

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  
*DEEP Commissioner Klee*

**1:35**

GC3 Milestones and Timeline  
*Keri Enright-Kato, CT DEEP*

**1:50**

Overview of Let's Go CT Initiatives:  
Impacts Vehicle Miles Traveled  
*Tom Maziarz, Department of Transportation*

**2:15**

Energy Efficiency Scenario – A Look at Implementing  
Deeper Energy Efficiency Measures  
*Julia Dumaine, CT DEEP and Jason Rudokas, NESCAUM*

**3:00**

Public Comments

# GC3 Milestones and Timeline



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# GC3 Milestones: 2015-2016

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

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

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

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

March 2016 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



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## 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

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# LET'S GO CT!

Connecticut's  
Bold Vision for a  
Transportation Future

## '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) = **2/3<sup>rds</sup>**

*(Expansion or Enhancement = 1/3<sup>rd</sup>)*

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

**Transportation** system needs

**Economic** opportunities

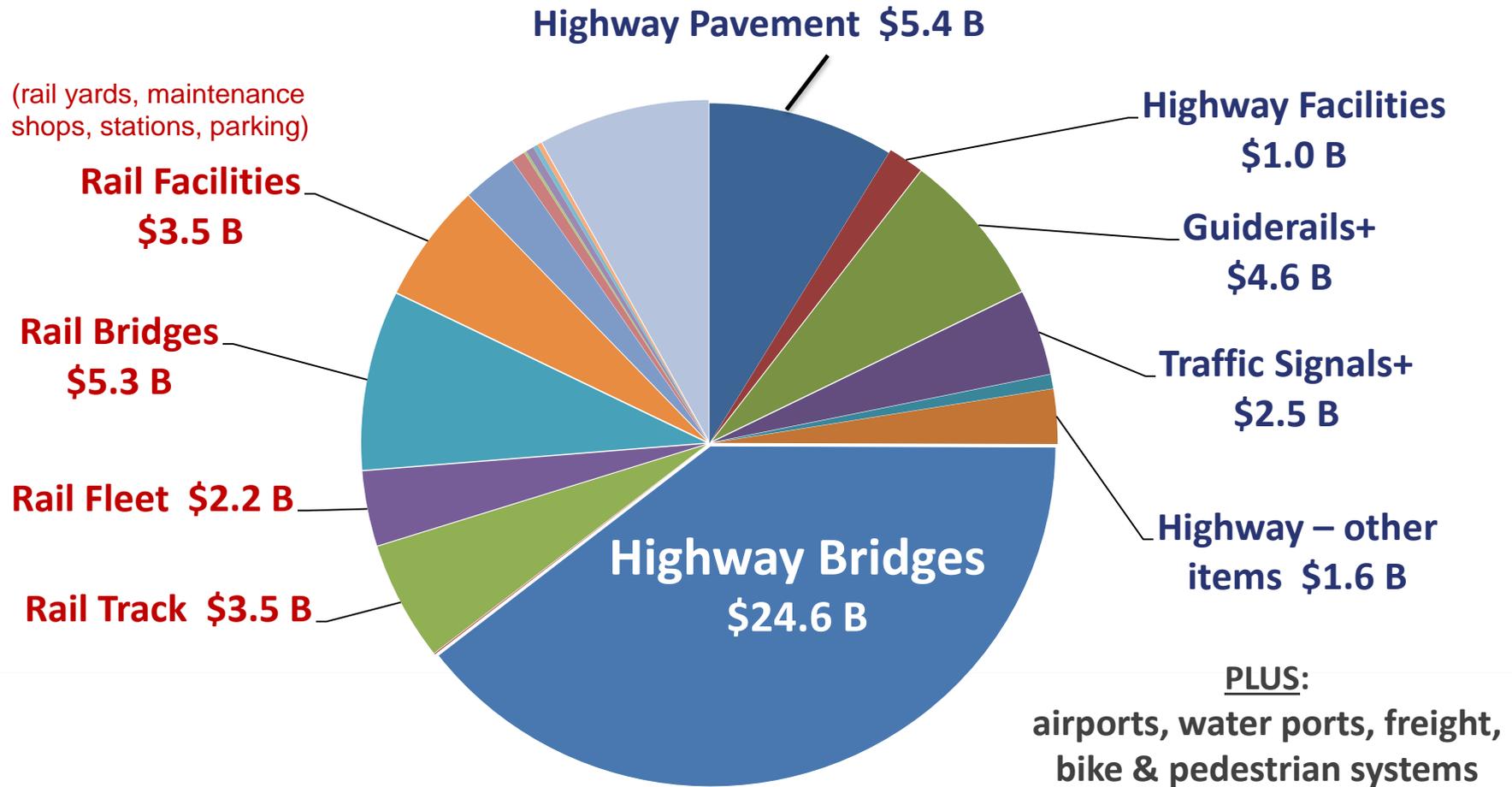
# Infrastructure Preservation

*(\$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



## 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

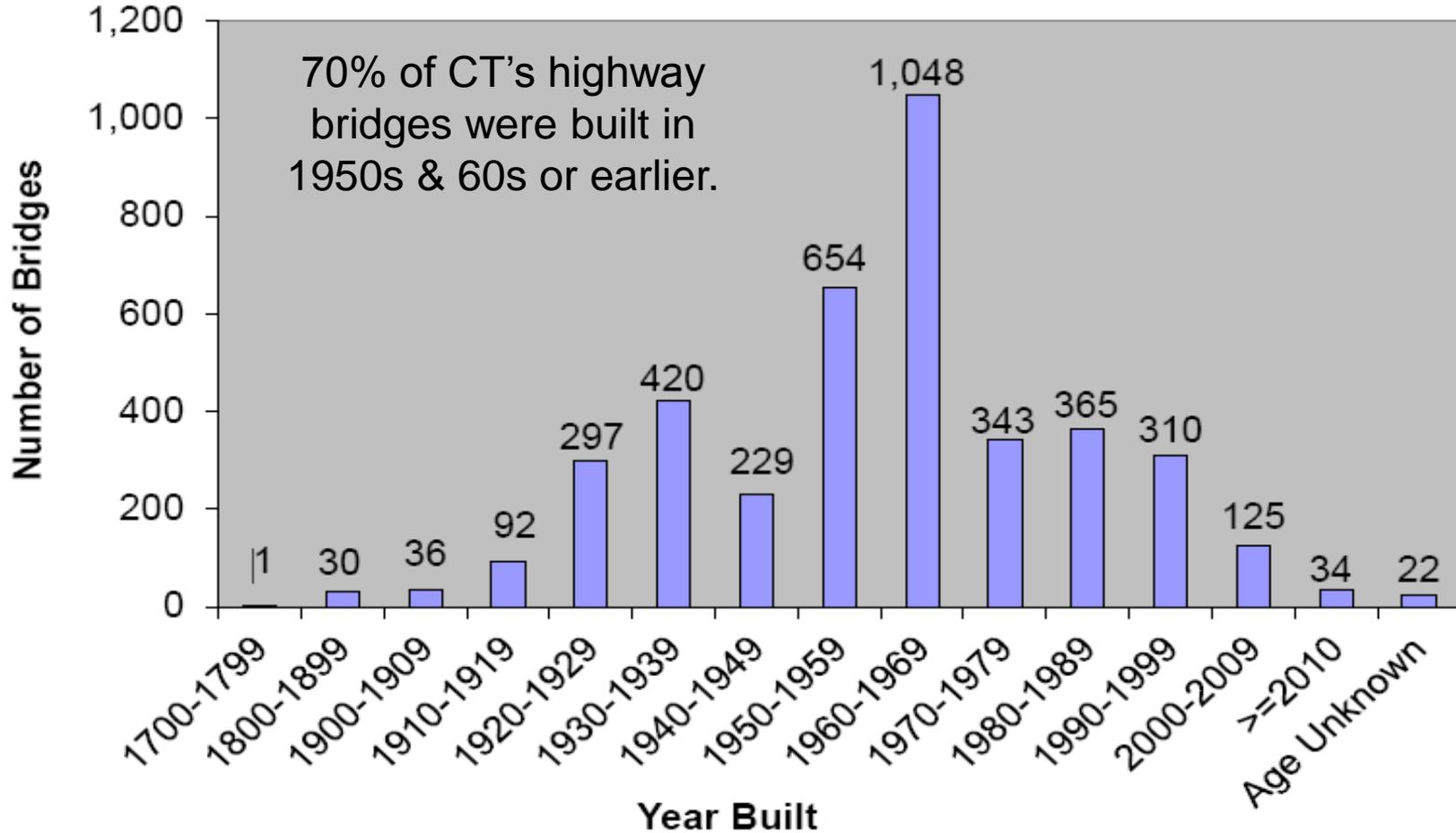
- 40+ million rail passenger trips per year
- 225 miles of passenger railroad
- 203 bridges on New Haven Line
- 500 rail coaches & cars
- 40+ million bus passenger trips per year
- 1,100 buses & paratransit vehicles



