# Meeting of the Governor's Council on Climate Change (GC3)

October 19, 2016

Connecticut Department of Energy and Environmental Protection

# Agenda

| | |
|---|---|
| **1:30** | Welcome and Announcements<br>*DEEP Commissioner Klee* |
| **1:35** | GC3 Milestones and Timeline<br>*Keri Enright-Kato, CT DEEP* |
| **1:50** | Overview of Let's Go CT Initiatives: Impacts Vehicle Miles Traveled<br>*Tom Maziarz, Department of Transportation* |
| **2:15** | Energy Efficiency Scenario – A Look at Implementing Deeper Energy Efficiency Measures<br>*Julia Dumaine, CT DEEP and Jason Rudokas, NESCAUM* |
| **3:00** | Public Comments |

# GC3 Milestones and Timeline

# GC3 Milestones: 2015-2016

Over **25** DEEP speaking engagements in which the work of the GC3 was highlighted.

**18** meetings to date (GC3, LAE & ADM working groups)

**3** Public Stakeholder Engagement Events – reaching approximately **500** people.

**24** webinars in our Exploring Climate Solutions Series – with over **700** participant views.

March 2015 release of the **GC3 Exploratory Report**

Development of **reference case** (includes the review of reference case inputs and assumptions)

**July 10, 2015 GC3 launch**

# Timeline: 2016-2017

| Task | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. |
|---|---|---|---|---|---|---|---|
| Refine and finalize GHG reduction scenarios in LEAP. | | | | | | | |
| Economic Analysis of Scenarios (REMI). | | | | | | | |
| Review and discuss midterm target(s) and policy options for achieving GHG reduction targets. | | | | | | | |
| Develop a policy narrative around GHG mitigation scenarios. | | | | | | | |

## Upcoming Meetings:

GC3 Meeting November 14, 2016 3:00 – 5:00 PM
GC3 Meeting December 15, 2016 1:30 – 3:30 PM

# Overview of Let's Go CT Initiatives: Impacts Vehicle Miles Traveled

Connecticut Department of Energy and Environmental Protection

# Connecticut's Vision & Strategy for a Transportation Future

- ***Vision & Strategy***
- ***$100 billion*** capital program
- ***Overview of full program***,
  - focus on ***NY – New Haven*** corridor for illustration

**Governor's Climate Change Council**
**October 19, 2016**

# *'Best in Class'*

*transportation system vision*

- **Multimodal:** must offer choices and connectivity among modes
- **Safe:** safety must top priority on all modes
- **Good Repair:** priority must be to fix what we already have
- **Congestion:** problem must be addressed.
- **Environment:** must be protected.
- **Livable & sustainable communities:** transportation must support livable & resilient communities
- ***Economic Growth*:** transportation must support economic growth

# $100 billion capital cost

*What's included? How did we develop it?*

**Statewide assessment** of infrastructure preservation needs

**Preservation** (State of Good Repair) = **2/3rds**

*(Expansion or Enhancement = 1/3rd)*

**Regionally strategies** to address special needs & opportunities

**Transportation** system needs

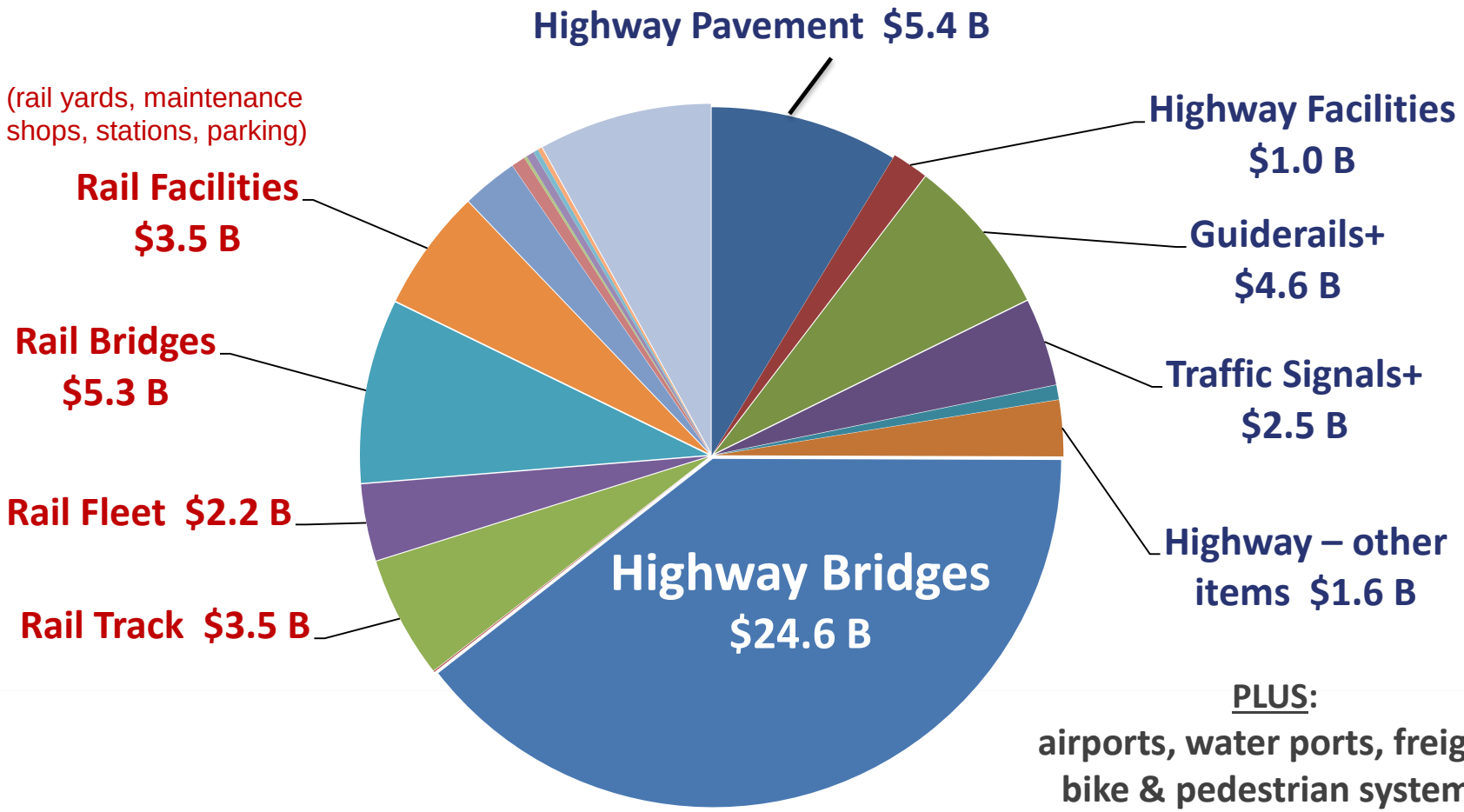
**Economic** opportunities

# Infrastructure Preservation
## *($62 billion)*

- Why is it such a large % of program?
- Why is it so critical?

