Near-Final Results

Rhode Island Carbon Pricing Study

Cadmus Group & Synapse Energy Economics, Inc.

Friday, October 30th, 2020

Agenda

- Welcome, Background & Introductions
- Refresh: Overview of Carbon Pricing Scenarios
- Policy Analysis Findings
- Economic & Health Impact Results
- Illustrative Household Near-term Impacts
- Key Takeaways
- Conclusion & Next Steps

Background & Introductions

Project Overview

The purpose of this study is to provide an impartial assessment of potential state and regional carbon pricing policies. It is intended to inform (not set) policy design.

As context, the Resilient Rhode Island Act of 2014 created greenhouse gas (GHG) emissions reductions targets for 45% below 1990 levels by 2035 and 80% below 1990 levels by 2050.

Final Deliverables

A report and associated presentation that outline key findings from the policy analysis, modeling and stakeholder engagement.

Note that this study is conducted in the context of other related efforts in the State.

Leading Agencies

DEM RHODE ISLAND

STATE OF RHODE ISLAND OFFICE OF ENERGY RESOURCES

RI DOT

Consulting Support From

CADMUS

Synapse Energy Economics, Inc.

Project Status

Tasks	Status	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Task 1. Project Management	Ongoing								
Task 2. Literature Review and Policy Selection	Complete								
Task 3. Policy Analysis	Complete								
Task 4. Carbon Pricing and Economic Modeling	Complete								
Task 5. Stakeholder and EC4 Engagement	Ongoing								
Task 6. Final Report and Public Presentations	In Progress								

CADMUS

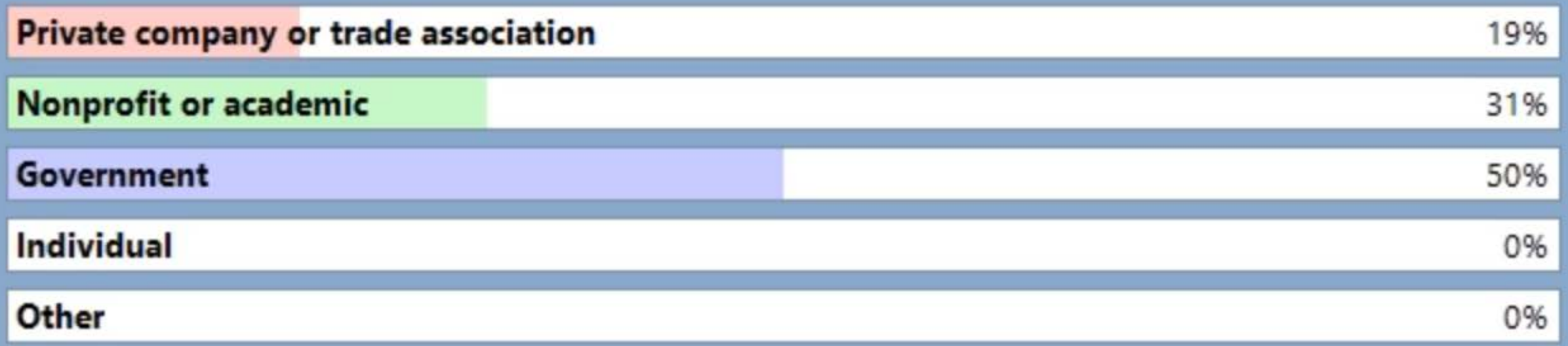
Today’s Objectives

- Share near-final results and key takeaways
  - Policy analysis findings
  - Final GHG emission
  - Economic impact
  - Health impact
  - Key Takeaways

- Provide an opportunity for feedback on results and key takeaways of the study, today and via comment following this meeting

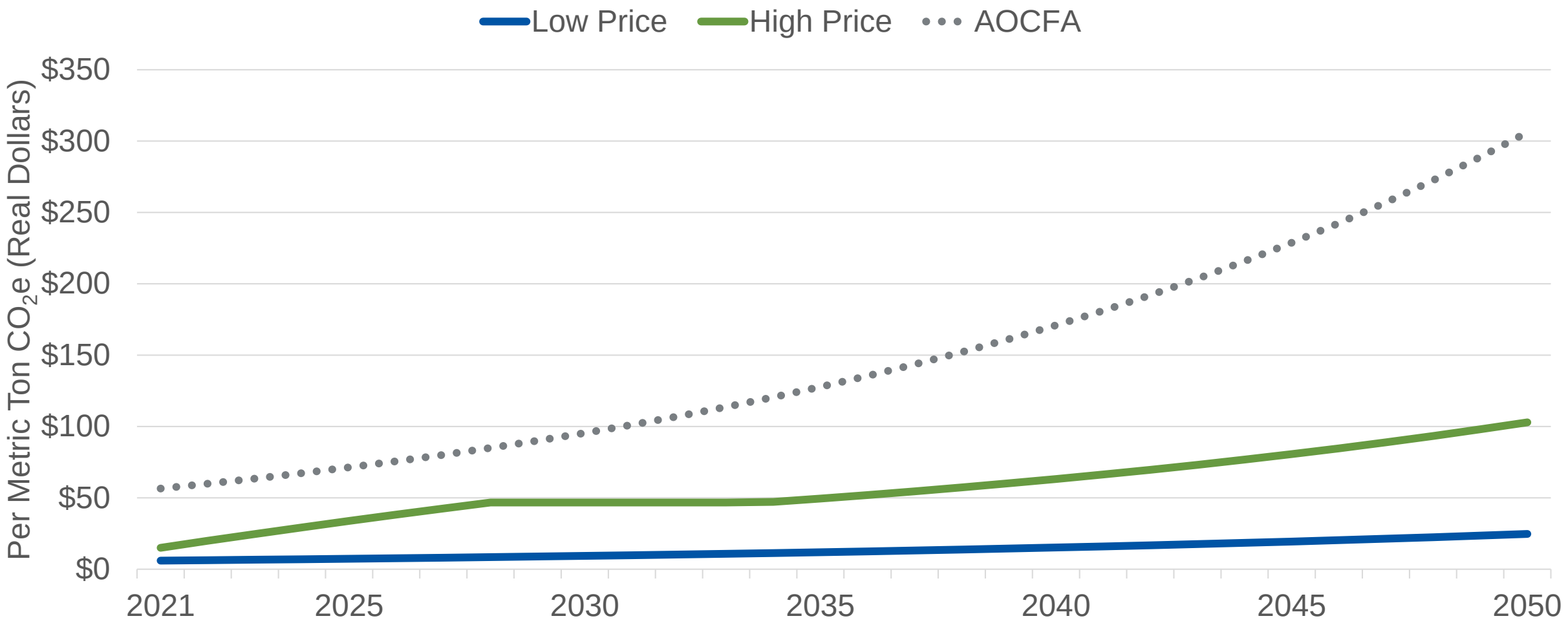
What organization do you represent?

Poll Results (single answer required):



Refresh: Overview of Carbon Pricing Scenarios

Illustrative Cases Studied | Price Levels



- Low price based on **Regional Greenhouse Gas Initiative** (RGGI)
- High price based on **Economic and Climate Resilience Act of 2019** (ECRA, known as Energize RI Act in previous years)
- **American Opportunity Carbon Fee Act** (AOCFA) is a federal bill introduce by RI's Senator Whitehouse
- AOCFA was included for initial pricing-response analysis, but is not included in deeper impacts analysis

CADMUS

Refresh- Illustrative Cases Studied

	Case	Carbon Price	Investment Focus	Rebates
1	Baseline	None	N/A	No
2	Low Price Alone	Low	N/A	No
3	Low + Incentives	Low	Incentives	No
4	Low + Public Services	Low	Public Services	No
5	High + Incentives	High	Incentives	Yes
6	High + 2x Incentives	High	Double Incentives	Yes*

*The rebate will be smaller in this scenario because investment is higher.