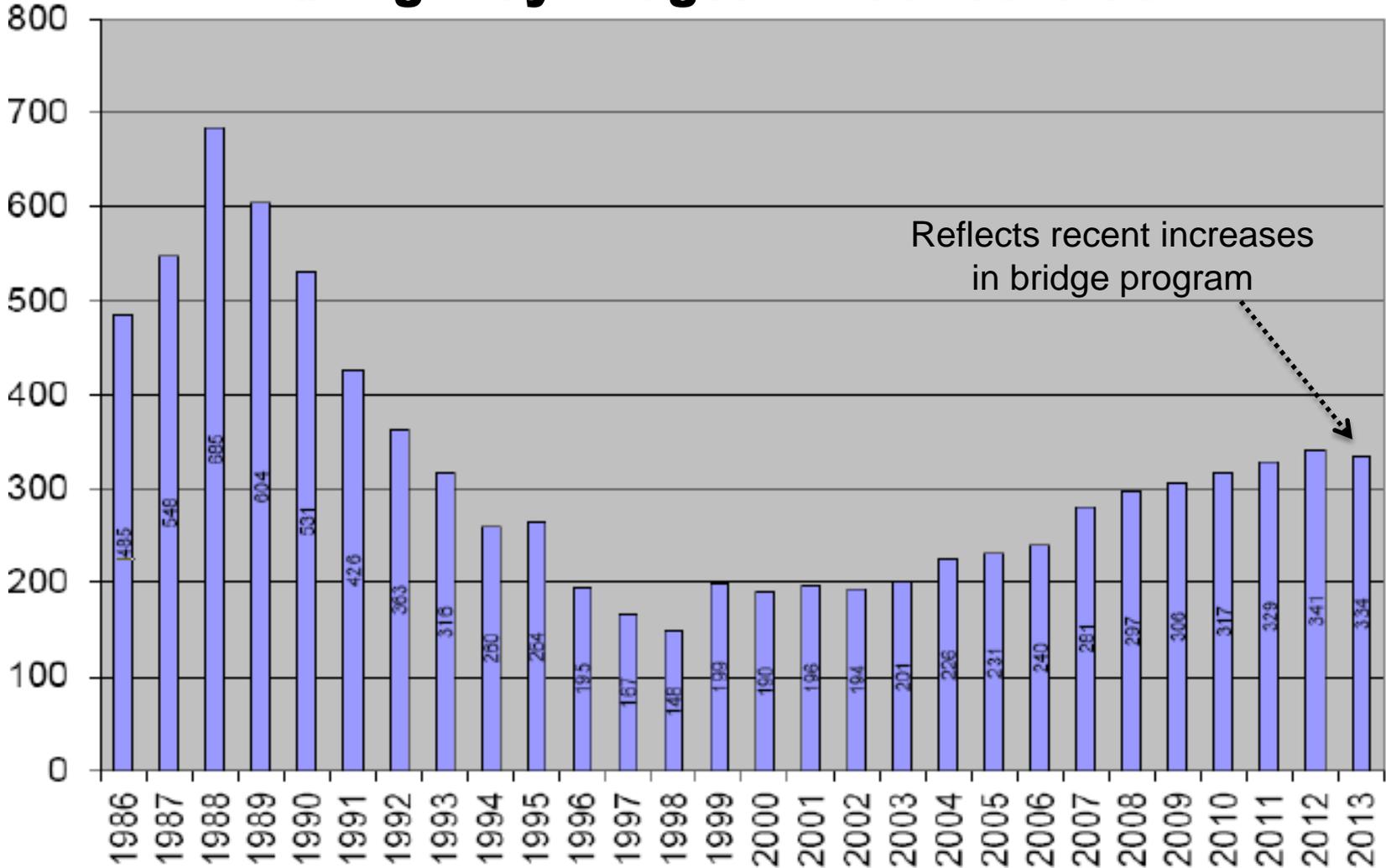
### Connecticut's Aging Infrastructure

(State Maintained)

