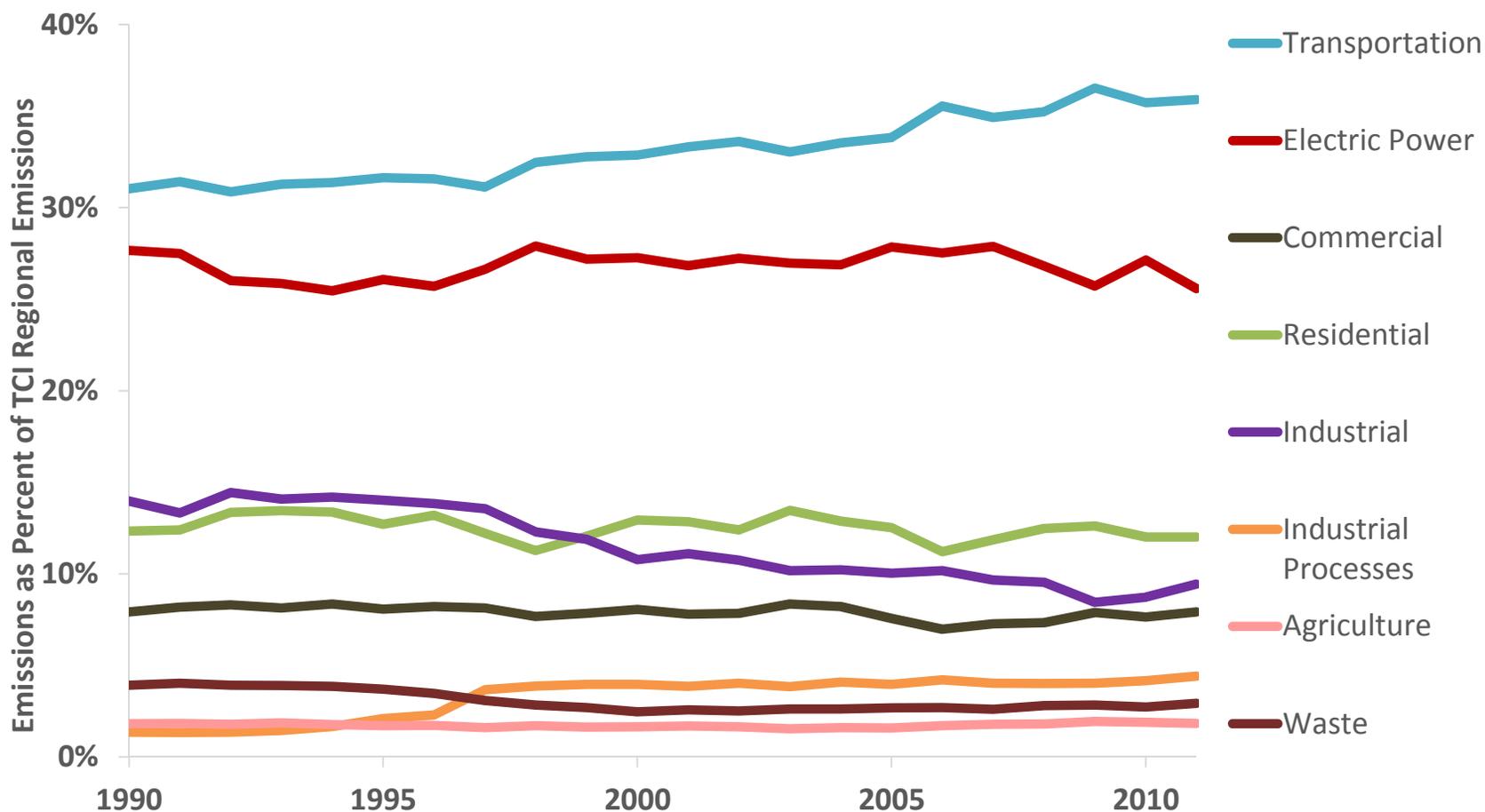


An Overview of
Electric Vehicle Initiatives in
New Hampshire
for the
Energy Efficiency and Sustainable Energy
Board

Rebecca Ohler
NH Dept. of Environmental Services
February 19, 2016

Transportation is the Largest Source of GHG Emissions in TCI Region



Source: Georgetown Climate Center – Report:
Reducing GHG Emissions in the Northeast, November 2015

GEORGETOWN CLIMATE CENTER
A Leading Resource for State and Federal Policy

Annual Vehicle Emissions Comparison National Average

Compare Electricity Sources and Annual Vehicle Emissions

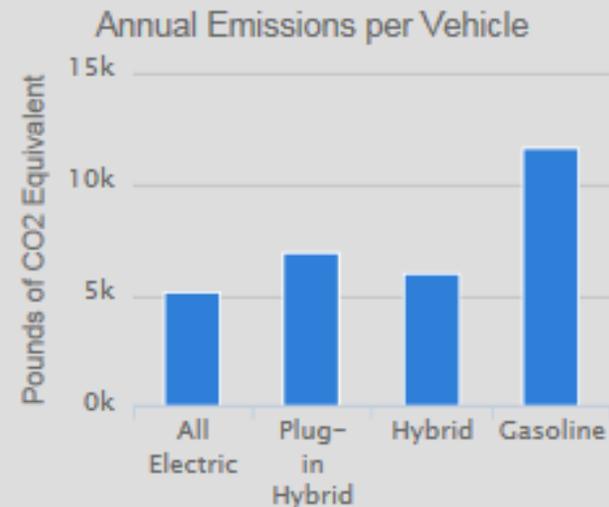
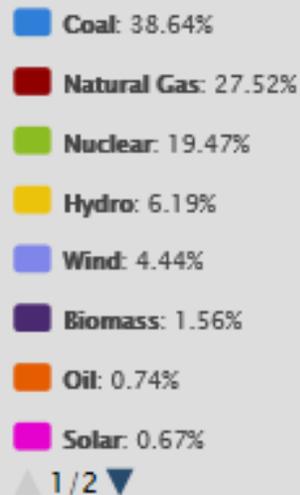
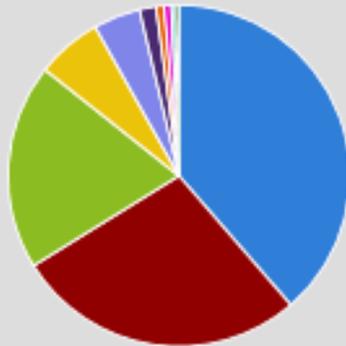
Enter a ZIP code to see a breakdown of the electricity sources used to charge EVs and PHEVs on a local grid and compare the annual emissions generated from vehicles using electricity from the grid, gasoline, or a combination of the two.

ZIP Code

Find Data

National Averages

Electricity Sources



Source: Alternative Fuels Data Center -
http://www.afdc.energy.gov/vehicles/electric_emissions.php

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Annual Vehicle Emissions Comparison New Hampshire / ISO-NE

Compare Electricity Sources and Annual Vehicle Emissions

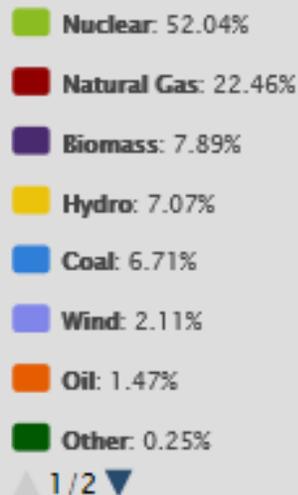
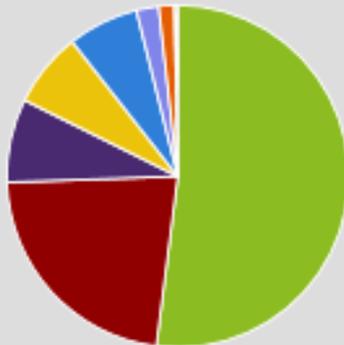
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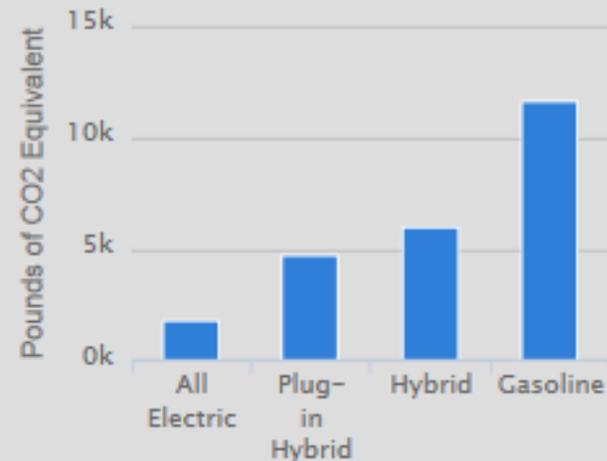
Find Data

NH - 03302

Electricity Sources



Annual Emissions per Vehicle



Source: Alternative Fuels Data Center -
http://www.afdc.energy.gov/vehicles/electric_emissions.php

