Connecticut Department of Energy and Environmental Protection

Connecticut Department of
ENERGY & ENVIRONMENTAL PROTECTION

Governor's Council on Climate Change

July 10, 2015

Connecticut Department of Energy and Environmental Protection

Governor's Council on Climate Change (GC3)

Executive Order 46 (April 22, 2015)

The Council Charge:

- Examine the efficacy of existing policies and regulations designed to reduce greenhouse gas emissions and identify new strategies to meet reduction targets
- Monitor greenhouse gas emission level in CT annually
- Recommend interim statewide greenhouse gas reduction targets to ensure meeting the 2050 target
- Recommend policies, regulations, or legislative actions to achieve targets
- Report findings to the Governor and the Office of Policy and Management

Connecticut climate change action & legislation

Connecticut Department of Energy and Environmental Protection

Connecticut climate action

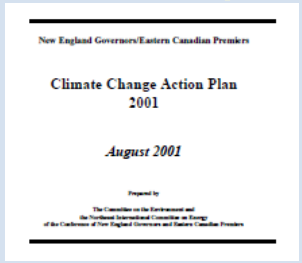
CT signs *NEG/ECP 2001 Climate Change Action Plan*

Creation of Governor's Steering Committee (GSC) on Climate Change

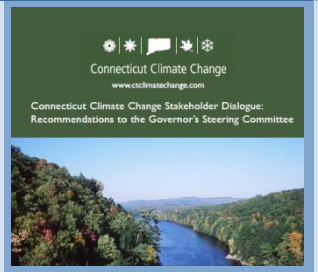
GSC finalizes *CT Climate Change Action Plan*

GSC Adaptation Subcommittee issues *Impacts of Climate Change on Connecticut Agriculture, Infrastructure, Natural Resources and Public Health*

NESCAUM publishes *CT Greenhouse Gas Emissions: Mitigation Options Overview and Reduction Estimates*

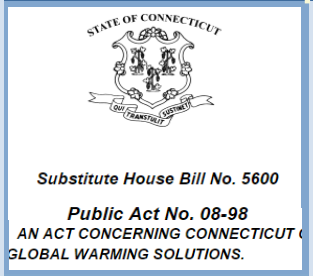


2001

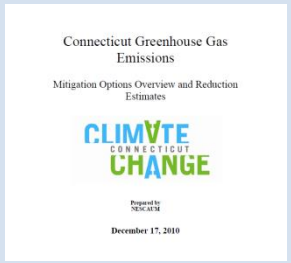


2004

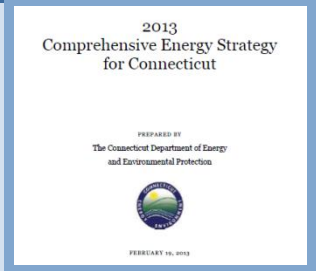
2005



2008



2010



2013

9-month stakeholder dialogue process develops *2004 Connecticut Stakeholder Recommendations*

An Act Concerning Climate Change (Public Act 04-252) sets GHG goals that align with NEG/ECP regional goals

CT Global Warming Solutions Act (Public Act 08-98) reaffirms commitment to GHG targets for 2020 and 2050

CT and other northeastern states participate in first auction of Regional Greenhouse Gas Initiative (RGGI), the nation's first carbon cap-and-trade program.

2013 Comprehensive Energy Strategy

Review timeline details

2008 Global Warming Solutions Act

Public Act No. 08-98

Reaffirmation of GHG reduction targets

- 10% below 1990 levels by 2020
- 80% below 2001 levels by 2050

Climate Action Planning

- Framework for monitoring and reporting progress to meet mandated targets
- Framework for engaging stakeholders

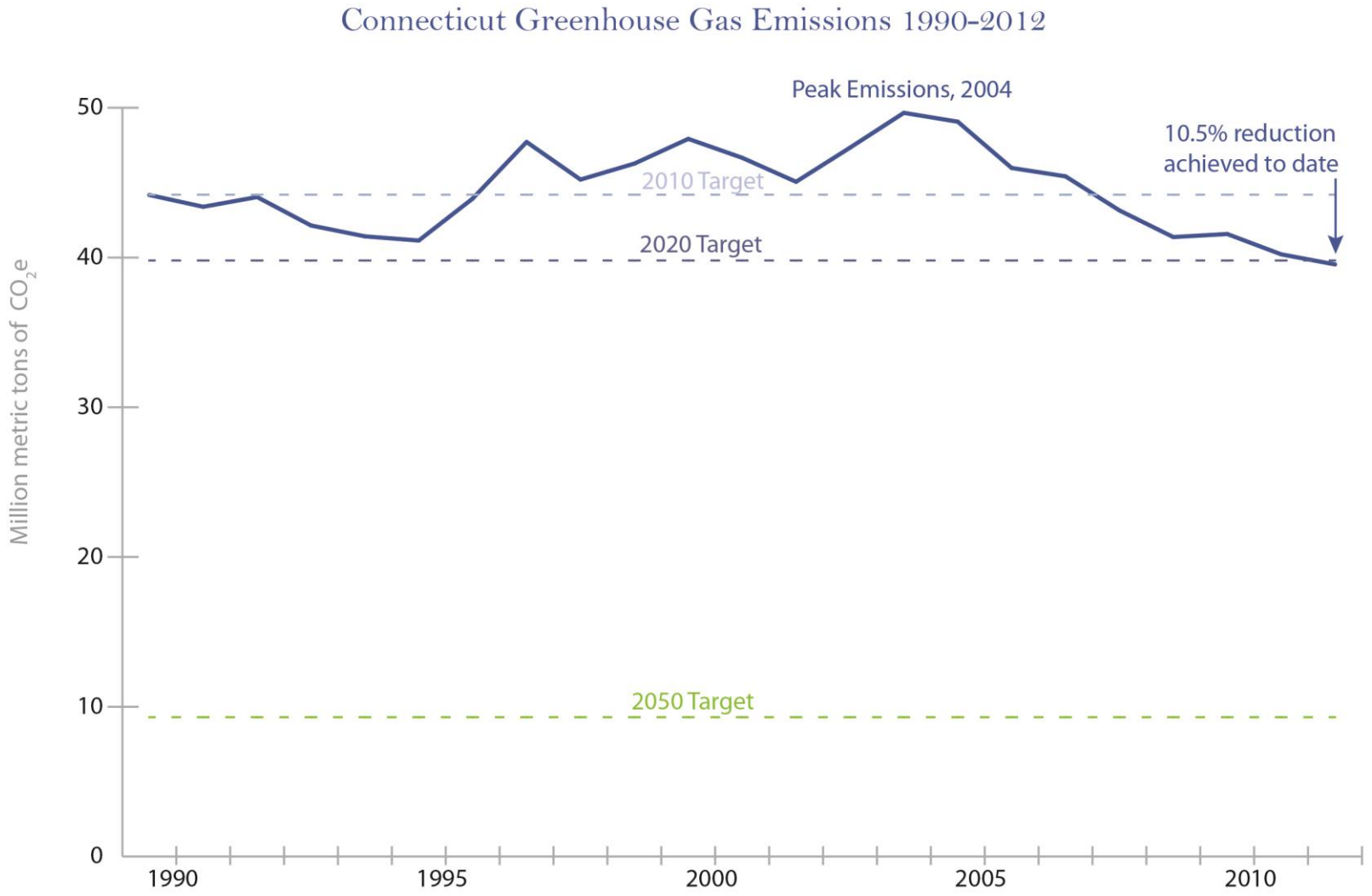
Regional Greenhouse Gas Emissions Inventory

