Transportation & Climate Initiative

Webinar:
Draft Memorandum of Understanding
& 2019 Cap-and-Invest Modeling Results

December 17, 2019

https://www.transportationandclimate.org/

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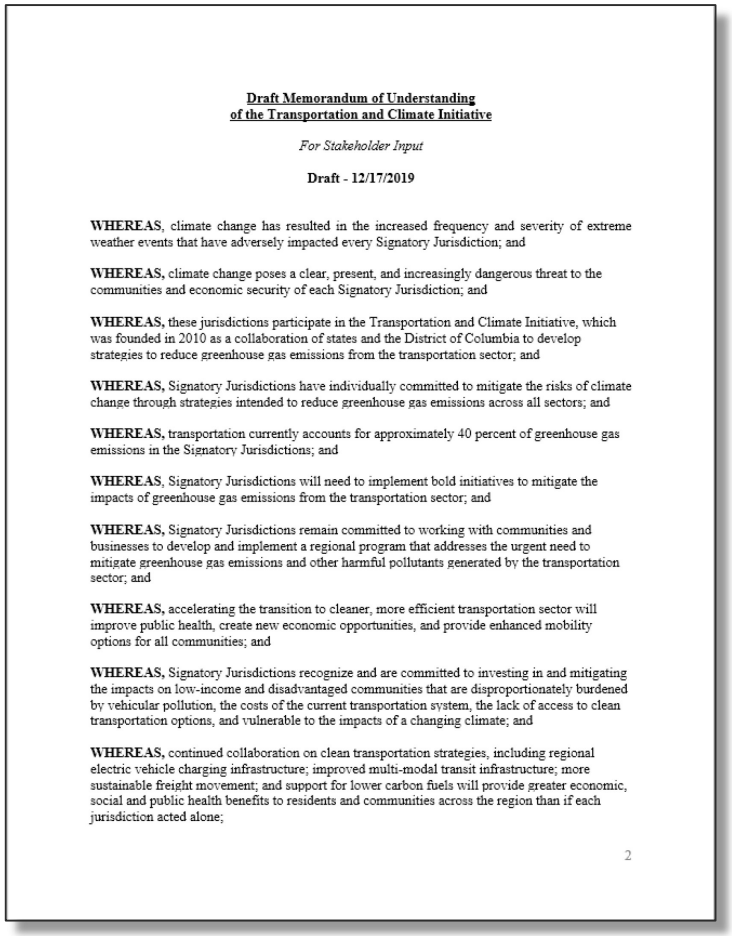
Draft Memorandum of Understanding

- Draft MOU Includes:
  - Program Goals and Schedule
  - Elements of a Model Rule
  - Investments & Equity
  - Regional Organization
  - Program Monitoring and Review
- Inviting Input through February 28, 2020
- Final MOU: Spring 2020



Draft Memorandum of Understanding
of the Transportation and Climate Initiative

For Stakeholder Input

Draft - 12/17/2019

WHEREAS, climate change has resulted in the increased frequency and severity of extreme weather events that have adversely impacted every Signatory Jurisdiction; and

WHEREAS, climate change poses a clear, present, and increasingly dangerous threat to the communities and economic security of each Signatory Jurisdiction; and

WHEREAS, these jurisdictions participate in the Transportation and Climate Initiative, which was founded in 2010 as a collaboration of states and the District of Columbia to develop strategies to reduce greenhouse gas emissions from the transportation sector; and

WHEREAS, Signatory Jurisdictions have individually committed to mitigate the risks of climate change through strategies intended to reduce greenhouse gas emissions across all sectors; and

WHEREAS, transportation currently accounts for approximately 40 percent of greenhouse gas emissions in the Signatory Jurisdictions; and

WHEREAS, Signatory Jurisdictions will need to implement bold initiatives to mitigate the impacts of greenhouse gas emissions from the transportation sector; and

WHEREAS, Signatory Jurisdictions remain committed to working with communities and businesses to develop and implement a regional program that addresses the urgent need to mitigate greenhouse gas emissions and other harmful pollutants generated by the transportation sector; and

WHEREAS, accelerating the transition to cleaner, more efficient transportation sector will improve public health, create new economic opportunities, and provide enhanced mobility options for all communities; and

WHEREAS, Signatory Jurisdictions recognize and are committed to investing in and mitigating the impacts on low-income and disadvantaged communities that are disproportionately burdened by vehicular pollution, the costs of the current transportation system, the lack of access to clean transportation options, and vulnerable to the impacts of a changing climate; and

WHEREAS, continued collaboration on clean transportation strategies, including regional electric vehicle charging infrastructure; improved multi-modal transit infrastructure; more sustainable freight movement; and support for lower carbon fuels will provide greater economic, social and public health benefits to residents and communities across the region than if each jurisdiction acted alone;

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Presentation Outline

- Context & TCI program objectives
- Introduction to modeling tools and underlying assumptions
- Updated business as usual / Reference case
- Approach to cap reduction policy case modeling
- Results from cap reduction modeling
- Results from macro-economic modeling
- Results from preliminary public health benefits modeling
- Next steps
- Q&A

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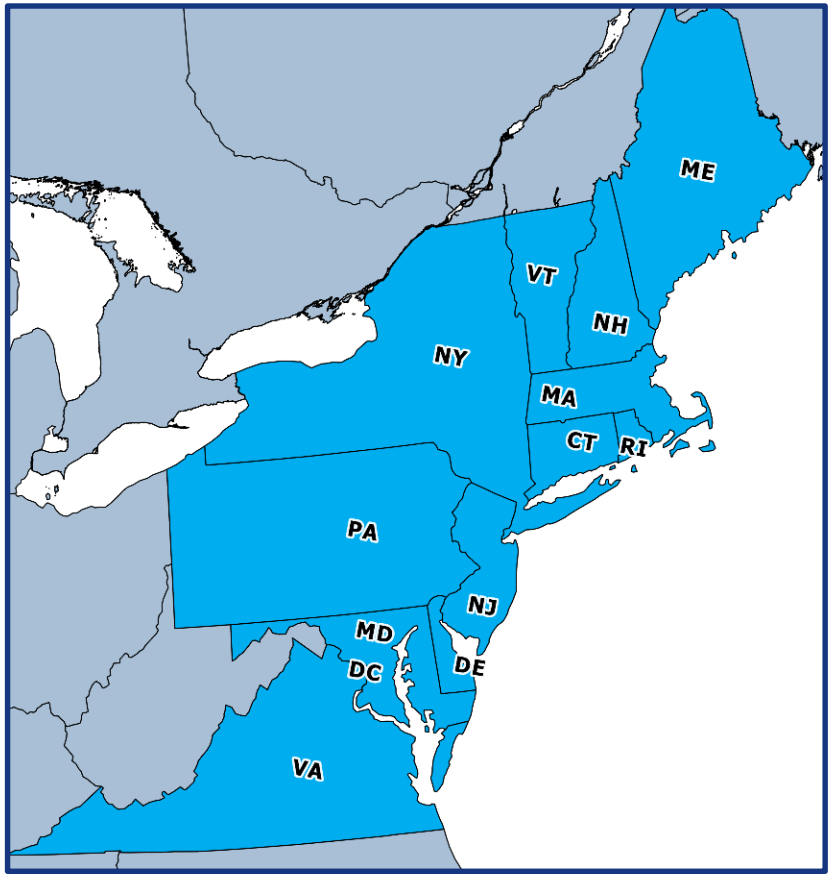
Scale of the TCI Opportunity

- 72 million people
- $5.3 trillion in GDP
- 52 million registered vehicles
- Modeled TCI cap (254 MMT CO_2) would cover more than three times the carbon pollution covered by RGGI cap



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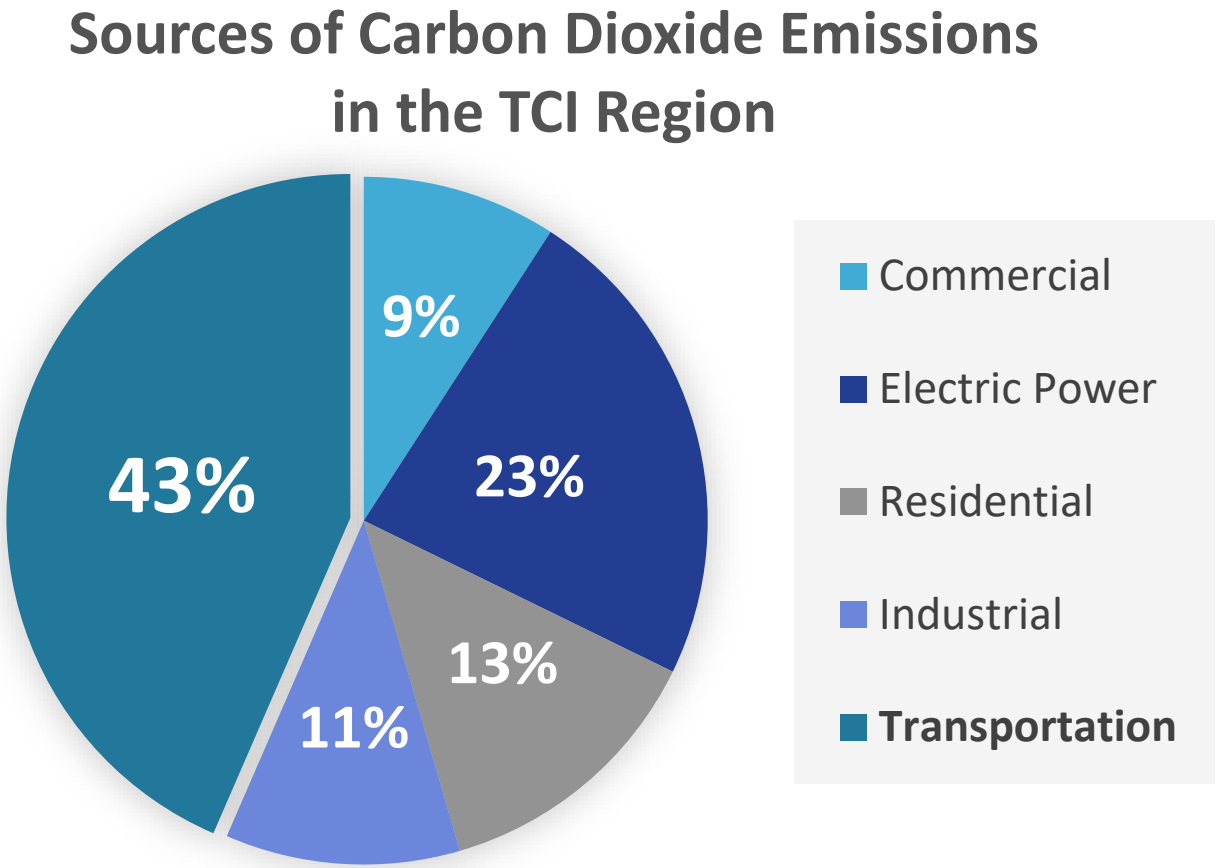
Transportation is the Largest Source of Carbon Pollution in the TCI Region