# Why is $62 billion needed for preservation?

CT has an *extensive* *multimodal* system that is *old* & *used intensely*




**PLUS:**
airports, water ports, freight, bike & pedestrian systems

# Our Transportation Infrastructure Is Large & Diverse

***Challenge:*** *Keeping it operating, in good condition, & safe is a major challenge*

## *Highway System:*

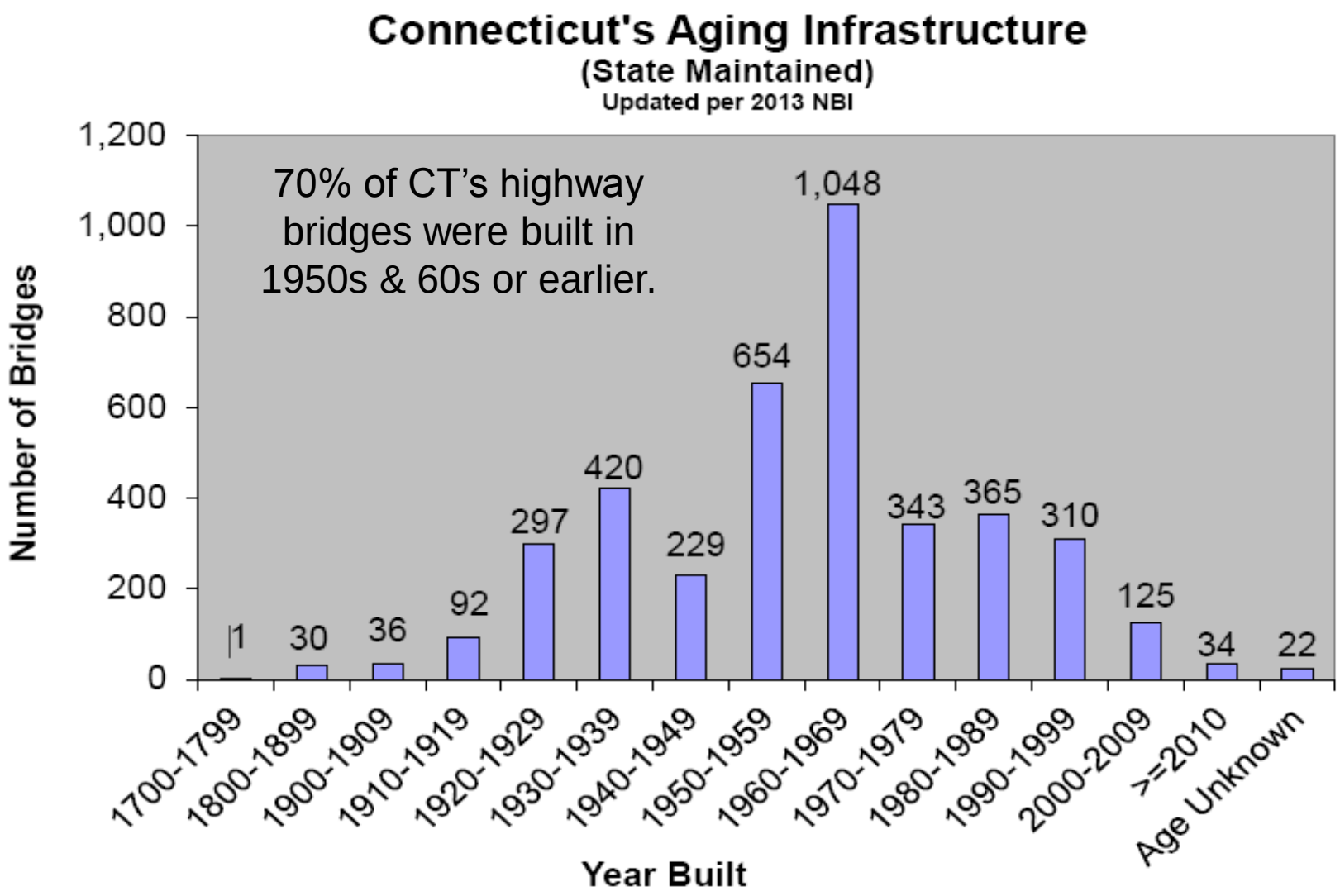
**Heavily used highway network**

- 85 million vehicle miles traveled daily
  - 100,000-180,000 cars & trucks daily on I-95, I-84, I-91
- 21,500 miles of state & local roads
- 7,400 state & local bridges
- 50 state highway maintenance garages
- 630 plow trucks

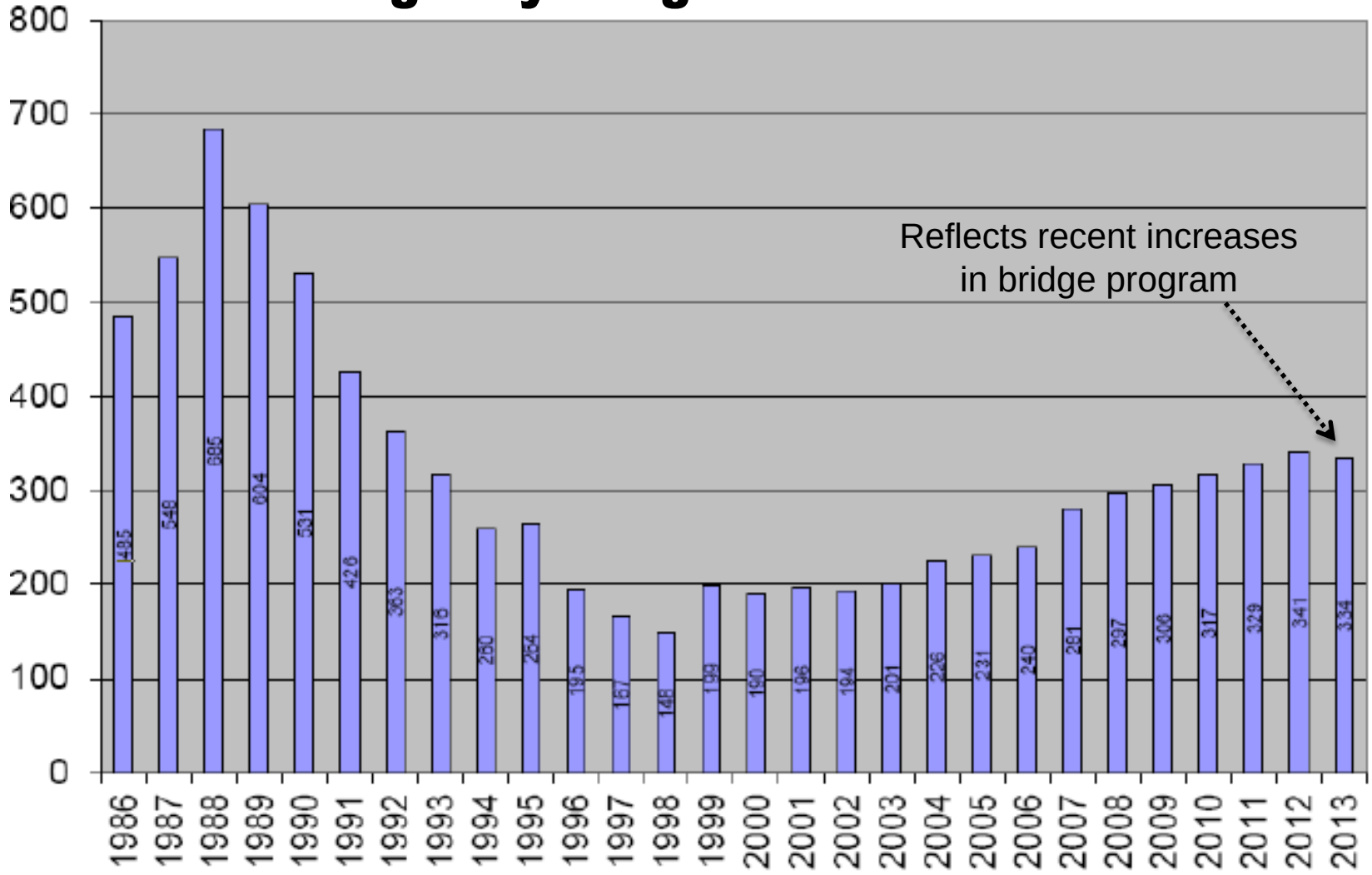
## *Transit System*

**Nation's busiest commuter railroad**

- 40+ million rail passenger trips per year
- 225 miles of passenger railroad
- 203 bridges on New Haven Lie
- 500 rail coaches & cars
- 40+ million *bus* passenger trips per year
- 1,100 buses & paratransit vehicles


Connecticut's Aging Infrastructure
(State Maintained)
Updated per 2013 NBI
70% of CT's highway bridges were built in 1950s & 60s or earlier.
Number of Bridges
1,200
1,000
800
600
400
200
0
1
30
36
92
297
420
229
654
1,048
343
365
310
125
34
22
1700-1799
1800-1899
1900-1909
1910-1919
1920-1929
1930-1939
1940-1949
1950-1959
1960-1969
1970-1979
1980-1989
1990-1999
2000-2009
>=2010
Age Unknown
Year Built