Updated per 2013 NBI



## # Highway Bridges in Poor Condition



Reflects recent increases in bridge program



# 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:

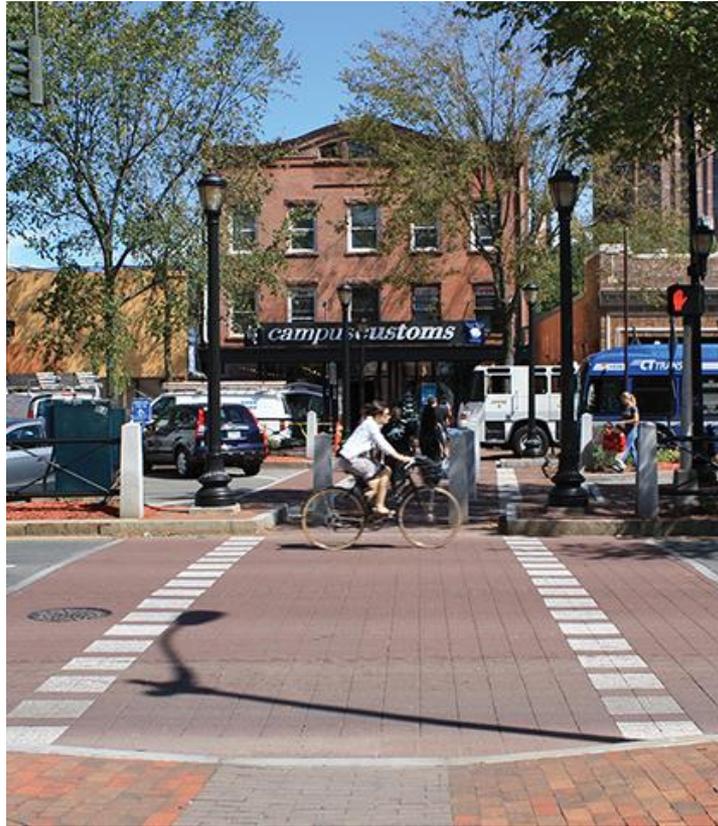
- **\$7 Billion** over 30 years