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2017 Data, U.S. Energy Information Administration

In 2018 TCI States Engaged the Public through Listening Sessions

Through six regional listening sessions, over 500 stakeholders discussed:

- Transportation needs and opportunities
- Goals for a future, low carbon-transportation system for our region
- How different types of policies and actions can help meet those goals

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TCI States Engaged with People and Communities Through Regional Workshops and Public Input Portal

- Three regional TCI workshops with participation of 1,000 people
- Over 1,200 submissions to TCI public input portal
- Community engagement by individual states

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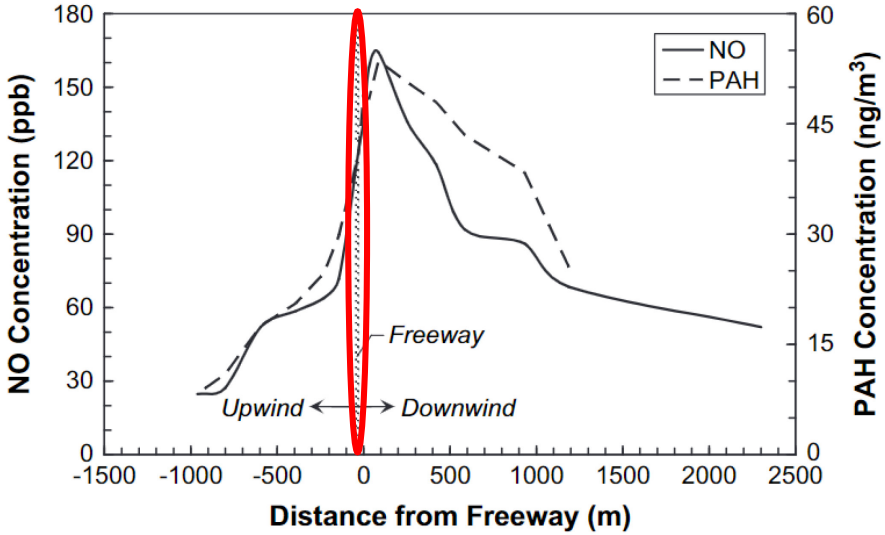
Reducing Pollution Benefits our Health

- Improves air quality
- Avoids asthma, other respiratory illnesses and cardiovascular conditions
- Decreases work days lost



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Modernizing Transportation Benefits our Communities

- Expanded clean mobility options and equity of access
- Intermodal connectivity
- Complete streets leading to vibrant communities

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Reducing Carbon Pollution and Investing in Clean Transportation Grows our Economy

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TCI 2019 Modeling & Analysis

- Overview of modeling approach
- Revised Reference Case for 2022 – 2032
- Evaluating potential policy implications using three emissions cap scenarios
  - Energy and emissions
  - Public health and
  - Economy

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2019 TCI Modeling & Analysis Overview

- Develop Reference Case assumptions
  - Public input following webinar
- Run Reference Case (what happens with no cap?)
  - Public input following webinar
- Revised Reference Case
- Run emissions cap scenarios (what happens with emissions caps?)
- Conduct macroeconomic & initial public health analysis
- Release modeling results and solicit stakeholder input on policy scenarios

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How does the **CAP** affect the transportation sector (& others)?

How do the **INVESTMENTS** affect the transportation sector?

What are the impacts from the program?

(economic effects, public health benefits)

How are the benefits and costs distributed?

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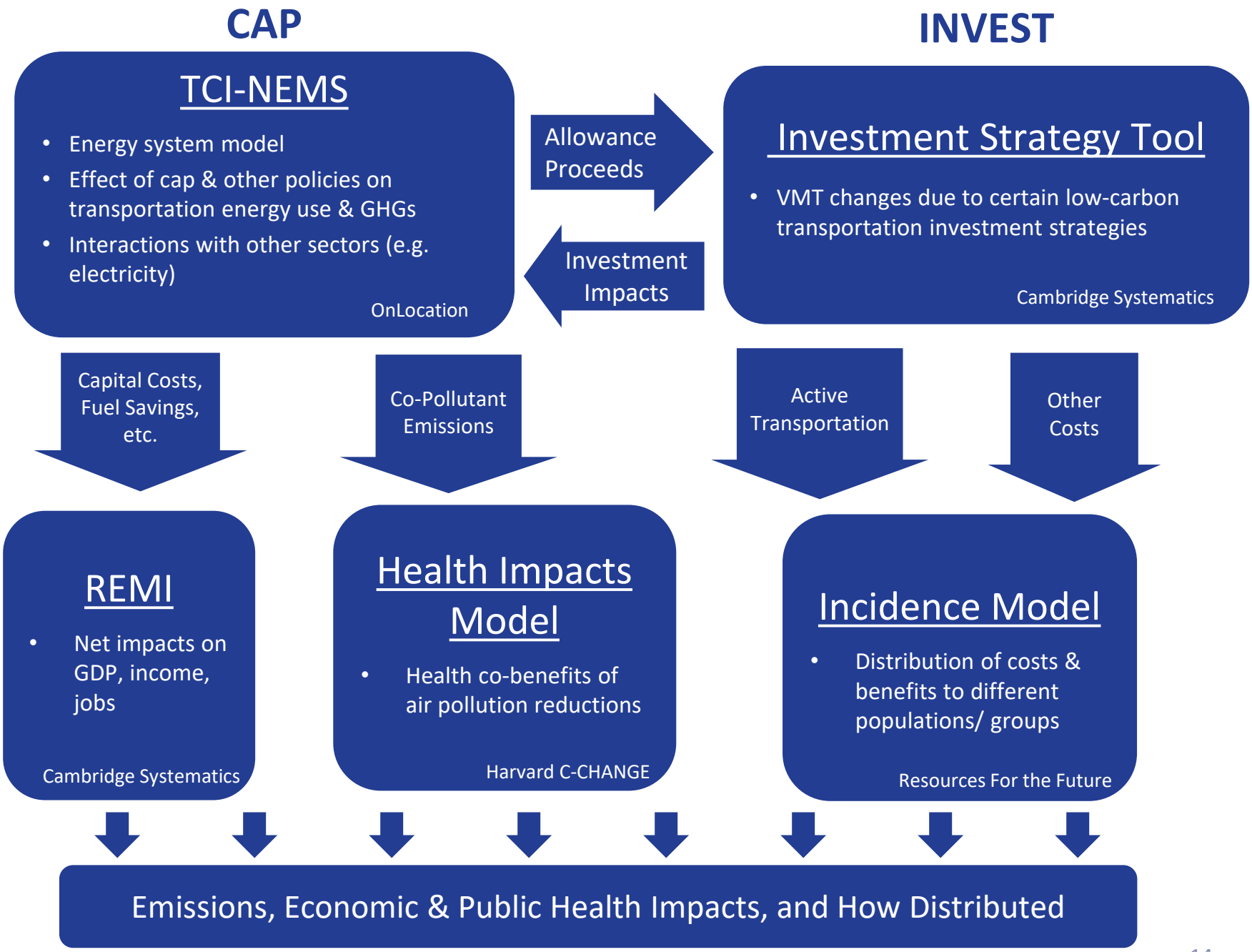
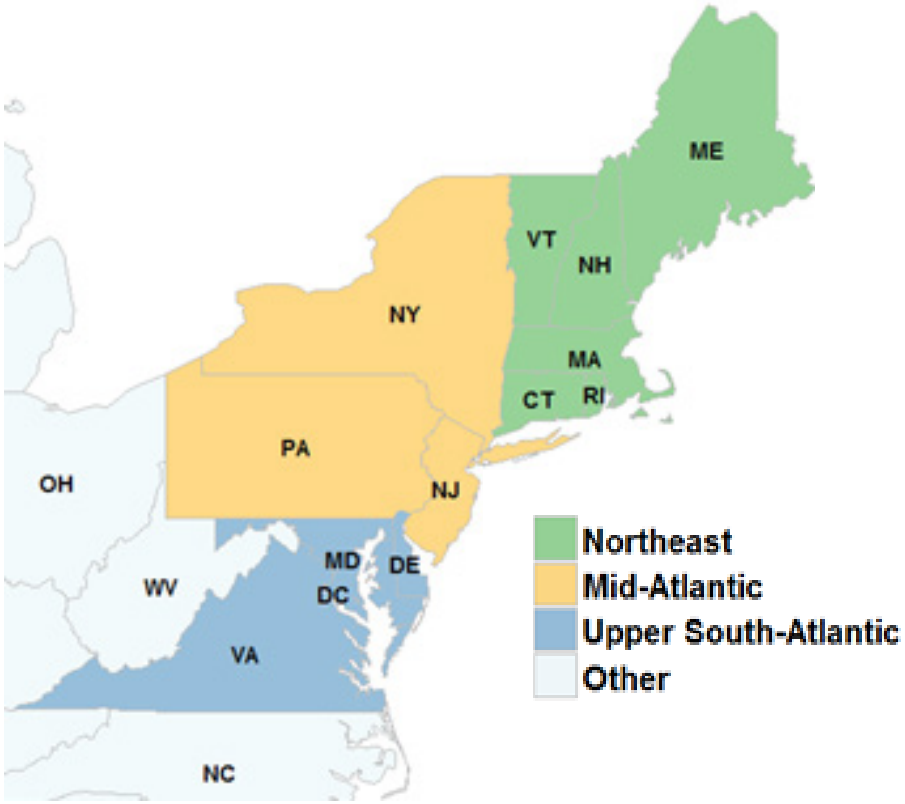

