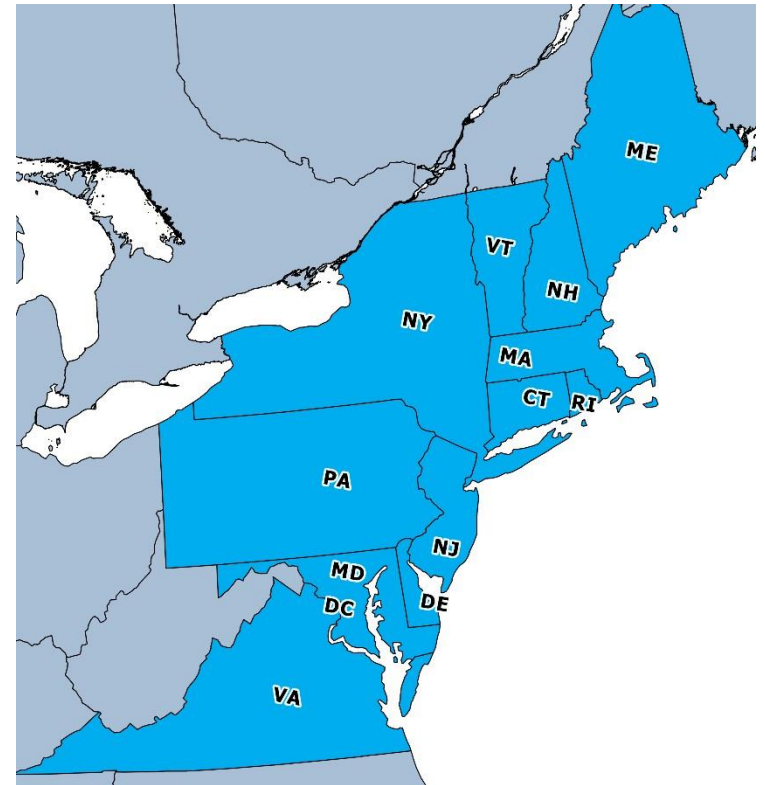# The Transportation and Climate Initiative

BRTB Technical Committee

February 4, 2020

What is TCI?

- Collaboration among 13 jurisdictions.

- Developing potential regional clean transportation policy

- Modeled on successful Regional Greenhouse Gas Initiative (RGGI)
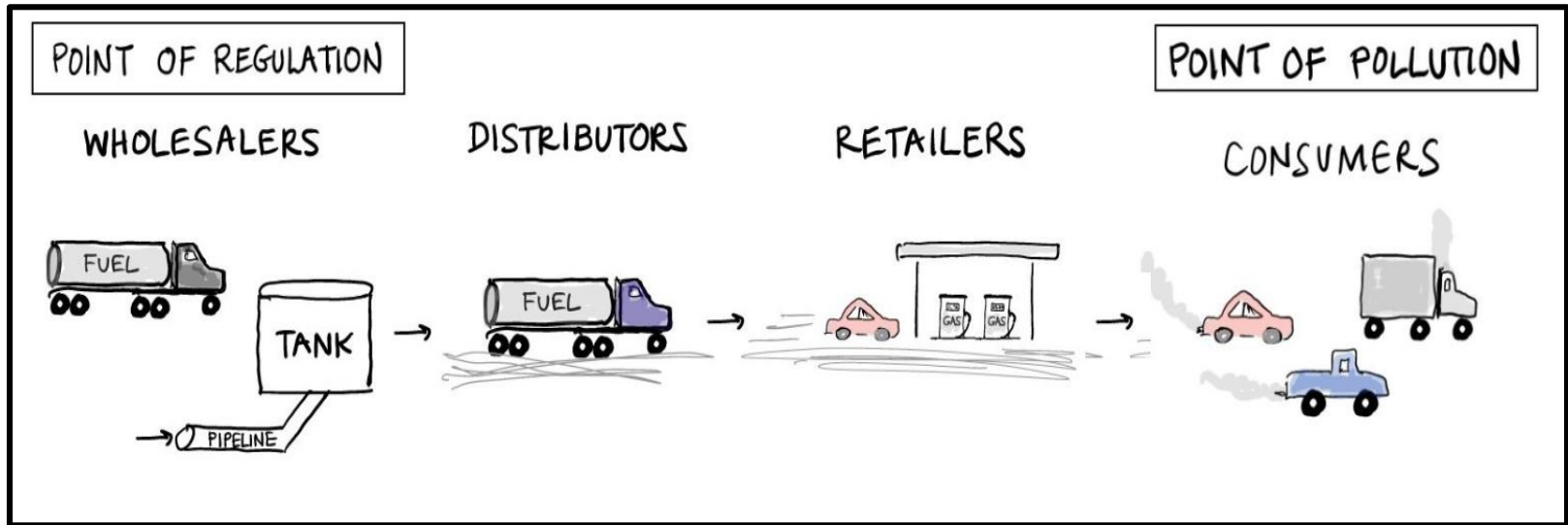   - "Cap-and-Invest"

