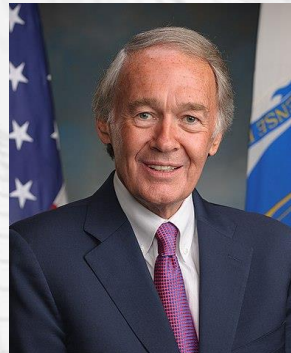


THE GREEN NEW DEAL: THE ROLE OF ANALYSIS

What is the “Green New Deal”?



- U.S. Rep. Alexandria Ocasio-Cortez and Sen. Ed Markey proposed a Congressional resolution defining the “Green New Deal”
 - ▣ Resolution would describe environmental and economic goals to be achieved in **10 years** - seeking net-zero greenhouse gas emissions, economic security, and a sustainable future
 - ▣ Initiatives included in the resolution:
 - Meeting **100 percent** of power demand in U.S. through renewable, zero-emission sources
 - Promoting energy efficiency, clean manufacturing, high-speed rail, zero-emission vehicles, and other innovations
 - Building resiliency to climate change impacts (i.e. extreme weather)
 - Upgrading infrastructure
 - Encouraging economic development and guaranteeing jobs with living wages

Political Context



- Increased public concern about climate change
 - Especially 18- to 34 year-olds (70% worried compared to 62% among ages 35-54 and 56% 55 or older - Gallup, May 11, 2018)
- Dissatisfaction with perceived Republican “denial” of a problem, link to man-made activities, or ability to solve (e.g. U.S. is just one contributor)
 - By contrast, center-right parties in Europe are more likely to believe climate change is a real issue
- Perception that status-quo politics from elected officials (including Democrats) is failing to resolve problem
 - In President Obama’s first term, U.S. House passed cap-and-trade bill but it never came to a vote in the Senate
- Linkage with a range of economic and social challenges such as income inequality, marginalized communities

State-level Significance



- Climate change matters to all states and regions, whether they are “blue” or “red”
 - ▣ Resiliency is a growing problem (hurricanes, wildfires, coastal and inland flooding)
 - \$150 billion for FEMA disaster relief in 2018
 - ▣ This problem HAS to be dealt with by state and local governments, regardless of the cause.
- Avoidance of market solutions or regulations may result in political backlash
- Natural-resource dependent states may wish to further diversify economy in any case, since oil and gas prices are volatile and may be depleted over time

How Does Analysis Fit In?



- The Green New Deal represents aspirational goals; implementation of even a small aspect required detailed understanding of engineering, economic, environmental and financial issues
 - ▣ REMI, in particular, has been involved in national, state and local evaluation of the economic effects of environmental policy (as well as social policies); these can inform the way forward

Market-based Solutions



- A carbon tax is an efficient means for reflecting the cost of carbon in all economic decisions
 - ▣ Applies to everything from investments made by companies to the product choices made by consumers
- A carbon tax may be better suited for setting a uniform standard to hold all nations accountable
 - ▣ This last point is important, given the global nature of the challenge and the fact that economic growth in developing economies will account for a significant portion of future greenhouse-gas increases
 - ▣ **Policy options must encourage and support global engagement**

Carbon Pricing in Congress



- Republicans and Democrats have filed bipartisan bills for carbon pricing
 - The Energy Innovation and Carbon Dividend Act is sponsored by GOP Reps. Francis Rooney of Florida and Brian Fitzpatrick of Pennsylvania, along with Democratic Reps. John Delaney of Maryland and Ted Deutch and Charlie Crist of Florida
 - Legislation would require energy companies to pay \$15 per ton of carbon emitted from their products, with the fee rising by \$10 each year
 - All revenue – minus administrative costs – would be returned to the taxpayers
 - Some progressives see carbon taxes as insufficient
 - *"A carbon price could be part of a 'Green New Deal,' but it must not prioritize corporate profit over community burdens and benefits."* - Stephen O'Hanlon, spokesman for the Sunrise Movement, an advocacy group supporting the "Green New Deal."