CAP
INVEST
TCI-NEMS
Energy system model
Effect of cap & other policies on transportation energy use & GHGs
Interactions with other sectors (e.g. electricity)
OnLocation
Allowance Proceeds
Investment Impacts
Investment Strategy Tool
VMT changes due to certain low-carbon transportation investment strategies
Cambridge Systematics
Capital Costs, Fuel Savings, etc.
Co-Pollutant Emissions
Active Transportation
Other Costs
REMI
Net impacts on GDP, income, jobs
Cambridge Systematics
Health Impacts Model
Health co-benefits of air pollution reductions
Harvard C-CHANGE
Incidence Model
Distribution of costs & benefits to different populations/ groups
Resources For the Future
Emissions, Economic & Public Health Impacts, and How Distributed

“TCI-NEMS” Energy System Model



- In the TCI-NEMS model run to inform the TCI policy development process, the region is represented by three subregions:
  - Northeast,
  - Mid-Atlantic and
  - Upper South-Atlantic*

** For this analysis, we have split the South Atlantic Census Division into 2 subregions and renamed the model TCI-NEMS*

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Modeling Business as Usual, or the TCI Reference Case

- ✓ The TCI analysis process began with the Reference Case, which projects future emissions, fuel use, and other aspects of the transportation system **in the absence of any TCI "cap and invest" program** (from present through 2032).
- ✓ The TCI jurisdictions proposed assumptions for the Reference Case via webinar on May 23, and incorporated input received.
- ✓ The first Reference Case was analyzed in July and presented on a public webinar on August 8.
- ✓ Non-battery electric vehicle (EV) cost assumption was revisited in September and a new TCI Reference Case was established in October.

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Key Assumptions in TCI Reference Case

- **Electricity Sector**
  - National Renewable Energy Lab (NREL) 2018 Annual Technology Baseline costs for wind, utility solar photovoltaics (PV), and residential solar PV
  - Annual Energy Outlook (AEO*) 2018 High Efficiency case for building energy demand
  - Updated offshore wind and battery storage mandates
  - Updated planned capacity additions and retirements in Regional Greenhouse Gas Initiative (RGGI) states
- **Electric Vehicles**
  - Battery costs trajectories were revised downward based on Bloomberg New Energy Finance (BNEF) and the New York State Energy Research and Development Authority (NYSERDA) cost estimates
  - Non-battery EV costs were revised downward, based on NYSERDA and International Council on Clean Transportation estimates
  - Electric vehicle introduction years were accelerated for several light-duty vehicle (LDV) categories based on market analysis
- **Federal Corporate Average Fuel Economy (CAFE) / Vehicle Emissions Standards**
  - Vehicle standards are based on current regulations and remain flat after 2025
- **Federal Electric Vehicle (EV) Tax Credit**
  - Phase-out of the tax credit is based on OnLocation analysis and phases out somewhat more slowly than AEO 2018
- **Vehicle Miles Traveled (VMT)**
  - Calibrated projected vehicle miles traveled (VMT) estimates to be consistent with TCI state estimates
- **State EV policies**
  - Estimated regional impact of state policies on EV prices is incorporated into TCI Reference Case
  - State zero-emission vehicle (ZEV) regulation is already accounted for in AEO 2018
- **Regional Greenhouse Gas Initiative (RGGI)**
  - New Jersey and Virginia are included as participants in the RGGI program

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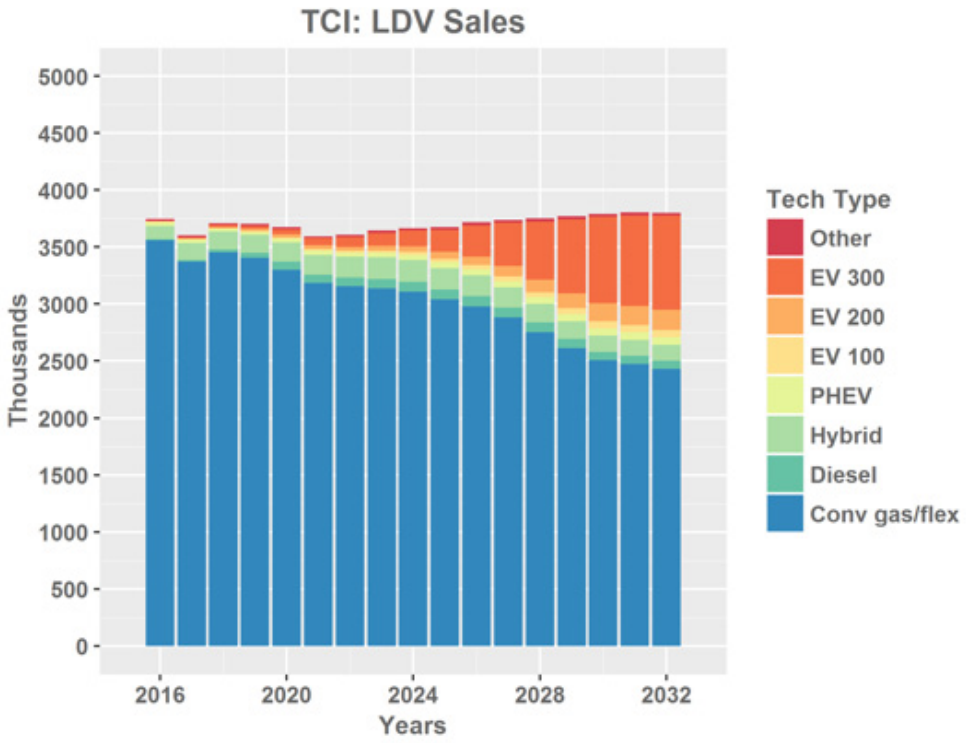
* The AEO is developed by the United States Energy Information Administration

Reference Case Results: Light-Duty Vehicle Sales by Technology Type

- Electric vehicle (EV) sales gain share in both car and light truck markets.
- By 2032, plug-in hybrid EVs (PHEV) and EVs comprise roughly 30 percent of LDV sales



Notes:

- *EV 300, EV 200 and EV 100 indicate the range of the vehicles modeled, in miles.*
- *Light-duty vehicle (LDV) excludes commercial light trucks*

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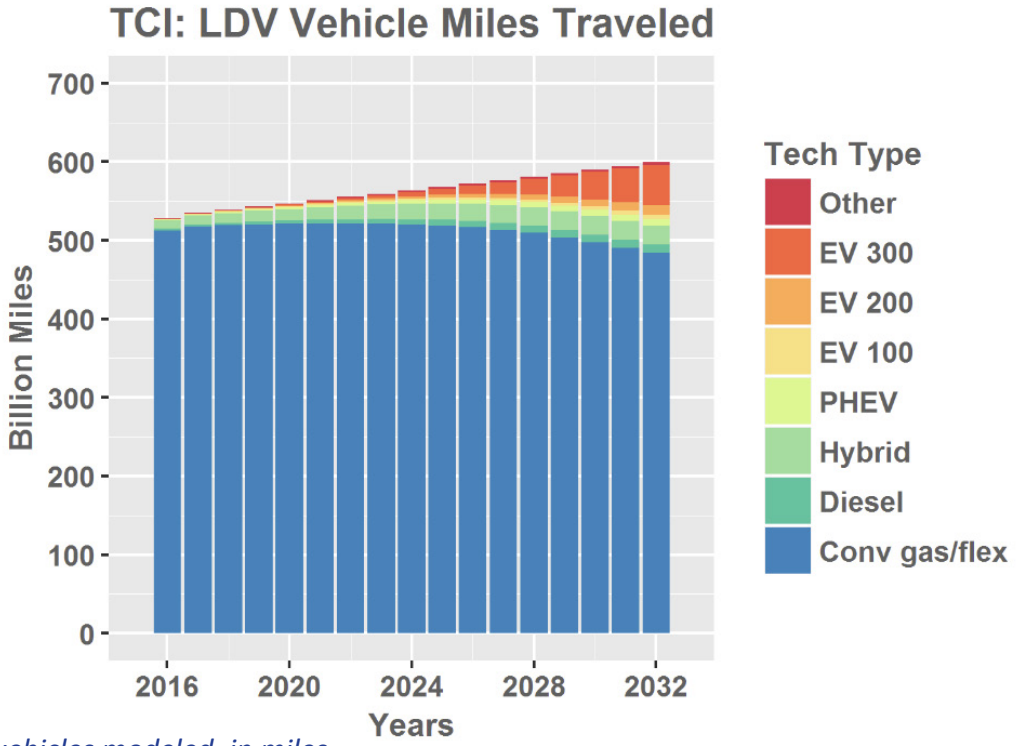
Reference Case Results: Light-Duty Vehicle VMT

- As sales of electric vehicles grow and total EVs in fleet increase, plug-in hybrid EVs (PHEV) and EVs make up a larger share of total VMT in the region with a share of 13% in 2032.