- Implement CT's participation in **RGGI**, nation's first market-based regulatory program to reduce GHG emissions

An Act Concerning Connecticut Global Warming Solutions Public Act No. 08-98

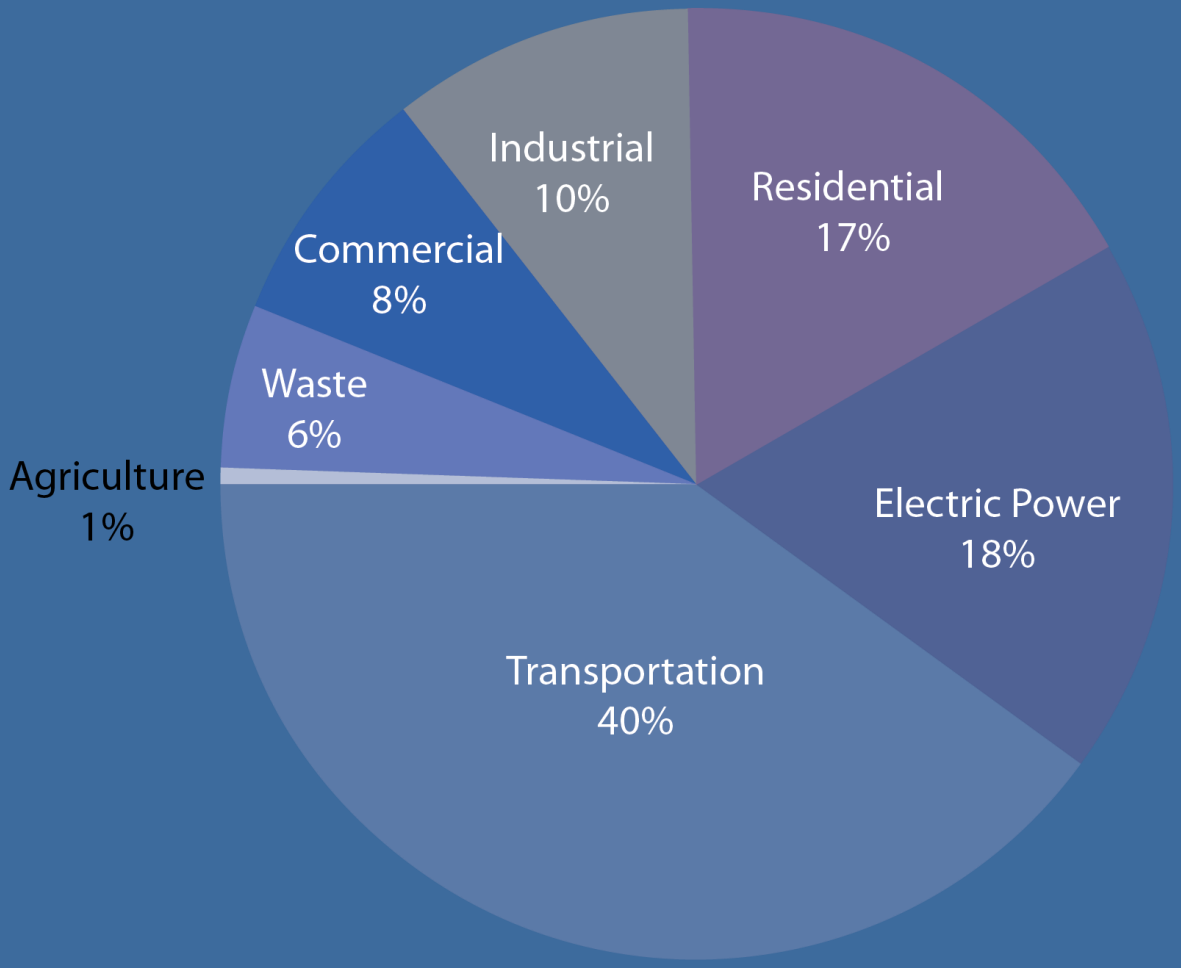
Greenhouse gas emissions — Goals & current progress

Connecticut Department of Energy and Environmental Protection

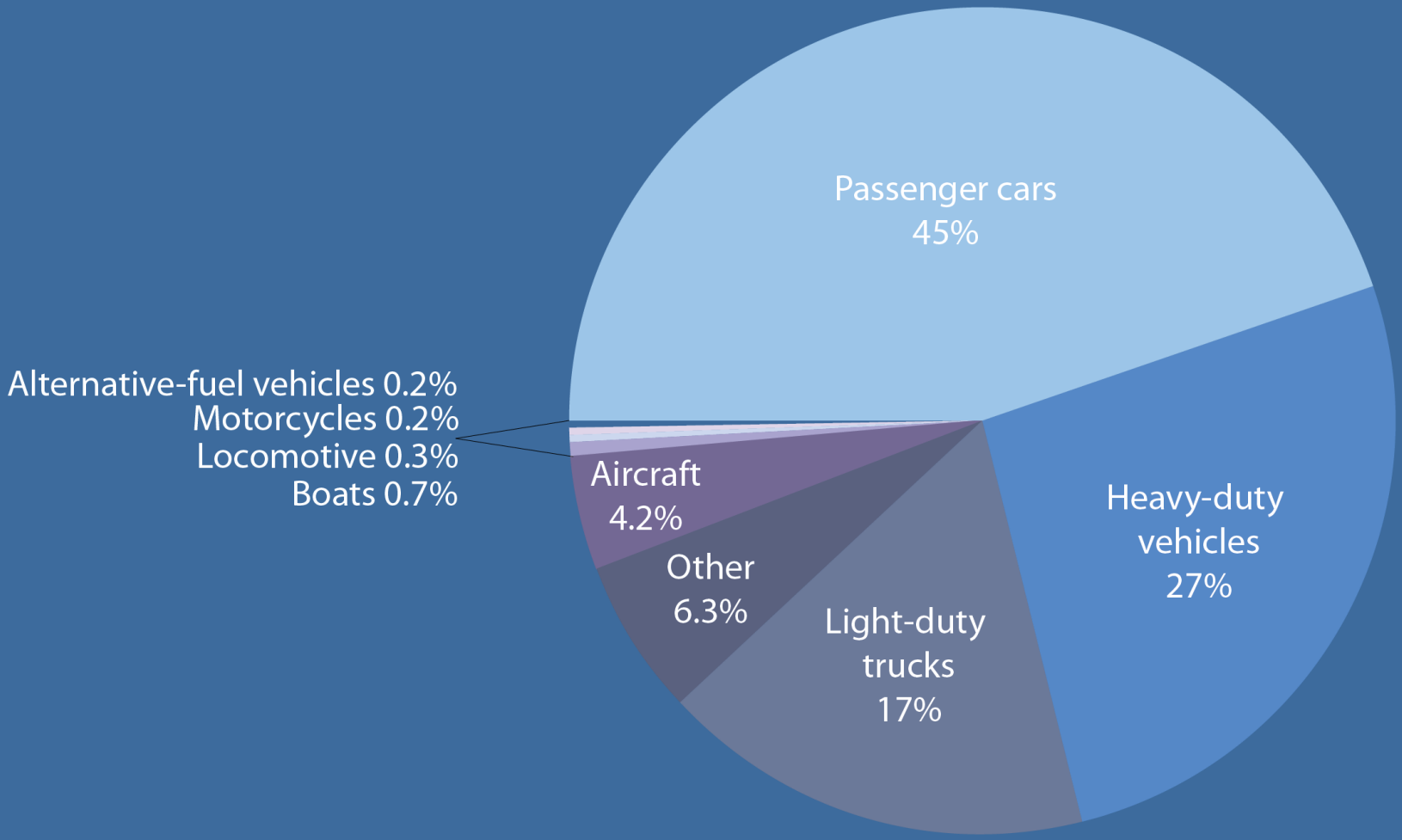


Statewide, Connecticut achieved a 10.5 percent reduction in greenhouse gas emissions between 1990 and 2012.