## 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

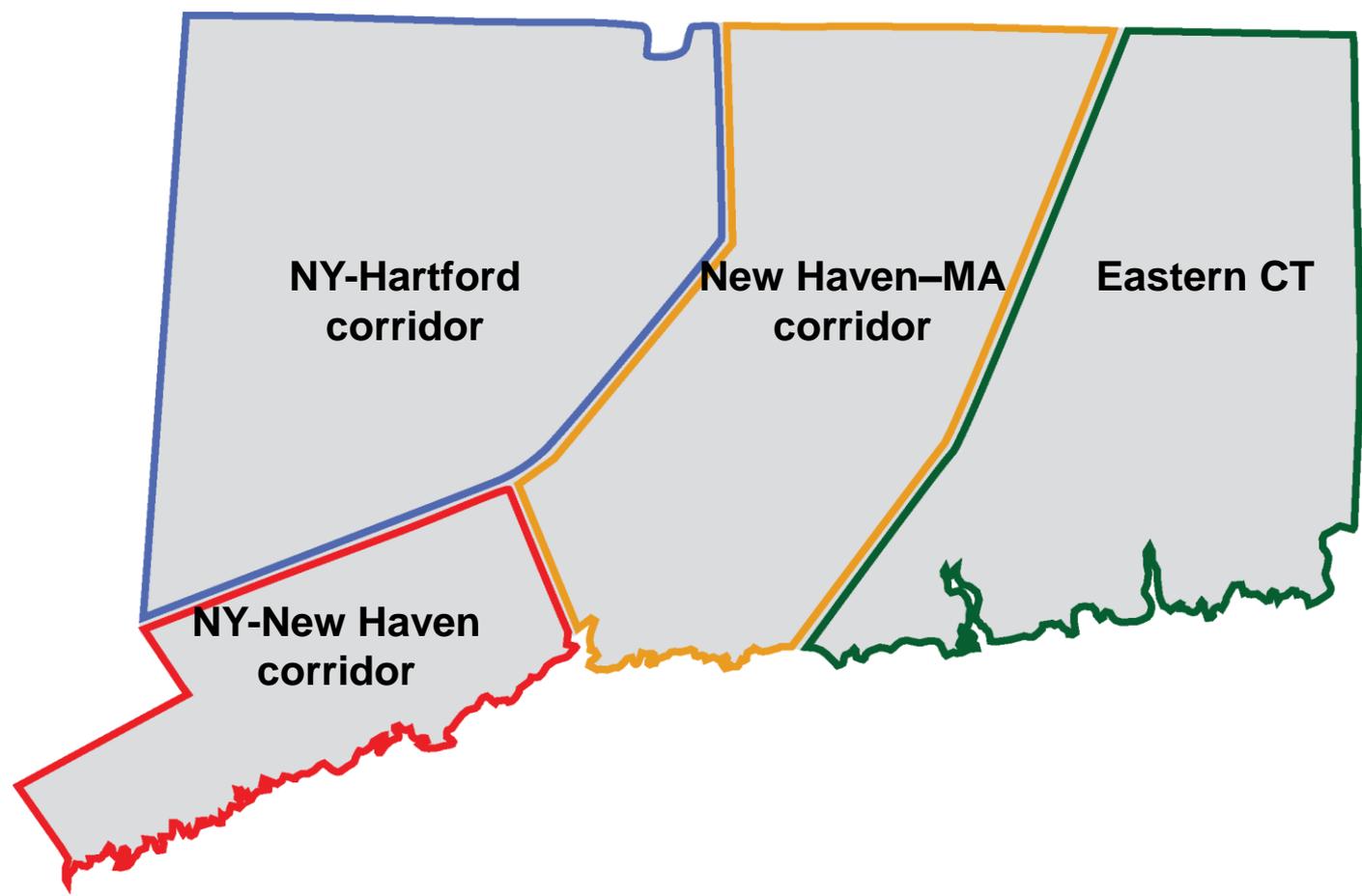
- Increased State program for municipal **roads**
  - from \$45M to **\$75M** annually
- Doubled State program for municipal **bridges**
- New program for municipal **traffic signal** replacement