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- *Light-duty vehicle (LDV) excludes commercial light trucks*

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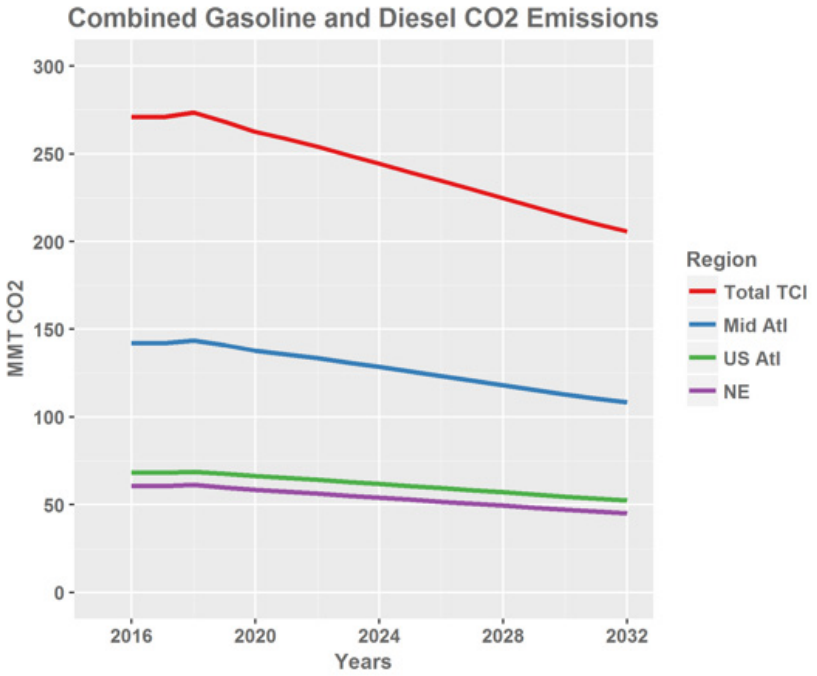
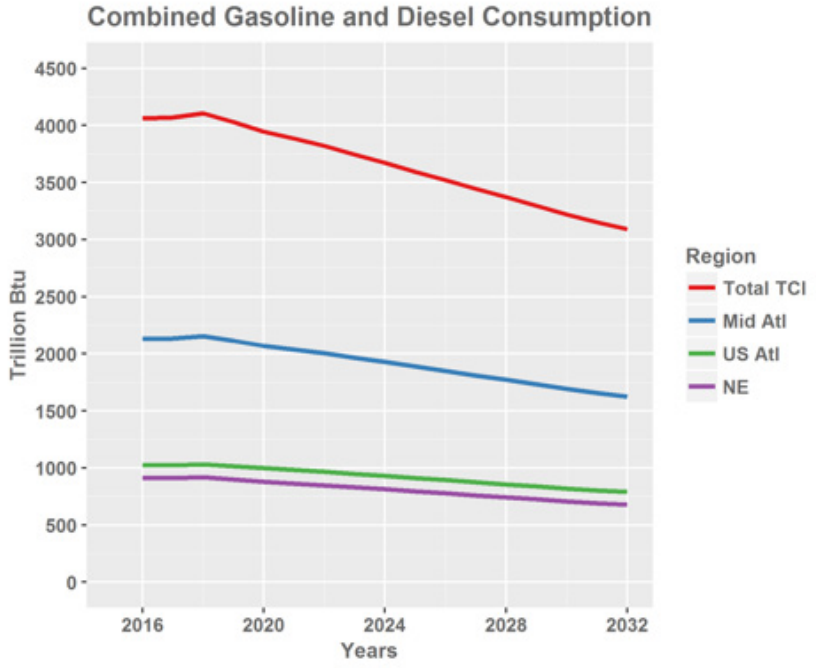
Total Motor Gasoline and On-Road Diesel Consumption and CO_2 Emissions

- Total gasoline and diesel consumption and CO_2 emissions both fall by roughly 19% from 2022 through 2032 as a result of increased fuel economy in light and heavy-duty vehicles and increased LDV EV shares.





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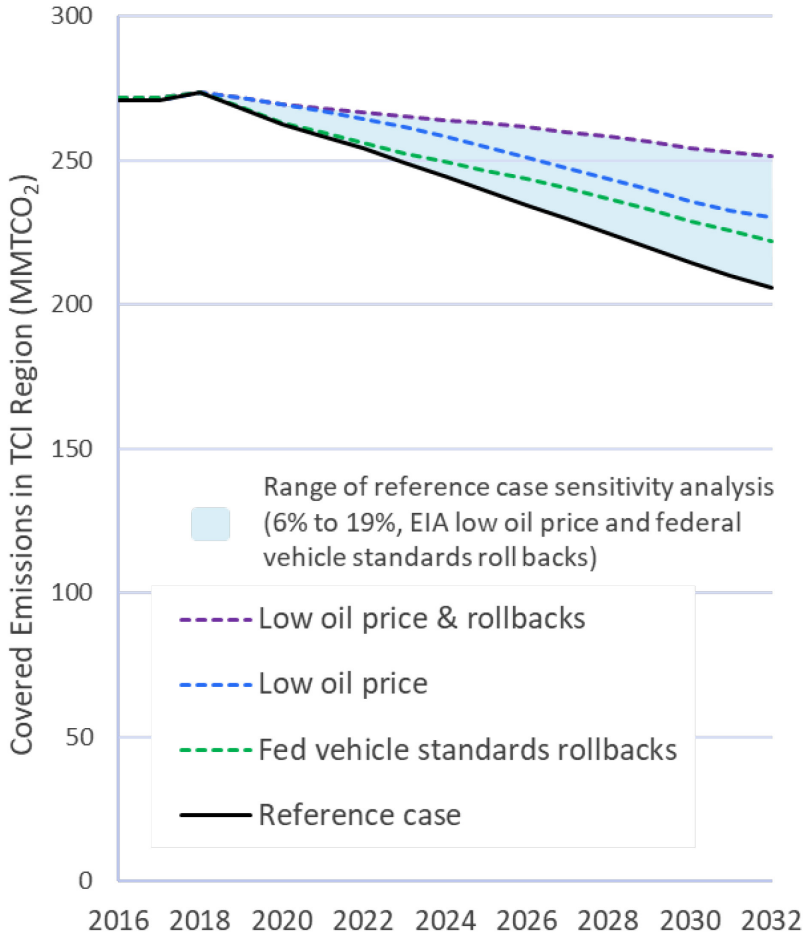
Exploring Uncertainty: Sensitivity Analysis

- Sensitivity analysis was used to explore how future emissions might change compared to the TCI Reference Case.
  - Federal proposed roll backs of vehicle fuel economy standards, and
  - EIA's low oil price projected in AEO 2018

- Business as usual may result in only a 6% decline in emissions (compared to a 19% decline in the reference case), making it harder for TCI jurisdictions to achieve our emission reduction goals.

- Policy actions by states and cities could help lock in needed reductions.



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Modeling Investments in Clean Transportation Strategies

- TCI is using an Investment Modeling Tool, in conjunction with TCI-NEMS, to estimate the reductions in CO_2 emissions (and other benefits) for different amounts of potential allowance proceeds and clean transportation investments.

- The Investment Tool generates rough estimates for specific investment types, recognizing that there is substantial variability in the real world when comparing the impacts of investments across places and project types.

- This investment modeling is directional and illustrative, and *does not take the place of each jurisdiction's discretion to invest using strategies that support the goals of the overall program within their jurisdiction.*

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Clean Transportation Investment Scenario

For the purposes of modeling, an illustrative portfolio of clean transportation investments was developed. This includes a broad range of options, with a significant portion of proceeds focused on the most cost-effective emission reduction strategies.

30% Electric cars, light trucks and vans

23% Low & zero-emission buses and trucks

18% Transit expansion and upkeep

14% Pedestrian and bike safety, ride sharing

8% System efficiency

8% Indirect/ Other

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Modeling Runs Conducted

All policy scenarios assume a regional CO_2 emissions cap is applied to the fossil portion of motor gasoline and on-road diesel combusted in vehicles (e.g., light-duty cars and trucks, commercial light trucks, freight trucks, and buses).