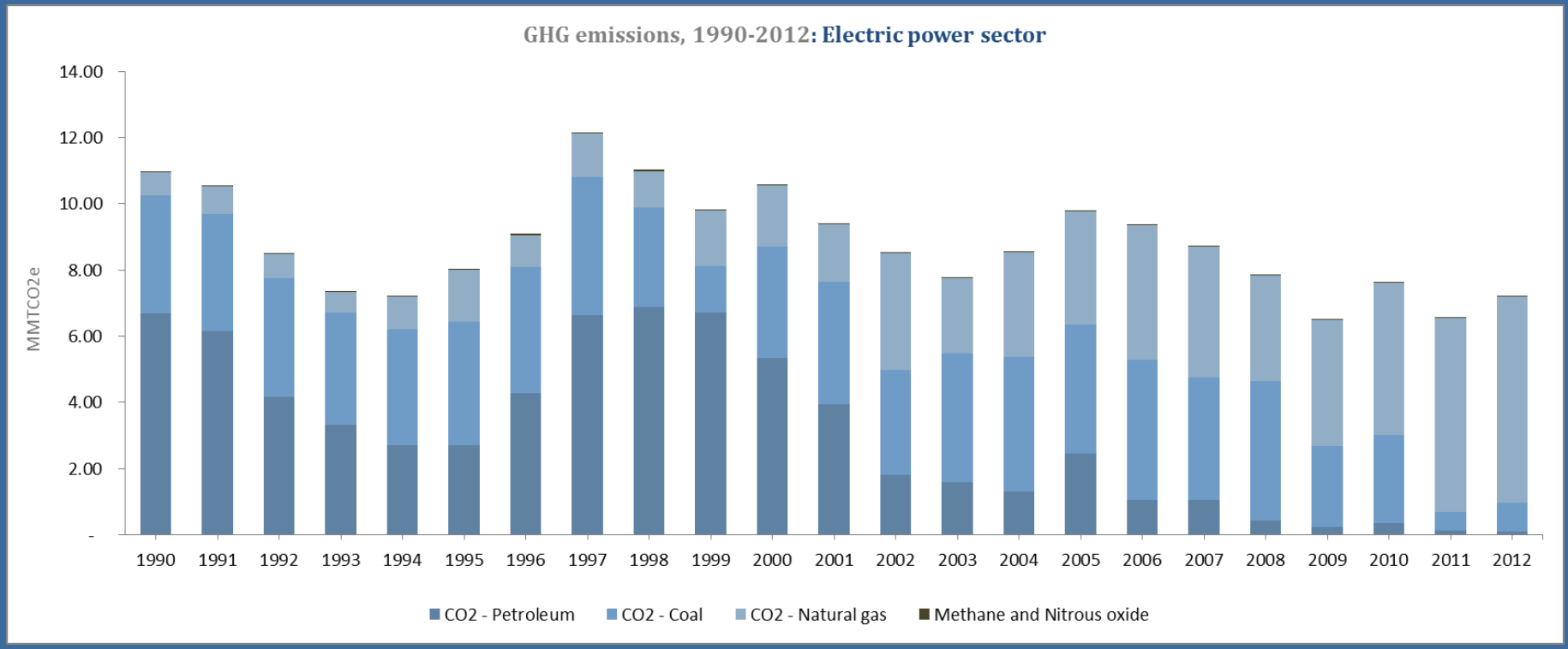
Distribution of greenhouse gas emissions by sector, 2012