- Study structure designed to illustrate impacts of each change, not to develop or propose any particular policy

Refresh- Revenue Investment Options

		Incentives	Public Services
Transportation	**Majority of Revenue**	• Light duty electric vehicle incentives	• Reduced transit fares
	Remaining Revenue	• EV charger incentives • Electric transit bus deployment	• Transit bus service expansion • Electric transit bus deployment • Active transportation infrastructure (i.e. bike lanes)
Building Thermal	**Majority of Revenue**	• Air- and ground-source heat pump incentives	• Air- and ground-source heat pump installation and building weatherization for low-income residents and public buildings
	Remaining Revenue	• Building weatherization • Heating/cooling billpay assistance	• Heating/cooling billpay assistance

Policy Analysis Findings

Policy Analysis Overview

- To help inform the design of a potential carbon pricing policy in the State of Rhode Island, **Cadmus analyzed the defining elements of a typical carbon pricing policy against assessment criteria** identified in collaboration with the Rhode Island Team.
- **Policy elements** (and tradeoffs) analyzed include:

Price Level
(High vs. Low)

Applicable Sector
(Transportation vs. Building Thermal)

Investment Options
(Incentives vs. Public Services)

- The purpose of this analysis is to **identify key tradeoffs related to the implementation or impact of a carbon pricing policy** related to each element that could be considered by Rhode Island to inform the design a wholistic carbon pricing policy.
- Evaluation **criteria** include: Technical Implementation Feasibility, Administrative Feasibility, Alignment with Existing Initiatives, Potential for Successful Regional Implementation, and Social Acceptability

Overview

- Based on the qualitative policy assessment, the Camus Team has identified findings related to each of the assessment criteria.
- Rebates are not included in this portion of the analysis. Rebate design is assessed with other design elements and will be discussed separately from this analysis.
- Findings are organized into the following categories and are assessed for each criteria:

General Findings	• Overarching findings for implementing a carbon price
Price Level Findings	• How the criteria are impacted by the price level of the carbon price
Sector Findings	• How the criteria are impacted by the sector in which the carbon price is implemented
Transportation Investment Options findings	• How the criteria are impacted by the investment of revenue within the transportation sector
Building Thermal Investment Option Findings	• How the criteria are impacted by the investment of revenue within the building thermal sector

Technical Implementation Feasibility

Definition: Extent to which a policy is feasible to implement given Rhode Island's current resources, including electronic systems and procedural frameworks for administering such a policy. The analysis considers the extent to which the Rhode Island State government is expected incur staff time and other costs to implement the policy.

General Findings

- Rhode Island already has years of experience implementing RGGI. **The lessons-learned from RGGI could be applied to a carbon pricing program and help minimize technical implementation burdens.**
- Additionally, **several other jurisdictions have implemented carbon pricing programs** spanning multiple sectors, including California and British Columbia, that could **serve as a model for Rhode Island.**

Price Level Findings

- **Price level is not expected to impact the technical implementation feasibility of a carbon price** as the updates to electronic systems and procedures for implementing such a policy will not vary greatly by price level.

Sector Findings

- **There are no major anticipated differences in the technical implementation feasibility** of a carbon price in the either sector as the updates to electronic systems and procedures for implementing such a sector will not vary greatly by sector.

Technical Implementation Feasibility

Definition: Extent to which a policy is feasible to implement given Rhode Island's current resources, including electronic systems and procedural frameworks for administering such a policy. The analysis considers the extent to which the Rhode Island State government is expected incur staff time and other costs to implement the policy.

Transportation Investment Options

- **Both investment options** are expected to have **high technically feasibility.**
- Reducing transit fares is **technically simple**.
- Restarting Rhode Island's EV incentive program would require **minimal electronic systems upgrades or staff hiring/training.**

Building Thermal Investment Options

- The technical feasibility of either investment option would ultimately **depend on program design**.
- Program design decisions that could influence the technical implementation feasibility include the extent to which Rhode Island leverages **existing programmatic infrastructure** to implement these investment options (i.e., provide more funding to expand existing programs).

Administrative Feasibility

Definition: Extent to which a policy is feasible to manage over its duration. The analysis considers the extent to which the Rhode Island State government is expected to incur staff time and other costs to administer a given policy over time.

General Findings

- Rhode Island can potentially **leverage its experience with RGGI to reduce administrative challenges** and **associated costs**.
- Rhode Island can also **leverage existing programs and institutions to further reduce the administrative burden** of collecting and distributing revenue.

Price Level Findings

- **Price level is not expected to impact the administrative feasibility of carbon pricing policy** as the processes for administering such a policy will not vary greatly by price level.

Sector Findings

- **There are no major anticipated differences in the administrative feasibility of a carbon price in either sector** as the same reporting requirements, administrative oversight, and enforcement activities will be needed, regardless of sector.

Administrative Feasibility

Definition: Extent to which a policy is feasible to manage over its duration. The analysis considers the extent to which the Rhode Island State government is expected to incur staff time and other costs to administer a given policy over time.

Transportation Investment Options

- **Incentive programs require internal or external staff time to administer,** while reducing transit fares requires minimal staff time over the lifetime of the reduced fare.
- Therefore, the **Public Service investment option is expected to face slightly lower administrative costs** than the Incentive investment option.

Building Thermal Investment Options

- The administrative feasibility of either investment option would ultimately **depend on program design**.
- Program design decisions that could influence administrative feasibility include the extent to which Rhode Island leverages **existing programmatic infrastructure** to implement these investment options and the expected number of **incentives distributed**.

Alignment with Existing Initiatives

Definition: Extent to which a policy is expected to align with existing decarbonization initiatives in Rhode Island (e.g., RGGI, Rhode Island RES, etc.)

General Findings

- Contributes to Rhode Island's goal to achieve **80% reduction in GHG emissions** by 2050
- There are several **existing policies, programs, and initiatives** in the transportation, building thermal, and electricity sectors that are seeking to reduce GHG emissions or study decarbonization.
- Carbon price can **generate revenue** for programs
- A carbon price would expand on the success of **RGGI**.

Price Level Findings

- A **lower price** is more in line with Rhode Island's **existing initiatives** and action on carbon pricing.
- A **higher price** is more in line with Rhode Island's GHG **reduction targets.**
- The price of **RGGI aligns** with this study's low price.

Sector Findings

- A carbon price in the **transportation sector** appears more aligned with existing initiatives than a price in the building thermal sector.
- The transportation sector has **TCI** and other initiatives aimed at **fuel-switching**, while initiative in the building sector focus on energy efficiency.

Alignment with Existing Initiatives

Definition: Extent to which a policy is expected to align with existing decarbonization initiatives in Rhode Island

Transportation Investment Options

- **Both investment options align** with current initiatives and programs in Rhode Island.
- Rhode Island has implemented the **ZEV mandate**, has signed onto both the LD and MHD **ZEV MOUs**, and is considering adopting California's **Advanced Clean Trucks rule**.
- Rhode Island currently has **limited forms of free/reduced fare transit**, such as free bus fares for low-income seniors and people with disabilities.

Building Thermal Investment Options

- Current initiatives primarily focus on **energy efficiency and building weatherization** (which aligns with the Public Services investment option).
- RI has undertaken a **Heating Sector Transformation Study**, which explored the transition to low-carbon heating options (which aligns with the Incentives investment option).

Potential for Successful Regional Implementation

Definition: Extent to which a policy could successfully be broadened to include regional participation

General Findings

- The **RGGI** program has a wide geographic scope and has demonstrated that regional carbon pricing programs can be successful.
- **TCI** shows continued interest in carbon pricing among a broad set of states.
- **MA** has adopted an **additional carbon pricing program** in the electricity sector, demonstrating some, but limited, carbon pricing activity outside of RGGI.

Price Level Findings

- While some **states in the region** are exploring ambitious decarbonization efforts and **may support a higher price**, a **lower price is more likely to garner a broader coalition.**
- To date, **RGGI** is in line with this study's low price and **TCI** has focused on a similarly **low range of pricing levels**.

Sector Findings

- The **transportation sector** is expected to have somewhat greater potential for successful regional implementation than in the building thermal sector.
- The transportation sector currently has some **momentum through TCI**.
- There are **more impactful initiatives** within the region to decarbonize the transportation sector than in the building thermal sector.

Social Equity

Definition: Extent to which net benefits associated with the policy are expected to be distributed equitably across Rhode Island residents, particularly the degree to which net benefits are expected to accrue to disadvantaged households. Benefits may include cost savings, local public health improvements, and workforce development opportunities.

General Findings

- Carbon prices are **potentially regressive**, unless intentional policy design choices are made such as careful revenue reinvestment.
- **Low income** households spend a higher portion of their income on energy.
- Equitability of a program depends on **how the revenue is targeted** (e.g., by income or geographic location).

Price Level Findings

- In the absence of revenue spending, a **higher price** is generally expected to place a **higher burden** on disadvantaged households than a lower price.
- A **higher price allows for more revenue to be targeted** towards programs that promote equity.

Sector Findings

- Excluding use of revenue, there are **no major net-differences** in the overall social equity impacts of a carbon price in the transportation sector as compared to the building thermal sector.
- The degree of impact will depend on several factors, including a **person's location**, their **home heating fuel**, and the extent to which they **rely on a car** for transportation.

Social Equity

Definition: Extent to which net benefits associated with the policy are expected to be distributed equitably across Rhode Island residents, particularly the degree to which net benefits are expected to accrue to disadvantaged households. Benefits may include cost savings, local public health improvements, and workforce development opportunities.

