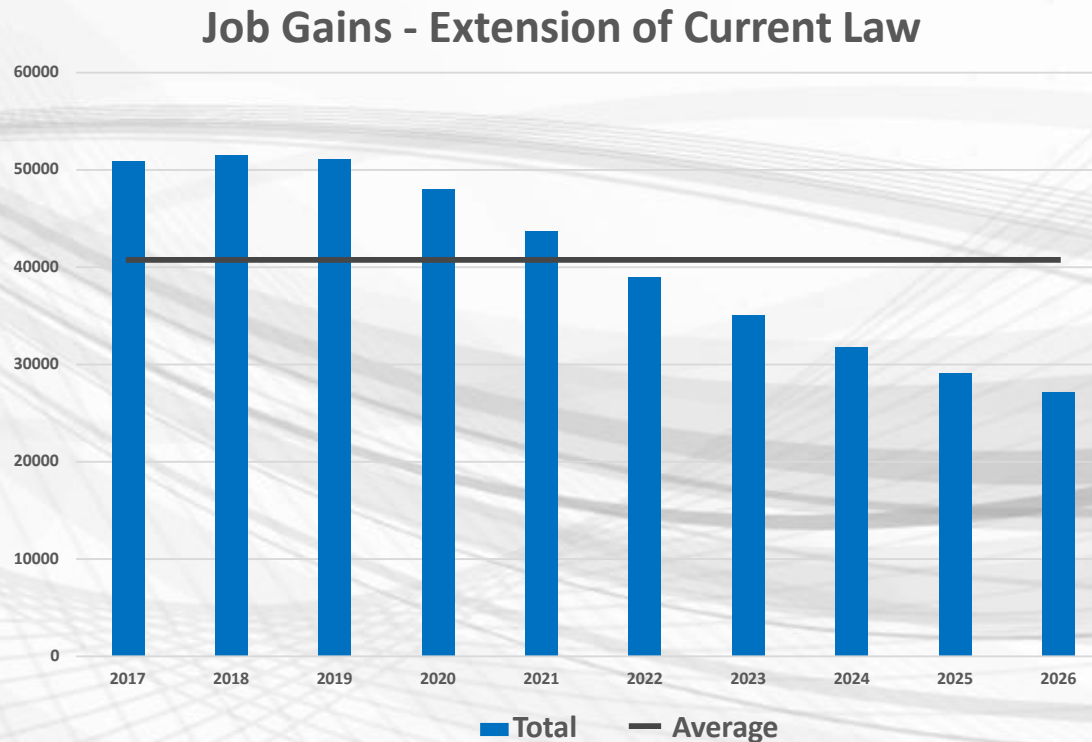


Results of this analysis show positive economic impacts over the first ten years in terms of job creation and economic expansion.

INDICATORS	Extension of Current Law	Extend and Expand	Strengthen and Modernize
Jobs	40,749	39,388	76,529
GDP (millions of 2016 dollars)	3,860	3,730	7,398
Personal Income (millions of 2016 dollars)	3,128	3,017	5,729