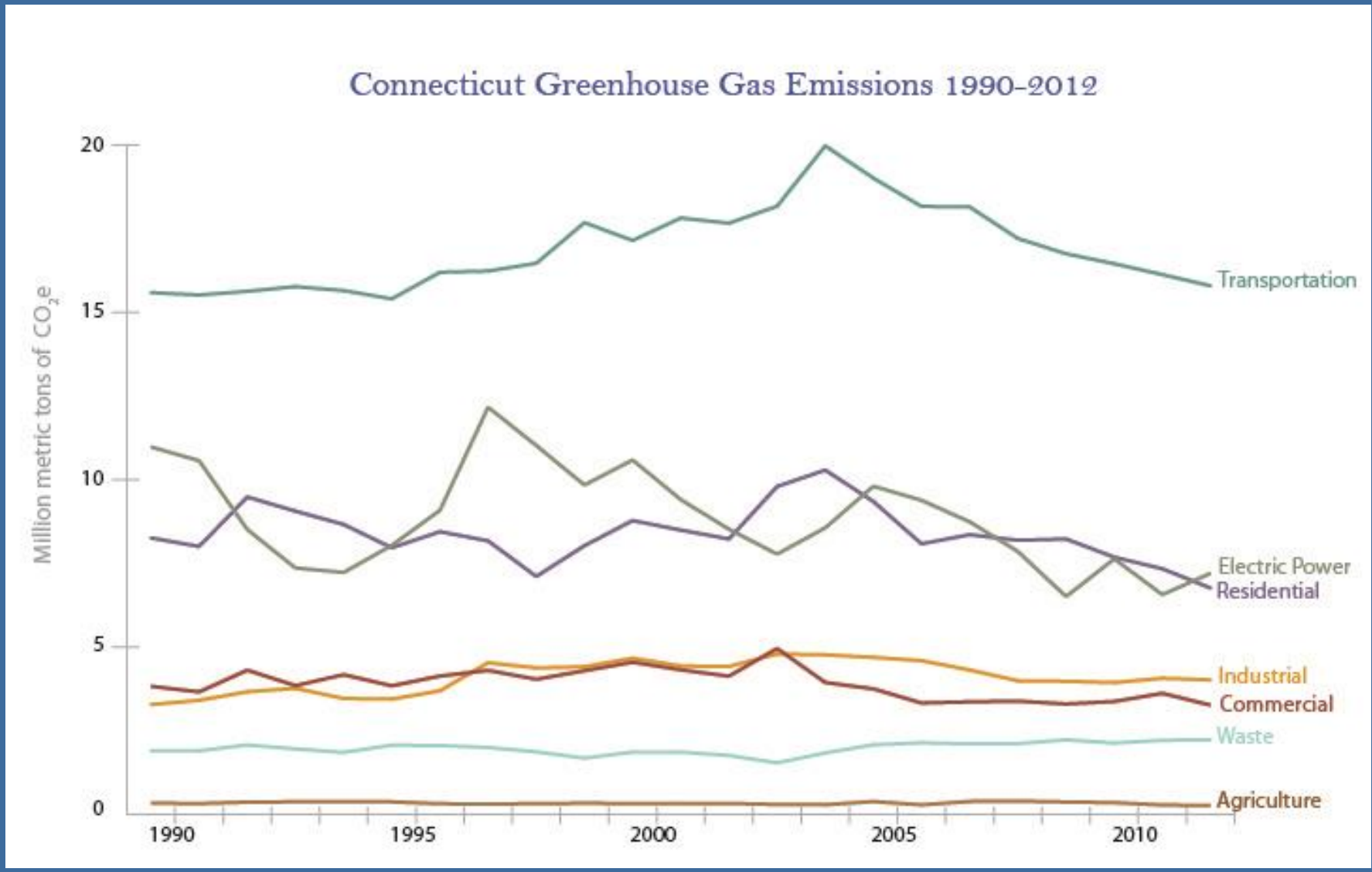


2012 GHG emissions: Transportation

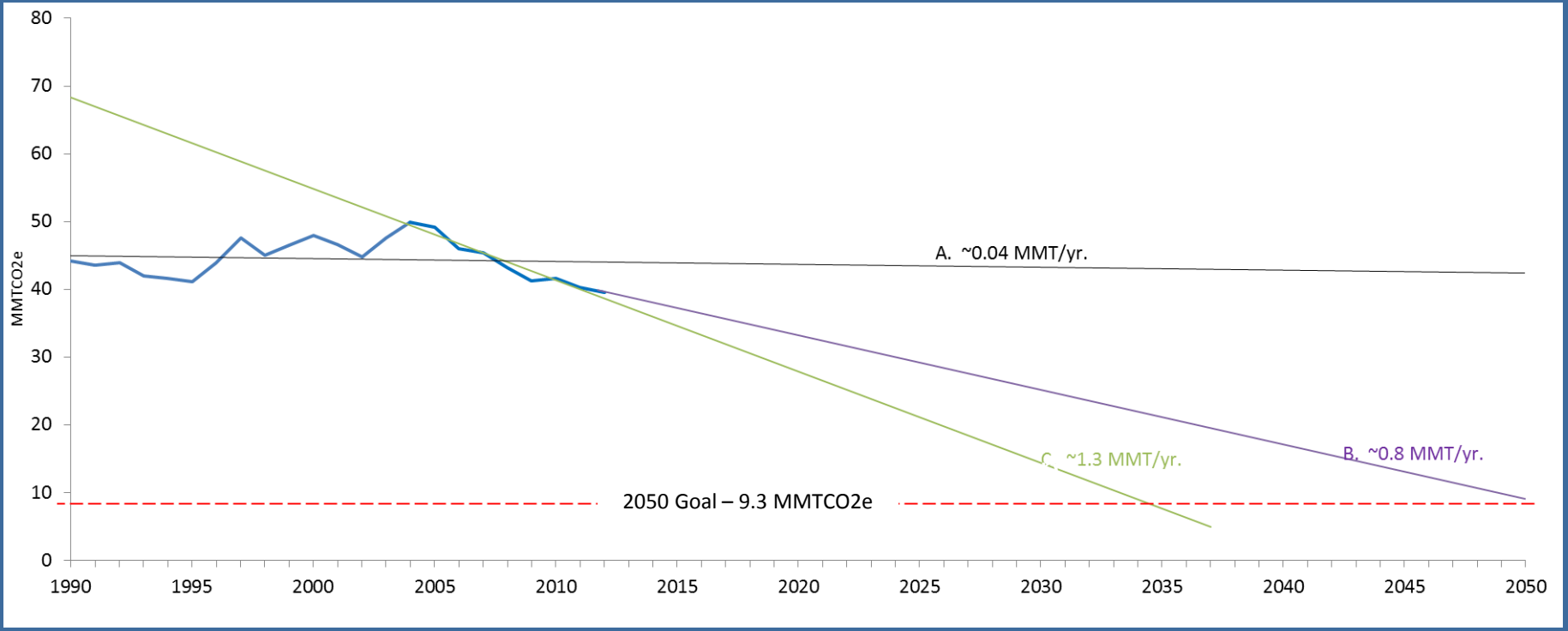


GHG emissions over time: Electric power




Connecticut Greenhouse Gas Emissions 1990-2012
Million metric tons of CO_2e
20
15
10
5
0
1990
1995
2000
2005
2010
Transportation
Electric Power
Residential
Industrial
Commercial
Waste
Agriculture

GHG reduction pathways



A. Maintaining 1990 and 2012 average annual reduction (~.04 MMT/year) until 2050 would fail to meet 2050 target of 9.3 MMT

B. Linear reduction from 2012 to 2050 goal would require average reduction of ~0.8 MMT/year

C. Between 2004, when emissions peaked, and 2012 emissions decreased at rate of ~1.3 MMT/year; maintaining this linear rate of reduction would achieve the 2050 target of 9.3 MMT by ~2034

State & regional strategies beyond 2020

Northeast States for Coordinated Air Use Management (NESCAUM)

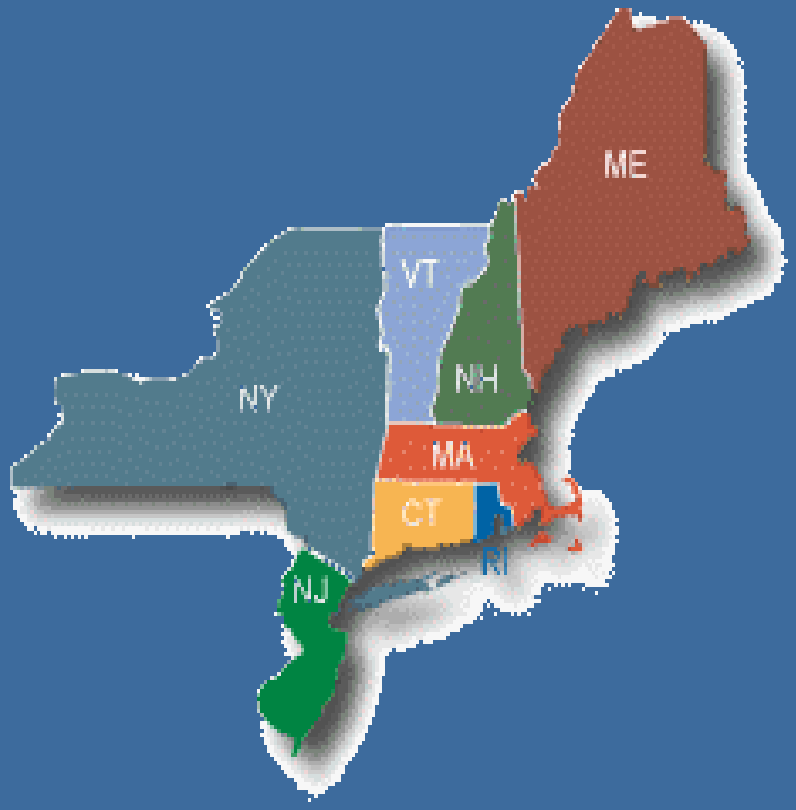
Connecticut Department of Energy and Environmental Protection

The Northeast States for Coordinated Air Use Management (NESCAUM)

The NESCAUM states are:

ME, NH, VT, MA, RI, CT, NY and NJ

The NESCAUM directors are the 8 state air agency chiefs



Climate change planning
Context and background

- State level – Climate planning processes on-going in neighboring states:
  - Massachusetts
  - Rhode Island
- Regional level – NEG/ECP investigating a 2030 GHG progress marker toward 2050 goal
- There is interest in using consistent analytical methods across state & regional planning efforts