Sources: E&E News, Yale Environment 360

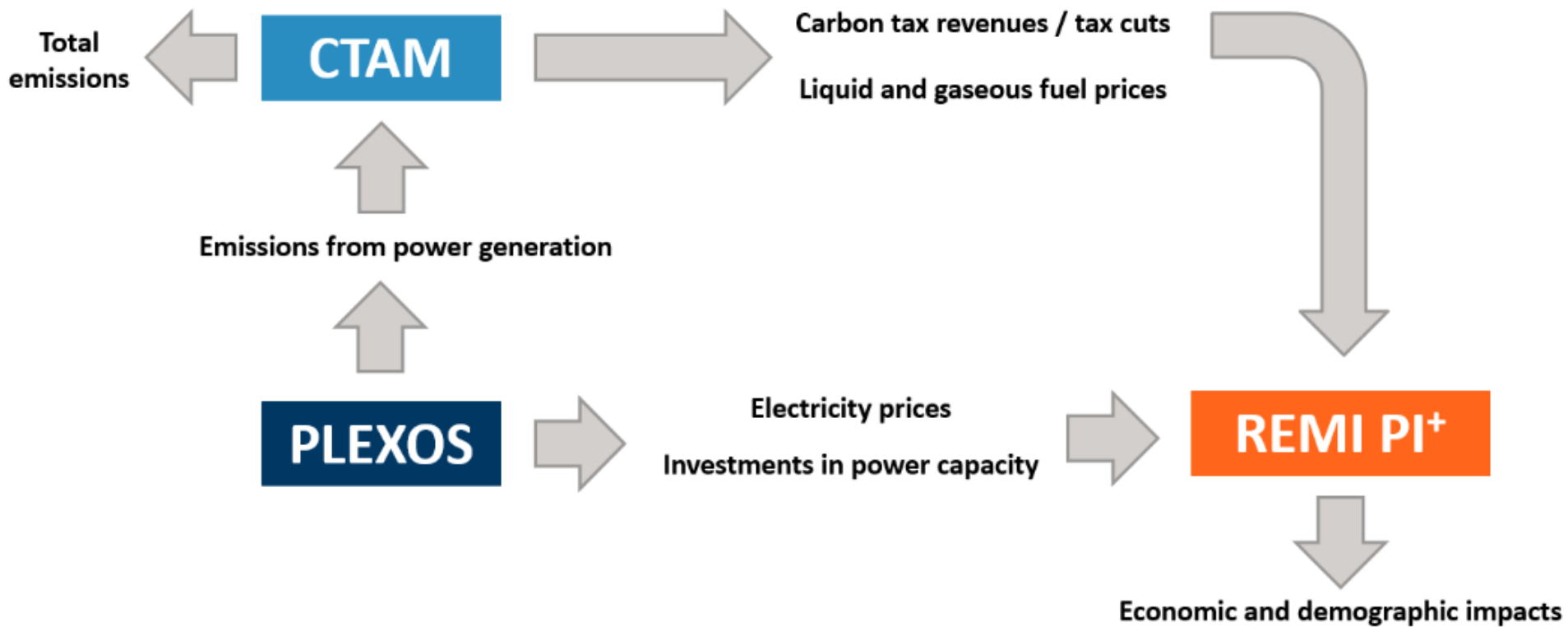
Evaluating the Carbon Tax

- Analysis can find efficient solutions and means to balance competing objectives (e.g. maintain benefits of a market-based economy while addressing social and environmental issues)
 - See, *The Conservative Case for Carbon Dividends*, endorsed by James Baker III, Hank Paulson, Greg Mankiw, Martin Feldstein and George Shultz)
- Alliance for Market Solutions, a conservative non-profit organization advocating for market-oriented clean energy and environmental policies, commissioned FTI Consulting to simulate a national revenue-neutral carbon tax
 - The report's authors - Scott Nystrom, Katie O'Hare, and Ken Ditzel - applied this tax at the point of extraction or import
 - They modeled the implications of raising the cost of fossil fuels on the national, state and industry levels, and estimated the resulting economic, fiscal and emission impacts