What is "Cap and Invest"?

1. Require pollution sources to turn in **allowances** for CO2 emissions.

2. Only issue a limited number of allowances.

3. Let sources trade allowances.

4. Invest proceeds from allowance auctions into reduction programs.
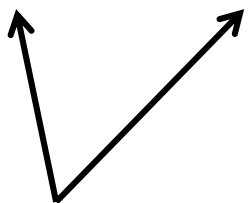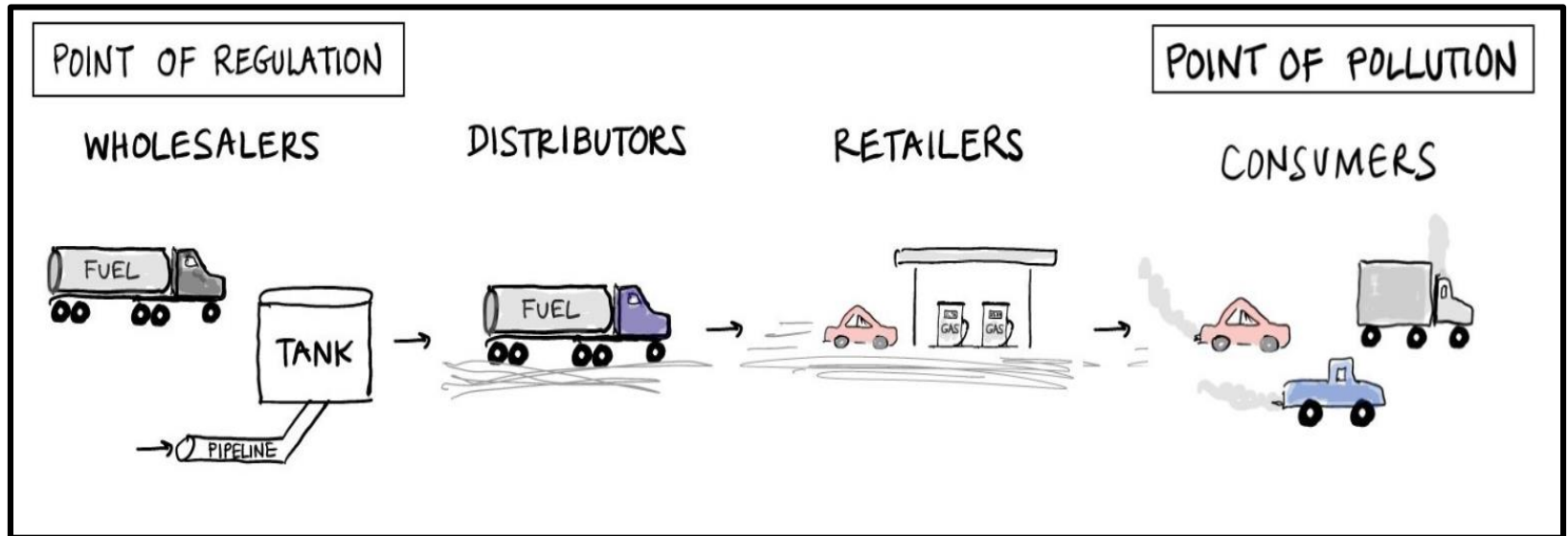
"Cap and Trade"

"Cap and Invest"

How would a CO2 Cap work in TCI?