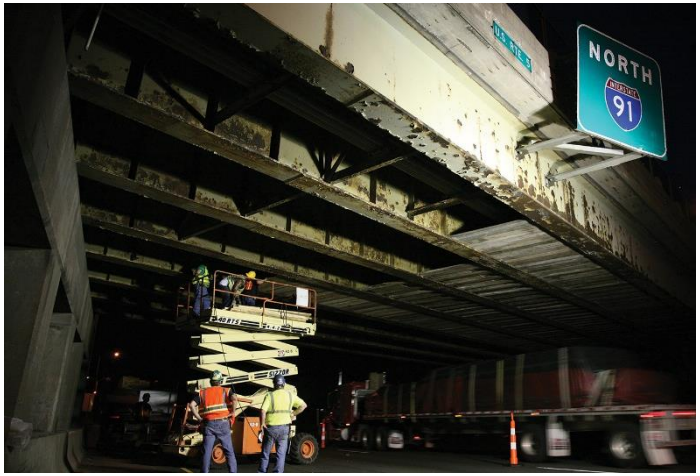
# # Highway Bridges in Poor Condition



# What's in the $100B program?

## Statewide Programs

*(preservation & enhancement)*



# Statewide *Highway & Bridge* Preservation Programs

**Bridge** preservation program

- **$25 Billion** over 30 years

**Pavement** preservation program:

- **$7 Billion** over 30 years

# Statewide *Bus* Program

- **Urban Bus Service:** Improve & expand urban bus service by **25%**
  - provide residents bus service within half-mile
- **Integrate services**: operating services, info, & customer service statewide
- **Service & info. delivery:** real-time information & smart card fare collection
- **Bus maintenance facilities:** upgrade

# Statewide *Bike & Pedestrian* Programs

- ***Design for Bikes & Pedestrians.*** Support livable & walkable communities:
  - complete streets policy
- ***Community Connectivity ($10 M/yr)*** Create program to improve conditions for pedestrians in community centers.
- ***Trail Program ($10 M/yr)*** Create program to fill gaps in trail system & maintain trails.

# Statewide *Ports & Maritime* Program

- **Port Authority**. Create Authority to advance freight, intermodal, commercial, & tourism statewide.
- **3 Deep Water Ports.**
  - Take advantage of rail & highway linkages
  - Renovate & add infrastructure: piers, cranes, warehousing
  - Maintenance dredging
- **Local Maritime**. Support local maritime economy across CT.

# Statewide *Municipal* Programs

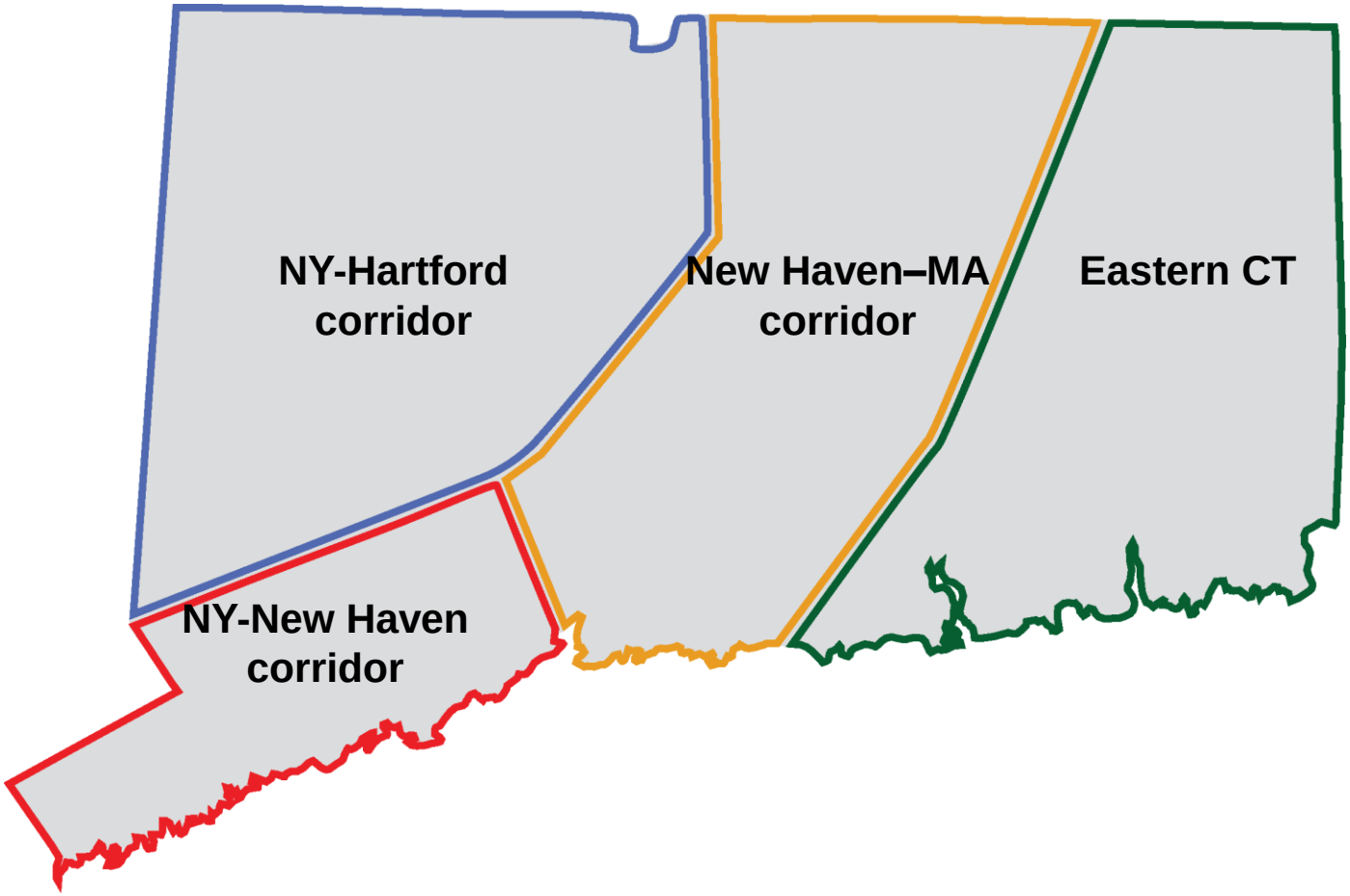
- Increased State program for municipal **roads**
  - from $45M to **$75M** annually
- Doubled State program for municipal **bridges**
- New program for municipal **traffic signal** replacement

# Statewide *Freight* Program

- Rail Freight Improvement Program: (**$10M** annually)
  - upgrade freight rail lines across the entire state
- Bridge upgrades (highway). Upgrade to meet 100,000 lb. national standard
- Overnight Truck parking. Expand overnight parking for trucks,.
- Electronic Truck permitting. Automated permitting for wide & heavy loads
- Intermodal connections:
  - improve deep-water ports (New London, New Haven, Bridgeport)
  - Improve other intermodal facilities & infrastructure (truck, rail, air)