NESCAUM support for climate planning

Connecticut

- NESCAUM was prime contractor during development of CT's Comprehensive Energy Strategy
  - Baseline data collection of CT energy use and GHG emissions
  - Assessment of opportunities and barriers for taking actions in line with State's energy and climate plans
  - Identification of sector-specific energy strategies capable of meeting multiple State goals

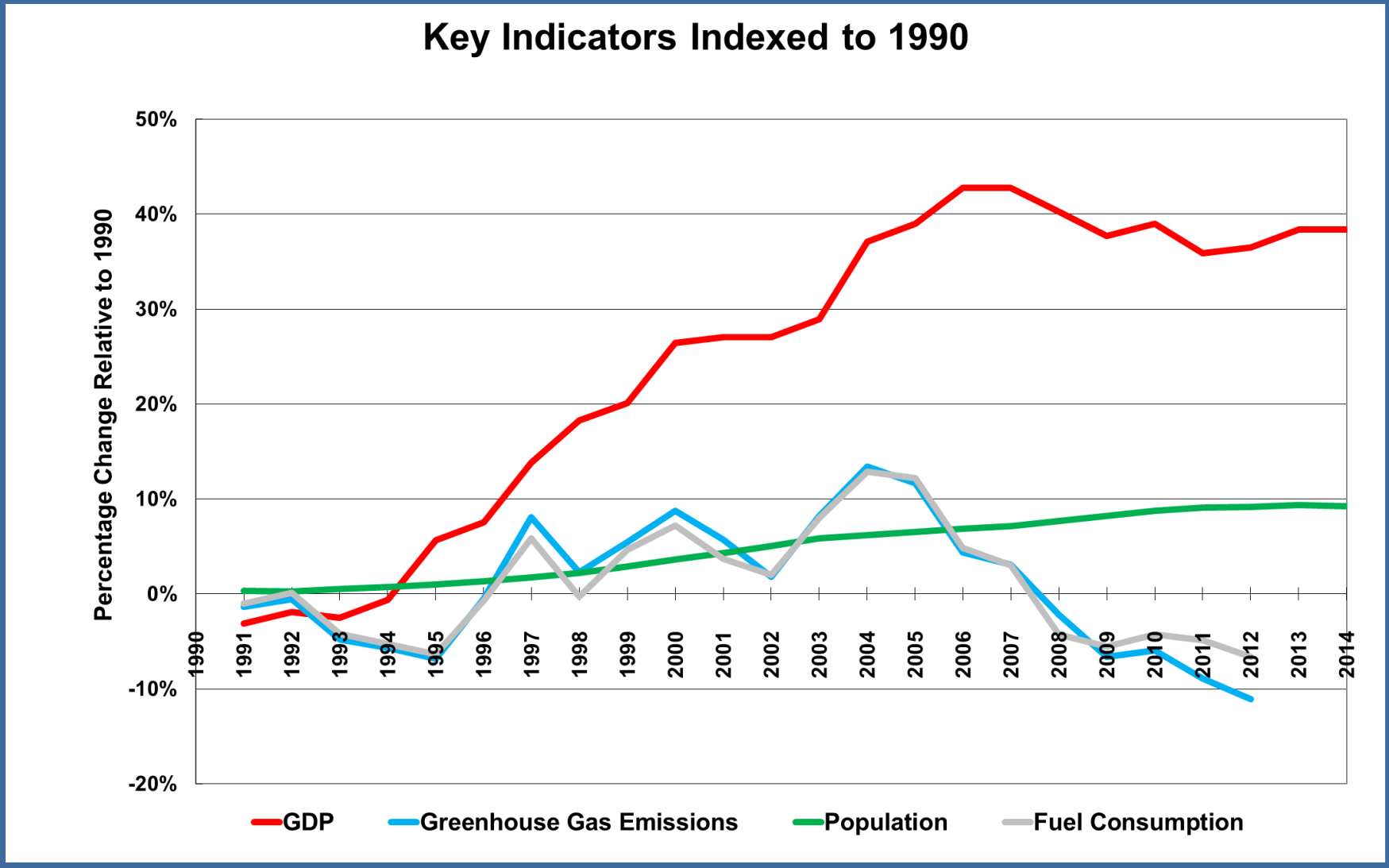
Massachusetts

- Analytical support for evaluating progress toward State's climate goals

NEG/ECP

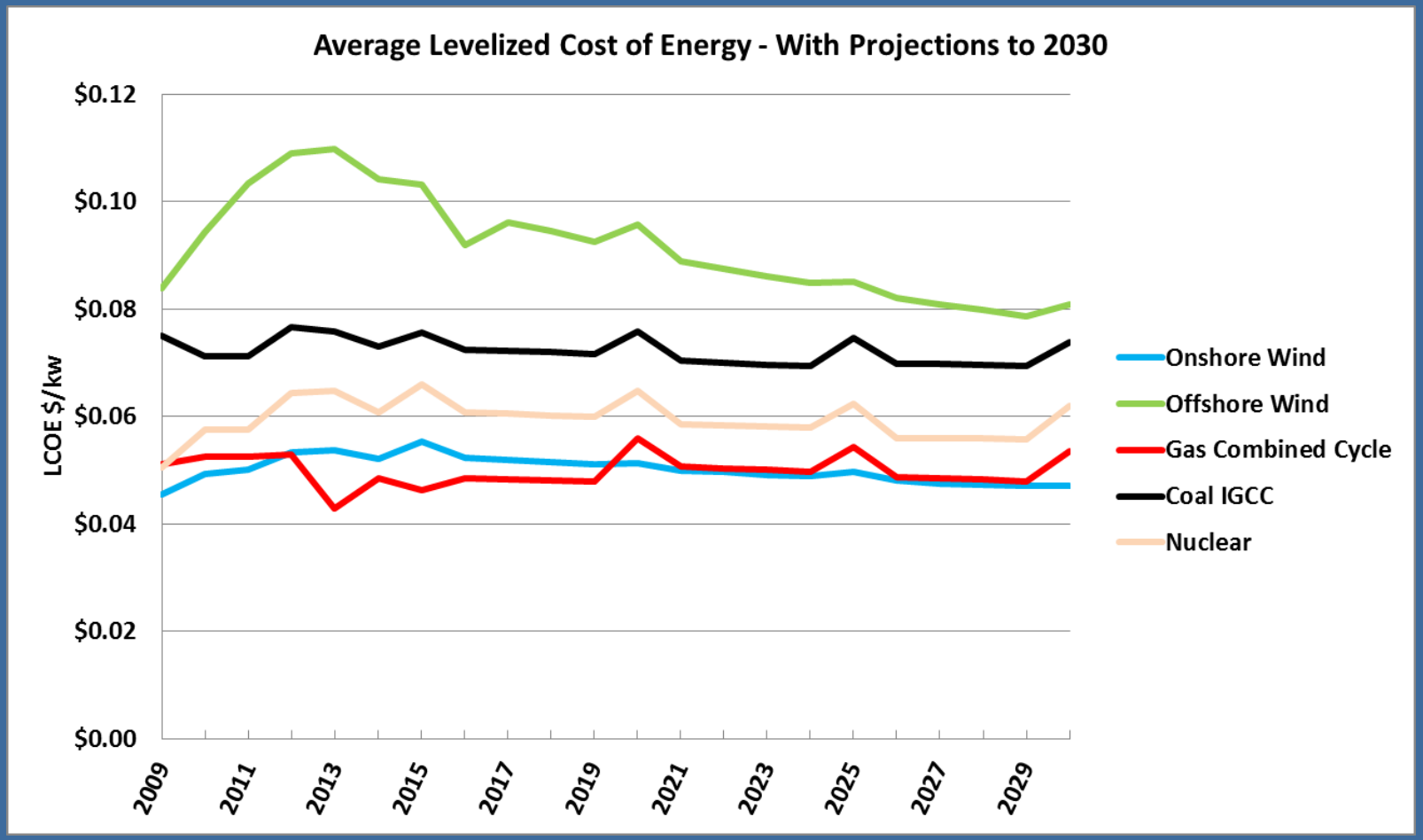
- Regional "wedges" analysis of climate mitigation options
- Analytical support in evaluating mid-term regional GHG progress marker