How would a CO2 Cap work in TCI?

POINT OF REGULATION

POINT OF POLLUTION

WHOLESALERS

DISTRIBUTORS

RETAILERS

CONSUMERS

FUEL

TANK

PIPELINE

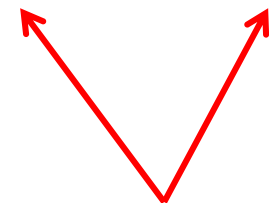FUEL

GAS   GAS

Fuel wholesalers would comply with a regulation by holding enough allowances to cover the CO2 from combustion of fuel sold (sometimes distributors, too).

Gas stations and consumers would not have any regulatory obligation.

How would the cap raise funds for investment?

- States would make allowances available to fuel companies through auctions.

- Proceeds from these auctions would come back to the states, to invest in clean transportation.

- Allowance price is a carbon price, providing market incentive to reduce GHGs

RGGI Auction Price ($/ton)
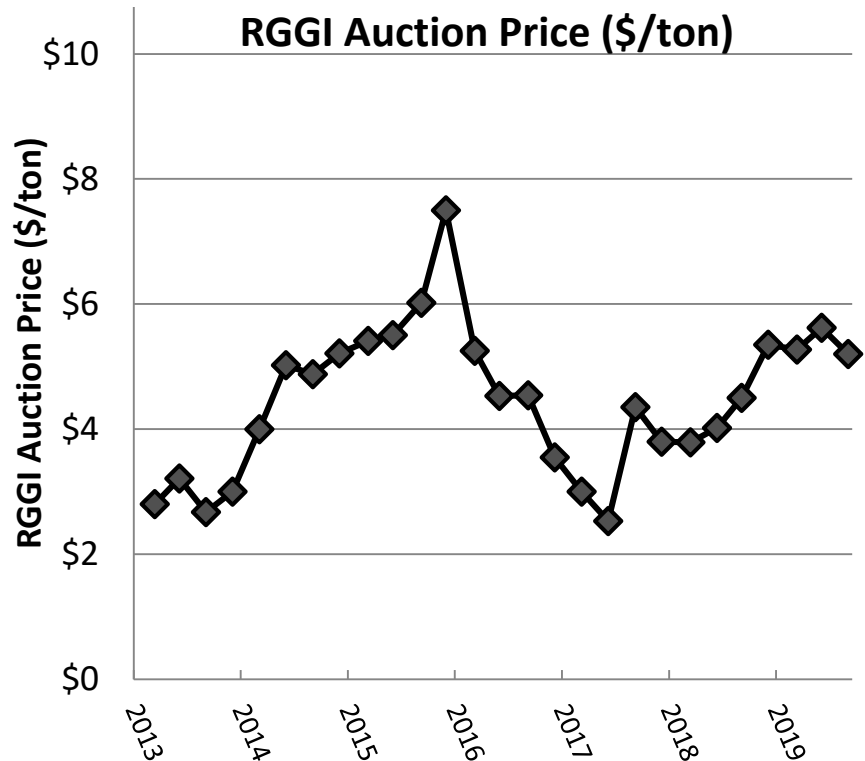
Example: RGGI auction price history.

How might Cap and Invest Achieve our Clean Transportation Needs?

CAP

- Reduces CO2 emissions that cause climate change through declining pollution cap

- Creates proceeds for state investments

Investments

How might Cap and Invest Achieve our Clean Transportation Needs?