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Some NH Policies Relative to EVs

- 2009 NH Climate Action Plan
- New England Governors/Eastern Canadian Premiers
 - 2001 Climate Action Plan
 - 2013 Transportation Air Quality Action Plan
 - 2015 Climate Resolution 39-1
- IR 15-510 – PUC docket - Investigation into Resale of Electricity by Electric Vehicle Charging Stations
- 2015 Under 2 MOU
- 2016 Governor's Accord for a New Energy Future

NH Climate Action Plan

Actions recommended by the Task Force:

- Support Stricter Corporate Average Fuel Economy Standards (TLU 1.A.1)
- Adopt a Low-Carbon Fuel Standard (TLU 1.C.1)
- Promote Advanced Technology Vehicles and Supporting Infrastructure (TLU 1.C.2)
- Adopt California Low Emission Vehicle (CALEV) Standards (TLU 1.A.3)

NEG/ECP

2013 Transportation Action Plan

- Promote and foster opportunities to increase production, generation, and use of transportation fuels and vehicles in a manner that delivers net GHG reductions.
- Promote lower-carbon fuel choices and encourage clean technologies in all modes of transportation through incentives, pricing and procurement mechanisms.
- Continued harmonization of low-emission and fuel economy standards throughout the entire region and the rapid adoption of these vehicles by consumers in the region.

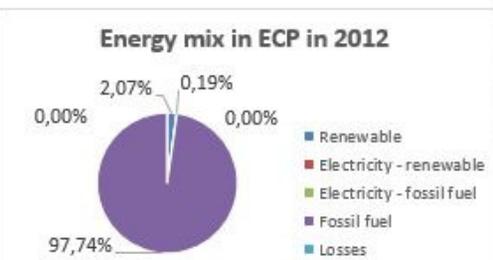
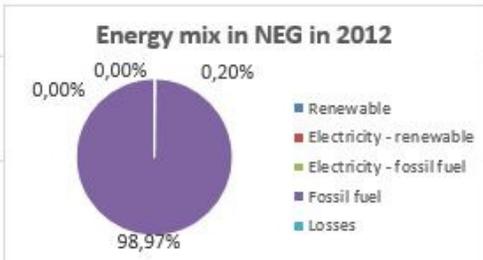
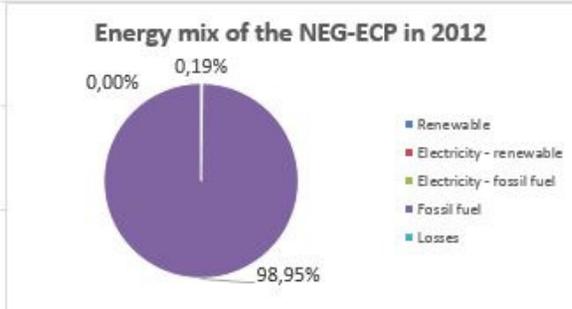
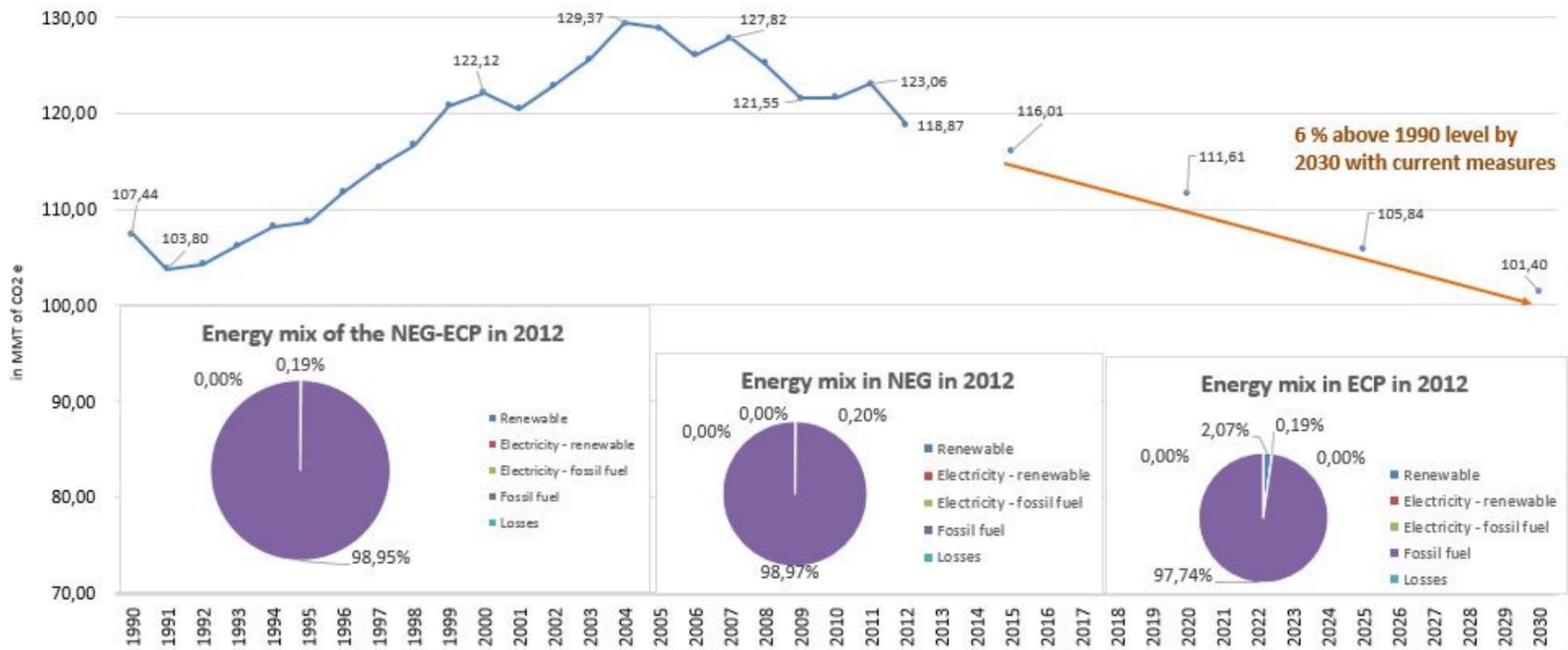
NEG/ECP Resolution 39-1

Adopted August 2015

- Adopted a 2030 reduction marker range of at least 35- 45percent below 1990 levels.
 - Midway between 2020 target (10% below 1990) and 2050 target (75-85% below 2001).
- The “strategies, policies and measures,” through which the region can achieve the 2030 reduction marker and 2050 target include both transportation and energy sectors
- Possible NEG/ECP regional actions to be presented to the governors and premiers at the 40th NEG/ECP Conference in Massachusetts (June 2016).
- Final recommendations and implementation plan to be presented at the 2017 conference.

Analysis of “BAU” indicates we have a long way to go!

NEG-ECP GHG Emissions for the Transportation sector



IR 15-510

- “The potential resale of electricity by EVC station operators raises, inter alia, issues related to the legal and regulatory status of EVC station operators as public utilities ...or as competitive electric power suppliers”
- “Because electric vehicles are a growing presence in New Hampshire and in New England, and their use is supported by both State and regional initiatives, the Commission expects that all electric distribution utilities will be affected by the resolution of these issues.”

Governor Hassan signs on to policy initiatives

Under 2 MOU Climate Agreement – October 27, 2015

“In addition to the emissions reduction goals, the Under 2 MOU calls for parties to aim to increase energy efficiency and develop renewable energy; **to coordinate on transportation issues and the development of electric vehicle infrastructure**; to collaborate on climate change adaptation and resilience efforts; and to coordinate in the areas of scientific assessments, communication and public participation.”