Climate change mitigation and economic growth in Connecticut



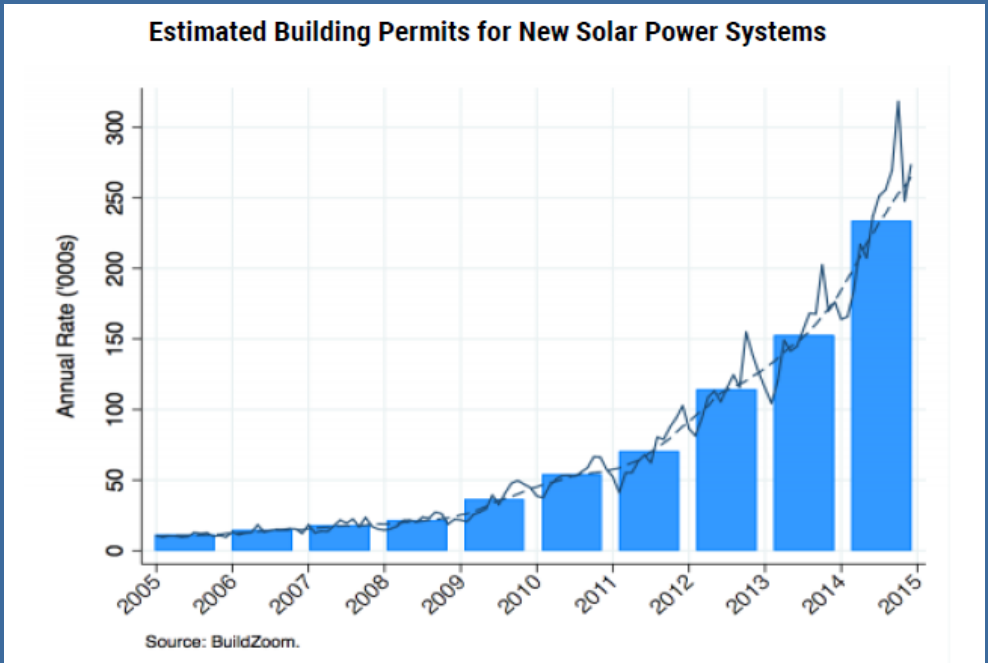
Examples of cost-competitive technologies for the future

Onshore wind is already cost-competitive with natural gas

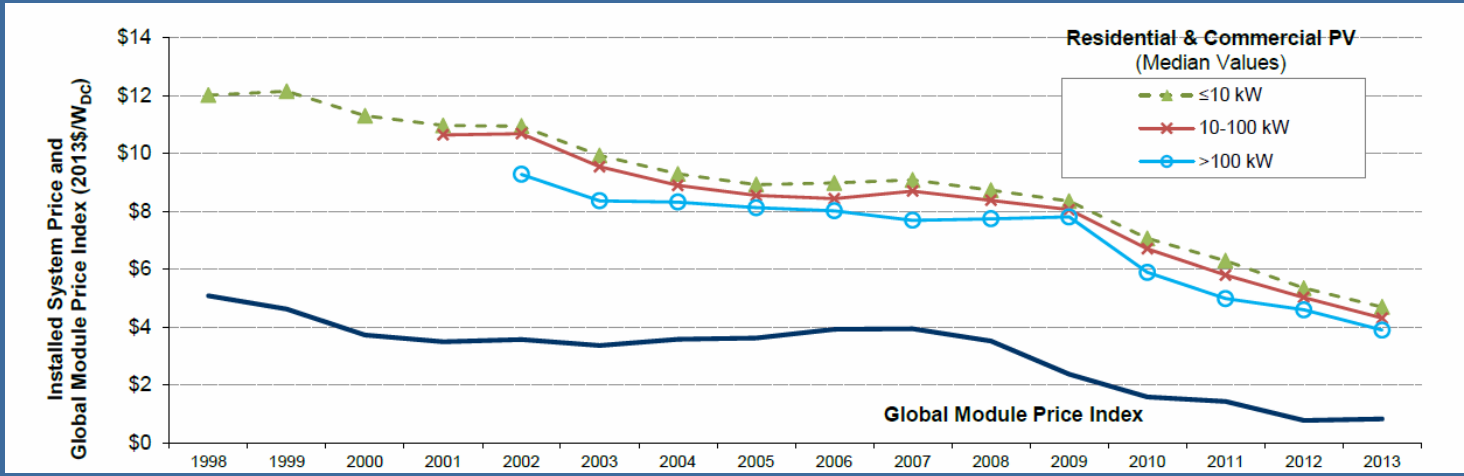


Source: Open Energy Information; Transparent Cost Database

Solar PV installations are growing as costs decline



Reported installed prices of residential and commercial PV systems over time



Electric vehicles are becoming a viable option

In one generation (2012-2017), affordable full-battery electric vehicles will have increased range by about 2.5x while holding costs consistent

2012 Nissan Leaf: $35,200 / 84 Miles
(*2012 MSRP*)

2017 Chevrolet Bolt: $37,500 / 200 Miles
(projected MSRP)

GM Press Release: "Chevrolet Commits to Bolt EV Production"

2017 Tesla Model 3: $35,000 / 200 Miles
(projected MSRP)

Green Car Reports: "Tesla Model 3: Revealed Next Year, Production Starts 2017, Company Confirms."