Model Run	Projected Emissions
Reference Case	19% CO_2 reductions from 2022 to 2032
Combined Sensitivity: Rollback of federal vehicle standards and low oil price	6% CO_2 reductions from 2022 to 2032
Below are policy cases with the same investment portfolio but different cap levels	
Policy: 20% Cap Reduction	20% CO_2 reductions from 2022 to 2032
Policy: 22% Cap Reduction	22% CO_2 reductions from 2022 to 2032
Policy: 25% Cap Reduction	25% CO_2 reductions from 2022 to 2032

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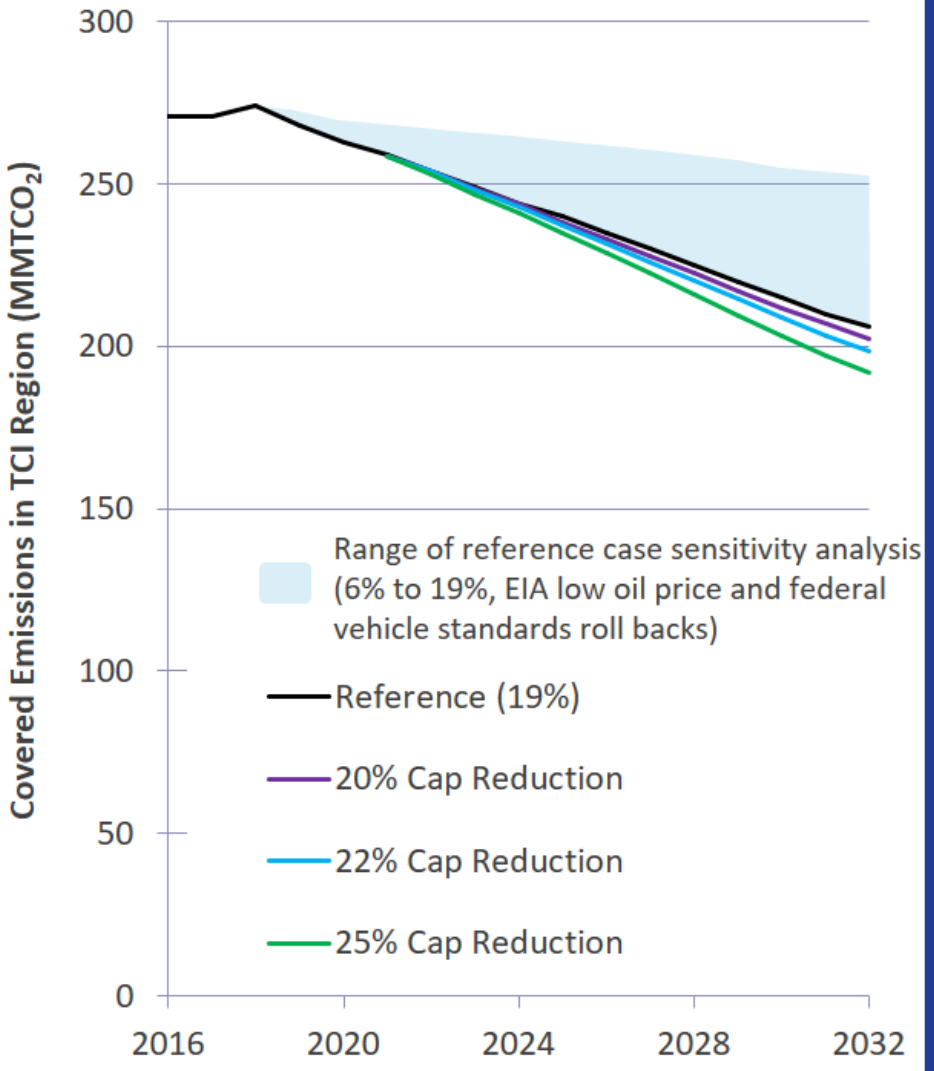
Emissions Cap Scenarios Results: Projected Transportation CO_2 Emissions

- A declining emissions cap could lock in decreases in carbon dioxide emissions that are expected through 2032 and drive additional reductions.
- In policy cases, emissions decline by roughly the levels prescribed by each cap from 2022 to 2032
  - Emissions decline slightly less in the later years, because of allowance banking



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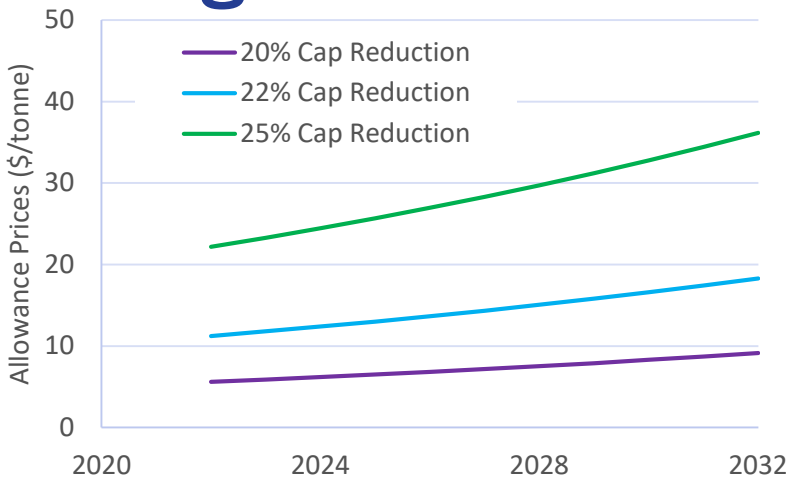
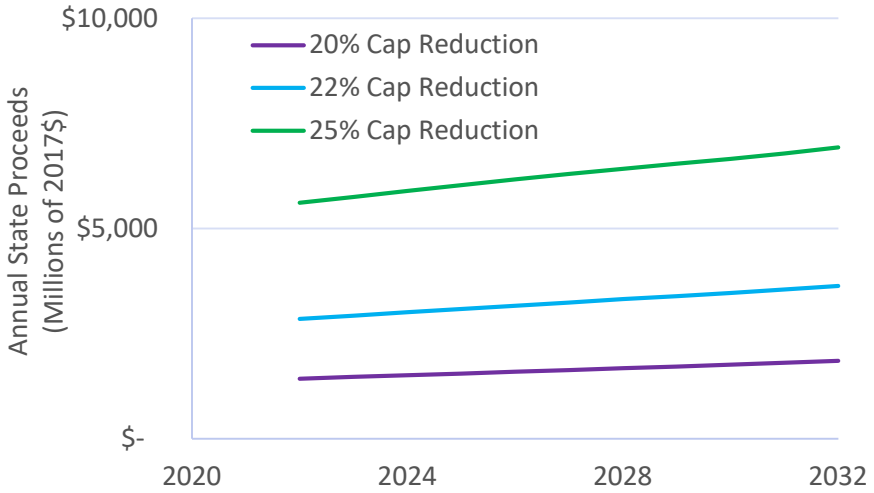
Emissions Cap Scenarios Results: CO_2 Allowance Prices & Program Proceeds

- Initial annual proceeds range from $1.4 billion at start in the 20% case up to $5.6 billion in the 25% case.
- Allowance prices reflect the combined effect of the cap and the investments
- More stringent caps result in greater proceeds for investments.





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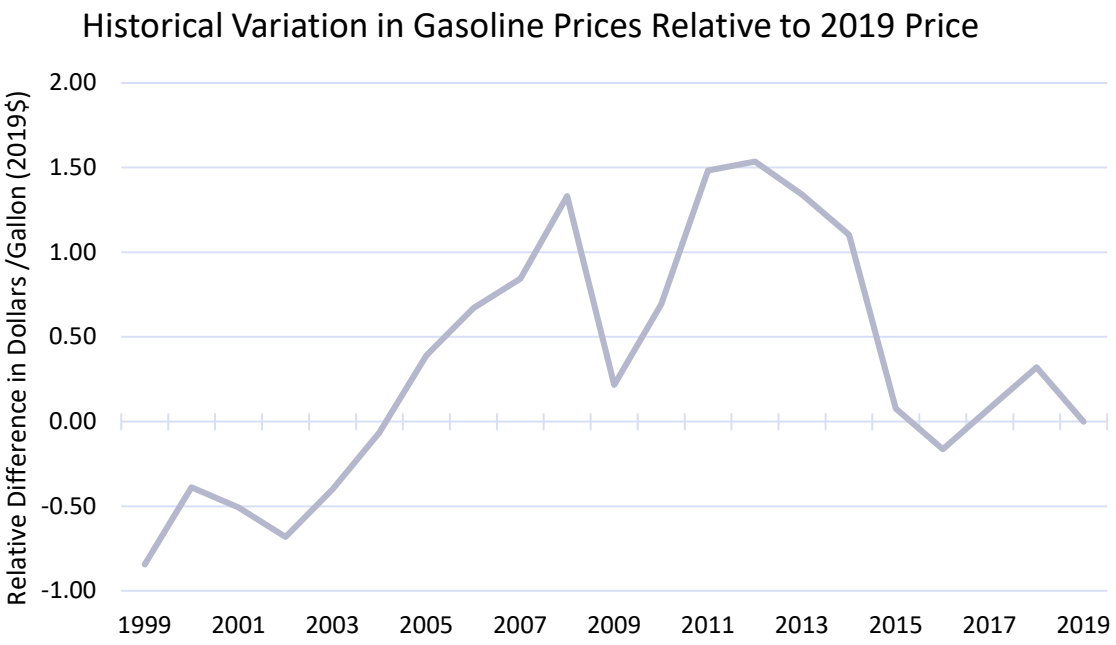
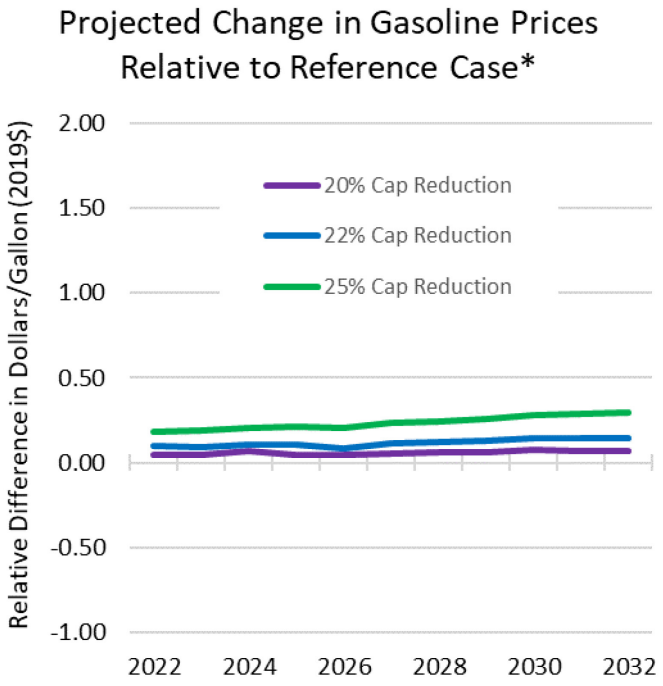
Modeled Gasoline Prices in Policy Scenarios

Compared with historical variations





*If fuel companies decide to pass on allowance costs it could mean an incremental price increase in 2022 of $0.05, $0.09 or $0.17 / gallon in the 20%, 22% and 25% Cap Reduction Scenarios, respectively. This is not a prediction of gasoline prices in the future. Several factors affect future gas prices, including policy and market forces.