Governor’s Accord for a New Energy Future – February 16, 2016

“The accord provides participating governors – a bipartisan coalition together representing 127 million Americans – with a platform through which their states will collaborate, learn from one another, and leverage partnerships in energy planning and policymaking. The accord reaffirms New Hampshire’s commitment to continue to diversify energy generation and expand clean energy sources, modernize energy infrastructure, **and encourage clean transportation options.**”

Types of charging stations

Level 1 Charging



Level 1 Charging - Standard House Outlet

4.5 miles/hour of charging,
or 22 hours for full charge

Level 2 Charging



ChargePoint/Coulomb Level 2 Charging Station

70 miles/hour of
charging

40 miles per 10 min of
charging

DC Fast Charging

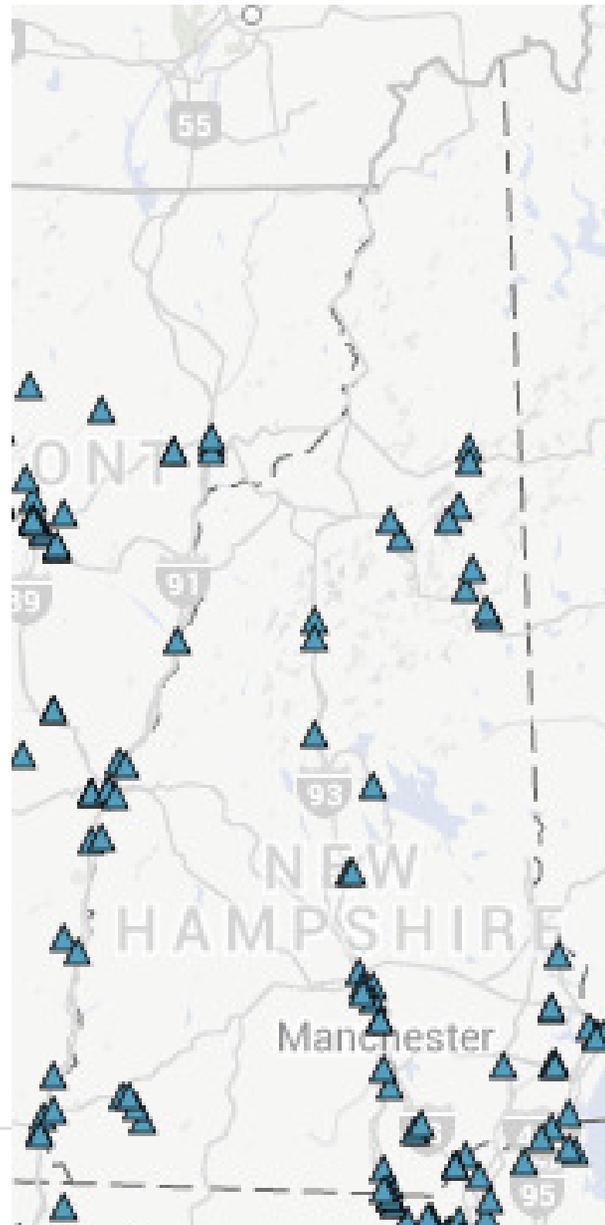


Blink DC Fast Charge Station
photo by ECOTality

How is NH Doing?

Total # EVs
Registered:
~900 as of 1/1/16

An increase of about
250 from a year ago



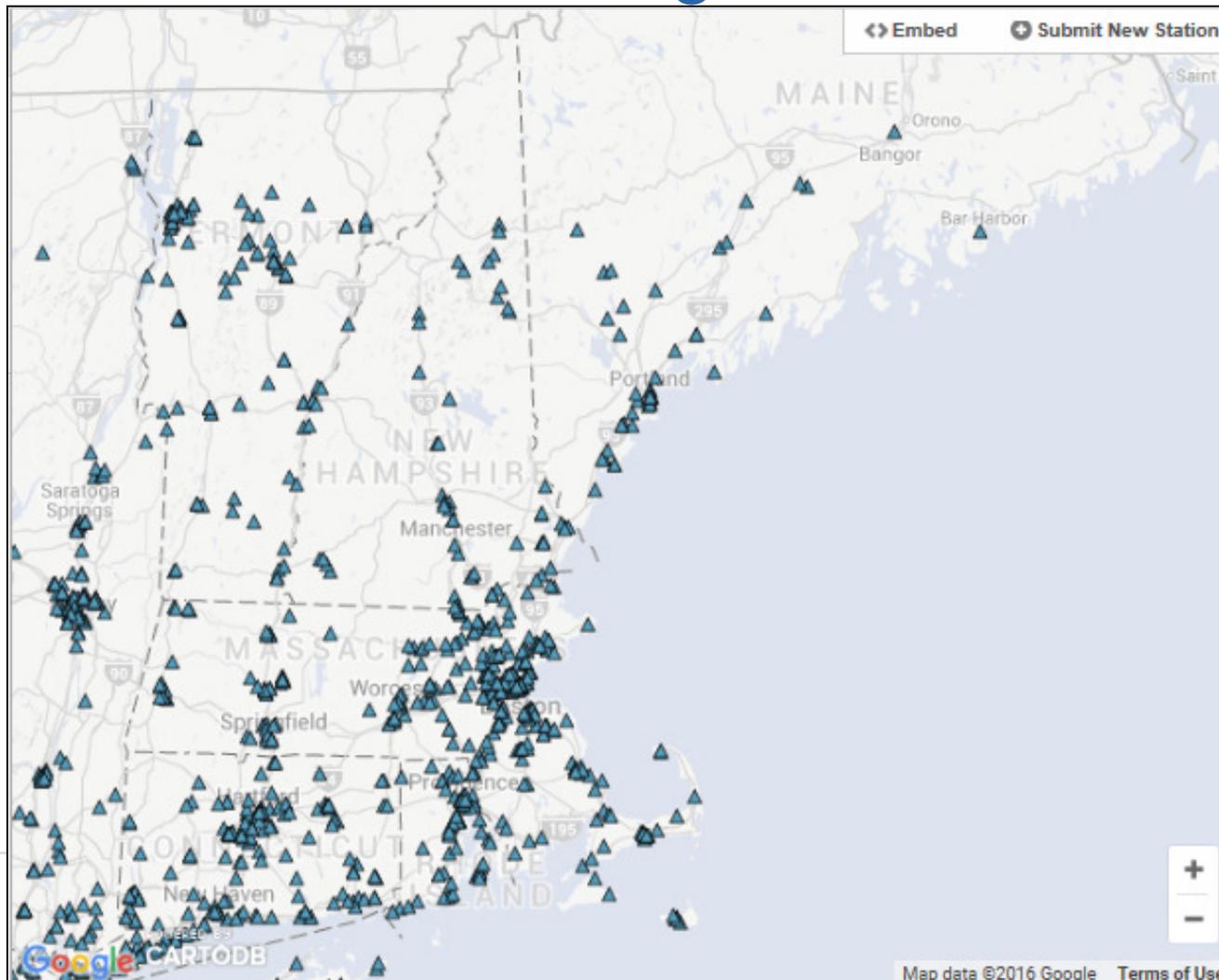
EV Charging Infrastructure in NH:

58 electric stations

112 charging outlets
in New Hampshire

Excluding private stations

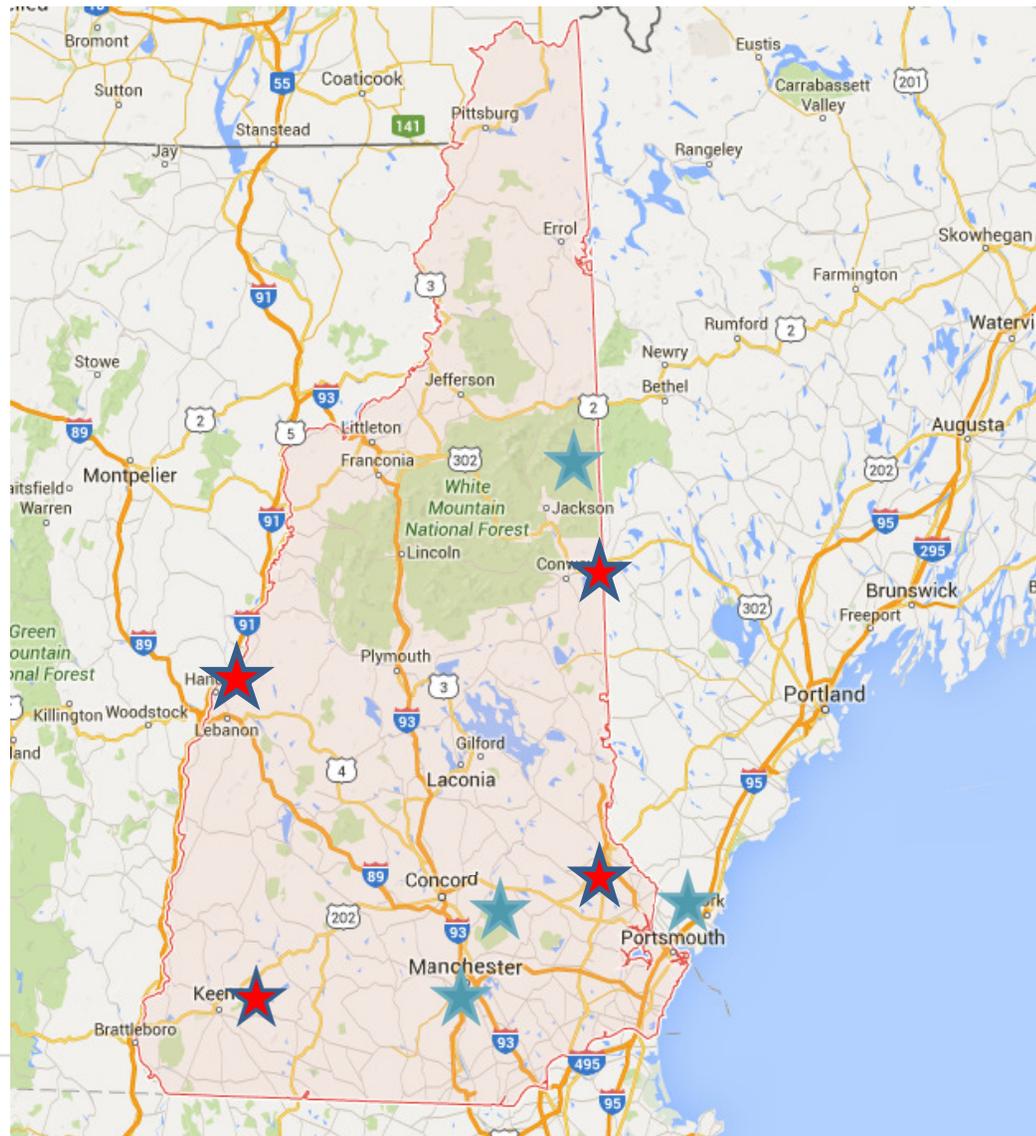
Electric Charging Stations New England



How Will New Hampshire Meet the Policy Goals?