Visualizing GHG pathways — linear vs. non-linear options

GHG wedges tool — Example 1

Uniform 10% reduction in energy consumption across all sectors

Transportation

0 0.1 0.8

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8

Residential

0 0.1 0.8

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8

Industrial

0 0.1 0.8

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8

Electricity

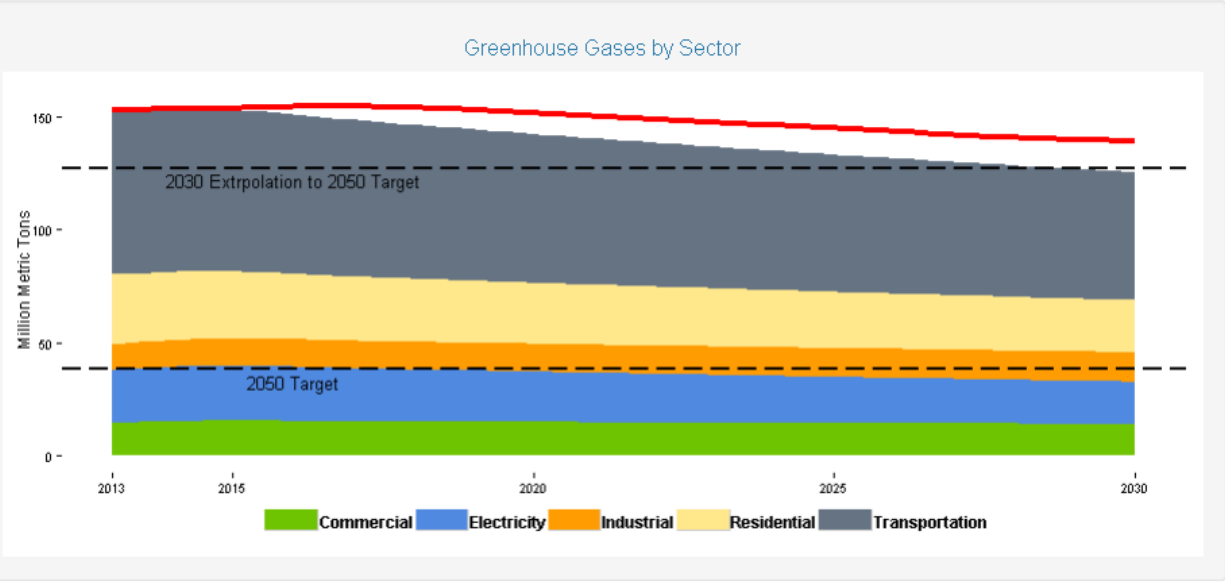
0 0.1 0.8

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8

Commercial

0 0.1 0.8

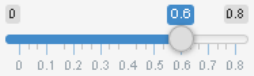
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8



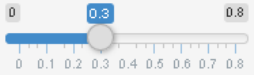
GHG Wedges Tool Example 2

Varying reductions in energy consumption across all sectors

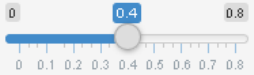
Transportation



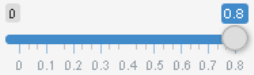
Residential



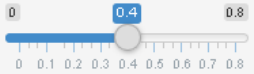
Industrial



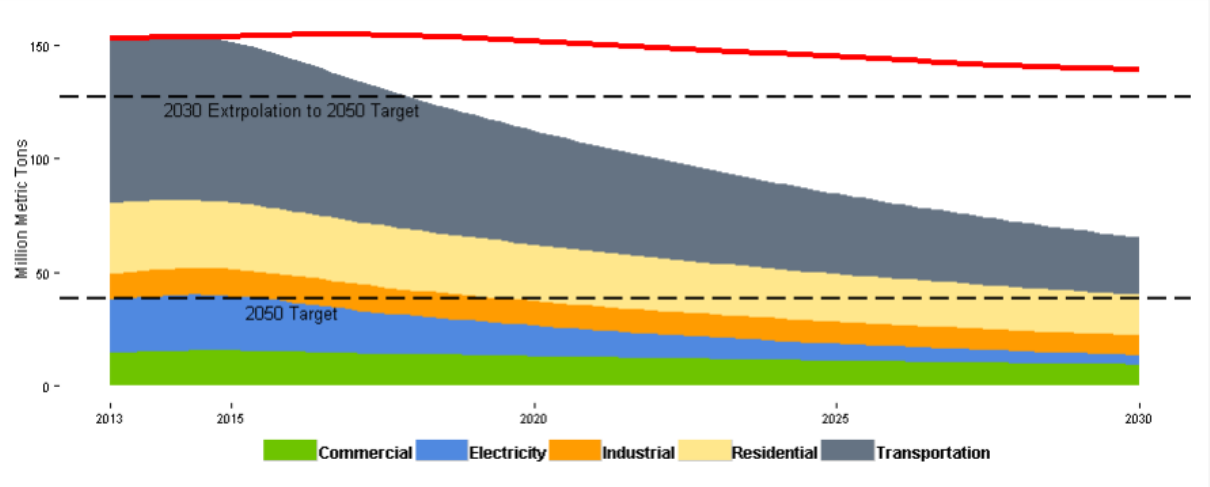
Electricity



Commercial



Greenhouse Gases by Sector



GC3 guiding principles and organization

Connecticut Department of Energy and Environmental Protection

Guiding Principles

Governor's Council on Climate Change

Commitment to Analysis

Use technical expertise and analytical rigor to inform the GC3's policy deliberations and recommendations.

Commitment to Leadership

Cultivate climate leadership in state government, in the business community, in non-governmental organizations, and in municipal government.

Commitment to Accountability

Assure the effectiveness of climate programs by monitoring progress, proposing course corrections as needed, engaging stakeholders, and making the GC3's deliberations transparent.

Informed by the executive order, three overarching principles will serve as lenses for Council's deliberations and outcomes

The Council will be guided by commitment to analytical rigor, accountability, and transparency while also cultivating climate leadership among all stakeholder groups

Council reports

The following reports will be submitted to the Governor and Office of Policy and Management in accordance with Connecticut General Statutes 22a-200a