CAP

- Reduces CO_2 emissions that cause climate change through declining pollution cap

- Creates proceeds for state investments

Investments

- Expand and improve clean transportation options in communities

- Reduce CO_2 emissions that cause climate change through clean transportation projects
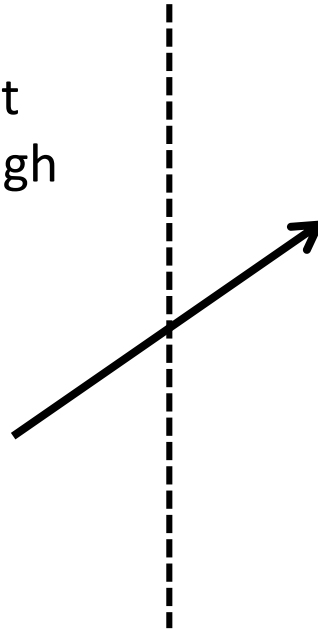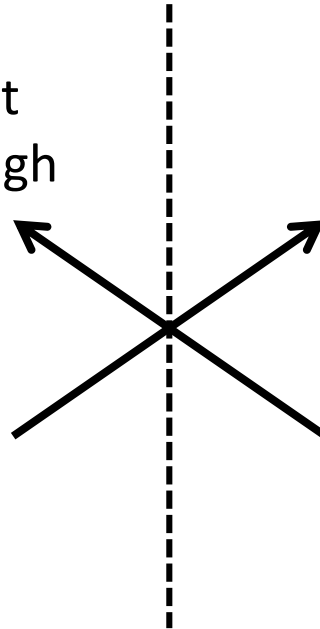
How might Cap and Invest Achieve our Clean Transportation Needs?

CAP

- Reduces CO_2 emissions that cause climate change through declining pollution cap

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Investments

- Expand and improve clean transportation options in communities

- Reduce CO_2 emissions that cause climate change through clean transportation projects

Together: Better climate, stronger economy, healthy air and communities

Current Status

- Released draft Memorandum of Understanding for comment (due Feb 28). Information on:
  - Equity approach
  - Regulatory program design
  - Cost containment and other stability mechanisms
  - Investment priorities
  - Implementation timeline

- Evaluated benefits from several program options

transportationandclimate.org

Excerpts from Regional Analysis

Full results and webinar recording at:

TransportationAndClimate.org

# 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
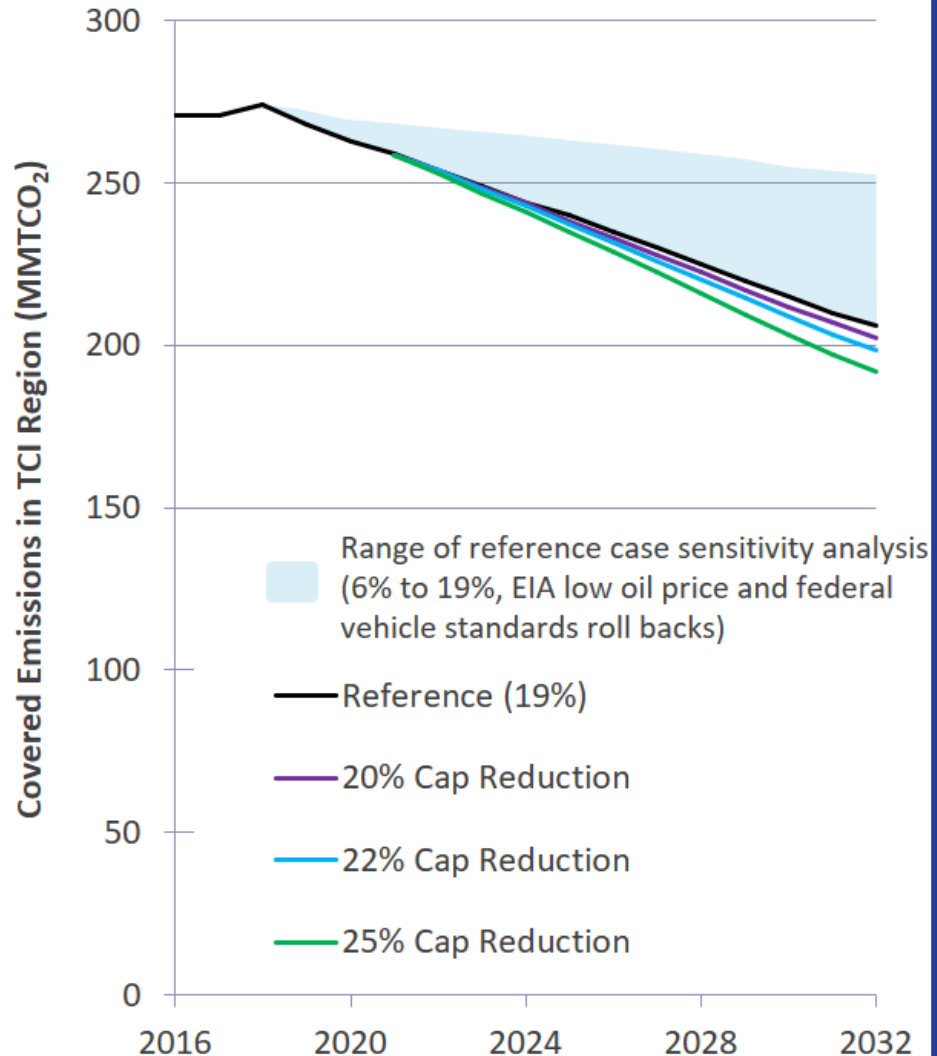
Modeled Gasoline Prices in Policy Scenarios
Compared with historical variations