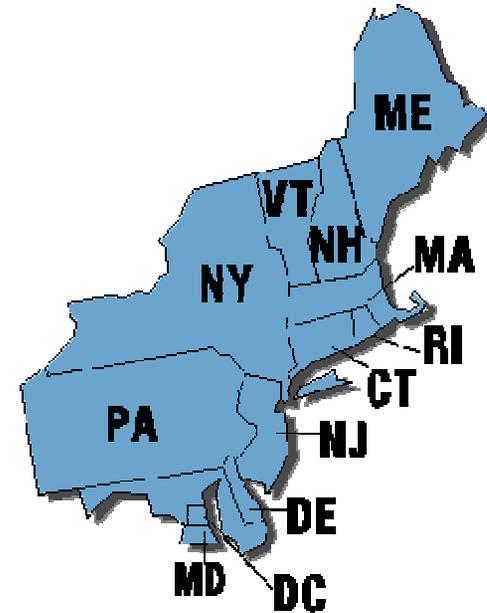
- Granite State Clean Cities
- Collaborate with stakeholders in the state
- Incentives for EV charging infrastructure
- Transportation Climate Initiative

Using US DOE funds provided by the NH Office of Energy and Planning, DES has supported development of four new EV charging locations and has received proposals for an additional four.



Transportation and Climate Initiative

- 11 northeast and mid-Atlantic states and the District of Columbia
- Working together to reduce energy use and GHG emissions from transportation



Georgetown Climate Center: A Resource for State and Federal Climate Policy

- TCI Launched in 2009 as a resource to states
- Works at the nexus of federal-state policies
- Supports states and other stakeholders through research, facilitation and convening



TCI Project Area: Clean Vehicles and Fuels

- Launched the Northeast Electric Vehicle Network in October 2011 to support the rollout of electric vehicles in the region.
- Received a nearly \$1 million Electric Vehicle Readiness Grant from DOE in Sept. 2011.
- Exploring opportunities to support the use of natural gas vehicles.
- Commissioned study of potential revenue losses from increased use of alternative fuel vehicles.



THE WALL STREET JOURNAL

Northeast States Form Electric Vehicle Network

BALTIMORE — Ten states from Massachusetts to Maryland are joining forces to promote electric vehicles.

The Northeast Electric Vehicle Network announced Wednesday it will work to help plan and install charging stations throughout the region as well as attract private investment in clean vehicle infrastructure.

Analysis Developed to Inform TCI

In 2012, TCI leaders asked to raise level of ambition and work together on meaningful emissions reduction policies.

- What are regional emission trends?
- What are opportunities for GHG reductions?
- What are economic impacts of clean transportation strategies?

Reducing Greenhouse Gas Emissions from Transportation

Opportunities in the Northeast and Mid-Atlantic



GEORGETOWN CLIMATE CENTER
A Leading Resource for State and Federal Policy

November 2015

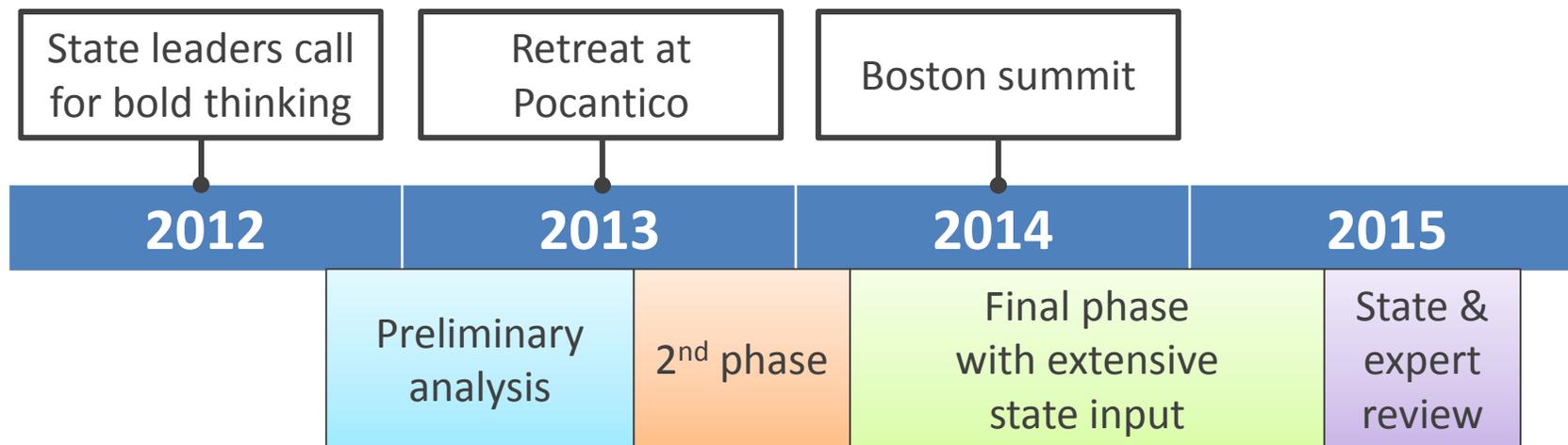
Gabe Pacyniak, Kathryn Zyla, Vicki Arroyo, and Matthew Goetz, Georgetown Climate Center

Christopher Porter and David Jackson, Cambridge Systematics

With additional research help by Suseel Indrakanti, Cambridge Systematics

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Multi-Year Process with Extensive State Engagement