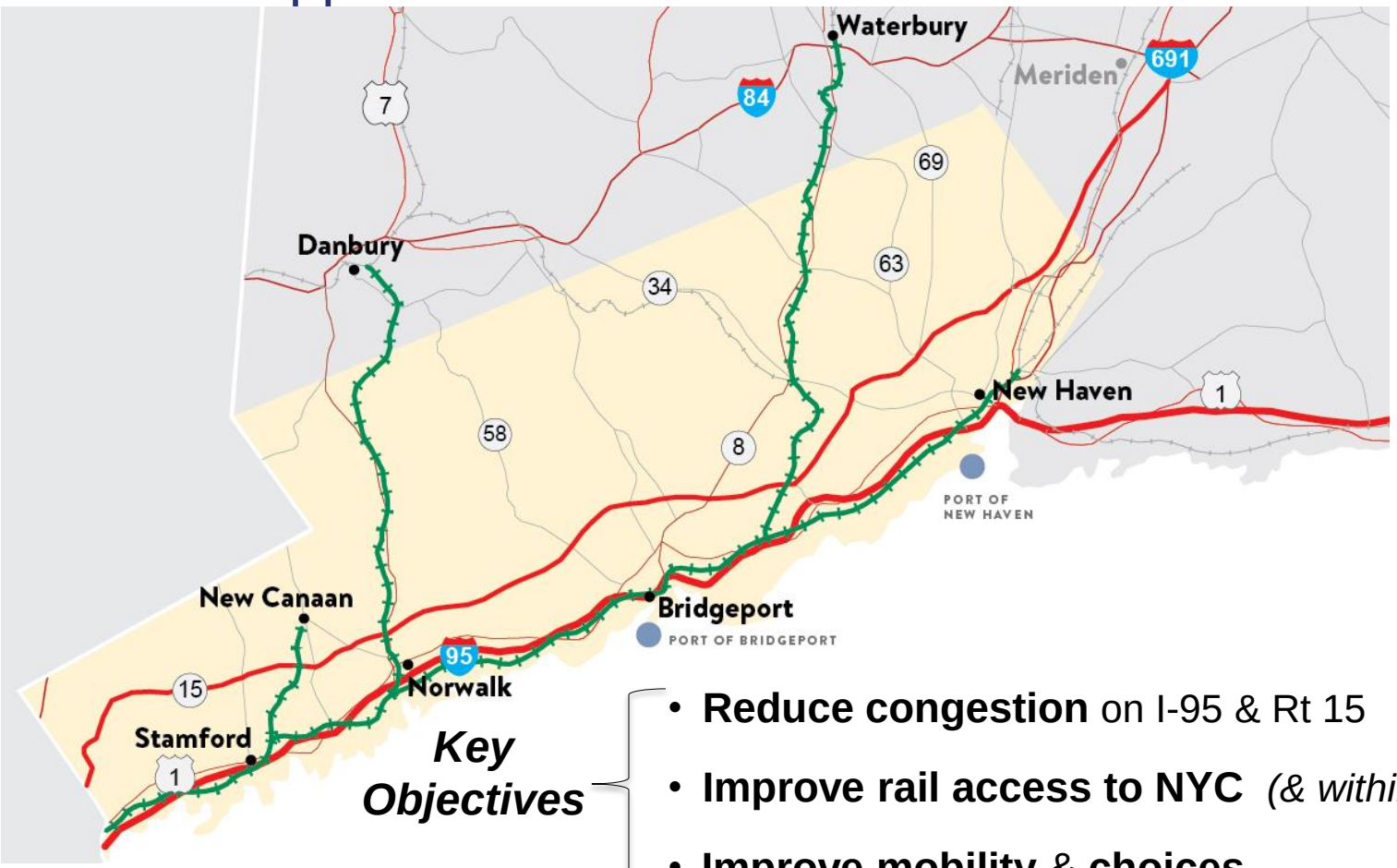
# Transportation Corridors

## Multimodal & Regionally-Based Strategies



# New York to New Haven Corridor

## Approx. $30 Billion over 30 Years




***Key Objectives***

- **Reduce congestion** on I-95 & Rt 15
- **Improve rail access to NYC** *(& within CT)*
- **Improve mobility** & **choices**

# New York to New Haven Corridor

## Highway Investment - $11 Billion *(preservation & enhancement)*

- **I-95:** Widen from NY to New Haven
  - Start with most congested segment: Bridgeport to Stamford
  - Institute congestion management practices
- **Major preservation projects** such as:
  - **I-95:** Complete reconstruction of West River Bridge in New Haven
  - **RT 15:** Reconstruct/replace West Rock Tunnel in Woodbridge
- **Fix traffic bottlenecks:** i.e. Rt. 7/15 interchange & Rt. 8 in Shelton-Derby

## Bus Investment - *$40 Million*

- Expand bus service – including easier access to rail stations
- Bus Rapid Transit

## Rail Investment - $18 Billion *(preservation & enhancement)*

- **New Haven Line:**
  - ***Restore rail infrastructure*** (movable & fixed bridges, track, catenary, etc.)
  - ***Improve safety & reliability***
  - ***Reconfigure 4 tracks***
    - ***2+2 concept:*** **capacity & service enhancement**
    - more frequent local "subway" type service on **2 local tracks**
    - faster express service on **2 express tracks**
  - Add & modernize stations, expand parking

- **Branch Lines:** Upgrade branch lines to provide full commuter service on 3 lines
  - New Canaan
  - Danbury
  - Waterbury

# 30 Year Rail Needs

## New Haven Line + Branches

**Approx. $18 Billion**

### State of Good Repair

| Initiatives | $ |
|---|---|
| Bridges *(fixed & moveable)* | $ 5,000 M |
| Track | $ 1,980 M |
| Fleet | $ 1,750 M |
| Stations & Parking *(existing)* | $ 1,500 M |
| Maintenance Facilities & Yards | $ 1,460 M |
| Communications & Signals | $ 1,120 M |
| Catenary & Power | $ 700 M |

**$ 13.5 Billion**

### Enhancements

| Initiatives | $ |
|---|---|
| **2 + 2 Service Improvements** | **$ 2,000 M** |
| Branch Line Enhancements | $ 1,335 M |
| Fleet Expansion | $ 500 M |
| Maintenance Facilities & Yards *(new)* | $ 100 M |
| Amtrak Layover Facility | $ 500 M |
| Stations & Parking *(new)* | $ 200 M |

**$ 4.6 Billion**

# NHL Program Spending – Next 5 Years

| | |
|---|---|
| **Normalized State of Good Repair Program** | **$554 million** |
| **Major State of Good Repair Projects** | |
| Walk Bridge Program | $900 million |
| Rolling Stock | $733 million |
| Signal System Replacement | $238 million |
| Positive Train Control | $170 million |
| New Haven Yard Improvements | $ 95 million |
| Atlantic Street Bridge Replacement | $ 93 million |
| Stamford Track 7 | $ 39 million |
| Noroton Heights Platform Replacement | $ 12 million |
| Network Infrastructure Phase 2 | $ 12 million |
| Other projects (4) | $ 30 million |
| **Total** | **$ 2.9 Billion** |

# Recent progress on New Haven Line

- 2014: most significant service increases in the history
  - 246 to 304 daily trains
  - off-peak & weekend 30-minute service
  - net positive revenue
- Moving from "commuter" railroad to "rapid transit"
- Improved reliability
- Complaints at record low
- Ridership at record high, outpacing all forecasts