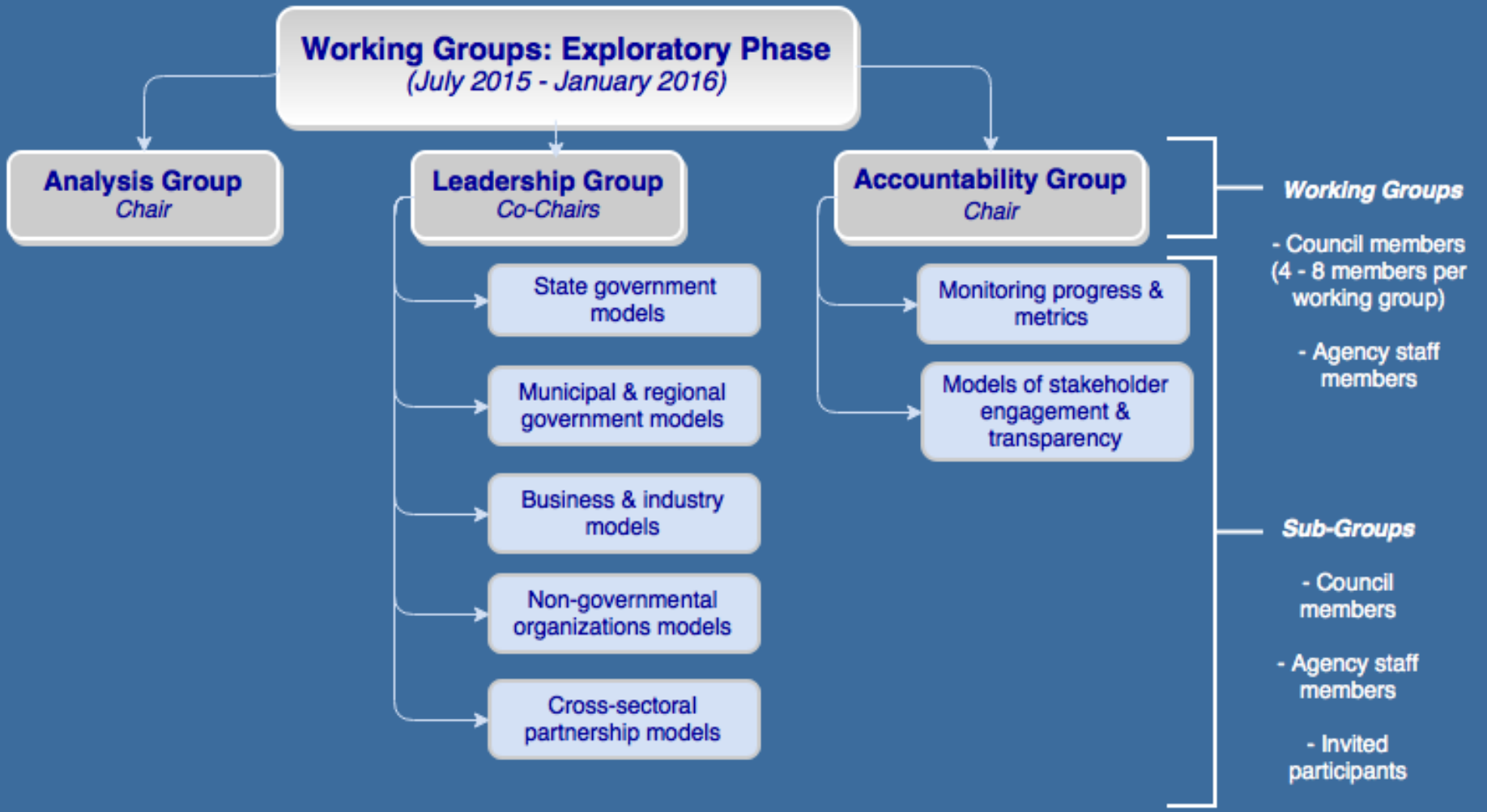
Exploratory report *(Dec. 31, 2015)*

- Summary of GC3 activities to date
- Recommendation for deeper analysis of GHG reduction measures
- Recommended models of leadership & accountability
- Scope & process for 2016

Final report *(2016)*

- 2013 GHG inventory
- Completed modeling (GHG reductions and economics)
- Recommendation for interim targets
- Recommendation for specific reduction measures plus leadership and accountability models
- Scope & process for subsequent reports

Structure of working groups



Examples of climate action — Accountability

CalEPA's GHG Reduction Report Card

Annual public report card to measure progress toward achieving GHG reduction goals.

State Agency Greenhouse Gas Reduction Report Card: Table 1

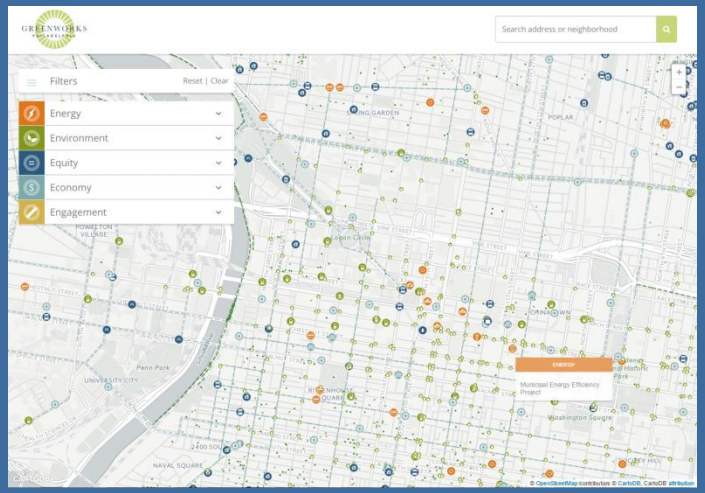
California Air Resources Board Program Title	Description of Measures	Emission Reductions, $MMTCO_2e$ 2011	2012
Goods Movement (Drayage Trucks)	This regulation requires the reduction of GHG, diesel particulate matter (PM), and oxides of nitrogen (NOx) emissions from drayage trucks operating at, or transporting cargos to or from, California's ports and intermodal rail yards through retrofits, and fleet turnover of pre-1994 trucks. Staff estimates 100,000 $MTCO_2e$ reductions in 2011 based on difference in fuel economy between pre-1994 and newer engines, and the engine population published in ARB 2007 staff report.	0.1	0.1
Ship Electrification	This regulation requires most container, passenger, and refrigerated cargo ships to shut off their auxiliary engines while at dock and receive power from the electrical grid, or reduce their emissions by a similar amount via the implementation of other technologies. Staff estimates 18,000 $MTCO_2e$ reductions in 2012.	<0.1	<0.1
Reduction of Refrigerant Emissions from Non-Professional Services	This regulation requires a self-sealing valve on small cans of refrigerant, and a deposit and recycling program for the cans.	0.3	0.3
High Global Warming Potential GHG Reduction in Semiconductor Operations	This regulation requires semiconductor operations to use process optimization, alternative chemistries, and abatement technologies in combination or separately to reduce GHGs. The emission standards apply to semiconductor operations that emit more than 0.0008 $MMTCO_2e$ per year. Reduction of GHG emissions from this measure began in 2012.	**	0.2
Global Warming Potential Use in Consumer Products	This regulation sets Global Warming Potential (GWP) limits for compounds used in specific consumer products.	0.2	0.2

Federal agency priority goals

Agency action on climate change is one of seven Cross-Agency priority goals for the federal government. Cross agency priority goals address the longstanding challenge of tackling horizontal problems across vertical organizational silos.

Equity Work Group, Portland, OR

As a part of the city's climate action planning process an Equity Work Group has been tasked with reviewing proposed climate actions to identify potential impacts (positive and negative) for communities of color, low-income populations and other marginalized groups.



GreenWorks Philadelphia

Interactive map to highlight sustainability initiatives implemented by the City of Philadelphia and its partners to meet the city's GHG reduction targets.

Examples of climate action — Leadership

Evergreen Jobs Leadership Team, WA
A leadership team was created to take on the responsibility of fulfilling the goals of the WA Evergreen Jobs Act, which required that 15,000 new green jobs be created by 2020.

CT Lead by Example — Energy Efficiency for State and Local Government
Lead By Example program (LBE) will reduce energy use in Connecticut's State and local government buildings and operations.

Sustainable Transportation for a Sustainable Future, Salt Lake City, UT
Multi-stakeholder coalition and outreach campaign to reduce motor vehicle emissions through alternative transit choices.

Boston Green Ribbon Commission
The Boston Green Ribbon Commission is a group of business, institutional and civic leaders in Boston working to develop shared strategies for fighting climate change in coordination with the city's Climate Action Plan.

Working Group: Example

Working group

Leadership Working Group

- Co-chairs
- Other council members and staff

Sub-group

State Government Models Sub-Group

Examine state GHG reduction report card models

- Council member 1, 2, 3, etc.
- Agency support staff 1, 2, 3, etc.
- Invited participant(s)

GC3 exploratory phase timeline (2015)

2015 — July — August — September — October — November — December

GC3 Meetings

- **July 10, 1 - 4 pm**
- **September 15, 2 - 4 pm**
- **November 13, 2 - 4 pm**
- **December 16, 2 - 4 pm**

Analysis Working Group

- Identify chair & members
- Launch first meeting
- Review preliminary GHG reduction strategy selections
- Review strategy evaluations
- Present recommendations

Analysis Working Group meetings – schedule determined by Chair

Leadership Working Group

- Identify chairs & members
- Launch first meeting
- Provide Leadership Working Group update
- Review leadership models
- Present recommendations

Accountability Working Group meetings – schedule determined by Chairs

Accountability Working Group

- Identify chair and members
- Launch first meeting
- Provide Accountability Working Group update
- Review accountability models
- Present recommendations

Accountability Working Group meetings – schedule determined by Chair

2015 GC3 meeting dates

September 15	2:00 – 4:00 p.m.
November 13	2:00 – 4:00 p.m.
December 16	2:00 – 4:00 p.m.