Transportation Investment Options

- **Public Service** investments are more likely to have better social equity outcomes than incentive investments.
- Given the higher upfront cost of **EVs**, low-income residents may still **not be able to afford them**.
- Providing reduced fare and expanded public transit will be a boon for **those who live close to it**. However, rural residents would essentially be subsidizing public transit without accruing benefits.

Building Thermal Investment Options

- **Public service** investments are more likely to have greater social equity outcomes than incentive investments.
- Given the high upfront cost of heat pumps, low-income residents may still **not be able to afford a heat pump** even with an incentive.
- Providing free weatherization and heat pump installation for low-income residents will **remove the cost barrier to participating in heating sector decarbonization**. However, cost is only one of multiple barriers, particularly for renters.

Social Acceptability

Definition: Feedback regarding how carbon pricing policy is expected to be received among stakeholders (based on the limited desk research and interactions with stakeholders conducted within the study).

General Findings

- **A carbon pricing policy would align with existing initiatives** the State of Rhode Island is supporting related to decarbonization and is therefore **supported by several groups who want to see decarbonization in RI.**
- **Some stakeholders have been opposed to carbon pricing legislation** in Rhode Island for various reasons, including business interests, concerns that it is not as effective as more prescriptive policies, and that it may result in costs being passed on to consumers, among others.

Price Level Findings

- **Some stakeholder groups prefer lower prices,** while **others prefer higher prices.**

Sector Findings

- **No major anticipated differences in the social acceptability** of a carbon price in the transportation sector as compared to the building thermal sector.

Social Acceptability

Definition: Feedback regarding how carbon pricing policy is expected to be received among stakeholders (based on the limited desk research and interactions with stakeholders conducted within the study).

Transportation Investment Options

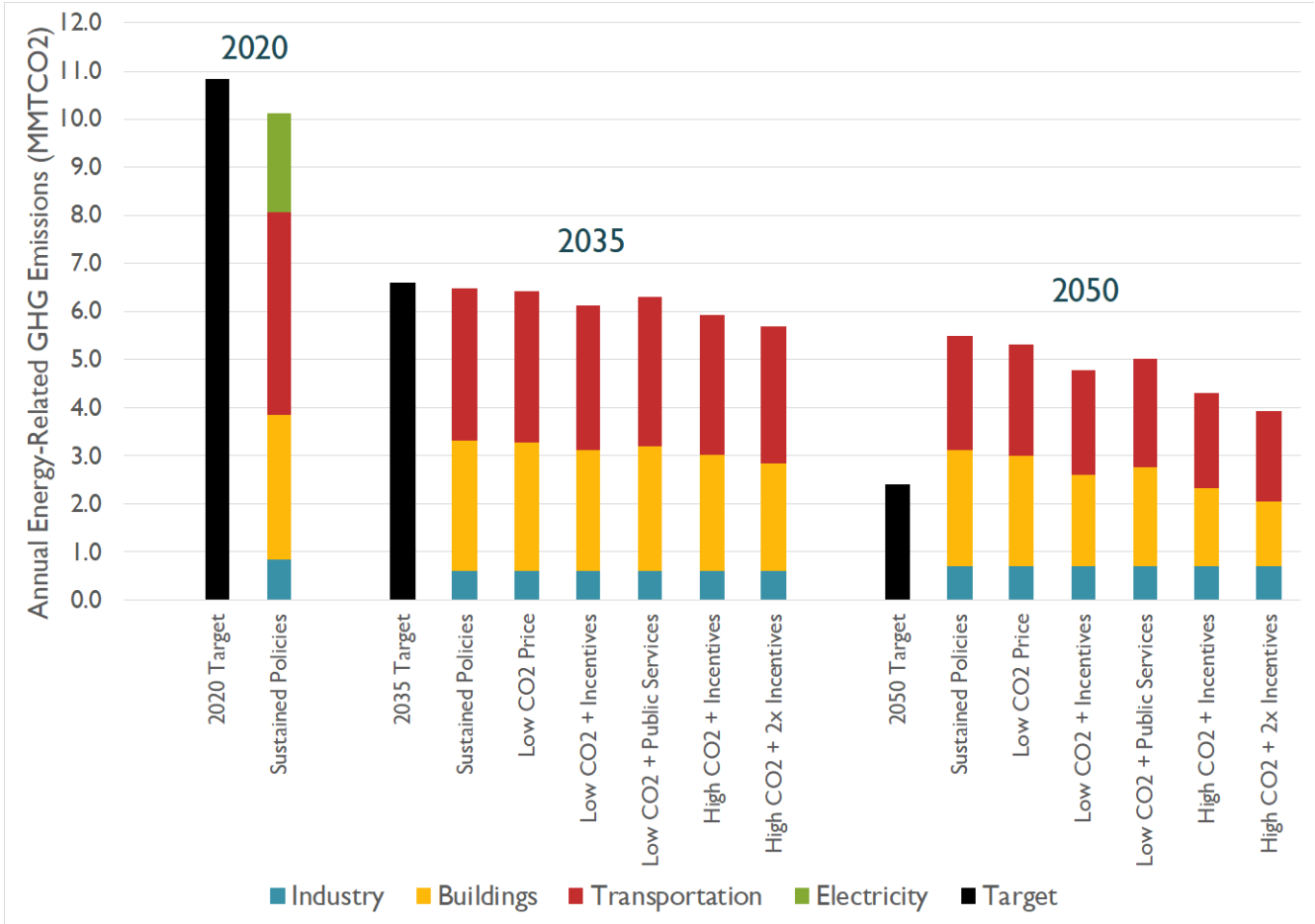
- Stakeholders have **differing opinions on how revenue should be used.**
- **Technology-neutral advocates** (e.g. biofuel industries) may **oppose ZEV incentives.**
- **EV incentives** are sometimes seen as **subsidies for affluent households.**
- The **modest associated emissions reductions for public transit fare reductions may limit support** among those who want more GHG reductions.

Building Thermal Investment Options

- Stakeholders have **differing opinions on how revenue should be used.**
- **Technology-neutral advocates** (e.g. biofuel industries) may **oppose technology-specific incentives**, such as ASHPs**.**
- Furthermore, **some stakeholders may be supportive of targeting resources** towards low-income households, while **others may prefer a greater emphasis on decarbonization**.

Emissions Modeling Update

Emission Results Update



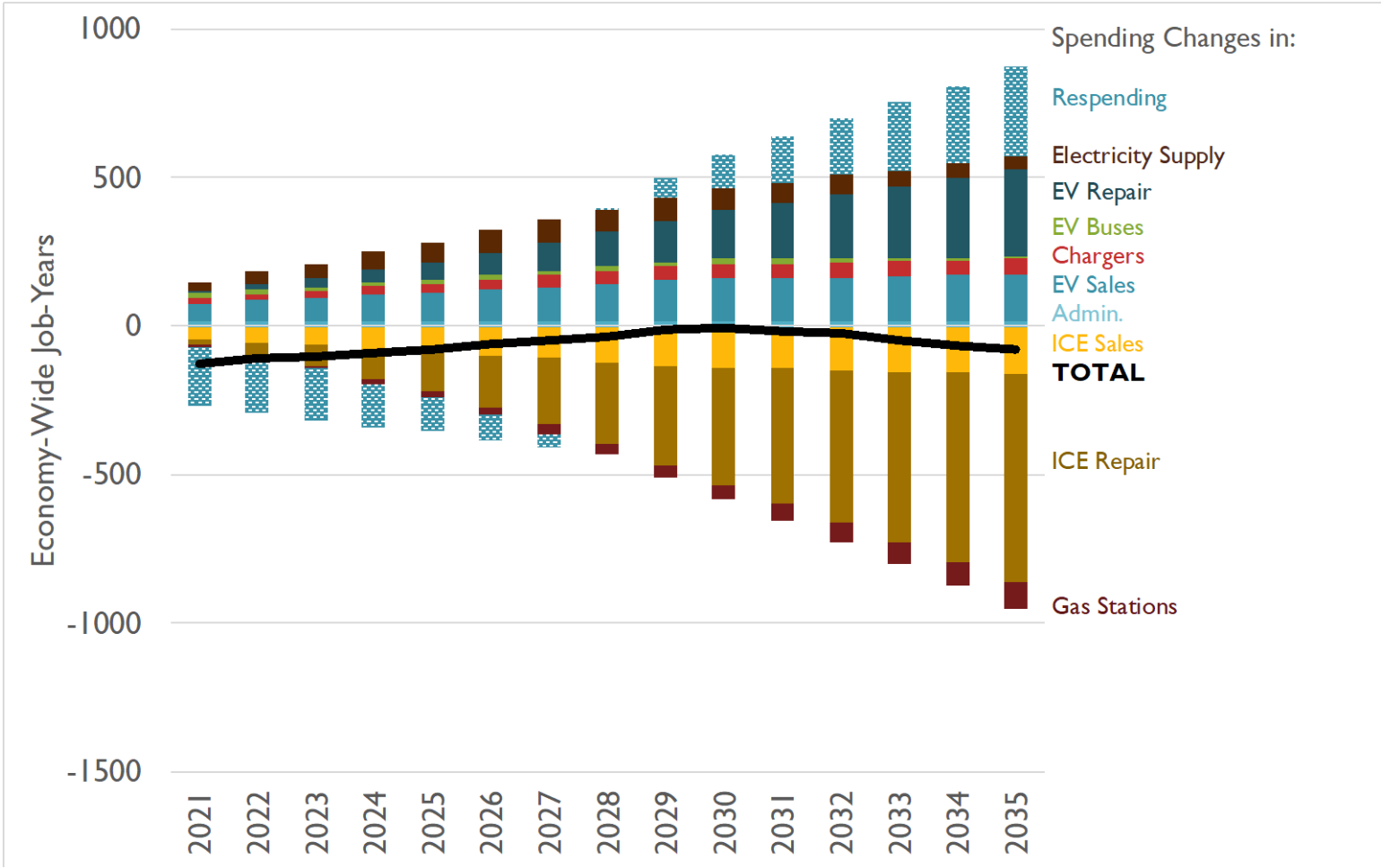
- Emissions are slightly higher in revised model runs than in earlier stakeholder presentations
- This is primarily due to revised modeling of the cost of 100% renewable electricity – more expensive electricity reduces uptake of EVs and heat pumps
- All cases meet the 2035 GHG target; additional policies would be required to achieve the 2050 target
- Relative impacts of the different policy approaches are unchanged