# Measuring the Economic Value

of major transportation investments in ***Let's Go CT***

# Positive Economic Impacts

## I-95 Widening Program

Part of multimodal strategy to manage congestion & promote economic growth

**$11.4 B** added business sales & output (30 yrs)

**$13.9 B** added business during const.

**3,300** permanent jobs.

**6,700-26,000** construction jobs.

## NHL Capacity Improvements

Part of multimodal strategy to manage congestion & promote economic growth

**$6.2 B** added business sales & output (30 yrs)

**$9.1 B** added business during const.

**2,000-3,000** permanent jobs.

**4,000-6,000** construction jobs.

# Positive Economic Impacts

*2 primarily preservation projects*

## I-84 Viaduct

***Hartford***

**$10.2 B** added business sales & output (30 yrs)

**$7.3 B** added business during construction

**2,500-3,500** permanent jobs

**3,000-7,000** construction jobs

## I-84 Mixmaster

***Waterbury***

**$8.8 B** added business sales & output (30 yrs)

**$10.4 B** added business during construction

**2,000-3,000** permanent jobs.

**6,000-11,000** construction jobs

# Thank You

# Energy Efficiency Scenario – A Look at Implementing Deeper Energy Efficiency Measures

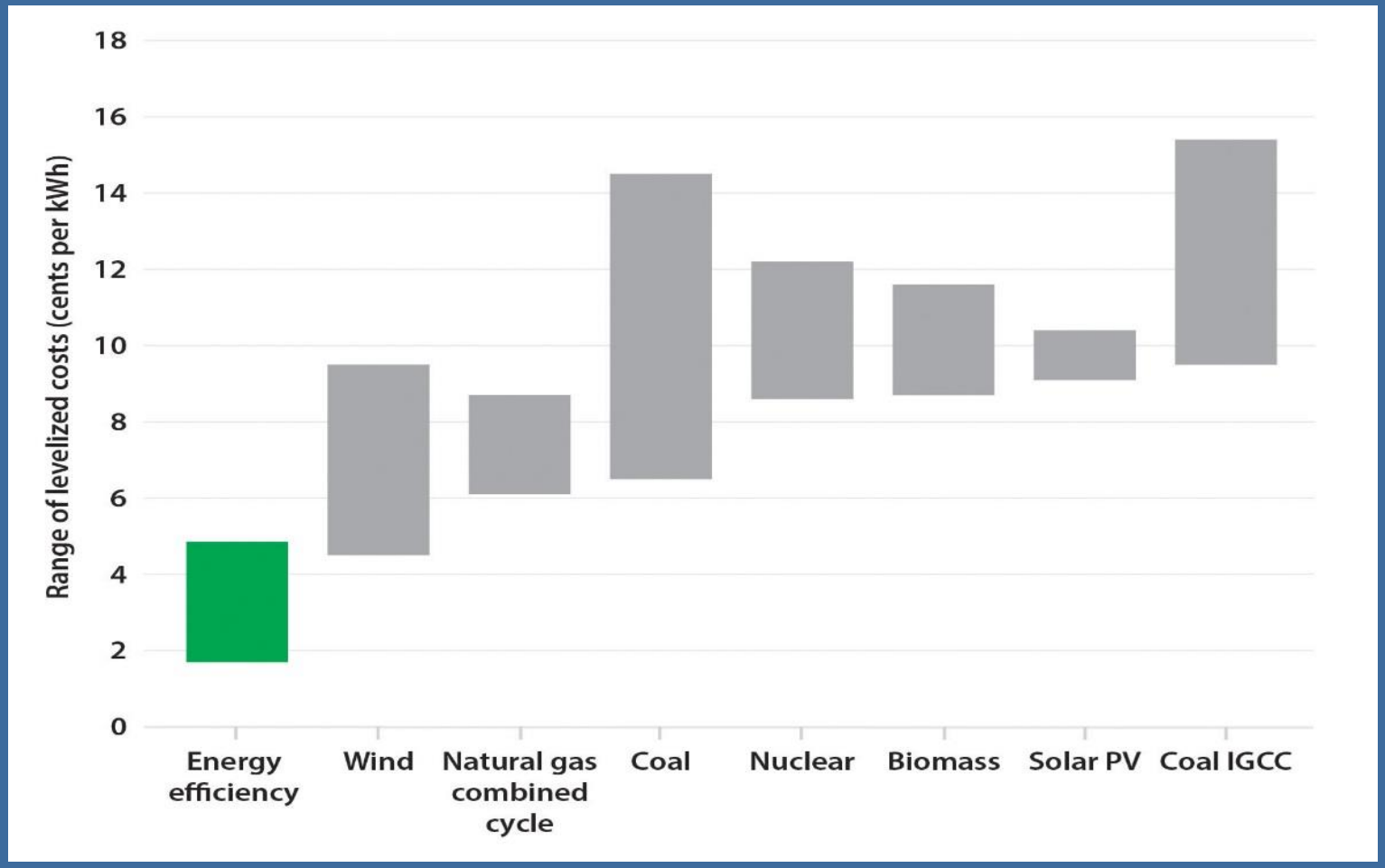
Connecticut Department of Energy and Environmental Protection

# Advancing Emissions Reductions Through Energy Efficiency

**Strategies**

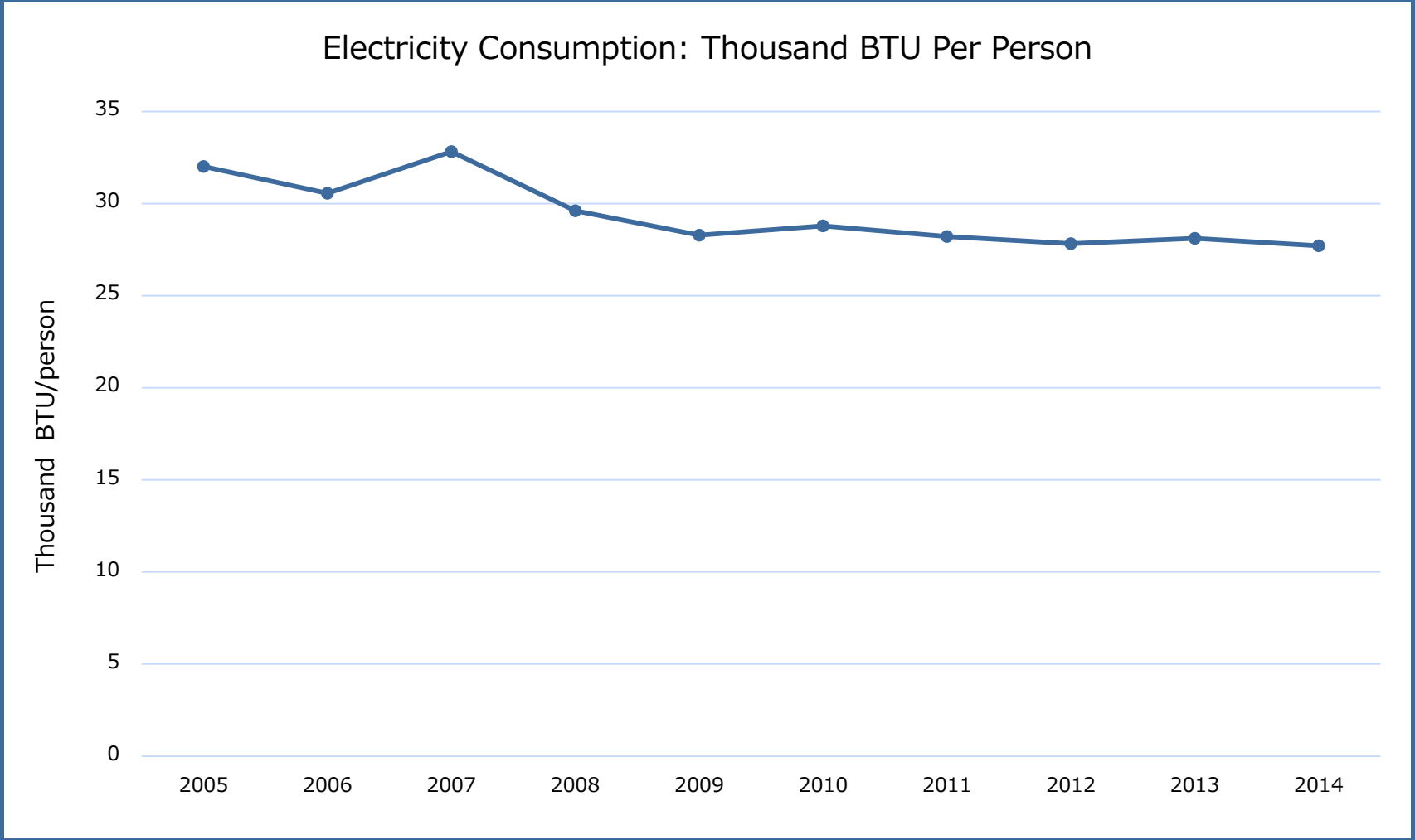
- Achieve increasingly targeted and deeper energy savings in our buildings through whole building-system approaches
  - Home Energy Solutions, Energy Conscious Blueprint, and more
- Leverage investments through efficiency financing and project brokering
  - Lead By Example, C-PACE, Smart-E Residential Loans
- Implement and enforce stronger building codes and high performance standards
- Promote sustainable energy management as a core value