Historical Variation in Gasoline Prices Relative to 2019 Price

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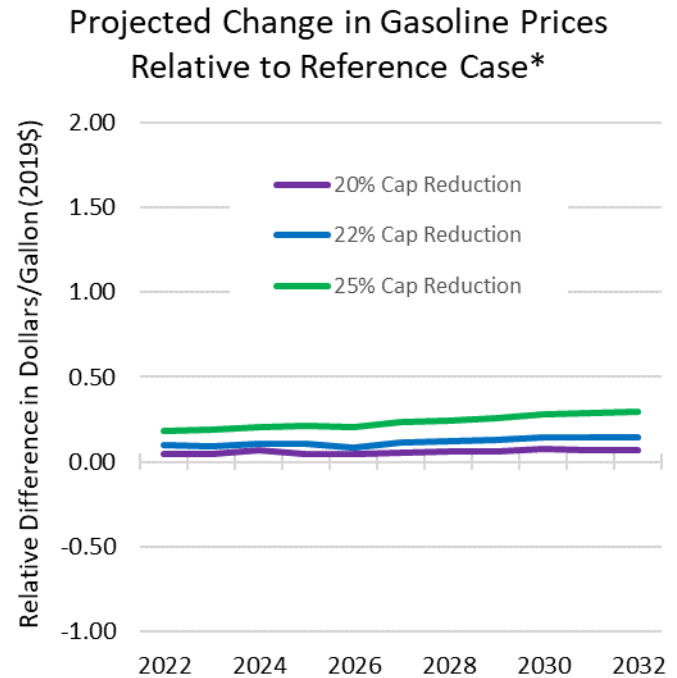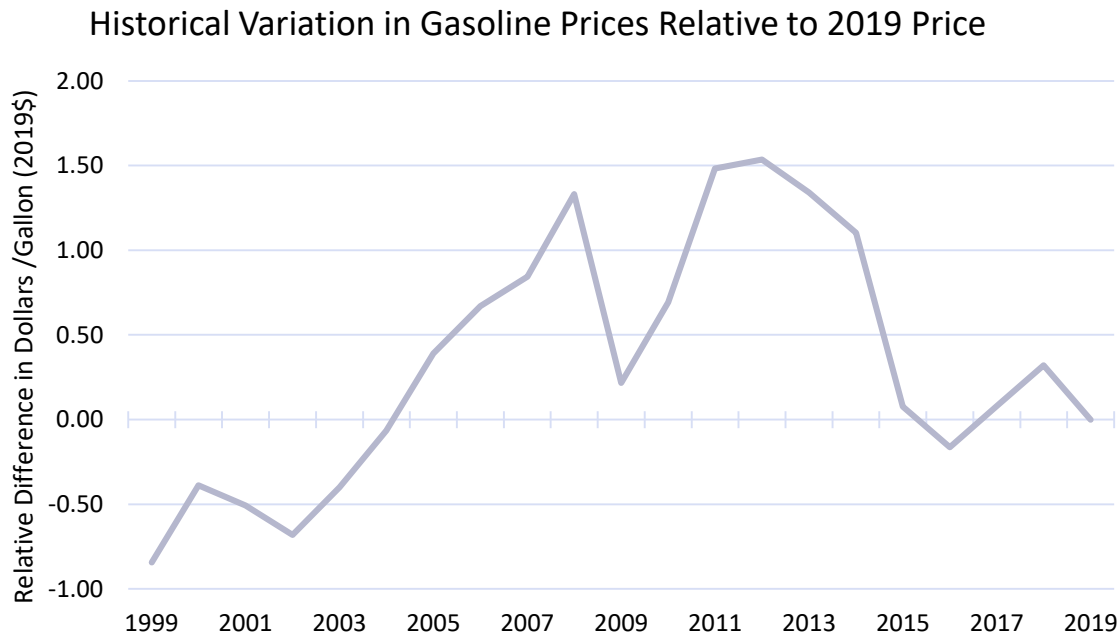
*If fuel companies decide to pass on allowance costs it could mean an incremental price increase in 2022 of $0.05, $0.09 or $0.17 / gallon in the 20%, 22% and 25% Cap Reduction Scenarios, respectively. This is not a prediction of gasoline prices in the future. Several factors affect future gas prices,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