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Extend Current Law - Jobs

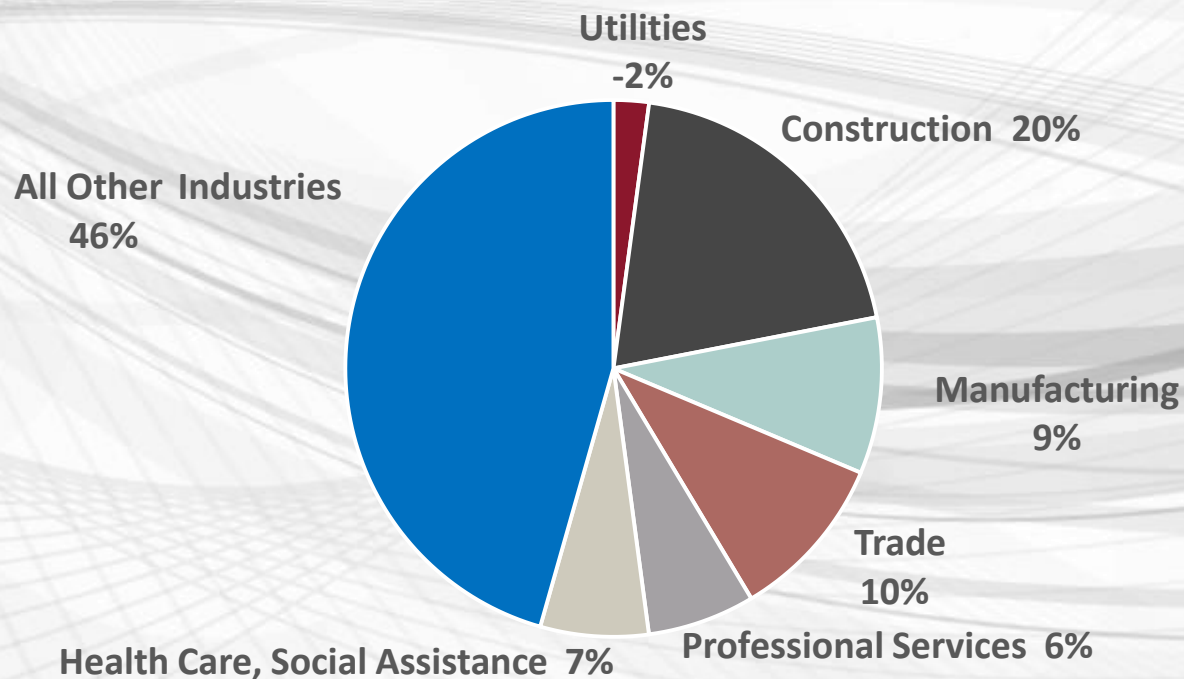


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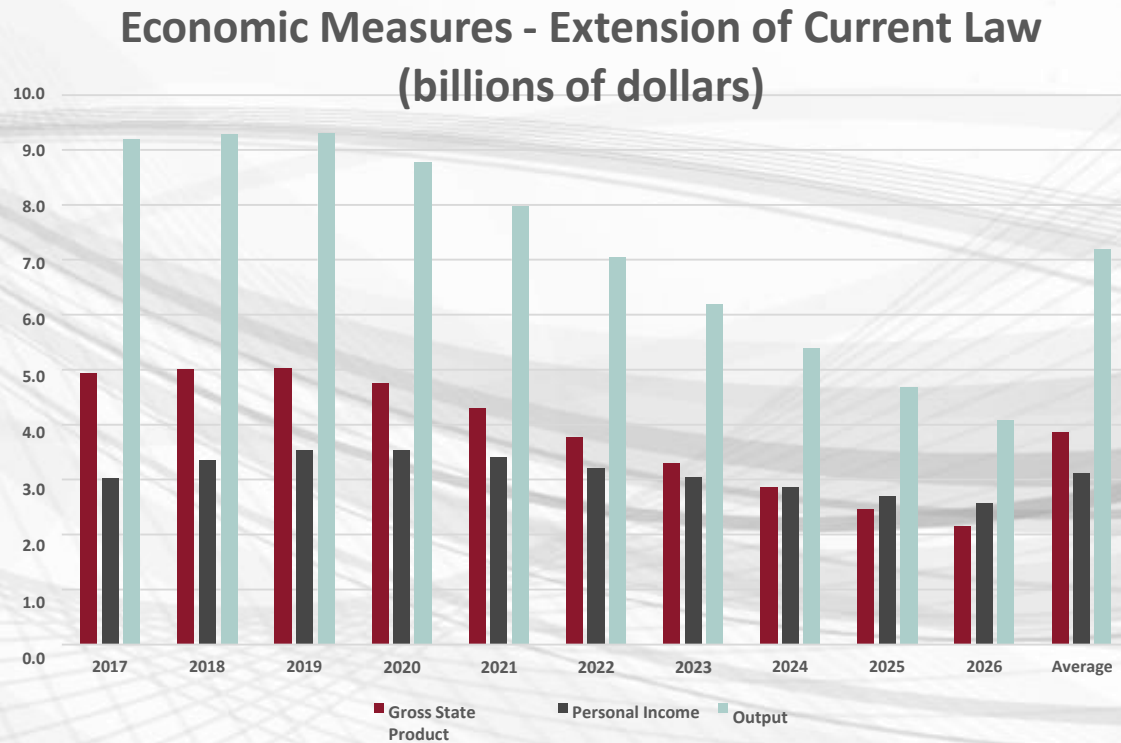
Extension – Jobs By Industry



Industry Job Gains and Losses - Extension of Current Law - Average Ten Year Impact



Extension – Output and Income



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Analysis Conclusion Highlights



- Extending and expanding the Section 179D Energy-Efficiency Commercial Buildings Tax Deduction will create jobs and expand the nation's economy
- Extending the program leads to an average annual gain of 43,453 jobs, \$4 billion in gross domestic product, and \$2.9 billion in personal income over first five years
- Strengthening and modernizing the existing program can yield even more substantial economic gains

Model Demonstration