CADMUS

Economic & Health Impact Results

Job Impacts: Transportation Example

Low + Incentives Case



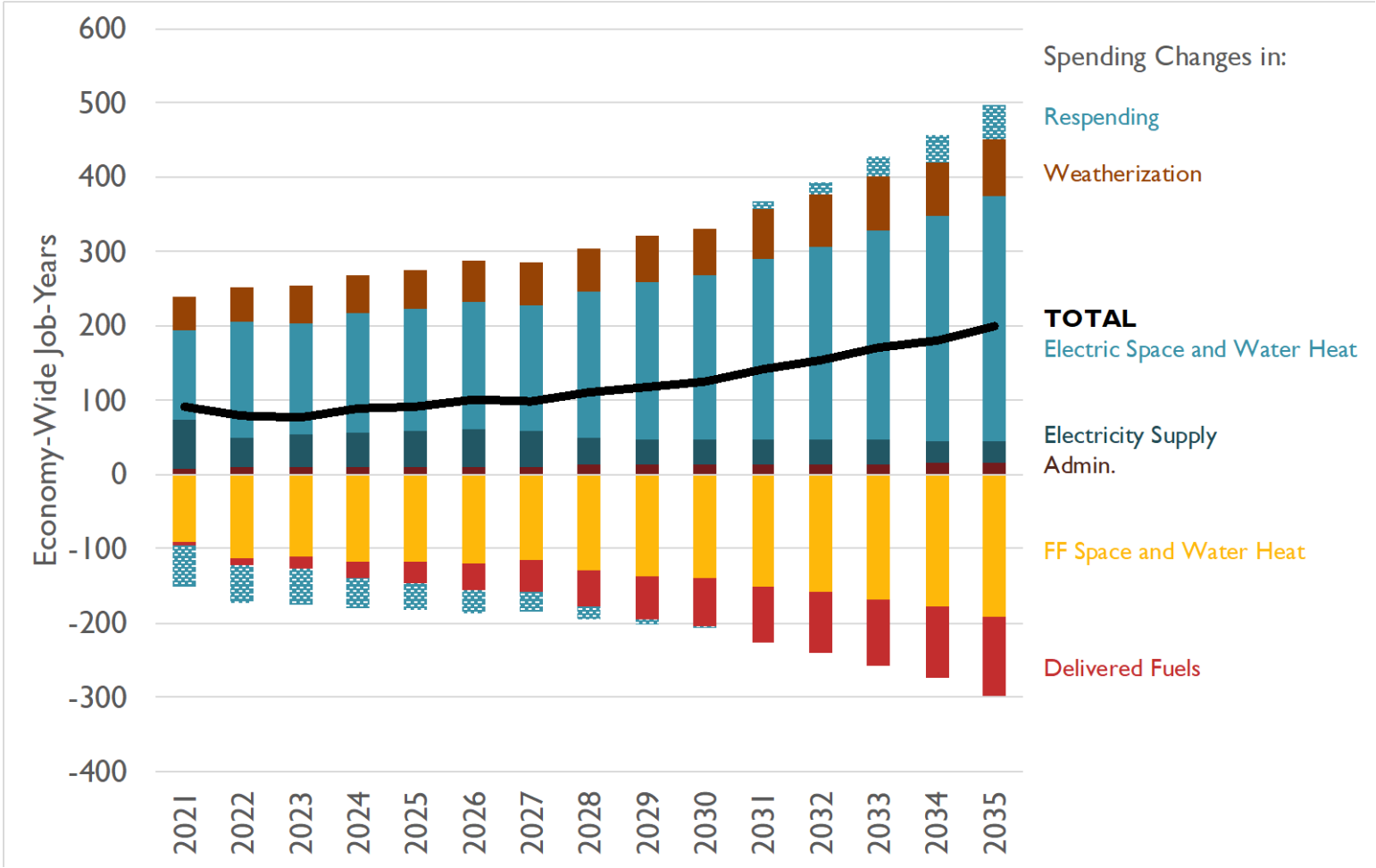
- Small net job reductions overall, driven by lower need for maintenance and repair for EVs
- Driver savings on fuel and maintenance means more $ to spend elsewhere in the economy, creating jobs via respending

Note: ICE stands for internal combustion engine, namely a fossil fuel-powered vehicle

CADMUS

Job Impacts: Buildings Example

Low + Incentives Case

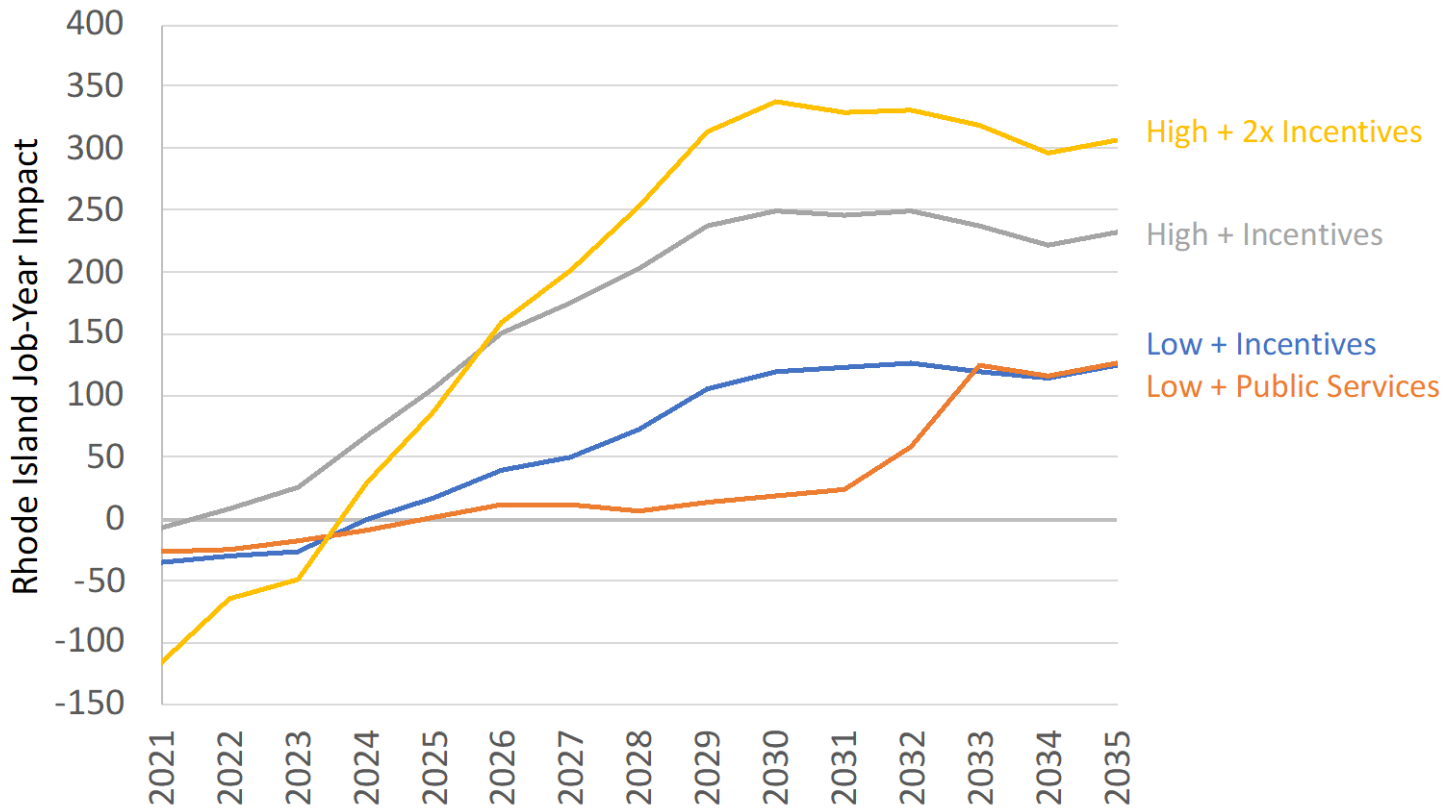


- Consistent net job creation, driven by weatherization and more expensive HVAC installations
- Smaller respending effect than in transport (only oil heat customers see consistent fuel savings)