Carbon Tax Modeling Methodology Overview



Figure 3: PLEXOS, CTAM, and REMI Integration



Carbon Tax Economic Results Overview



Table 3: Economic Impact during the Study Period (Total Jobs or 2016 \$ trillions, 2019-2028)

RESULT	CALCULATION	BASE CASE	CARBON TAX CASE	DIFFERENCE	PERCENTAGE
Employment	Average	200.09 million	200.10 million	+10,000	<0.01%
Sales Output	Aggregate	\$371.404	\$371.158	-\$0.246	-0.07%
GDP	Aggregate	\$215.525	\$215.424	-\$0.100	-0.05%
RDPI	Aggregate	\$165.511	\$165.122	-\$0.389	-0.23%

ES Figure 5: Impact to GDP Contribution by Industry (Aggregate, 2019-2028, 2016 \$ billions)

Largest Increase in Aggregate GDP

1. \$263 billion – Finance and Insurance
2. \$14 billion – Healthcare and Social Assistance
3. \$10 billion – Oil and Natural Gas Extraction
4. \$9 billion – Construction

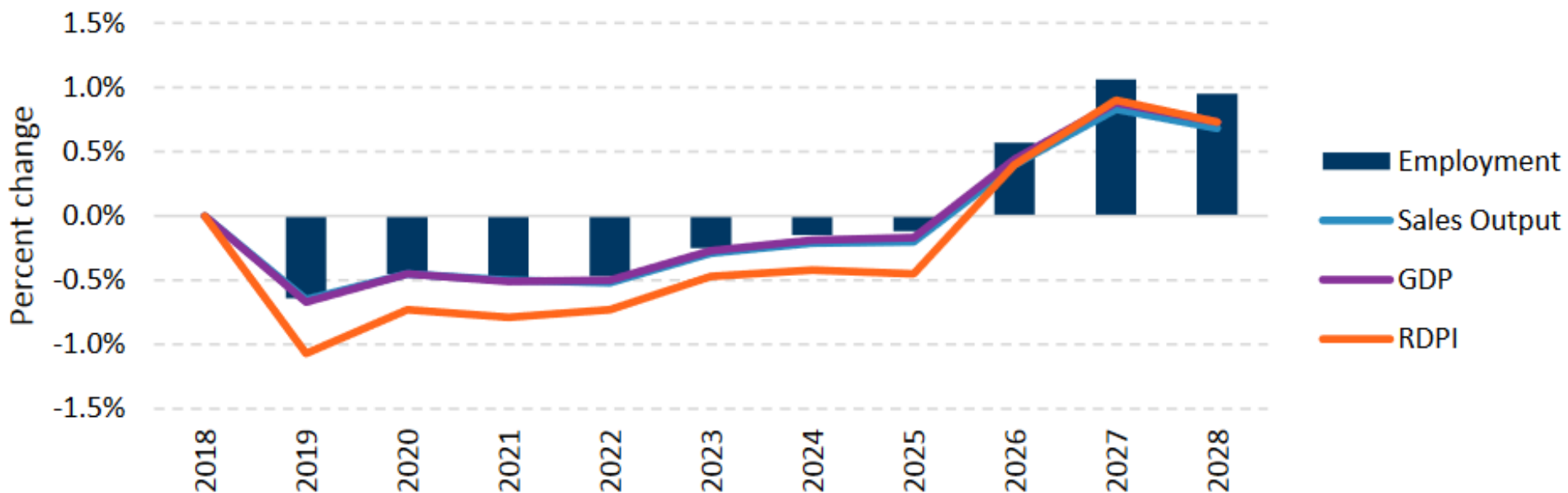
Largest Decrease in Aggregate GDP

1. -\$84 billion – Utilities
2. -\$83 billion – Mining (including Coal)
3. -\$43 billion – State and Local Government
4. -\$35 billion – Retail

Carbon Tax Dynamic Economic Results



ES Figure 2: Economic Impact of Revenue-Neutral Carbon Tax (Carbon Tax Case vs. Base Case)