# Energy Efficiency Is a Low-Cost Energy Resource




***Source:*** Moline, Maggie (March 2014) The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs

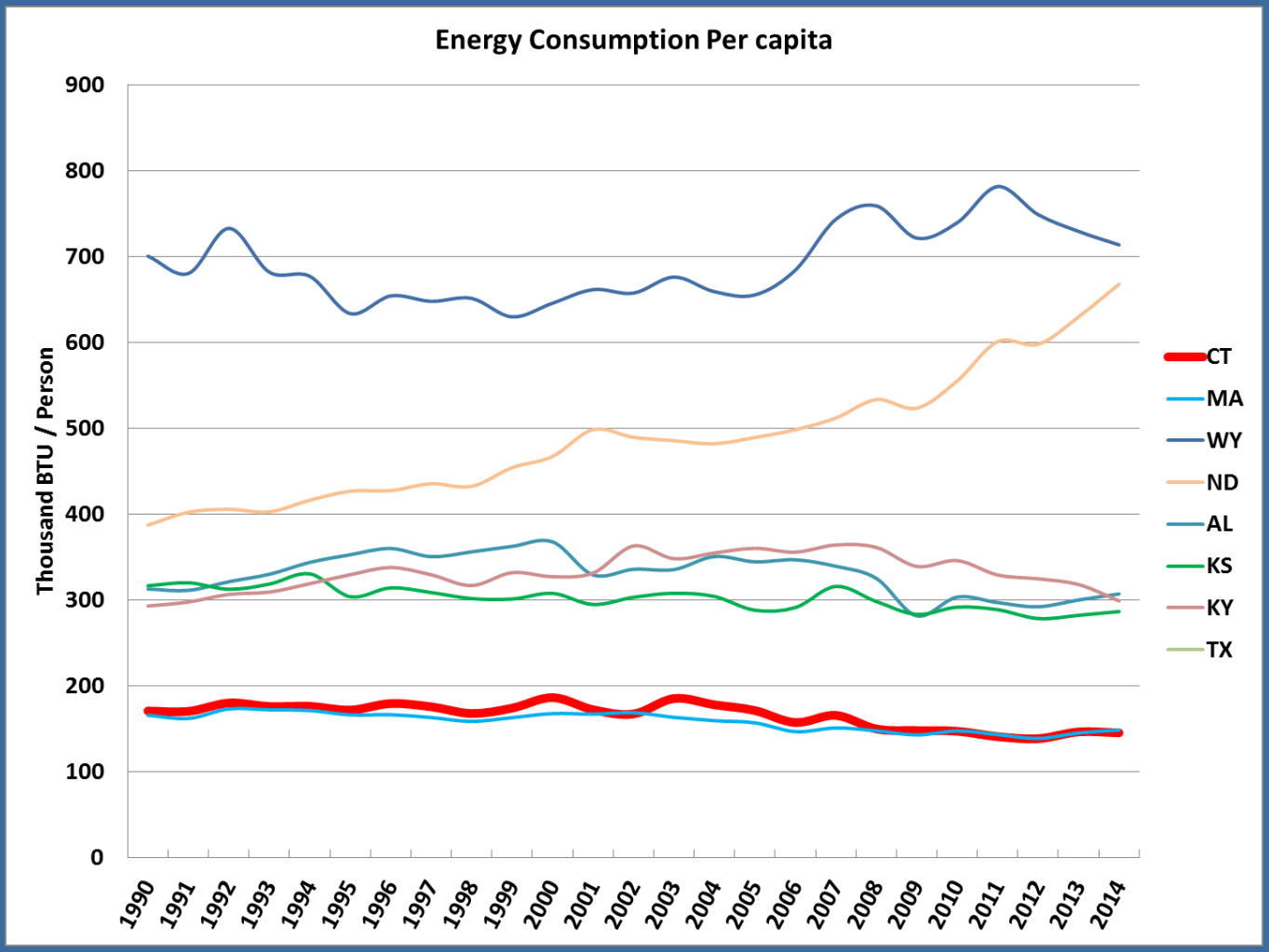
# Energy Intensity of Electricity Consumption




Source: EIA State Energy Data System, 2016

13% reduction in electricity consumption per person from 2005

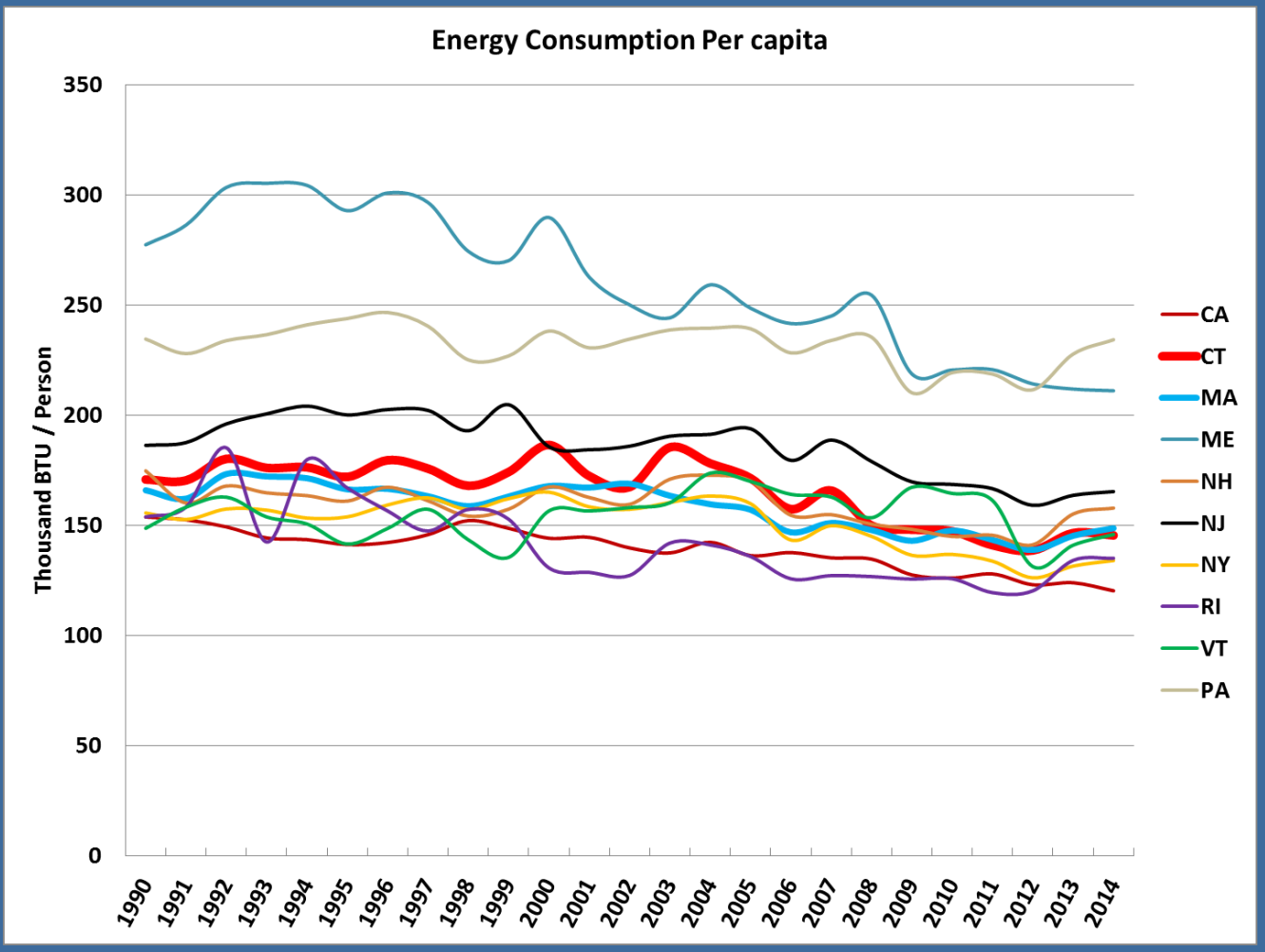
# Residential, Commercial and Industrial Energy Consumption Trends