CADMUS

Job Impacts Across Cases

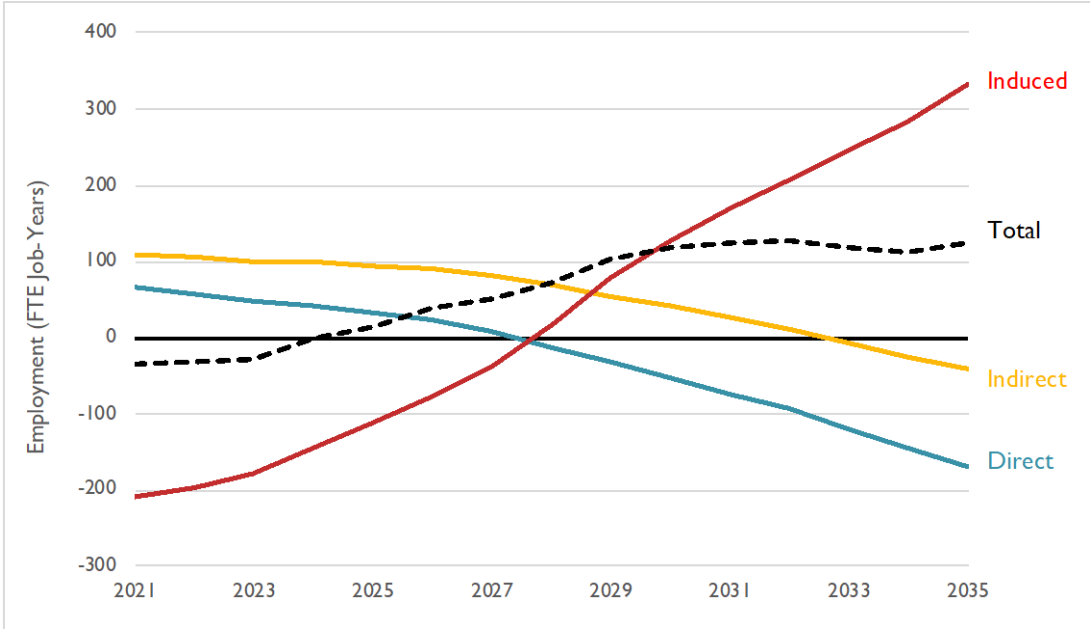
- Aggregate impact less than 0.1% of state employment
- Negligible aggregate differences between cases
- Public Services case shows boost in late years due to shift from EV bus investments toward expanding service and active transport investments



CADMUS

Disaggregating Job Impacts

Low + Incentives case, for example:

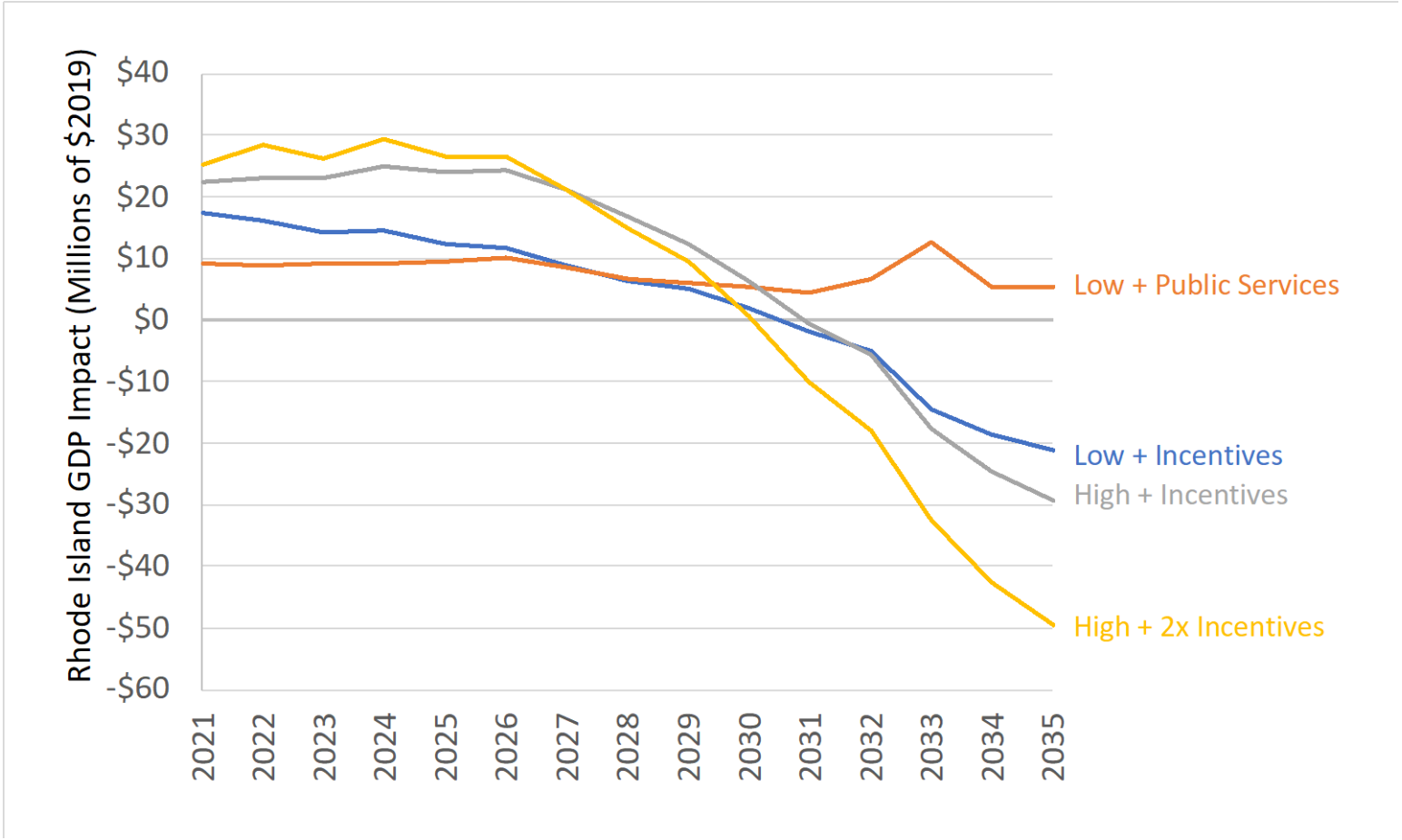


- Net job impacts are the result of combining direct, indirect, and induced jobs
- In general, direct and indirect jobs fall as the policies come into effect (driven by auto repair job impacts), while induced jobs rise (driven by operating cost savings)

CADMUS

GDP Impacts Across Cases

- Aggregate impacts in the range of +/- 0.1% of state GDP
- Building sector GDP impacts are positive across all years
- In incentives cases, transportation sector GDP impacts fall negative from auto repair and fueling impacts
- Public service transportation investments create more positive GDP



CADMUS

Cumulative Health Impacts of Bookend Cases (2021-2050)

- Reminder: Impact of carbon pricing policy only, not the whole energy transition
- Overall health benefits are small
- Avoided mortality provides the largest value, when using EPA's monetary analysis

Low Carbon Price + Public Services

	Rhode Island			National
Reductions in…	*Buildings*	*Transport*	*Total*	*Total*
Mortality	6.7-15.2	2.8-6.3	9.5-21.5	22.4-50.5
Non-fatal heart attacks	0.8-7.2	0.3-3	1.1-10.2	2.5-23.6
Respiratory hospital admits	1.7	0.7	2.4	5.6
ER visits for asthma	3.1	1.3	4.3	11.9
Lost work-days	724	296	1,020	2,472