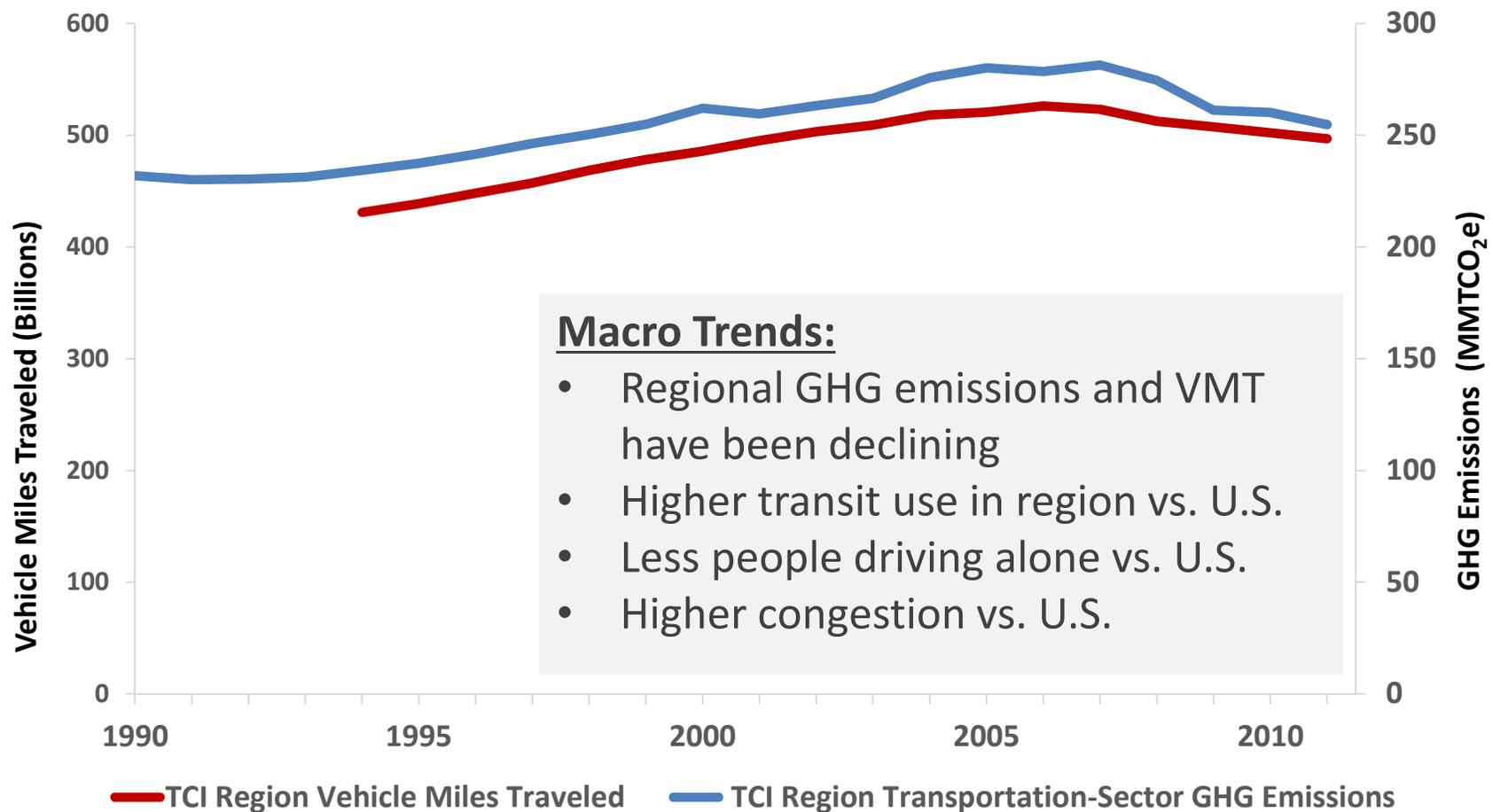


- State input shaped scope, design of analysis
- Analysis & our TCI work made possible by generous support from Rockefeller Brothers Fund, Barr Foundation, New York Community Trust, Town Creek Foundation, Oak Foundation, Surdna Foundation, John Merck Fund, Emily Hall Tremain Foundation, Rockefeller Foundation, & DOE.

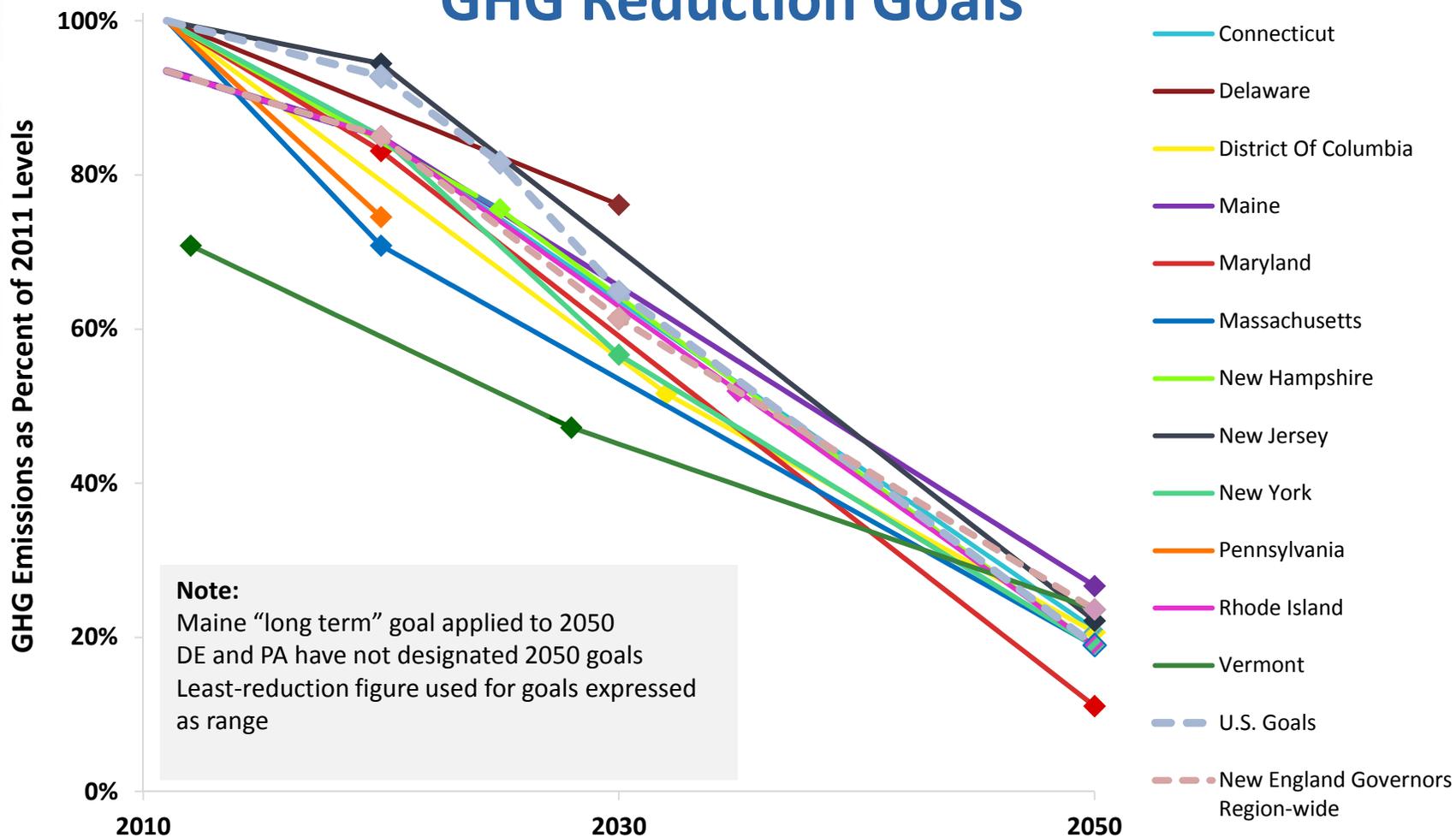
Overview of Analysis Findings

“The region can significantly cut GHG emissions, while also bringing billions of dollars in cost savings, improving public health, growing the economy, and creating jobs.”

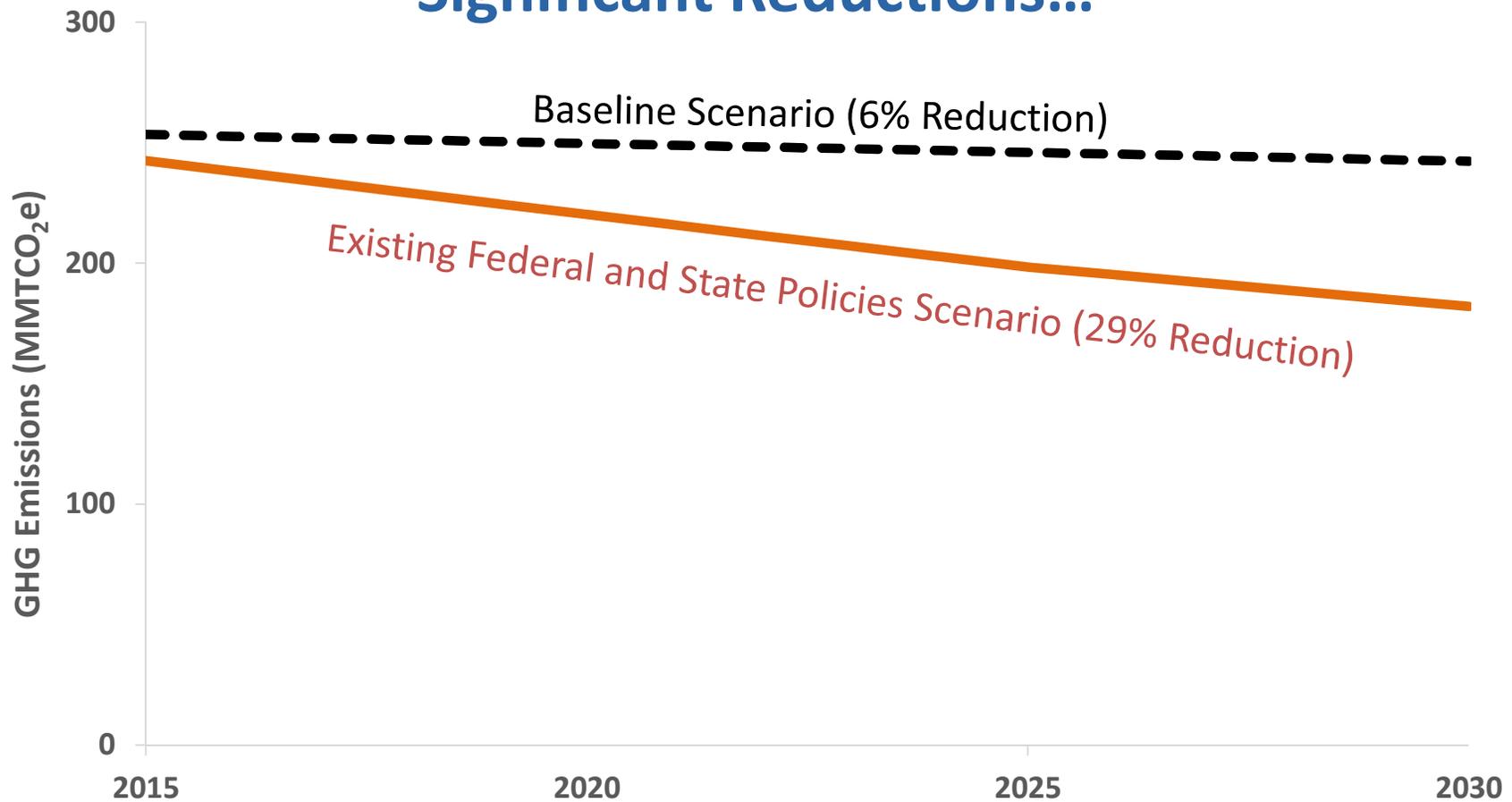
The Region is Already Reducing Emissions and Leading in Transit Use