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	No Cap No Investments		20% Cap Reduction with Investments		22% Cap Reduction with Investments		25% Cap Reduction with Investments	
	Reference Case		Policy Case		Policy Case		Policy Case	
	2022	2032	2022	2032	2022	2032	2022	2032
Emissions Total, million metric tons; and percent reduction from 2032 to 2022	254	206 **-19%***	254	202 **-20.5%**	254	199 **-22%**	253	192 **-24%**
Allowance Prices per metric ton (2017$)	*n/a*	*n/a*	$6	$9	$11	$18	$22	$36
Total Proceeds (Billion/ year)	*n/a*	*n/a*	$1.4	$1.8	$2.8	$3.6	$5.6	$6.9
Public Health Benefits, *Prelim.* (Billions of 2017$)	*n/a*	*n/a*	-	$3	-	$6	-	$10
Avoided Climate Impacts (Billions of 2017$)	*n/a*	*n/a*	-	$0.25	-	$0.46	-	$0.89

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*Reference case projections represent TCI's best estimates. Sensitivity analysis assumptions—such as a roll back of federal vehicle standards and low oil prices—could lead to CO_2 emission reductions of as little as 6% from 2022 to 2032.

Illustrative Portfolios of Clean Transportation Investments

	A	B* (introduced on slide 22)	C	
	5%	30%	54%	Electric cars, light trucks and vans
	21%	23%	27%	Low & zero-emission buses and trucks
	35%	18%	-	Transit expansion and upkeep
	16%	14%	10%	Pedestrian and bike safety, ride sharing
	7%	8%	8%	System efficiency
	17%	8%	-	Indirect/ Other

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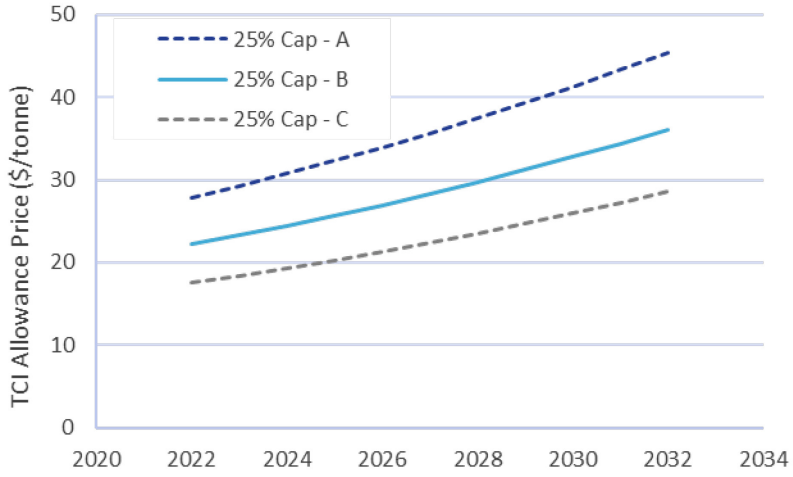
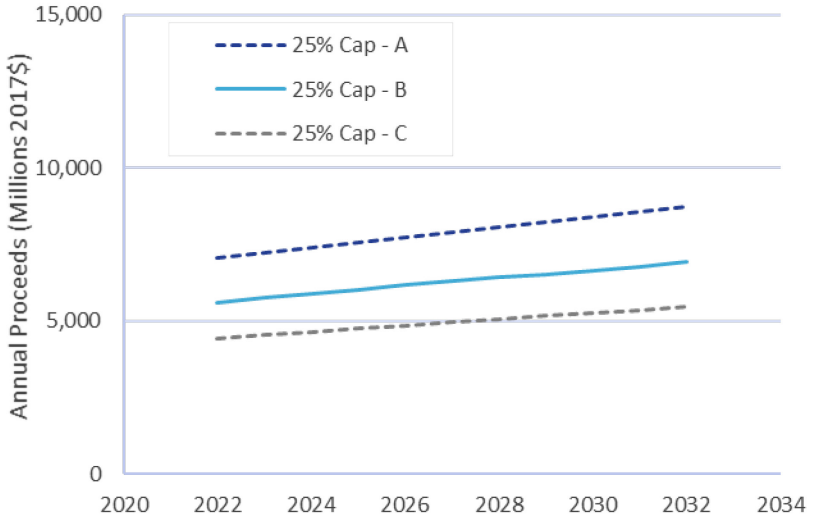
*Scenario B is the illustrative portfolio used for most TCI cap reduction scenarios, including those used as the basis for economic and health benefit analysis.

Investment Scenarios Results: CO_2 Allowance Prices & Program Proceeds for 25% Cap Reduction Scenario

- Allowance prices reflect the combined effect of the 25% Cap Reduction scenario and the investments
  - Investments in more cost-effective solutions lower allowance prices.
- Higher allowance prices result in greater proceeds for investments.
- Initial annual proceeds range from $4.4B during the first year with investment portfolio C and up to $7B with investment Portfolio A.





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Background on REMI Macroeconomic Model

- Dynamic model of the regional economy
- Considers monetary flows throughout the economy
- Model includes:
  - 12 states & D.C.
  - 23 industry sectors

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Overview of REMI Modeling Results

- Shown are REMI model economic inputs and outputs for the 20%, 22%, & 25% reduction cases, illustrative annual average investments of $1.6 to $6.25B compared to the Reference Case
- Changes represent combined output of NEMS and TCI Investment Modeling Tool
- Changes for 2033 – 2040 time period assume discontinuation of cap-and-invest, but continuation of accrued benefits from 2022-2032 investments

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Key Findings from Macroeconomic Modeling

- Businesses and individuals save money from:
  - reduced overall fuel expenditures,
  - lower congestion, and
  - lower vehicle operating and maintenance costs.
- Cost of policy (fuel prices increase due to allowance prices) is small relative to overall expected economic growth in the 'business as usual' Reference Case.
- The modeled program would have a modest positive impact on GDP, income, and jobs, all of which would be greater than business as usual in 2032 and substantially net positive over the 2022-2040 timeframe.

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Change in Regional Economic Indicators: 20% Reduction Cap

Economic Indicators	Year 2032	Year 2040	Average annual 2022 - 2040
Gross Domestic Product (GDP)			
Increase in GDP (Billions of 2017$)	$0.70	$1.41	$0.69
% Increase from Reference Case	0.01%	0.02%	0.01%
GDP at Projected Reference Case Level (Billions of 2017$)	$5,270	$7,096	$6,129
Disposable Personal Income (DPI)			
Increase in DPI (Billions of current $)	$0.47	$1.21	$0.52
% Increase from Reference Case	0.01%	0.02%	0.01%
DPI at projected Reference Case Level (Billions of current $)	$4,731	$6,931	$6,816
Employment			
Increase in Employment (job-years)	1,900	6,300	2,421
% Increase from Reference Case	0.004%	0.01%	0.01%
Reference Case Level	48,878,000	50,413,000	48,777,000

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Change in Regional Economic Indicators: 22% Reduction Cap

Economic Indicators	Year 2032	Year 2040	Average annual 2022 - 2040
Gross Domestic Product (GDP)			
Increase in GDP (Billions of 2017$)	$1.40	$2.81	$1.38
% Increase from Reference Case	0.03%	0.04%	0.02%
GDP at Projected Reference Case Level (Billions of 2017$)	$5,270	$7,096	$6,129
Disposable Personal Income (DPI)			
Increase in DPI (Billions of current $)	$0.94	$2.42	$1.04
% Increase from Reference Case	0.02%	0.03%	0.02%
DPI at projected Reference Case Level (Billions of current $)	$4,731	$6,931	$6,816
Employment			
Increase in Employment (job-years)	3,982	12,709	4,917
% Increase from Reference Case	0.01%	0.03%	0.01%
Reference Case Level	48,878,000	50,413,000	48,777,000

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Change in Regional Economic Indicators: 25% Reduction Cap

Economic Indicators	Year 2032	Year 2040	Average annual 2022 - 2040
Gross Domestic Product (GDP)			
Increase in GDP (Billions of 2017$)	$2.86	$5.59	$2.78
% Increase from Reference Case	0.05%	0.08%	0.05%
GDP at Projected Reference Case Level (Billions of 2017$)	$5,270	$7,096	$6,129
Disposable Personal Income (DPI)			
Increase in DPI (Billions of current $)	$1.95	$4.85	$2.11
% Increase from Reference Case	0.04%	0.07%	0.03%
DPI at projected Reference Case Level (Billions of current $)	$4,731	$6,931	$6,816
Employment			
Increase in Employment (job-years)	8,900	25,600	10,316
% Increase from Reference Case	0.02%	0.05%	0.02%
Reference Case Level	48,878,000	50,413,000	48,777,000

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Preliminary Estimates of Health Benefits

- A multi-university team led by Harvard C-CHANGE is in the process of conducting detailed modeling and mapping of the health consequences of county-level changes in air pollution and physical activity across the entire region for multiple scenarios.
- A preliminary, region-wide analysis by Cambridge Systematics found, for illustrative purposes in the year 2032, the following central estimates of potential benefits resulting from cleaner air, improvements in safety, and more physical activity (range is for 20% & 25% cap scenarios):
  - 306 to 1,014 fewer premature deaths
  - 338 to 1,366 fewer asthma symptoms
  - 459 to 1,701 fewer injuries due to traffic accidents
  - Total monetized benefits range from $3 B to $10 B

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Public Health Benefits Results in 2032: Reduced Air Pollution

- Transportation is a major contributor of ozone and particulate matter pollution, which has a wide range of impacts for public health. Children and the elderly are especially vulnerable.
- Since impacts are more concentrated in urban areas and along roadways, this preliminary region-wide analysis is likely conservative.