Clean Transportation Investments to Reduce Pollution in Modeled TCI Scenarios

- **Electric Transit Buses:**
Up to 44,000 transit buses by 2032.

- **Bus service and transit Improvements:**
Up to $1.1 billion annually

- **Electric school buses:**
Up to 42,000 by 2032.

- **Electric Trucks:**
Up to 84,000 by 2032.

- **Bike Lanes & Sidewalks:**
Up to $5.6 billion region-wide through 2032

(Regional totals)

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Preliminary Public Health Benefits

- Fewer asthma symptoms

- Fewer premature deaths

- Fewer traffic-related injuries

- Total estimated public health benefits in 2032: **$3.2 billion to $10.5 billion**

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Avoided Climate Impacts

$249 million – $892 million in avoided climate impacts in 2032

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Conclusions from Macroeconomic Modeling

- Program has a positive impact on the economy.

- GDP, income, and jobs are projected to be greater than business as usual in 2032 and substantially net positive over the 2022-2040 timeframe.

- Significant progress towards achieving climate goals by reducing GHG and other pollution from transportation at modest cost and net benefit to the economy

Economic Indicators in 2032	20% Cap Reduction	22% Cap Reduction	25% Cap Reduction
Increase in GDP growth, from Reference Case	$0.7B (0.01%)	$1.4B (0.03%)	$2.9B (0.05%)
Increase in DPI growth, from Reference Case	$0.5B (0.01%)	$0.9B (0.02%)	$1.9B (0.04%)
Increase in Jobs, from Reference Case	1,900 (0.004%)	3,982 (0.001%)	8,900 (0.02%)