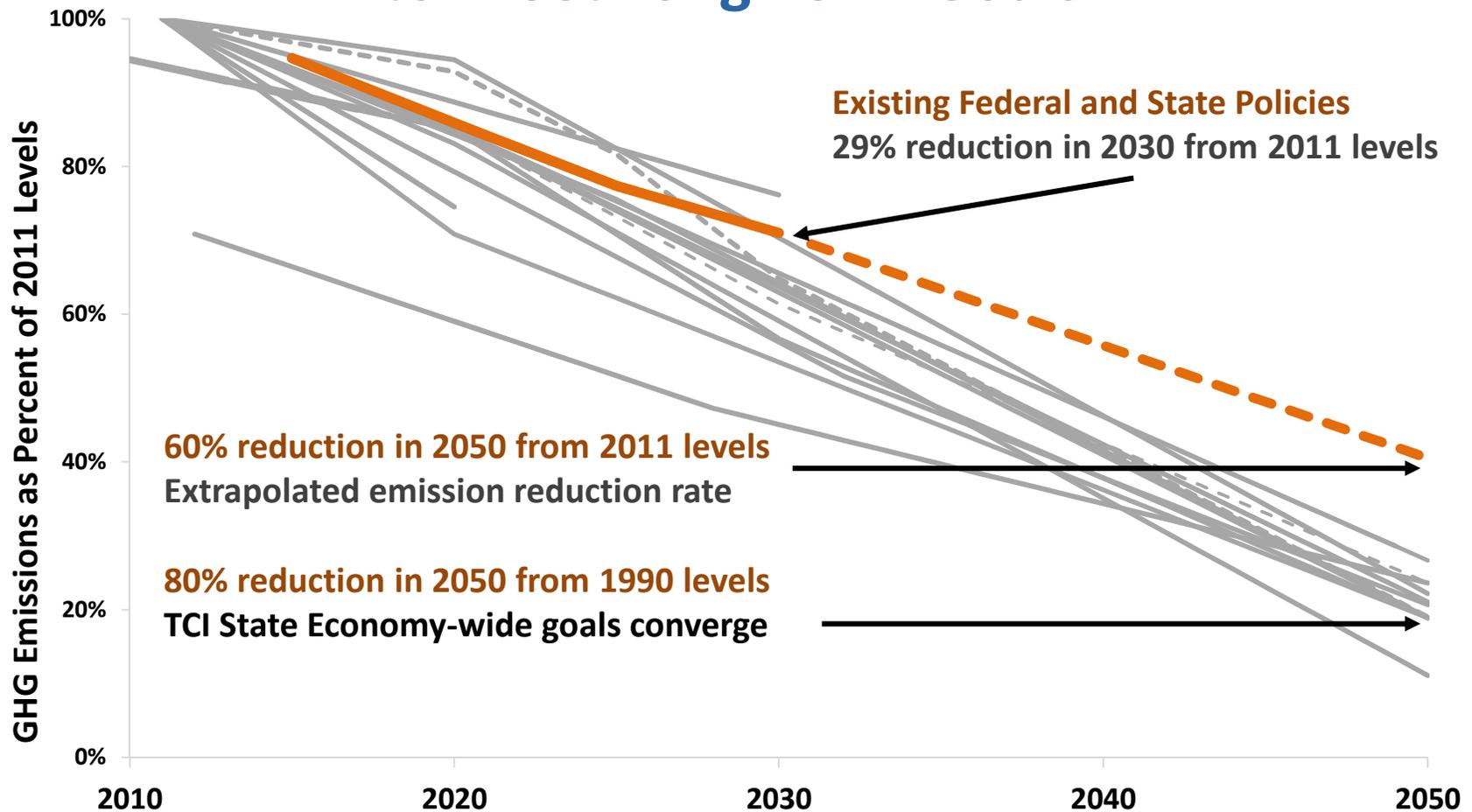
TCI States Have Set Economy-Wide GHG Reduction Goals



Existing Federal and State Policies will Achieve Significant Reductions...