Carbon Tax Emissions Reductions



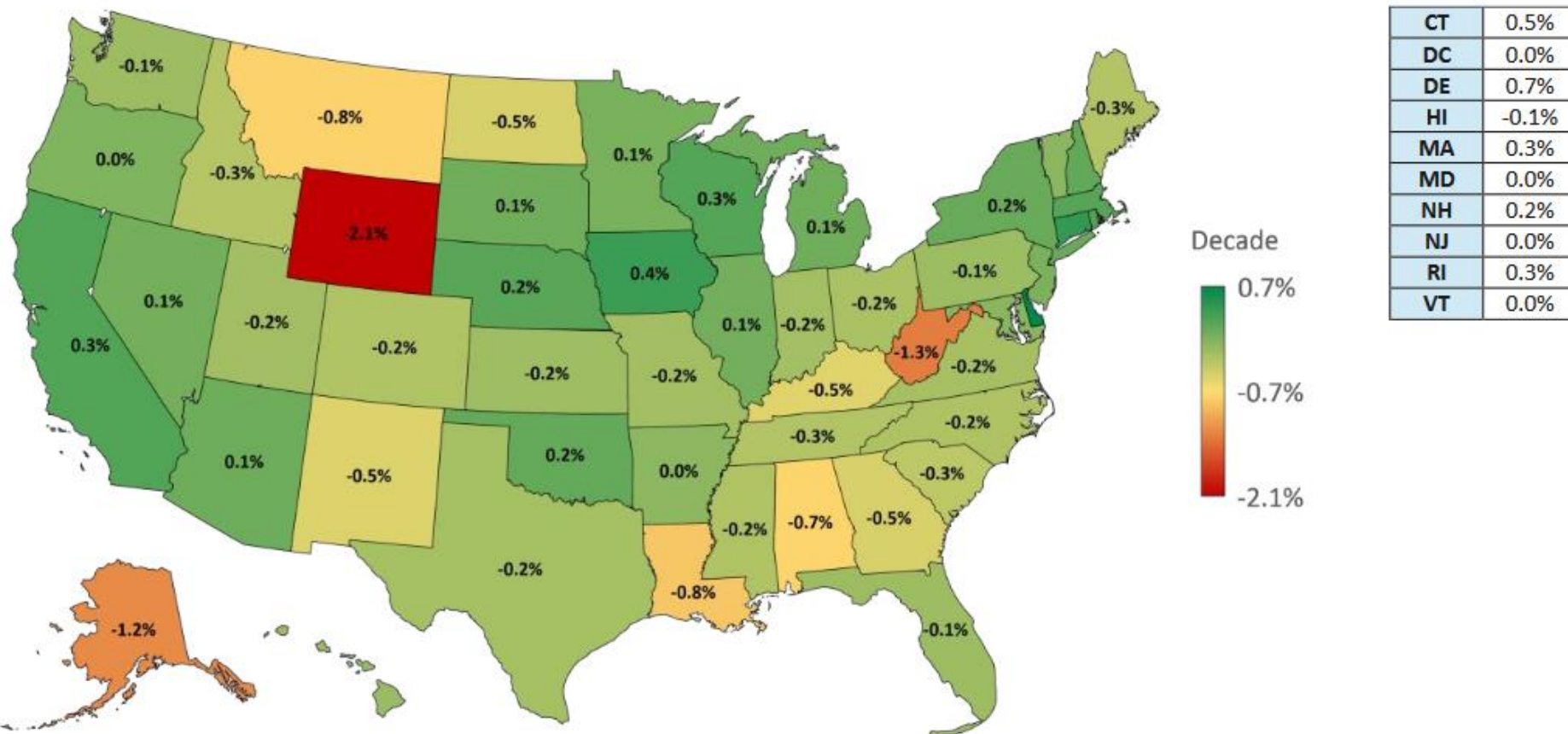
ES Figure 3: Reduction of Emissions from Carbon Tax (millions of metric tons)