Northeast states use energy more efficiently compared to other regions

Source: EIA State Energy Data System, 2016

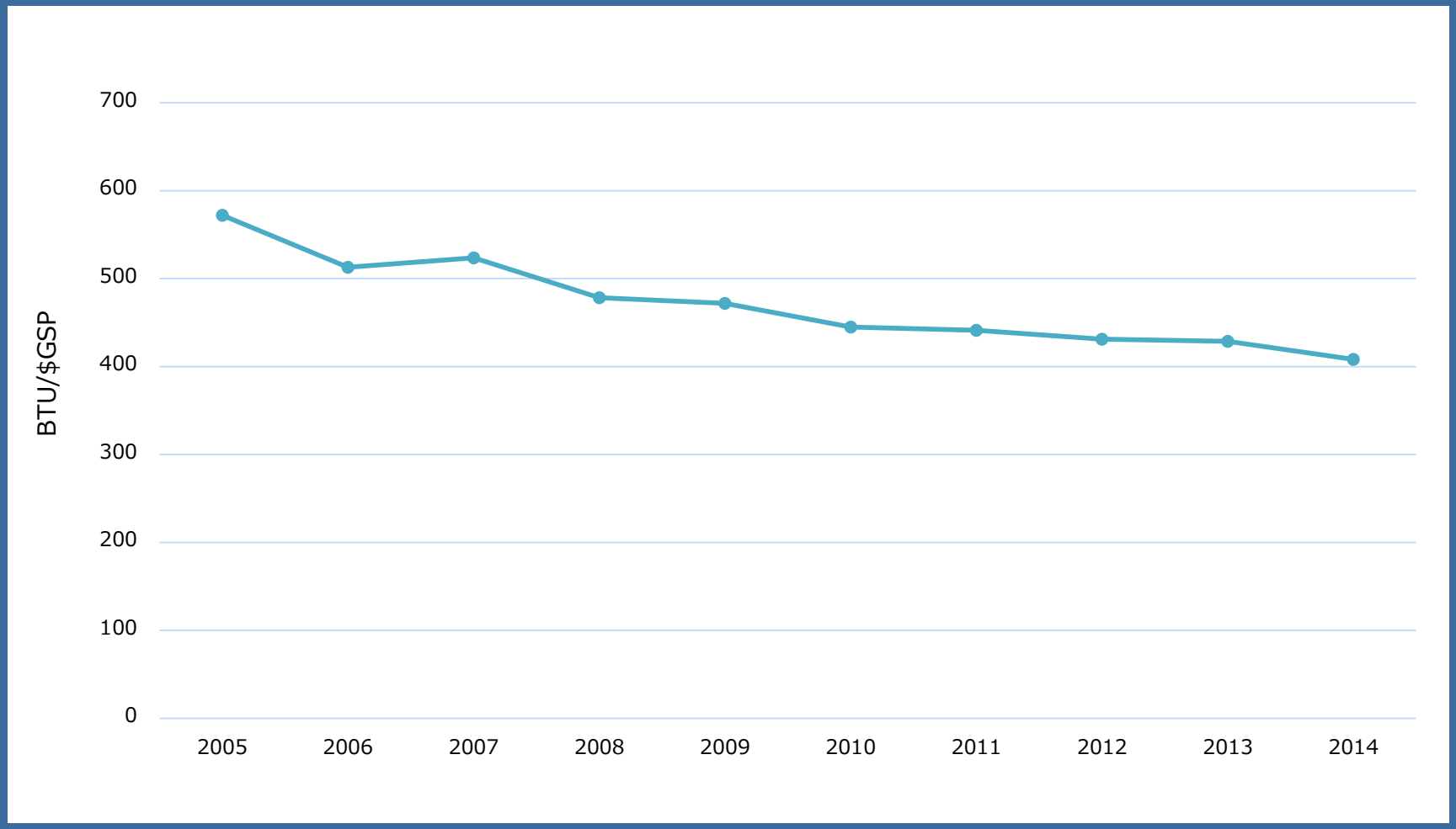
# Residential, Commercial and Industrial Energy Consumption Trends




- Declining trend since early 2000s
- Trend is flattening out for most Northeastern states
- How much further down can this trend go and at what cost?

Source: EIA State Energy Data System, 2016

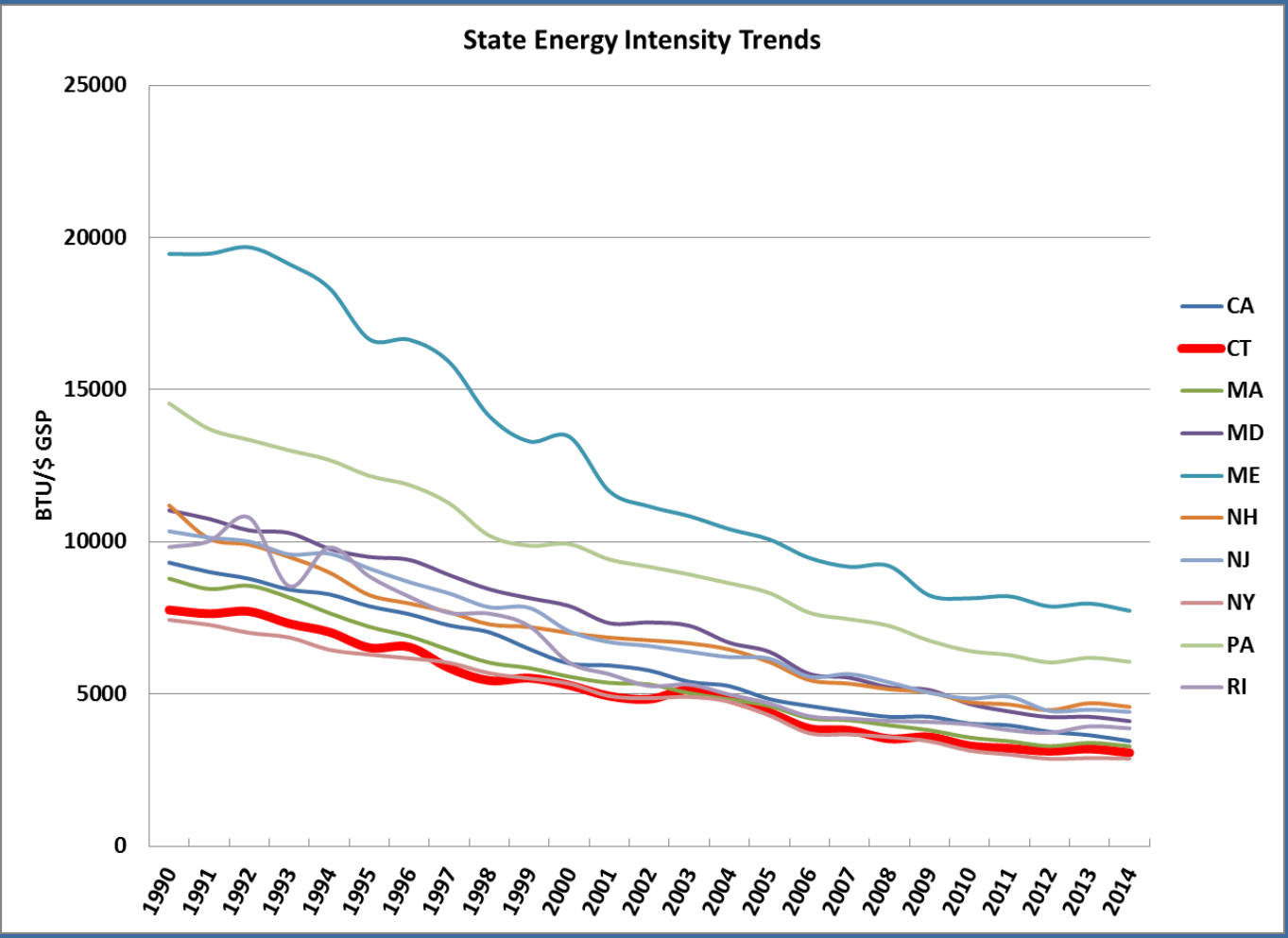
# Energy Intensity of CT Gross State Product




***Source:*** EIA SEDS data

29% reduction in electricity consumption per $ of GSP

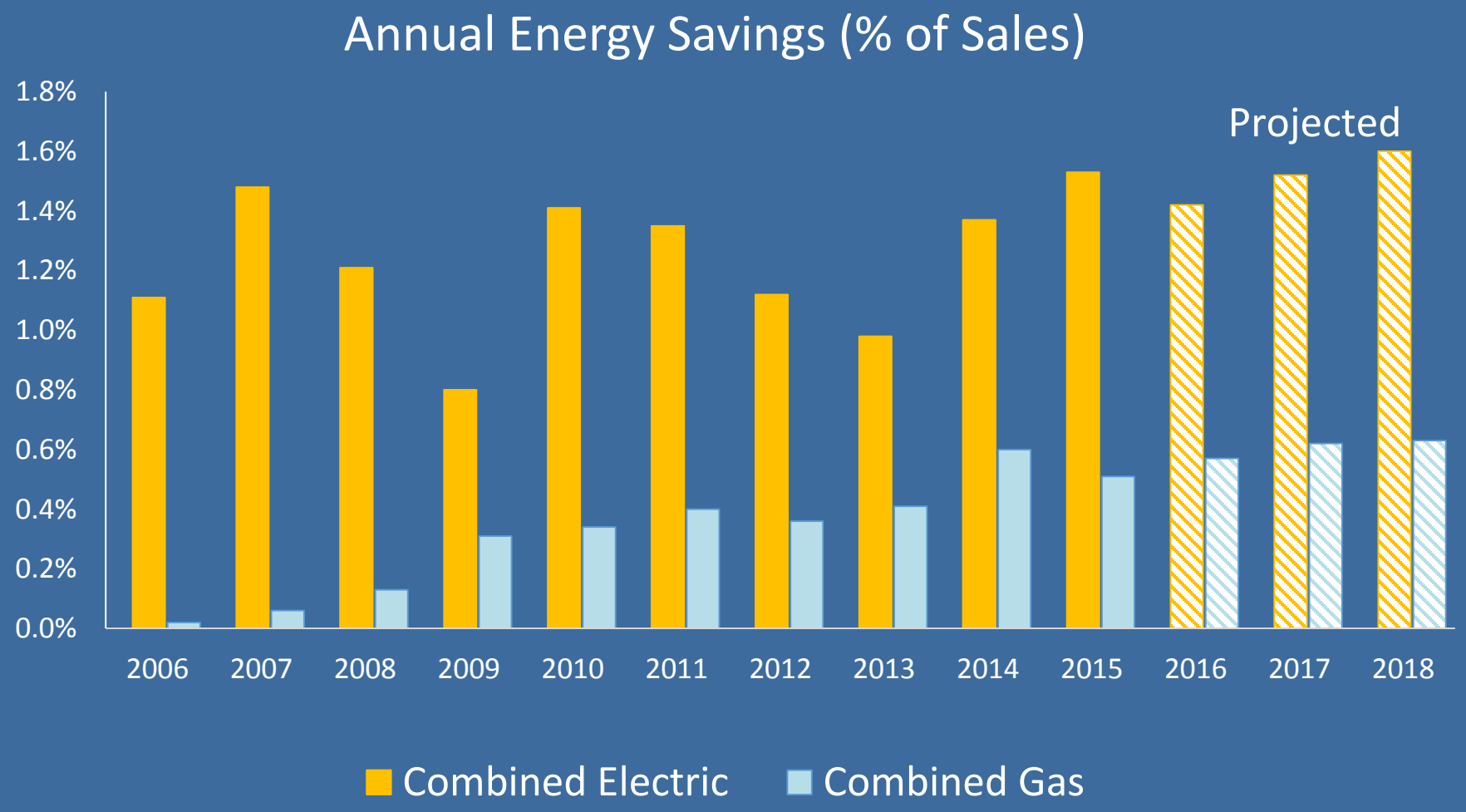
# Economy Wide Energy Consumption Trends