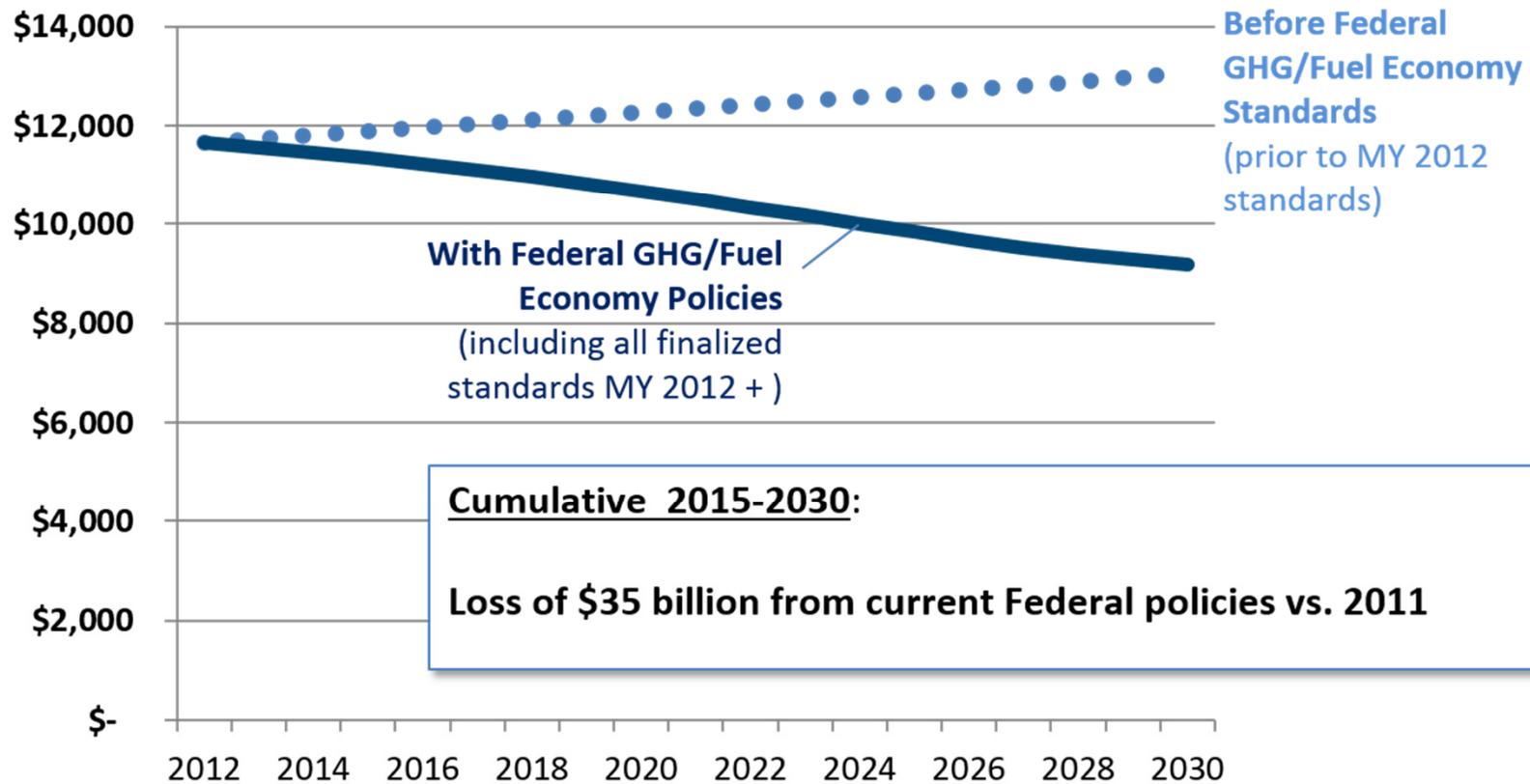


...But Will Not Put States on Track to Meet Long-Term Goals

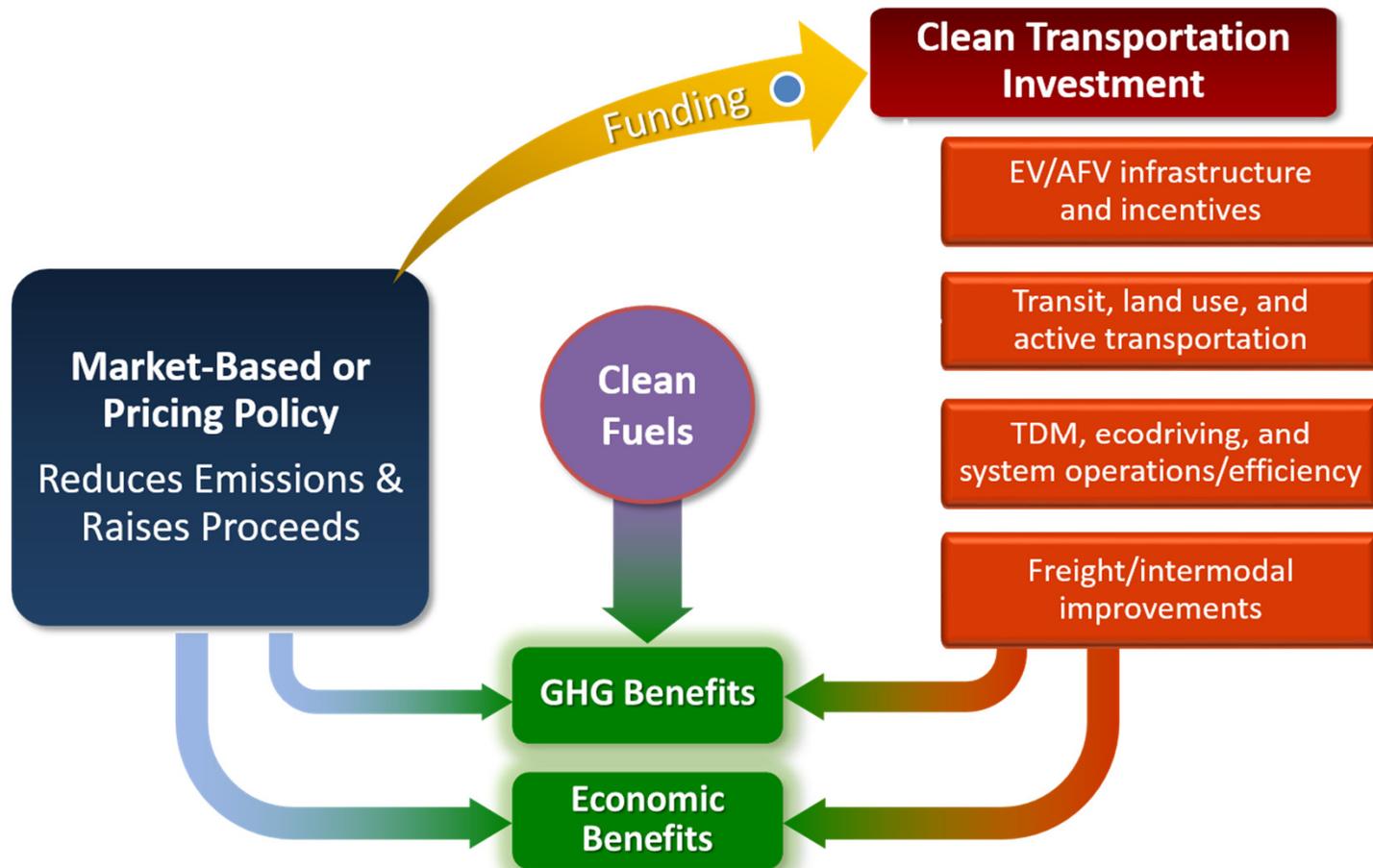


Existing Federal Policies will Reduce State Transportation Funding

TCI Region Federal + State Motor Fuel Tax Revenue (\$ millions)



“Policy Bundles” Analysis Combines Investment Scenarios with Market-Based & Fuels Policies