RESULT	REDUCTION	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2019-2028
Total	Absolute	257	414	511	620	701	769	912	999	1,052	1,136	7,371
Total	Percentage	5%	8%	10%	12%	14%	15%	18%	20%	21%	23%	13%
Non-Power	Absolute	38	72	111	153	198	248	302	359	421	487	2,389
Non-Power	Percentage	1%	2%	3%	4%	6%	7%	9%	11%	12%	14%	6%
Power	Absolute	219	342	400	467	503	521	610	640	631	649	4,982
Power	Percentage	13%	21%	25%	29%	32%	33%	39%	41%	41%	43%	28%

Results Differ by Region



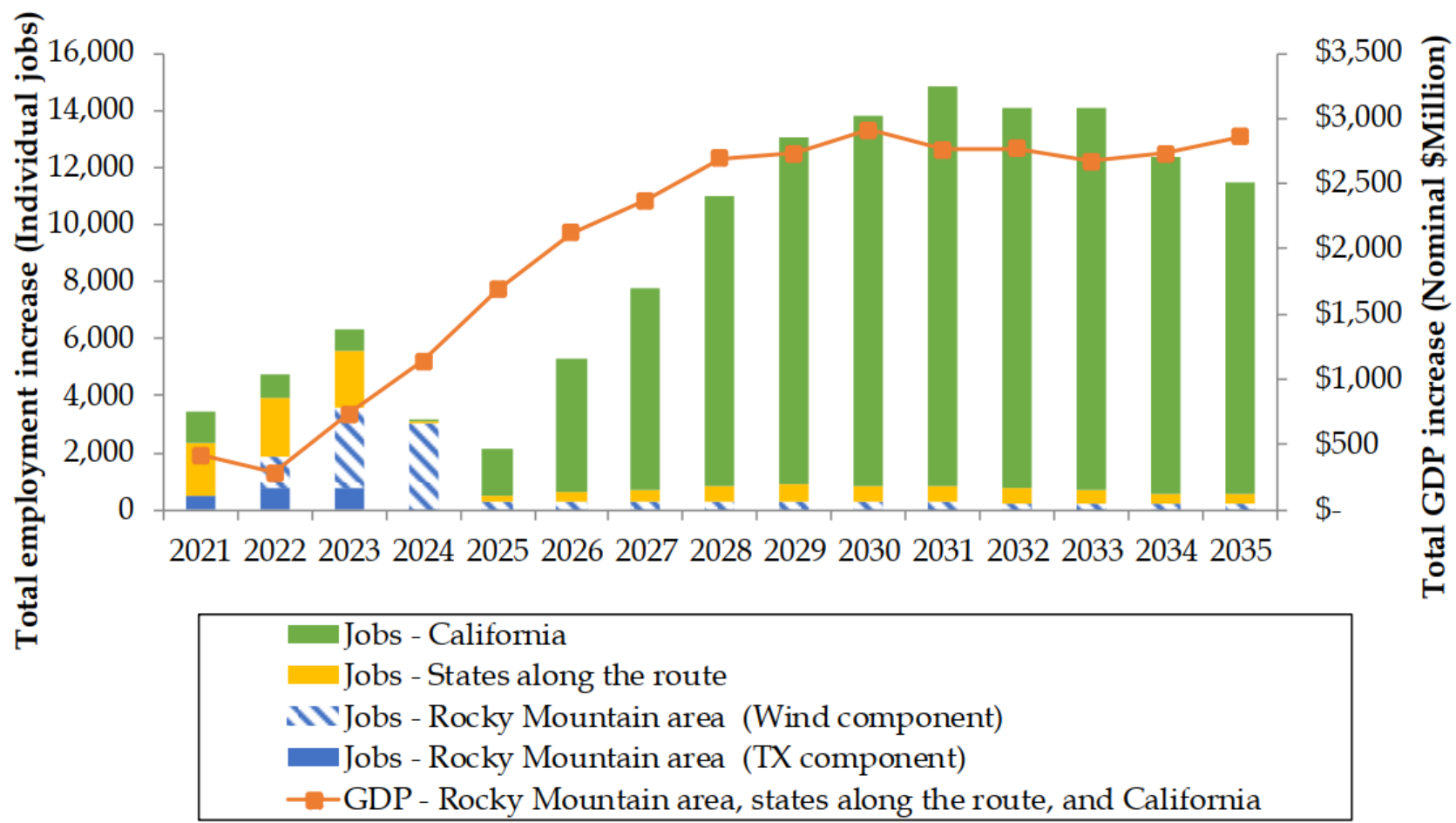
ES Figure 4: Impact to State GDP (Aggregate, 2019-2028)



what does **REMI** say? sm

How Does Electric Transmission Benefit You? Identifying and Measuring the Life-Cycle Benefits of Infrastructure Investment – London Economics International, 2018