High Carbon Price + 2x Incentives

	Rhode Island			National
Reductions in…	*Buildings*	*Transport*	*Total*	*Total*
Mortality	15.5-35	5.2-11.8	20.7-46.9	48.6-109.8
Non-fatal heart attacks	1.8-16.7	0.6-5.6	2.4-22.3	5.5-51.2
Respiratory hospital admits	4.0	1.3	5.3	12.1
ER visits for asthma	7.1	2.4	9.5	25.9
Lost work-days	1,671	557	2,228	5,375

Illustrative Household Near-term Impact Vignettes

Household Parameters That Matter

Household economics of carbon price impacts are shaped by:

- House size (more floor area to heat and cool => larger impacts)
  - Median home size in RI is 1400 sq ft; 1800 for single-family
- House age/insulation quality
- Heating fuel (gas and oil have different costs and GHG emissions)
  - Rural areas have less access to gas
- Vehicle miles per year (more driving => more impact)
  - State average is about 9,000 miles/vehicle/year
- Vehicle efficiency (lower MPG => more impact)
- Number of HH members (more members => greater rebate; correlated with house size)
- Building ownership (renters have less ability to make improvements)

Household Near-term Vignette: Family A

Profile:

- Single parent and child
- Renting a 1,300 sq ft. apartment
- Heats with gas, cools with central AC
- Drives 8,000 miles/year in a relatively efficient (28 mpg) car.
- Sustained Policies case 2025 mobility and comfort fuel costs approx. $3,050

Impact of Carbon Price Policy:

- No action:
  - Low carbon price costs: +$64/year
  - High carbon price costs: net +$21/year (after rebate)
- If the household electrified with an EV and heat pumps:
  - Mobility costs fall 45%; 4-year simple payback on EV incremental cost
  - Space and water heating costs +3.5%; no simple payback
  - Both EV + HPs: 10 yr. payback at low carbon price and <6 yrs. at high carbon price

Household Near-term Vignette: Family B

Profile:

- Family of four
- 2,200 sq ft. suburban home w/ condensing gas furnace, central air, and std. water heater.
- Two cars
  - 13,000 miles/year at 28 mpg
  - 7,000 miles/year at 20 mpg
- Sustained Policies case 2025 mobility and comfort fuel costs approx. $4,670

Impact of Carbon Price Policy :

- No action:
  - Low carbon price costs: +$100/year
  - High carbon price costs: net fall $100/year (after rebate)
- If the household electrified with an EVs and heat pumps:
  - Mobility savings $5-600/year (-25%); <4-year simple payback on incremental cost of EV
  - Space and water heating costs increase $660/year
  - Both EV + HPs: No payback at low carbon price and 70 yrs. at high carbon price
  - Second EV can help economics

Household Near-term Vignette: Family C

Profile:

- Retired couple
- Rural home, 1,800 sq ft.
- Heats with oil boiler, cools with window AC
- Two cars
  - 11,000 miles/year at 28 mpg
  - 5,000 miles/year at 20 mpg
- Sustained Policies case 2025 mobility and comfort fuel costs approx. $5,500

Impact of Carbon Price:

- No action:
  - Low carbon price costs: +$110
  - High carbon price costs: net +$250 (after rebate)
- If the household weatherized and electrified, with one EV and heat pumps:
  - Mobility costs fall about 25%; 5-year simple payback on EV incremental costs
  - Space and water heating costs fall $1300/yr. (-40%); <5 yr. payback for weatherization and heat pumps
  - Weatherization, EV, + HPs: 5 yr. payback at either carbon price

Household Near-term Vignette: Family D

Profile:

- Low-income family of four
- Urban home, 1,400 sq ft.
- Heats with gas
- Drives 8,000 miles/year in a relatively efficient (28 mpg) car
- Other parent uses transit (monthly pass)
- Sustained Policies case 2025 mobility and comfort fuel costs approx. $4,600

Impact of Carbon Price:

- No action:
  - Low carbon price costs: +$75
  - High carbon price costs: net decrease $200 (after rebate)
- With public service investments:
  - Mobility costs fall 20% from reduced-price transit pass
  - Comfort costs fall by $260/yr. (low carbon price) to $460/yr. (high carbon price) from combination of weatherization and electrification (at no cost to family)
  - Combined savings $660 (low carbon price) to $1080/year (high carbon price) relative to sustained policies case

Overall Key Takeaways

Overall Key Takeaways

- The following slides lay out **key takeaways**
- The key takeaways pull together findings from the
  - **GHG modeling**
  - **economic modeling**
  - **health impacts modeling**
  - **qualitative policy assessment**
  - **stakeholder outreach**

- Unless otherwise noted, the **findings hold true across all price levels and cases** examined in this study

Revenue use has important implications for GHG reductions, equity, and impacts on households

- **Revenue can be spent in numerous ways**
- **This study examined a limited scope** for revenue use
- **Incentives had larger impacts on GHG emissions**, but did not necessarily benefit low-income and frontline communities
  - **Program design** can increase the equitability of incentives

A carbon price alone at the levels analyzed would not achieve Rhode Island's 2050 GHG reduction target

- **Additional actions** will be needed to complement carbon pricing
  - To ensure necessary technological transitions that a carbon tax may not facilitate
  - Even assuming Rhode Island achieves 100% renewable electricity by 2030

- **Higher price** results in **more GHG reductions**
  - More aligned with Rhode Island's **GHG reduction goals**

- **More investment** in decarbonization programs results in **more GHG reductions**

A carbon price will create shifts in RI's economy, but aggregate economic impacts are negligible

- Aggregate impacts on **jobs is slightly positive, but essentially zero**
- Aggregate impacts on **state GDP is slightly negative, but essentially zero**
- Jobs shift from **gas-powered cars to electric vehicles**
  - Car salespeople
  - Auto repair
  - Gas stations
  - Less O&M costs for EVs results in **more respending** into economy
- Jobs shift from **fossil fuel heating to electric heating and weatherization**
  - HVAC technicians
  - Delivered fuel suppliers

A carbon price would generally have a limited impact on households

- The **aggregate cost impact** on households **is small**
  - In the high price case with a rebate, **some households see a net gain in income**
  - Households that see **highest cost increases** include those:
    - That **drive more than average**
    - That **heat with oil**
    - With **poor insulation**
- Benefits can be enhanced by adopting **clean energy technologies and weatherizing homes**
- **Policy design** can dictate how revenue use is targeted, which **determines how different households are impacted**
- **Health impacts** are **positive but small**

A carbon price has a small impact on EV adoption

- Under the assumptions of this study based on TCI modeling
  - Upfront **cost parity** for EVs is expected in **2030** without carbon price
  - Because of optimistic baseline, carbon price **does not change economics enough** to drive significant additional adoption of EVs
- **Incentives drive more adoption** than the carbon price
  - Some people using the incentive **would have bought an EV anyway**
- **Price is only one component** of increasing EV adoption
  - **Other barriers need to be overcome** (e.g. range anxiety, awareness, availability)
- As **electric prices rise from RES**, cost savings from EVs are not quite as significant

A carbon price contributes in a limited fashion to increasing adoption of air source heat pumps

- Even the **high carbon price does not significantly impact the dynamics already seen in the heating industry**
  - **High cost of heating oil promotes transition to ASHPs**, which is slightly amplified by a carbon price
  - **Low cost of natural gas prevents widespread transition** from gas heating system to ASHPs, which is not changed enough by a carbon price to make ASHPs more cost-effective
- As **electric prices rise from RES**, ASHP economics are not quite as favorable

Equity needs to be a conscious choice in both process and ultimate policy design

- Carbon prices are **potentially regressive**, unless intentional policy design choices are made such as targeted revenue reinvestment
  - Low income households spend a **higher portion** of their income on energy and thus would be disproportionately impacted by a carbon price
  - Equitability of a program depends on the **use of the revenue**
- Low income households could see a **net gain** in income with a rebate
- If Rhode Island moves forward with developing a carbon price, it should **engage residents early in the process and frequently throughout and utilize feedback appropriately**

Wider geographic scope would lead to greater success

- Operating at a regional scale helps make it more **socially acceptable**
- RGGI program has **wide geographic scope** and has been **successful**
  - New states still joining
- Emission reductions can occur at **lower cost**
- Administrative costs can be **shared**
- Regional participation may involve **making tradeoffs** on other important parts of policy design **based on the needs and preferences of other states (including price)**

Conclusion & Next Steps

Next Steps

- Receive stakeholder comments through November 13 (via email as on next slide)
- Incorporate feedback and complete report by early December

We Welcome Your Input

Please submit your feedback and questions by **Friday, November 13** to:

- **Chris Kearns,** *of the Rhode Island Office of Energy Resources* (christopher.kearns@energy.ri.gov)

For previous presentations and response to stakeholder feedback, please visit the Rhode Island Carbon Pricing Study Website: http://www.energy.ri.gov/carbonpricingstudy/

Thanks!