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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.
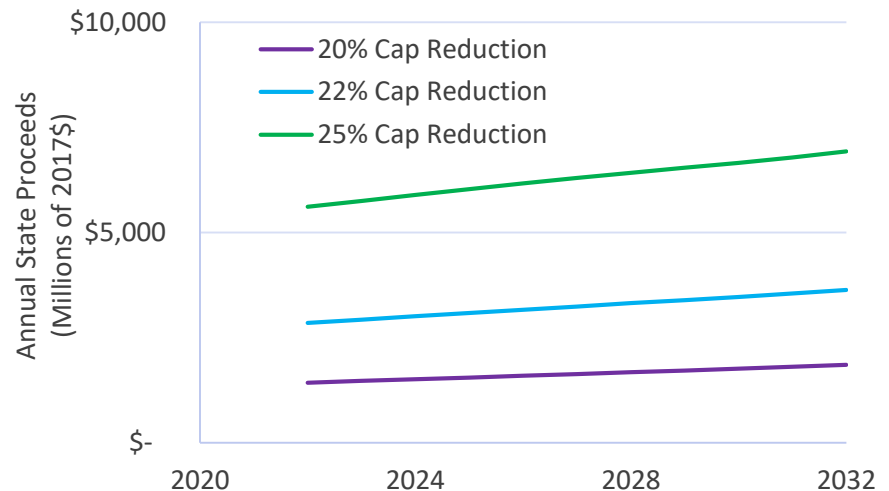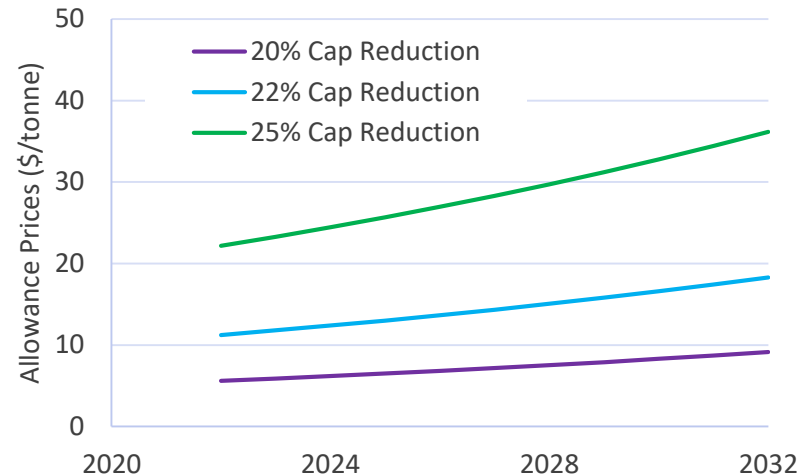
What happens next?

Feb 28, 2020: Comments requested on draft MOU

Spring 2020: Governors decide whether to sign MOU

2020: Participating states develop model regulation

2021: Participating states promulgate regulations

As early as 2022: Program begins

Each state would determine its own investment mix.

Contact

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Climate Change Program Manager