Figure 23. Projected increase in local economic activity (GDP) and employment during the first 15 years of operations of the Western Interconnect project



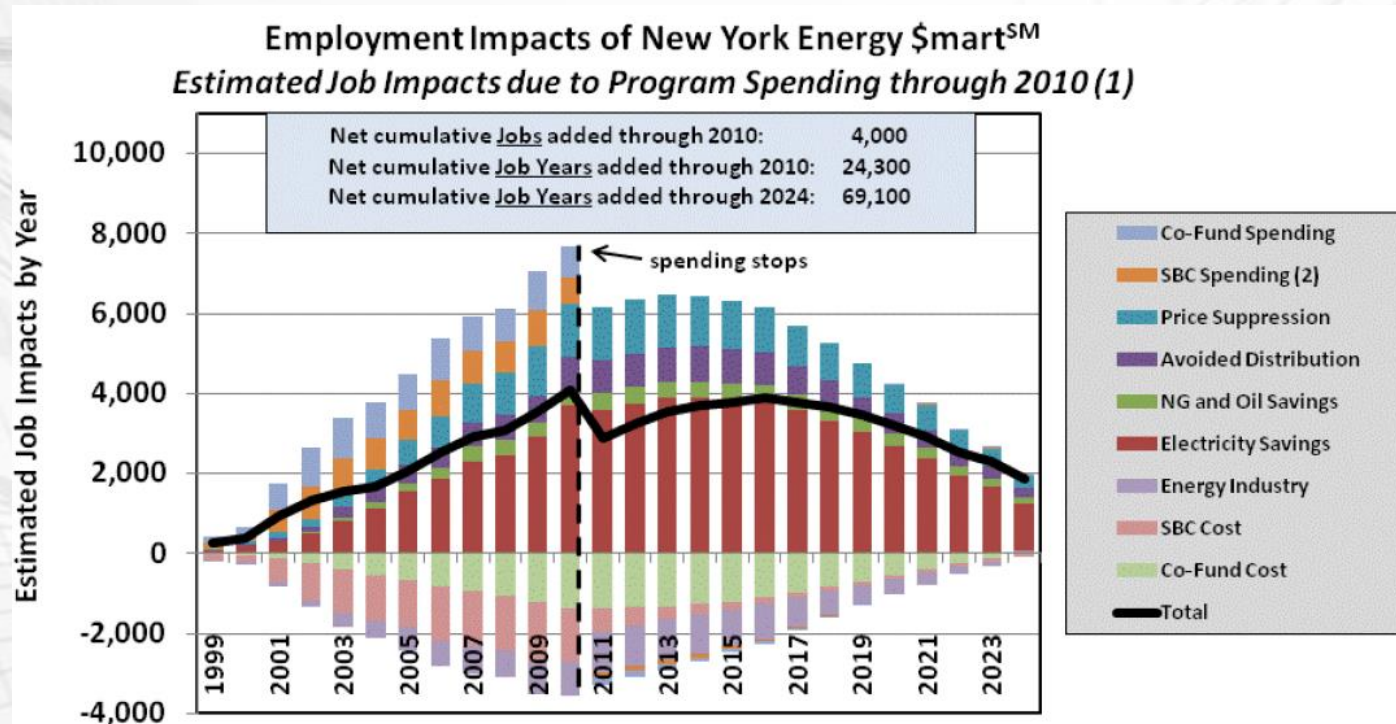
Note: For the **Western Interconnect project**, the projected GDP growth by regions follows a similar pattern as the job increase. Also, the negative local economic impact due to delayed renewable investment in California is netted out from the results.