Questions?

CADMUS

Thank You

Farrah Andersen

ASSOCIATE

Farrah.Andersen@cadmusgroup.com

Jesse Way

SENIOR ANALYST

Jesse.Way@cadmusgroup.com

Asa Hopkins

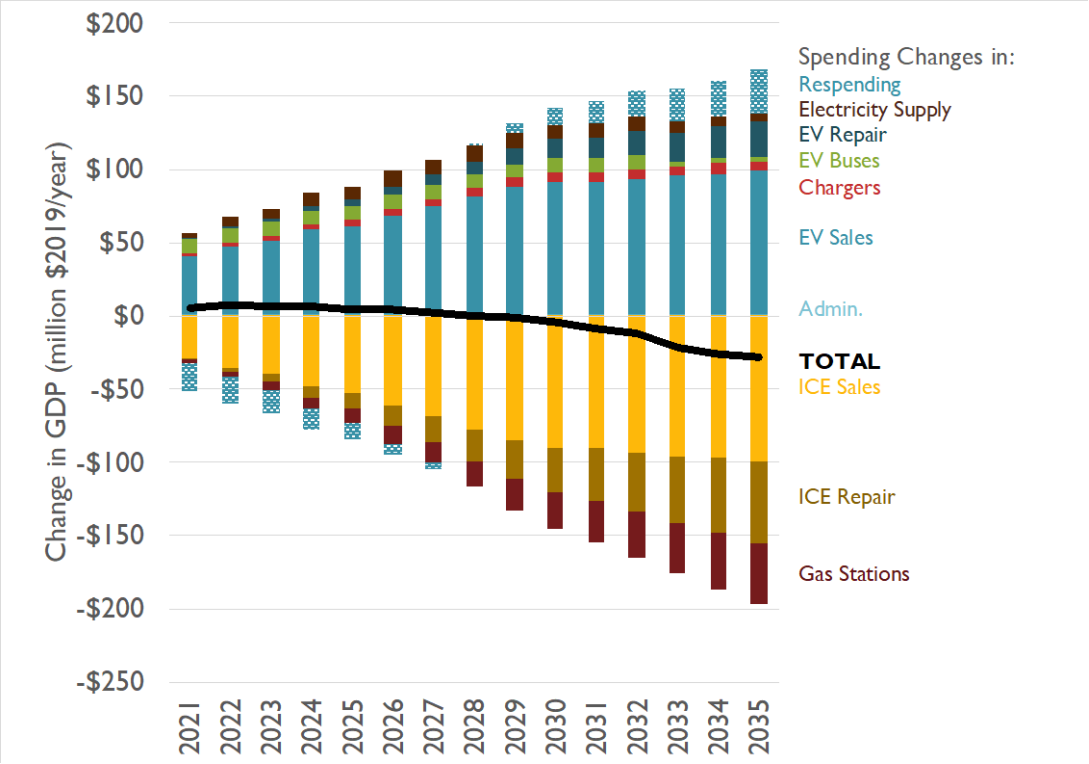
VICE PRESIDENT - SYNAPSE

ahopkins@synapse-energy.com

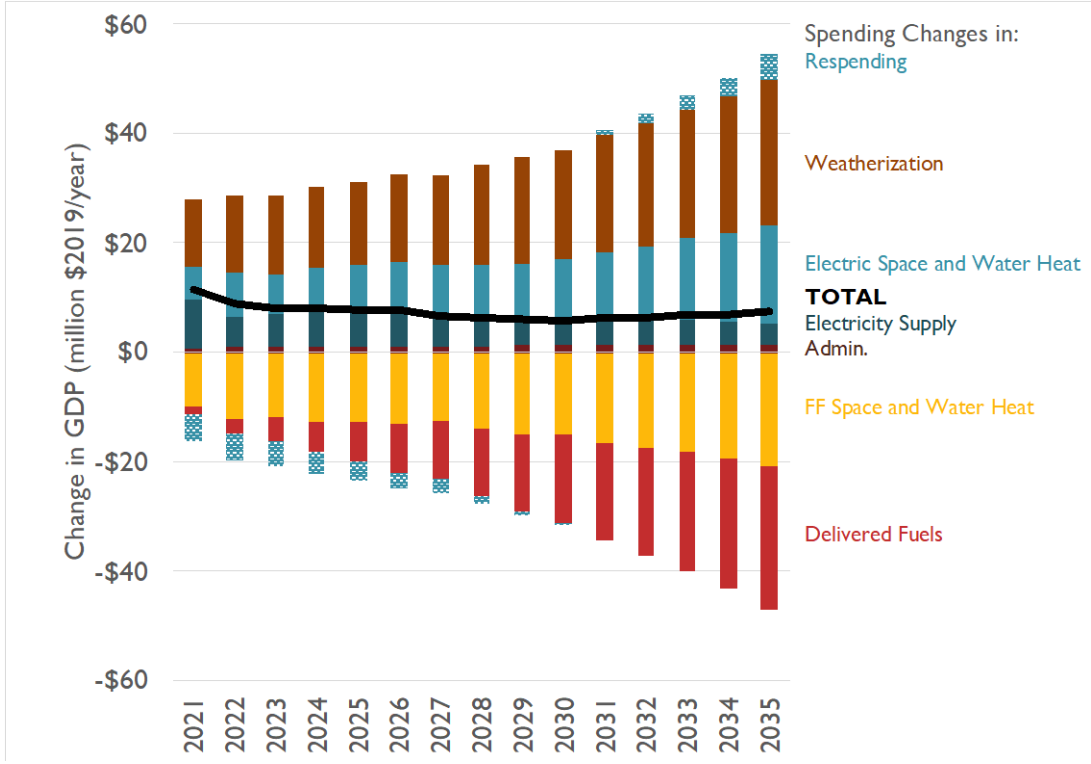
Appendix

Economic Impacts: Low Carbon Price + Incentives

Transportation GDP Impacts:



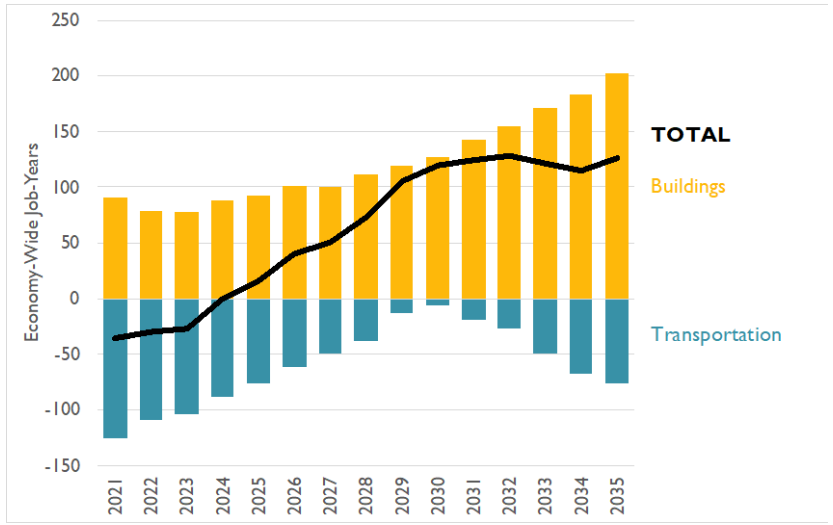
Buildings GDP Impacts:



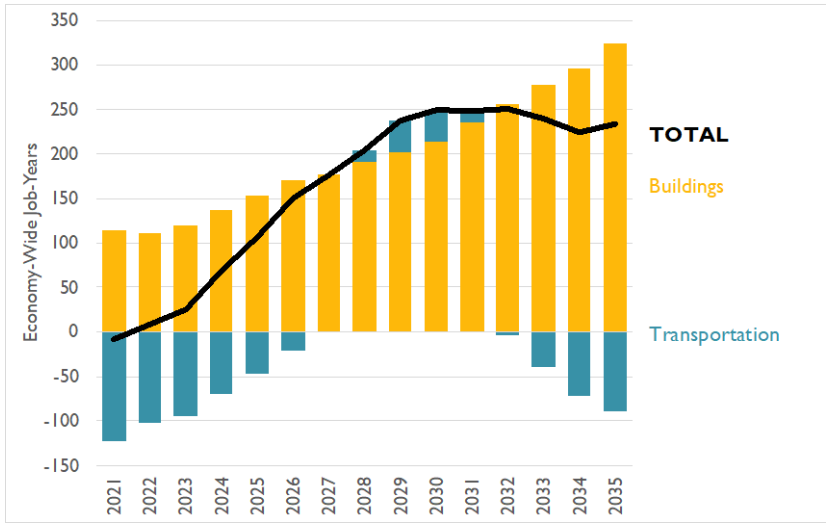
CADMUS

Job Impacts Across Cases

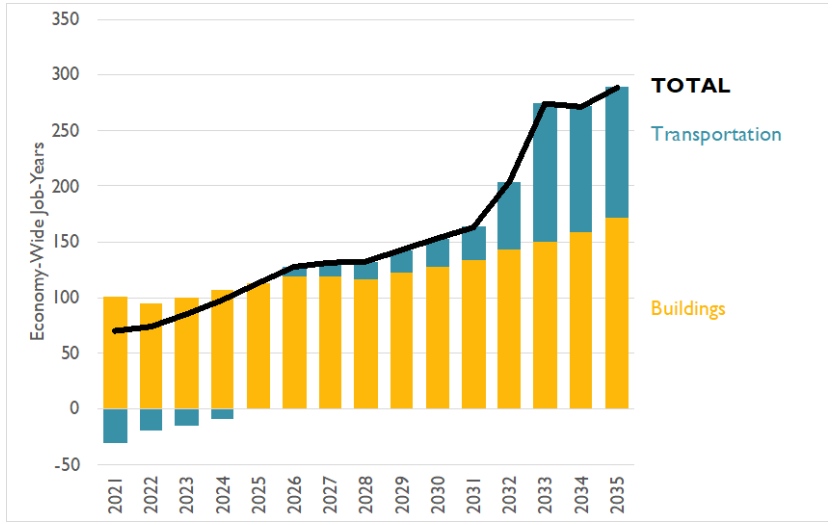
Low + Incentives



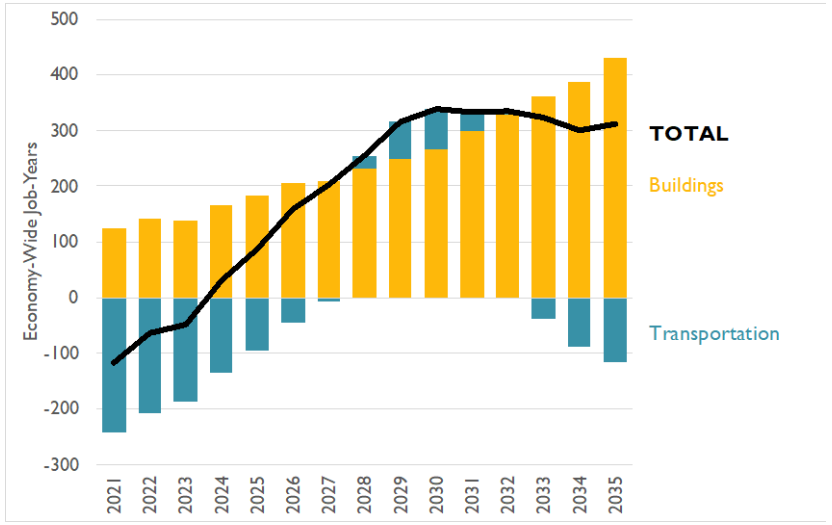
High + Incentives



Low + Public Services



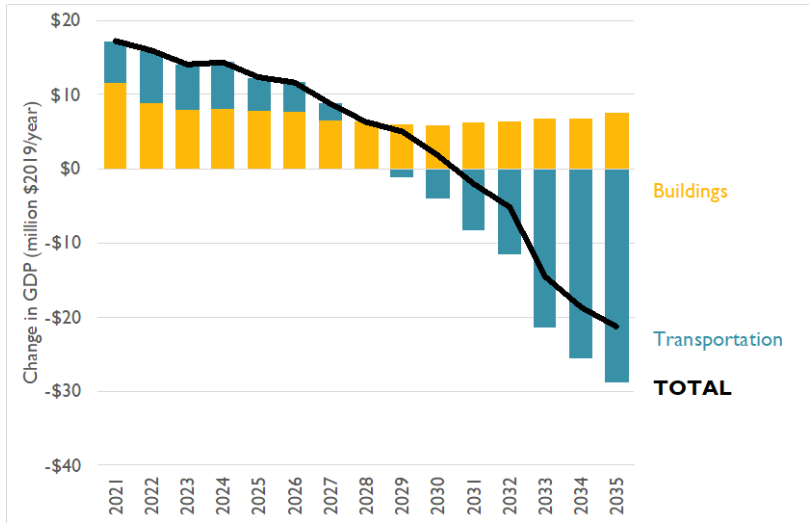
High + 2x Incentives



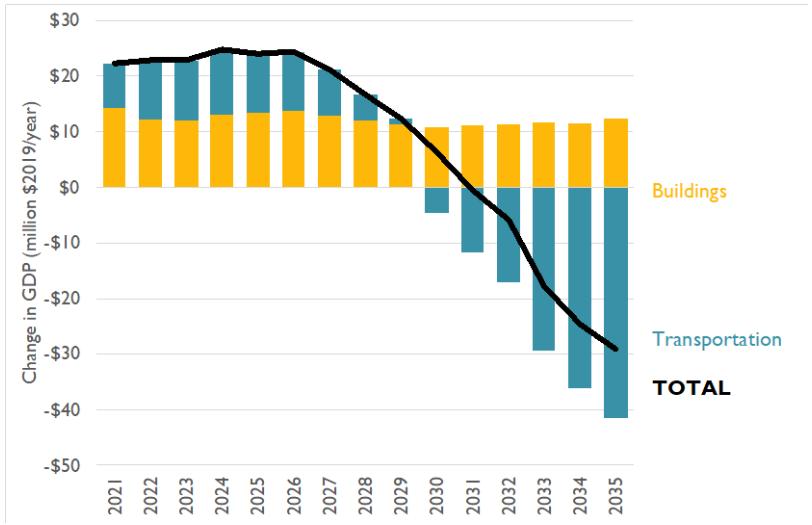
CADMUS

GDP Impacts Across Cases

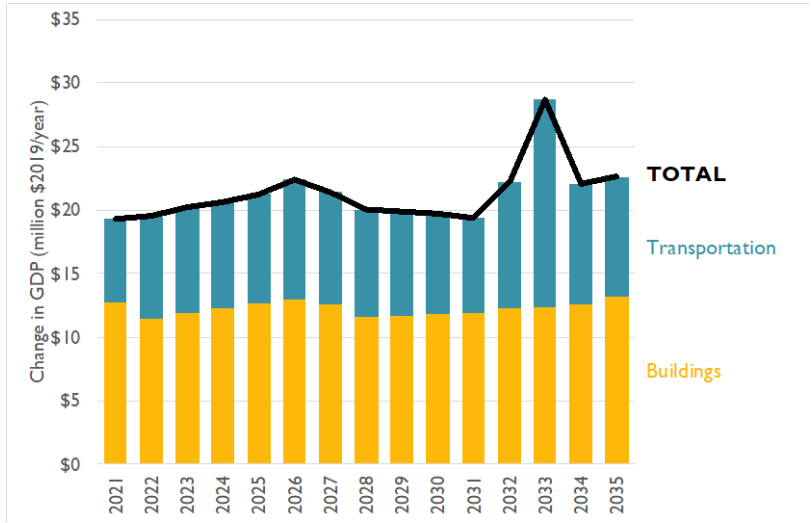
Low + Incentives



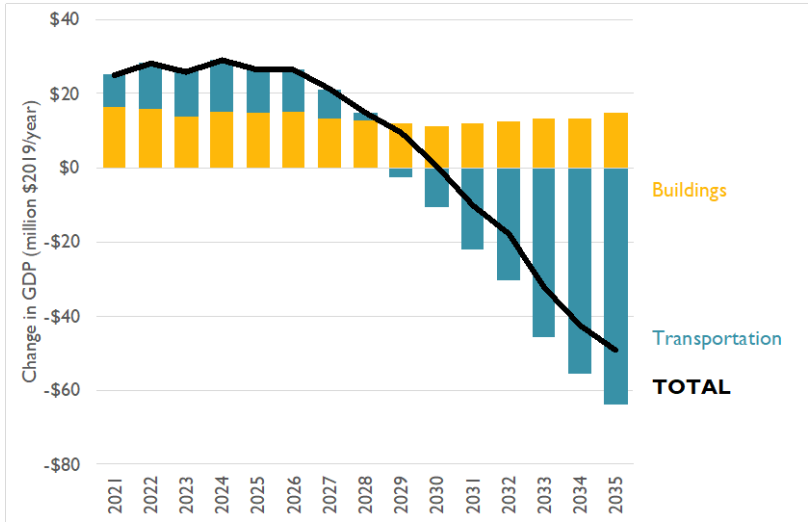
High + Incentives



Low + Public Services



High + 2x Incentives



CADMUS