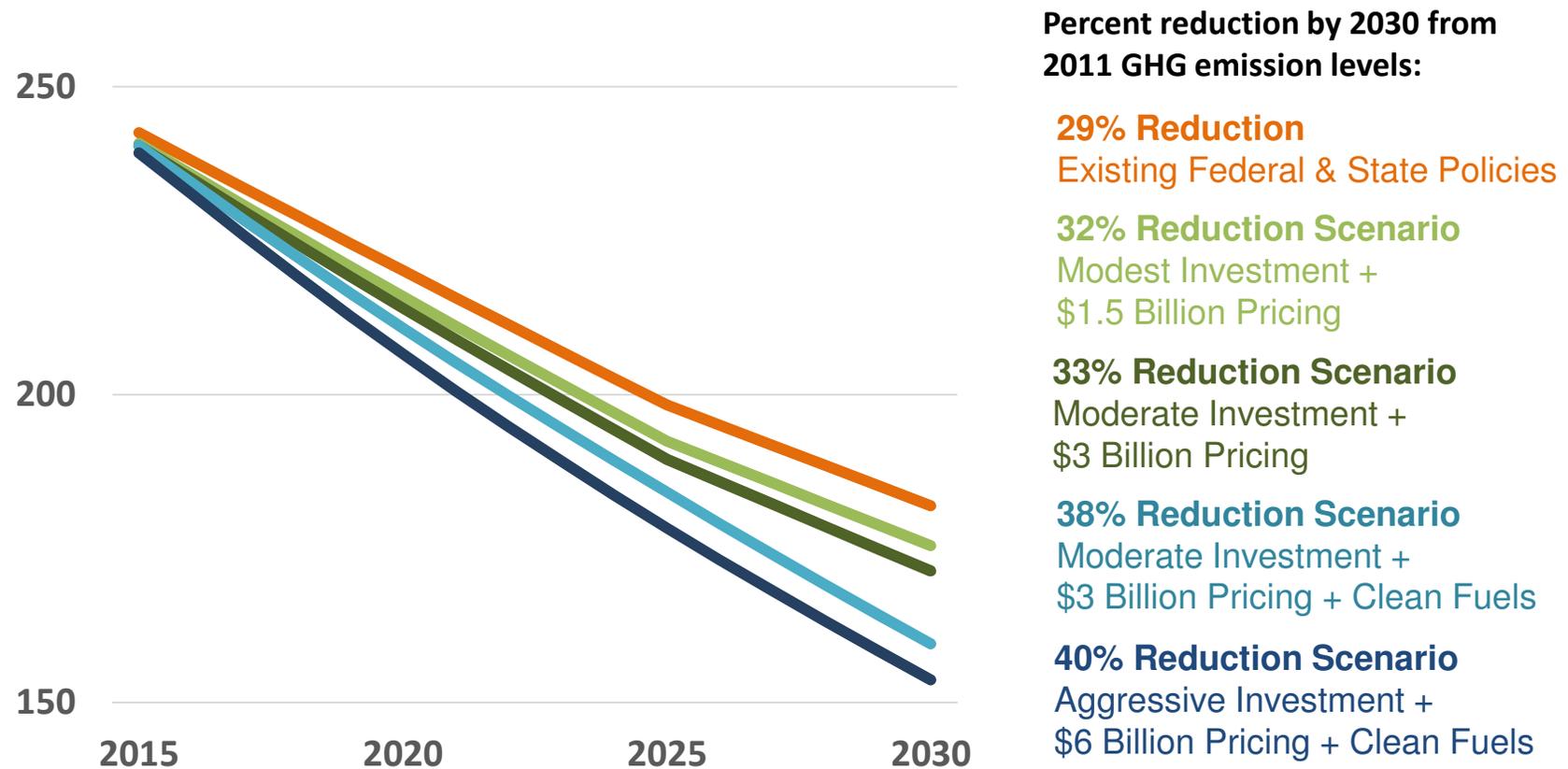


Analysis Modeled Three Clean Transportation Investment Scenarios

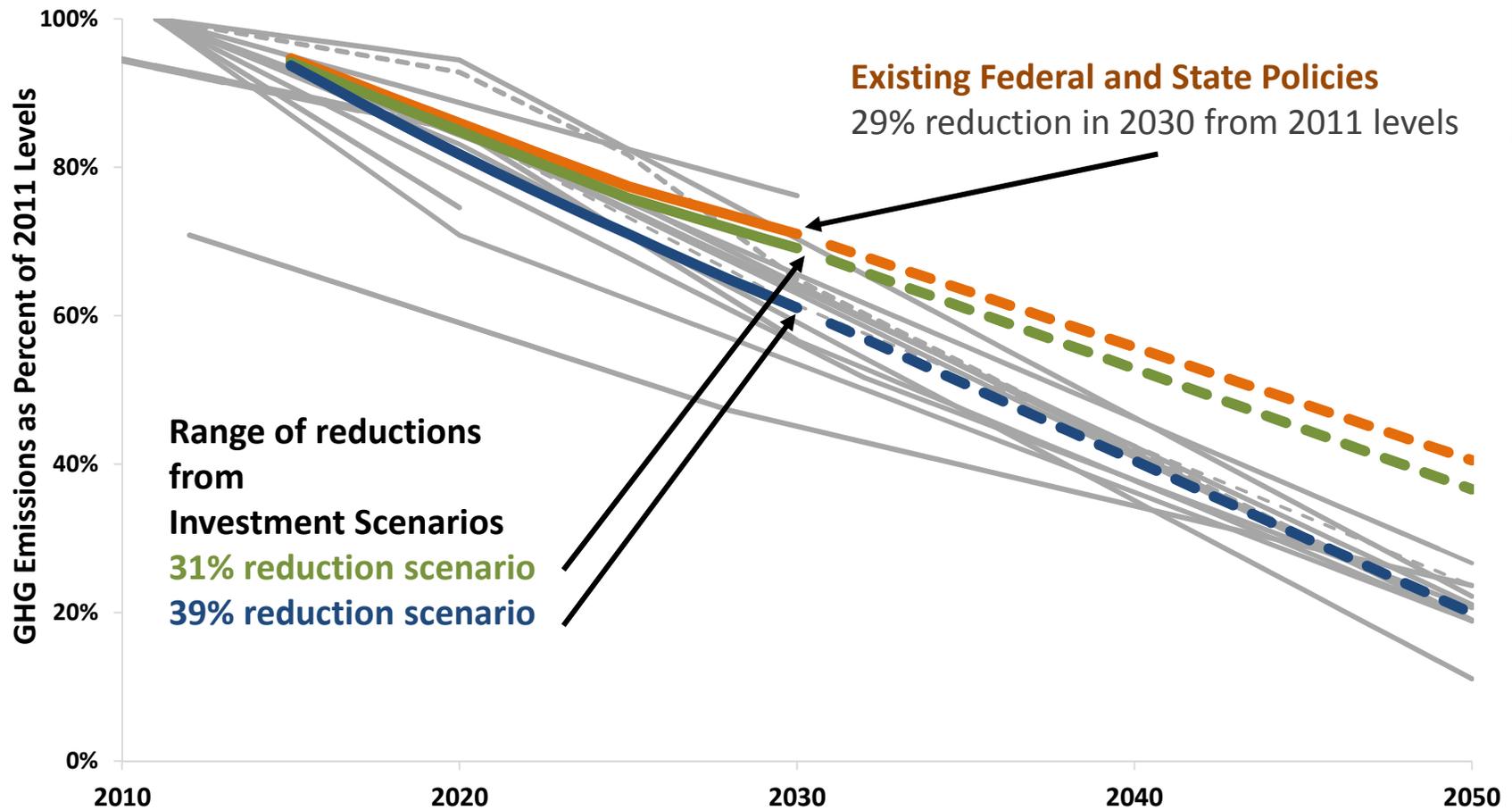
- **Modest Investment**
 - \$1.5 billion annual funding
- **Moderate Investment**
 - \$3 billion annual funding
- **Aggressive Investment**
 - \$6 billion annual funding

Investment Allocation Strategy	Allocation
EV /alt. fuel infrastructure and incentives	20%
Urban and intercity transit	25%
Land use / Smart growth	7.5%
Active transportation	7.5%
TDM and Ecodriving	10%
System operations / Efficiency	15%
Freight / Intermodal	15%
Total	100%

GHG Emission Reduction Potential from “Policy Bundles”

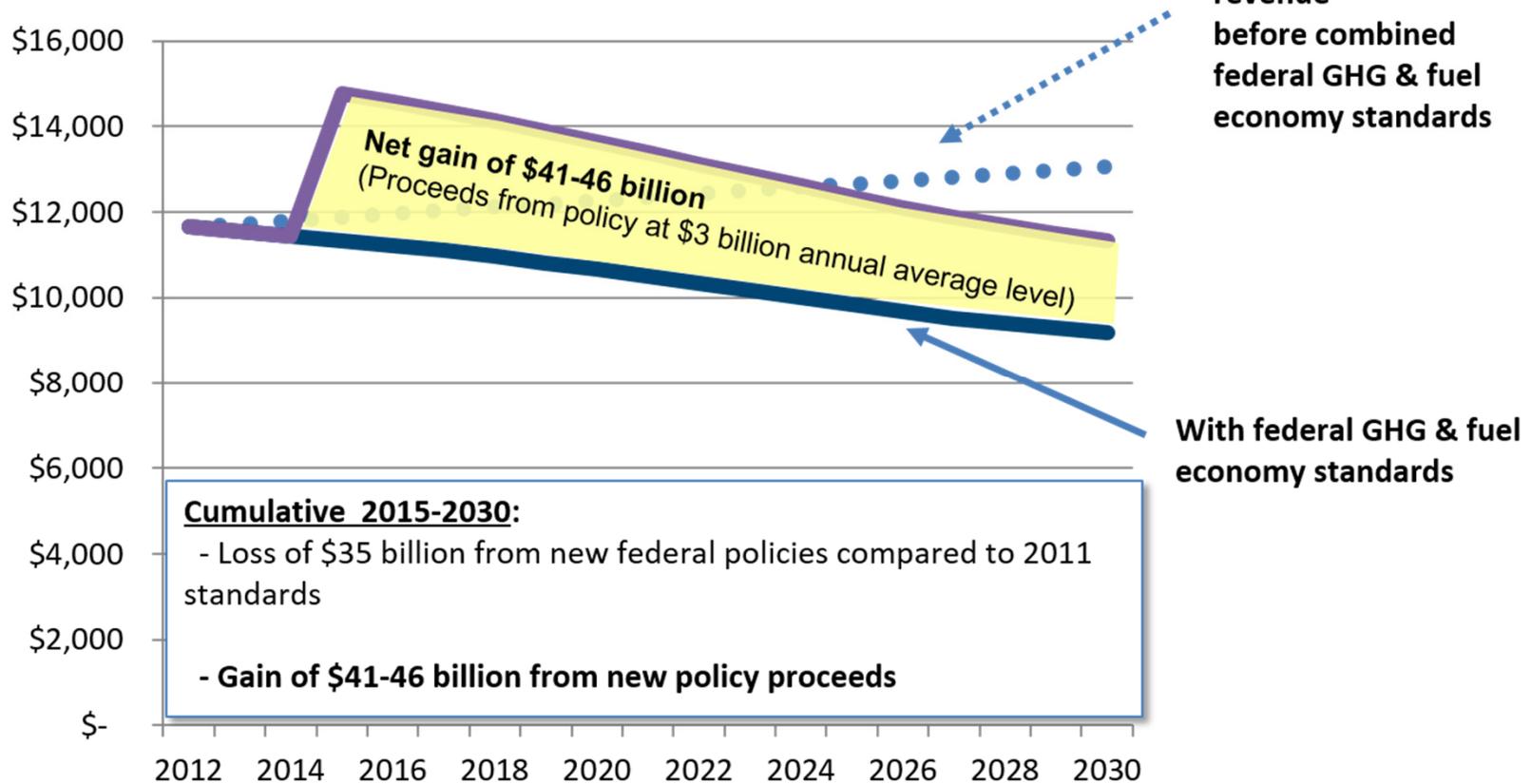


Resulting Reductions Would Help States Achieve 2050 Goals



Comprehensive Policy Proceeds Could be Used for Transportation

TCI Region Federal + State Motor Fuel Tax Revenue (\$ millions)



\$3 Billion Annual Regional Investment Projected to Provide Significant Benefits

Impact	2030	Cumulative 2015-2030
↑ in Regional Employment	91,000-125,000	794,000-1,167,000
↑ in Gross Regional Product	\$11.7-17.7 Billion	\$92-144 Billion
↑ in Disposable Personal Income	\$9.9-14.4 Billion	\$71-109 Billion

Range reflects low-end and high-end outcomes of four modeled scenarios

Businesses Save \$1.6 to \$3.2 Billion by 2030

Some costs increase:

Vehicle costs



Taxes, tolls, & fees



But are quickly offset by savings:

Reduced petroleum fuel spending



Reduced shipping transportation costs



Reduced costs from less congestion



Consumers similarly save \$284 million to \$1.2 billion by 2030

Reducing Carbon Pollution Creates Other Benefits

- **Reduce petroleum consumption 4-27% beyond existing policies and diversify transportation energy sources**
- **Reduce conventional pollution, preventing premature deaths and thousands of asthma cases**
 - Public health benefits valued at \$152-463 million in 2030
- **Travelers would spend less time in traffic**
- **Reduced vehicle travel would also result in fewer accidents, reduced wear on roads and bridges**

States' Announcement

- States are already experiencing climate change and will need to achieve significant reductions from all sectors of economy
- Since 2010, states have been working through TCI, which has become a successful partnership
- Georgetown report suggests substantial GHG reductions on the order of 29 to 40 percent from 2011 levels by 2030 may be feasible on a regional level and could bring economic benefits to our states
- ***Our states will work together through TCI to develop potential market-based policies that, when combined with existing programs, are targeted to achieve substantial reductions in transportation sector***

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