Program Evaluation



Macroeconomic Impact Analysis of New York's Energy Efficiency Programs

- NYSERDA, 2011 and ongoing



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.

what does REMI

Disruptive Technologies



Impacts of Hybrids and Electric Vehicles in Connecticut

- Retrospective and Prospective Connecticut Center for Economic Analysis, 2015

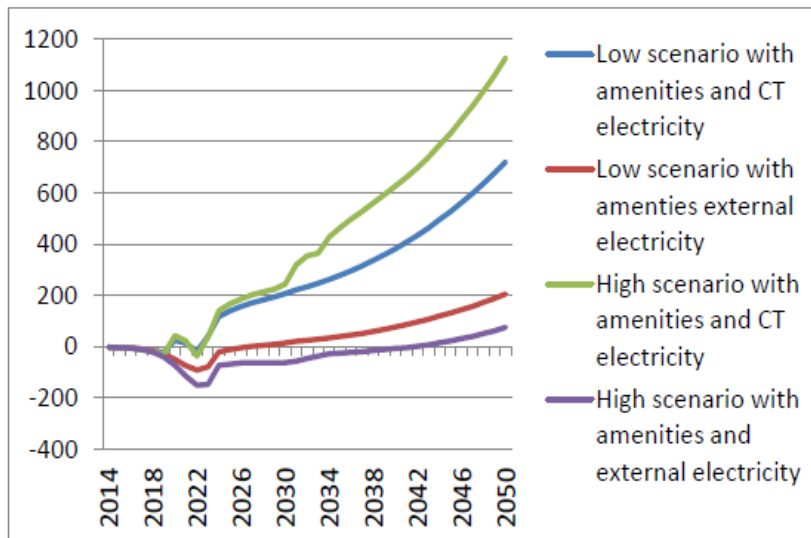


Figure 6. Personal Disposable Income Impacts Utilizing External or Connecticut Generated Electricity (\$M)

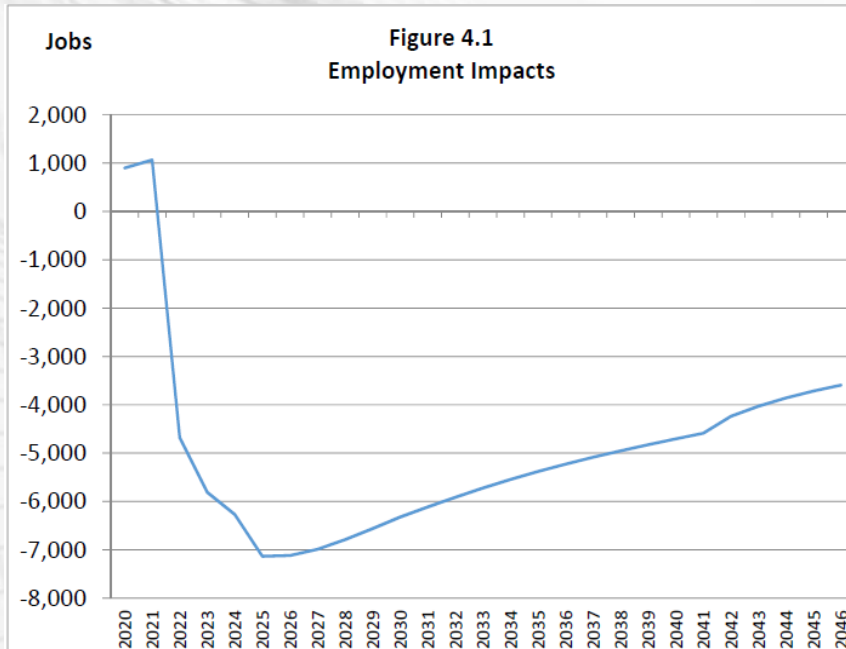
“In contrast with the impact on jobs at least in the low growth scenario, changes in Personal Disposable Income (PDI) turn positive over time when amenity impacts are included as noted in Chart 4. The good performance of PDI relative to job creation arises from improved productivity. “

Regulation Impacts



The Economic Implications of Implementing the EPA Clean Power Plan in Montana

- Conducted for Northwestern Energy using REMI, 2015



Spending (\$ millions per year)	Impacts by Year		
	2025	2035	2045
Category			
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

what does REMI say?