Health Benefits - *Reduced Air Pollution*	20% Cap Reduction	22% Cap Reduction	25% Cap Reduction
Reduced PM2.5 emissions (short tons)	78	159	333
Reduced VOC emissions (short tons)	640	1,247	2,404
Reduced NO_x emissions (short tons)	1,856	3,791	8.111
Premature deaths avoided (adults age 30+)	6	12	24
Reduced asthma symptoms/exacerbation	338	673	1,366
Value of air pollution reduction ($millions)	$ 105	$ 212	$ 447

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Source: Cambridge Systematics

Public Health Benefits Results in 2032: Physical Activity

Investments in clean transportation options provide a range of public benefits. Building sidewalks, protected bike lanes and other pedestrian infrastructure increases safety, which results in physical activities that yield significant public health benefits.

Health Benefits - *Physical Activity*	20% Cap Reduction	22% Cap Reduction	25% Cap Reduction
Deaths avoided (annual)	270	539	877
Statistical value of lives saved ($millions)	$ 2,589	$ 5,179	$ 8,416

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Source: Cambridge Systematics;
World Health Organization, HEAT Tool.

Public Health Benefits Results in 2032: Safety

Investments that increase transportation choices – e.g., public transit – reduce the number of vehicles on the road and this reduces traffic-related fatalities and injuries (US FTA)

Health Benefits - *Safety*	20% Cap Reduction	22% Cap Reduction	25% Cap Reduction
Deaths avoided (annual)	31	59	113
Injuries avoided (annual)	459	888	1,701
Statistical value of fatalities and injuries avoided ($millions)	$ 294	$ 569	$ 1,089

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Source: Cambridge Systematics

Conclusions from Macroeconomic and Public Health Modeling

- A declining emissions cap could lock in decreases in carbon dioxide emissions that are expected through 2032 and drive additional reductions throughout the region.
- The modeled program would have a modest positive impact on GDP, income, and jobs, all of which would be greater than business as usual in 2032 and substantially net positive over the 2022-2040 timeframe.
- Significant region-wide benefits to public health would result from improvements to air quality, public safety, and greater access to active transportation options, including walking and cycling.

We can make significant progress towards achieving climate goals by reducing GHG and other pollution from transportation at modest cost and net benefits to the economy

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Next Steps

- Public input will continue to be welcome and encouraged through the TCI online portal. *Please provide input by Friday, February 28, 2020*

https://www.transportationandclimate.org/main-menu/tci-regional-policy-design-stakeholder-input-form

- Modeling
  - More sensitivity analysis, to reflect uncertainties and inform the design of stability mechanisms
  - More policy cases, based on sensitivity analysis
  - Detailed modeling on benefits for public health is underway by a multi-university team led by Harvard C-CHANGE
  - Incidence modeling to evaluate benefits and costs for households, led by Resources of for the Future
- Public engagement through webinars and in-person events

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Questions?

Speakers on today's webinar:

State Officials

Marty Suuberg, Commissioner, Massachusetts Department of Environmental Protection

Brian Woods, Environmental Analyst in the Vermont Agency of Natural Resources

Chris Hoagland, Program Manager for the Climate Change Program at Maryland Department of the Environment

Keri Enright-Kato, Director of the Office of Climate Change, Technology, and Research at the Connecticut Department of Energy and Environmental Protection

Consultants

Frances Wood, Director, OnLocation

Chris Porter, Principal, Cambridge Systematics

Georgetown Climate Center

Vicki Arroyo, Executive Director

James Bradbury, Mitigation Program Director

Joe Kruger, Director of Research and Strategy

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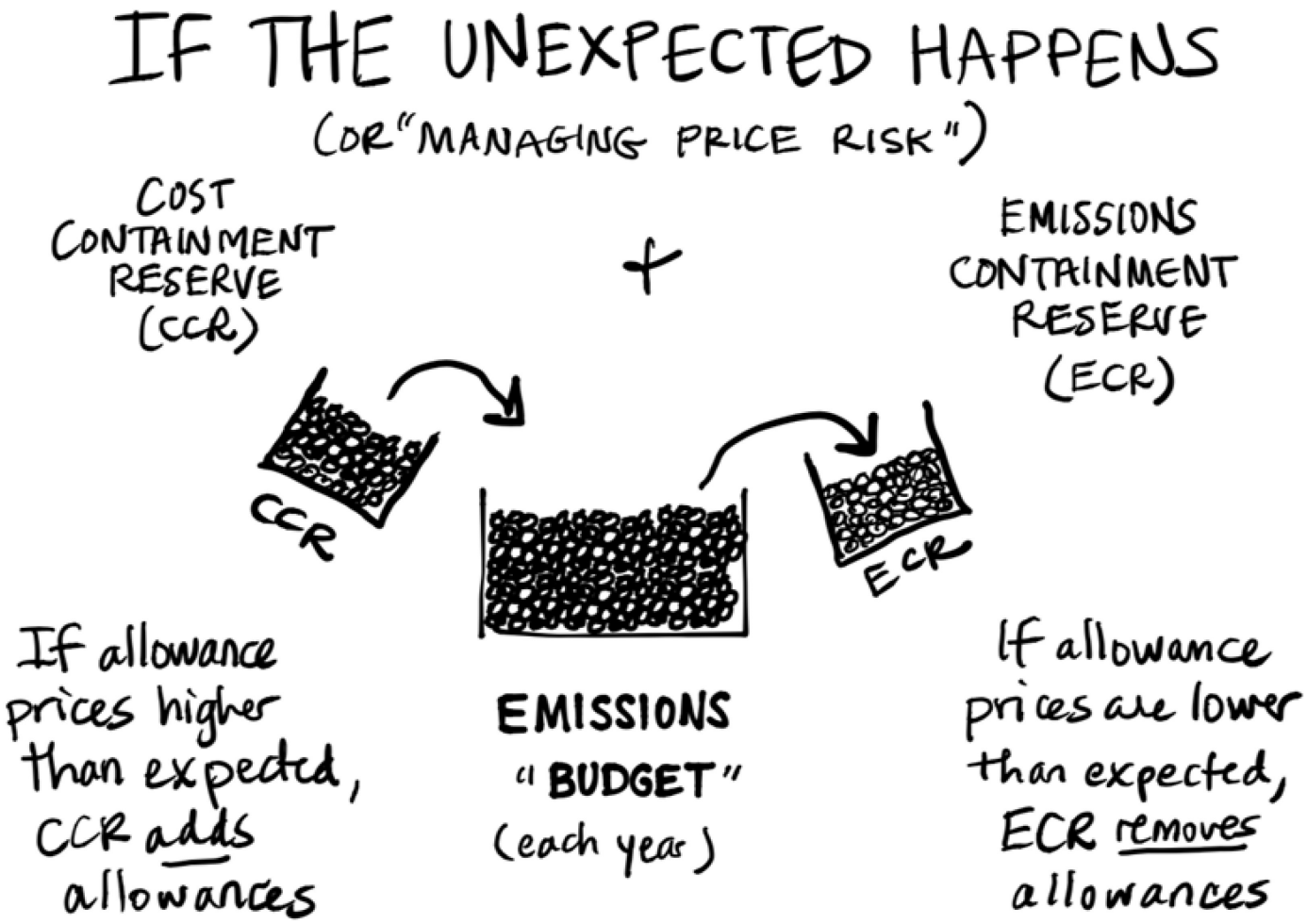
Appendix

Managing Uncertainty



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Source: https://www.transportationandclimate.org/tci-video-cap-and-invest-101

Illustrative Clean Transportation Investment Scenario (B)

30%	Electric cars, light trucks and vans	Consumer incentives to purchase full battery electric (EV) and plug-in hybrid electric (PHEV) light-duty vehicles

23%	Low & zero-emission buses and trucks	Electric trucks MDT/urban, Electric school buses, Electric transit buses, CNG trucks, Passenger rail electrification, Hydrogen trucks - long-haul

18%	Transit expansion and upkeep	Bus service efficiency, Bus service expansion, Bus rapid transit, Transit fare reduction, Urban rail, Commuter rail, Intercity rail, Bus maintain, Urban rail maintain, Commuter/intercity rail maintain

14%	Pedestrian and bike safety, ride sharing	Strategies to reduce VMT: Bicycle investment, Pedestrian investment, Land use/smart growth, Shared ride incentives, Travel demand management

8%	System efficiency	Highway preservation, System operations, Freight/intermodal

8%	Indirect/ Other	Proceeds are invested in ways that do not directly reduce transportation GHG emissions (e.g., returned directly to consumers).