Source: EIA State Energy Data System, 2016

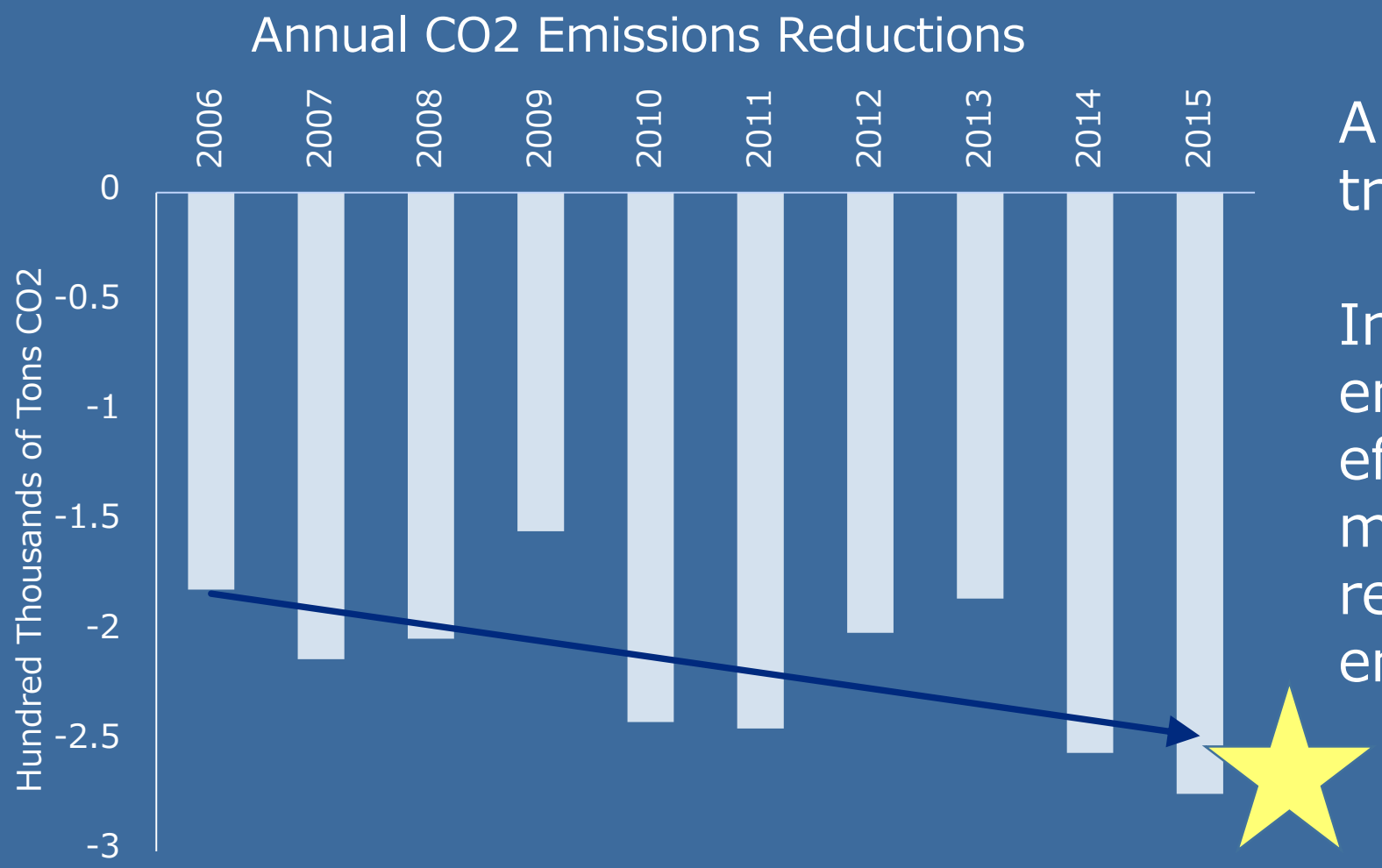
- Consumption per $ Gross State Product
- Declining trend since early 2000s
- Trend is flattening out for most Northeastern states
- How much further down can this trend go and at what cost?

# CT Energy Savings Are Growing Through Increased Energy Efficiency Investment




***Source:*** Connecticut Energy Dashboard

# Energy Efficiency in CT Reduces Emissions




A positive trend:

Increased energy efficiency means reduced emissions

***Source:*** CT Energy Efficiency Board Annual Legislative Reports

# Beyond the C&LM Fund: Lead By Example (LBE)

Connecticut General Statutes 16a-37x:

- Energy Savings Performance Contracting (ESPC) program for use by state agencies and municipalities
- Implement portfolio of comprehensive energy savings measures with minimal upfront capital
- Uses a list of pre-approved Qualified Energy Services Providers (QESP's)
- Guarantees energy savings and utilizes the resulting cost savings as the debt service until paid off (typically about 10-15 years)

CT government facilities make up 15% of the energy consumed in the C&I Sector (electric and natural gas)

# State Facilities Energy Efficiency and Renewables Implementation Plan

**Benchmarking and Procurement**

Compare energy use to prioritize; Update procurement documents, contract language, and processes

**Inventory Facilities Universe**

Data Collection and Correlation

**Screening**

for potential opportunities and future facility use; feasibility analyses for renewable generation sources

**Energy Assessments**

Conduct investment grade energy audits; identify appropriate financing mechanisms

*Efficiency Measures and Renewable energy generation sources financed, constructed and installed, and remain effective into the future*

# Measurable Impact of LBE bond funded program

**56** completed projects to date

**14** projects are in construction/design phase

Estimated annual cost avoidance **$2.8M**

# Greenhouse Gas Impacts of State Energy Efficiency and VMT Strategies

# Energy Efficiency and VMT Assumptions

- Energy Efficiency
  - Reference case programs already achieving a 2.5% reduction in electricity and natural gas demand
  - EE Scenario 1: Total loads reduced by 3.5%
  - EE Scenario 2: Total loads reduced by 4.5%

- Let's Go Connecticut
  - Bus trips up 9,890 trips per day
  - Rail trips up 14,660 trips per day
  - Over VMT reduction of .36%

# GHG Reductions in 2030 and 2050

| | 2030 | 2050 |
|---|---|---|
| Let's Go CT | -0.19% | -0.17% |
| State EE Programs 3.5% | -1.14% | -1.03% |
| State EE Programs 4.5% | -1.85% | -1.67% |

- Values represent percentage changes relative to the reference case.
- Smaller changes in 2050 reflect the fact that overall loads/demand is very modestly decreasing in the reference case.

# Public Comments