Planning for the Future



The Economic Impact of a Southeast Energy Hub

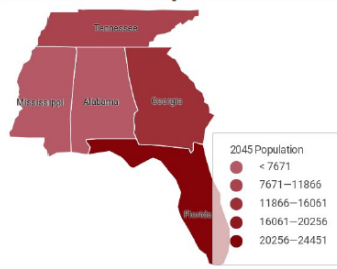
- REMI contracted by Southern Company, 2016

The Southeast's Future Demand

2016 Population



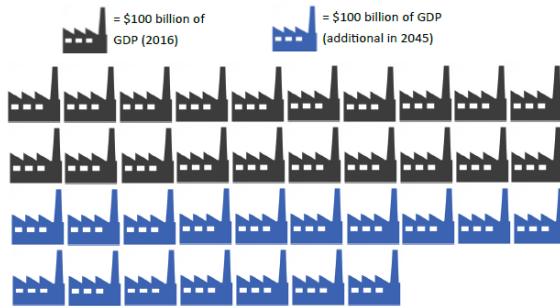
2045 Population



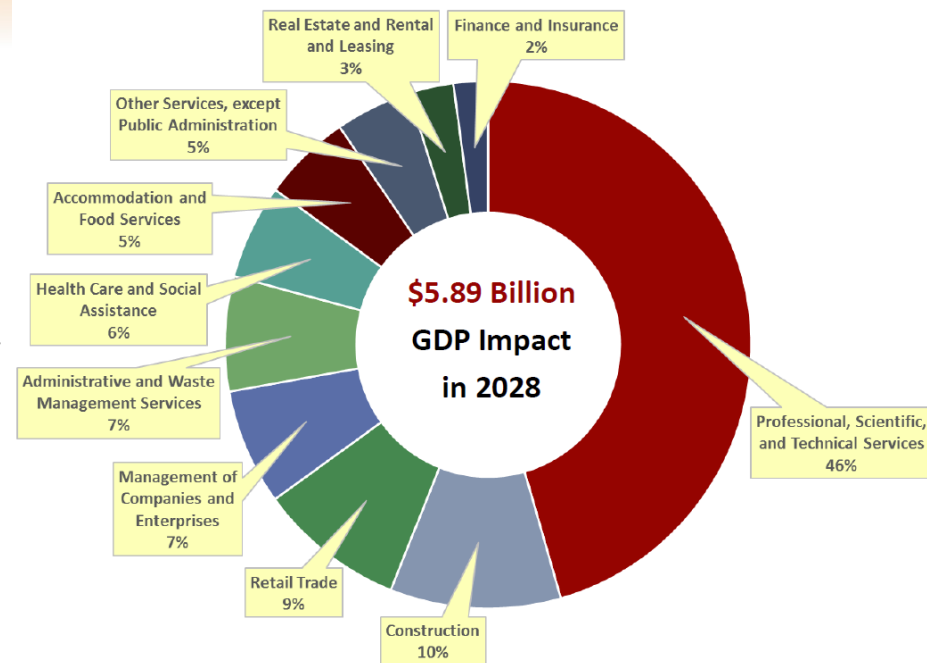
From 2016 to 2045, population is expected to increase by 19% throughout the Southeast region.

GDP Growth Projection in the Southeast Region

By 2045, the Southeast economy will **add** an additional \$1.7 trillion to its annual GDP. Manufacturing will account for 10.66% of the overall GDP in 2045.



Industries with the Largest Employment Impacts (2028)



What does REMI say?

Conclusion



- Populist ideas – green new deal or “hoax”
- Springboard for looking at real world policy decisions
 - ▣ Carbon tax
 - ▣ Renewable and energy efficiency programs
- Integrated economic development and infrastructure planning