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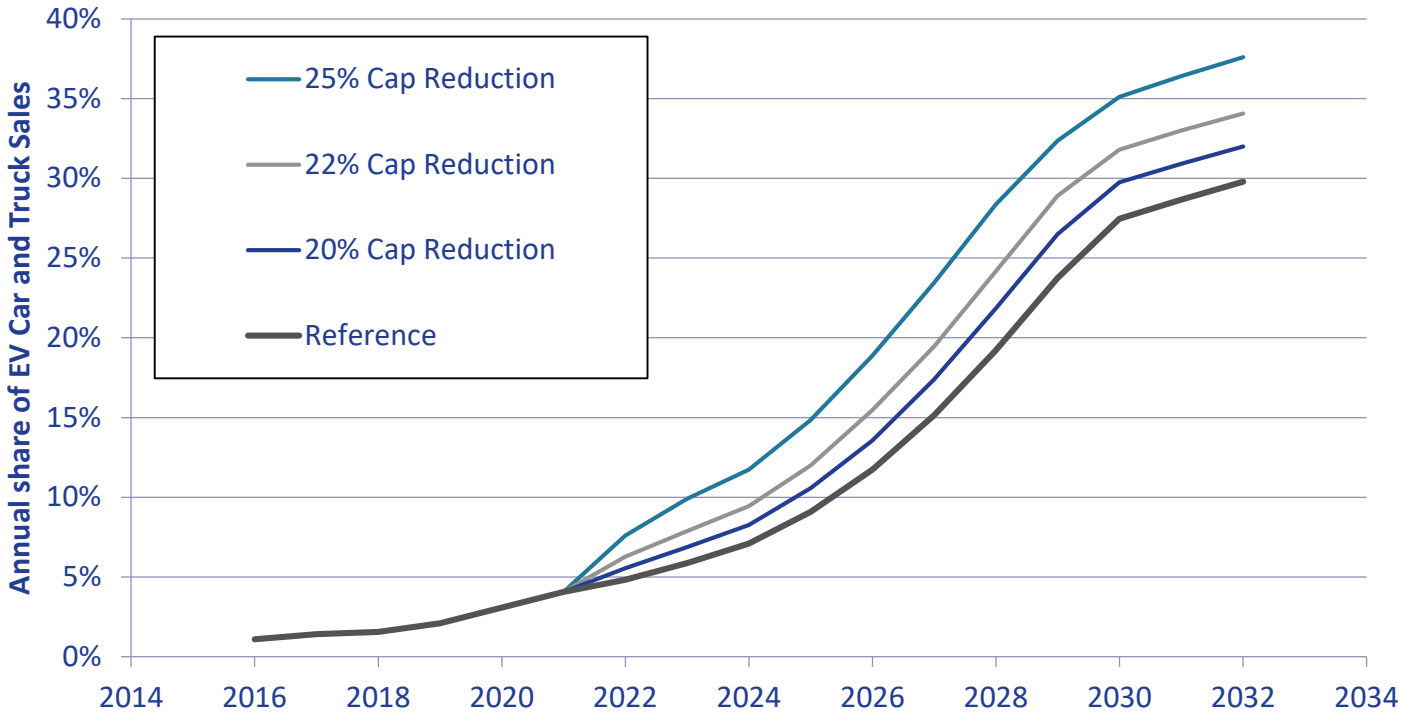
Emissions Cap Scenarios Results: Light Duty Electric Vehicle Sales Shares

- Light Duty EV Deployments increase in response to the carbon allowance prices and investments in EV incentives



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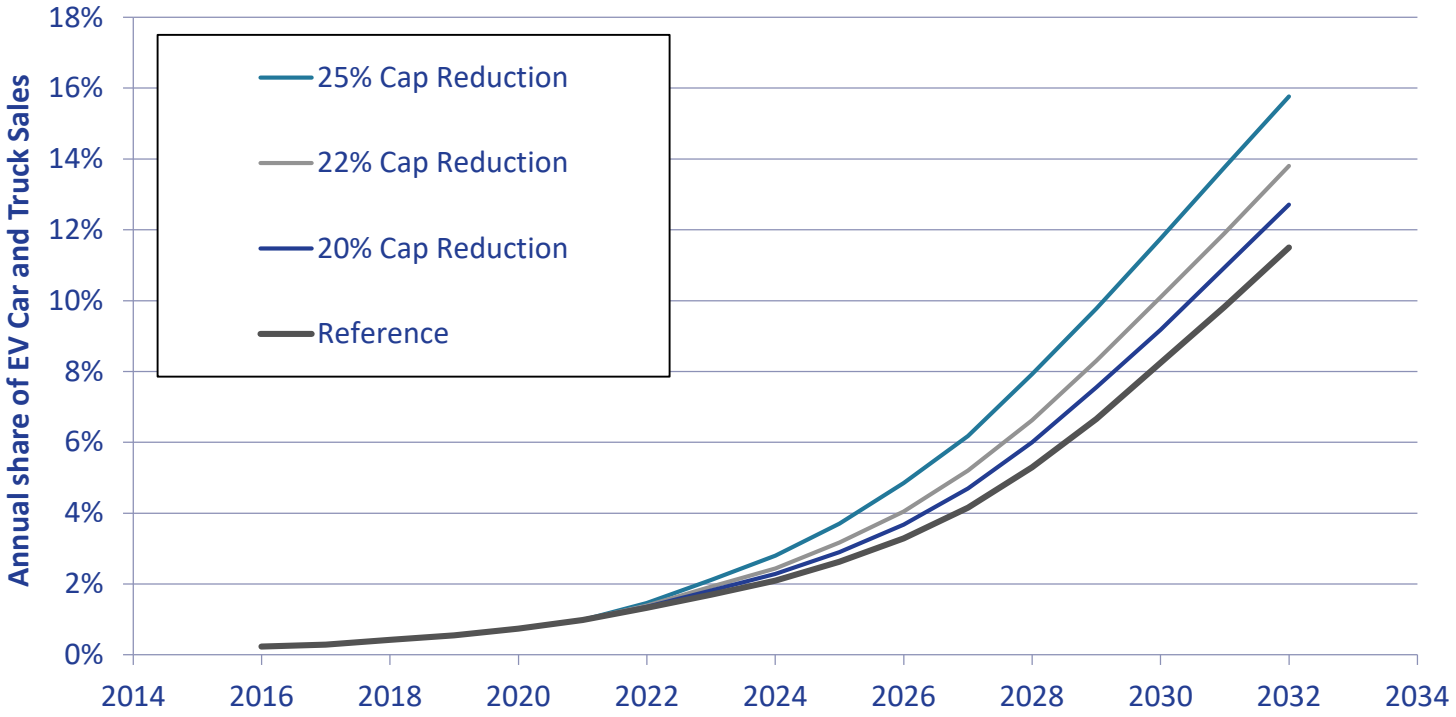
Emissions Cap Scenarios Results: Light Duty Electric Vehicle Stock Shares

- Light Duty EV Stock increases as more vehicles are sold into the market and the existing fleet gradually retires



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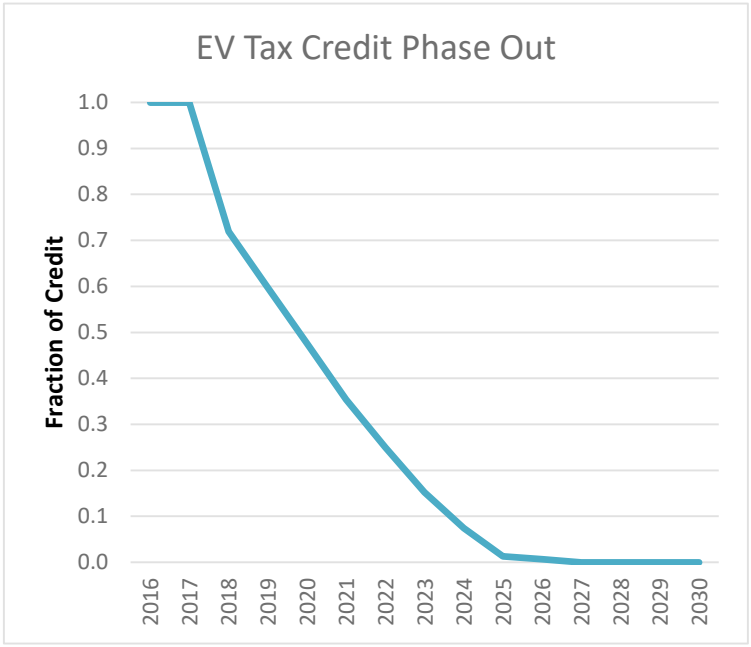
Federal EV Tax Credit

- The states have incorporated OnLocation's estimates for federal tax credit phase-out into the Reference Case.
- The Federal government offers tax credits of up to $7,500 for the purchase of electric vehicles.
- The tax credit eligibility and phase-out are tied to individual vehicle manufacturers and the phase-out begins when cumulative sales of qualified vehicles reach 200,000.
  - Because NEMS does not track vehicle sales by manufacturer, the credits are assumed to phase-out over time.
  - The AEO2018 phase-out rate appeared out-of-date, so OnLocation has modified it based on projections of manufacturers EV sales expectations.



From August 8, 2019 Reference Case Results Webinar

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