Maryland Department of the Environment

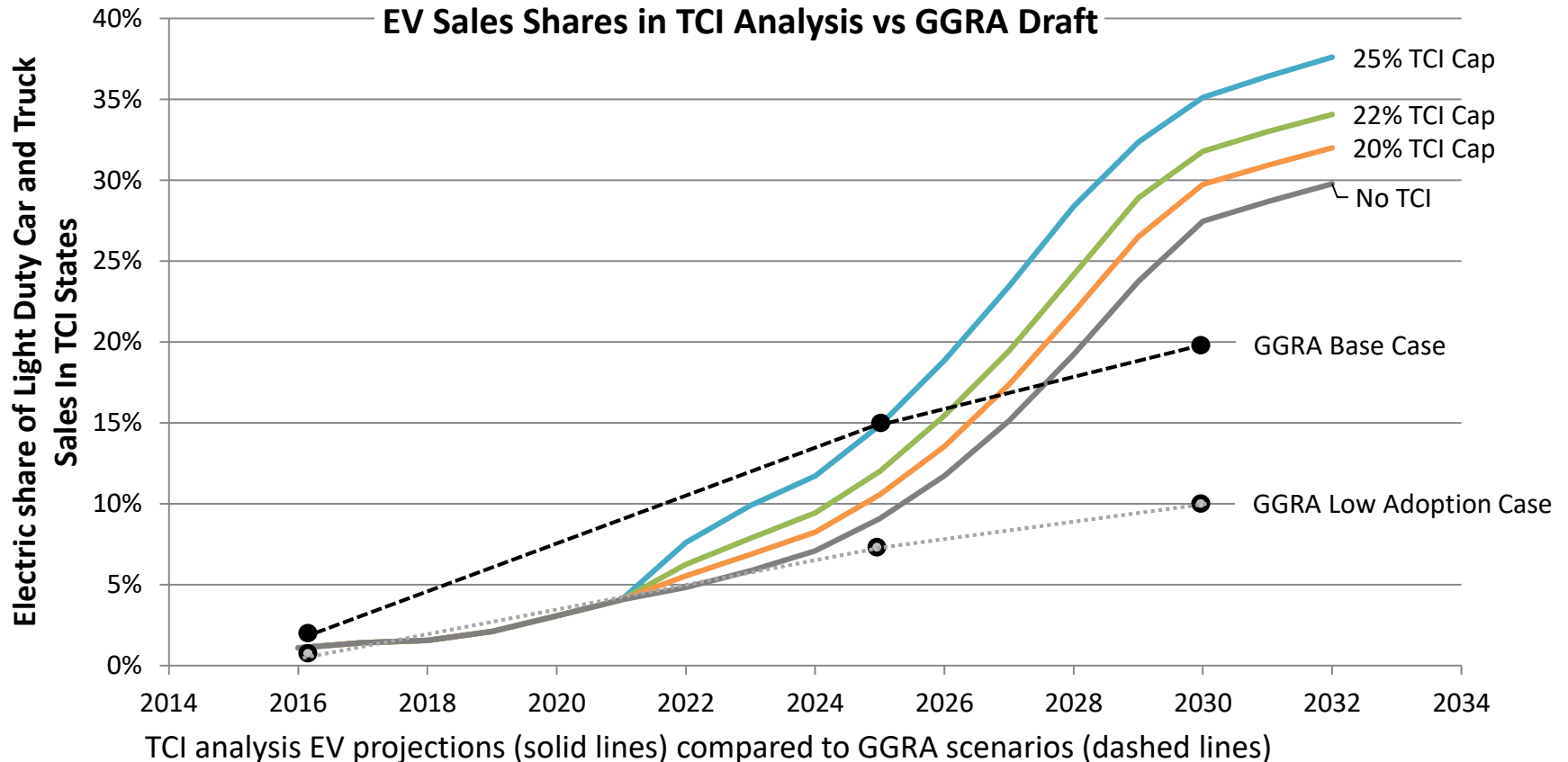chris.hoagland@maryland.gov

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More Details

TCI and the Draft MD GHG Plan

- Maryland's draft plan to achieve 2030 climate goals points to TCI as a potential program to enable transportation measures (esp. EVs)
- TCI has provided sophisticated analysis on EVs, which we can incorporate into the final plan

EV Sales Shares in TCI Analysis vs GGRA Draft

Y-axis: Electric share of Light Duty Car and Truck Sales In TCI States (0% to 40%)
X-axis: 2014 to 2034

Labels: 25% TCI Cap, 22% TCI Cap, 20% TCI Cap, No TCI, GGRA Base Case, GGRA Low Adoption Case

TCI analysis EV projections (solid lines) compared to GGRA scenarios (dashed lines)

Where do these estimates come from?

TCI States use National Energy Modeling System (NEMS) and other tools

For assumptions and model information, see modeling presentations at transportationandclimate.org

- May 2019: Model development and assumptions

- August 2019: Reference case results

- December 2019: Cap-and-Invest model results

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

How do the **INVESTMENTS** affect the transportation sector?
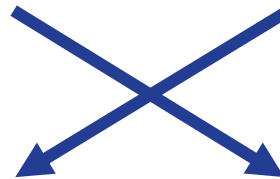
What are the impacts from the program?

(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

25

Illustrative Portfolios of Clean Transportation Investments

	A	B*	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.