## 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)

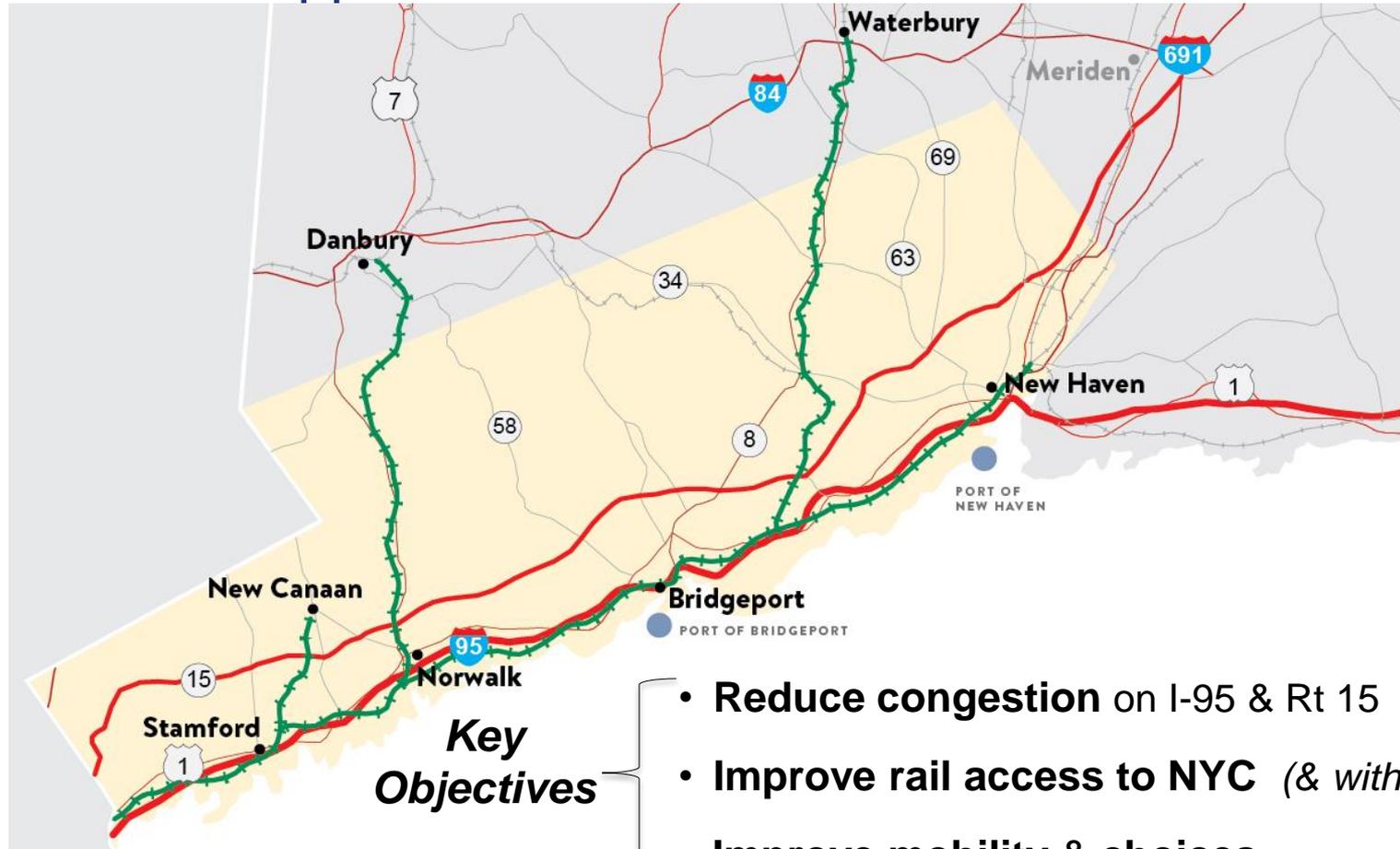
# Transportation Corridors

## Multimodal & Regionally-Based Strategies



## New York to New Haven Corridor

Approx. \$30 Billion over 30 Years



## 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 ( <i>fixed &amp; moveable</i> )	\$ 5,000 M
Track	\$ 1,980 M
Fleet	\$ 1,750 M
Stations & Parking ( <i>existing</i> )	\$ 1,500 M
Maintenance Facilities & Yards	\$ 1,460 M
Communications & Signals	\$ 1,120 M
Catenary & Power	\$ 700 M

**\$ 13.5 Billion**

**Enhancements**

Initiatives	\$
<b>2 + 2 Service Improvements</b>	<b>\$ 2,000 M</b>
Branch Line Enhancements	\$ 1,335 M
Fleet Expansion	\$ 500 M
Maintenance Facilities & Yards ( <i>new</i> )	\$ 100 M
Amtrak Layover Facility	\$ 500 M
Stations & Parking ( <i>new</i> )	\$ 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

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**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



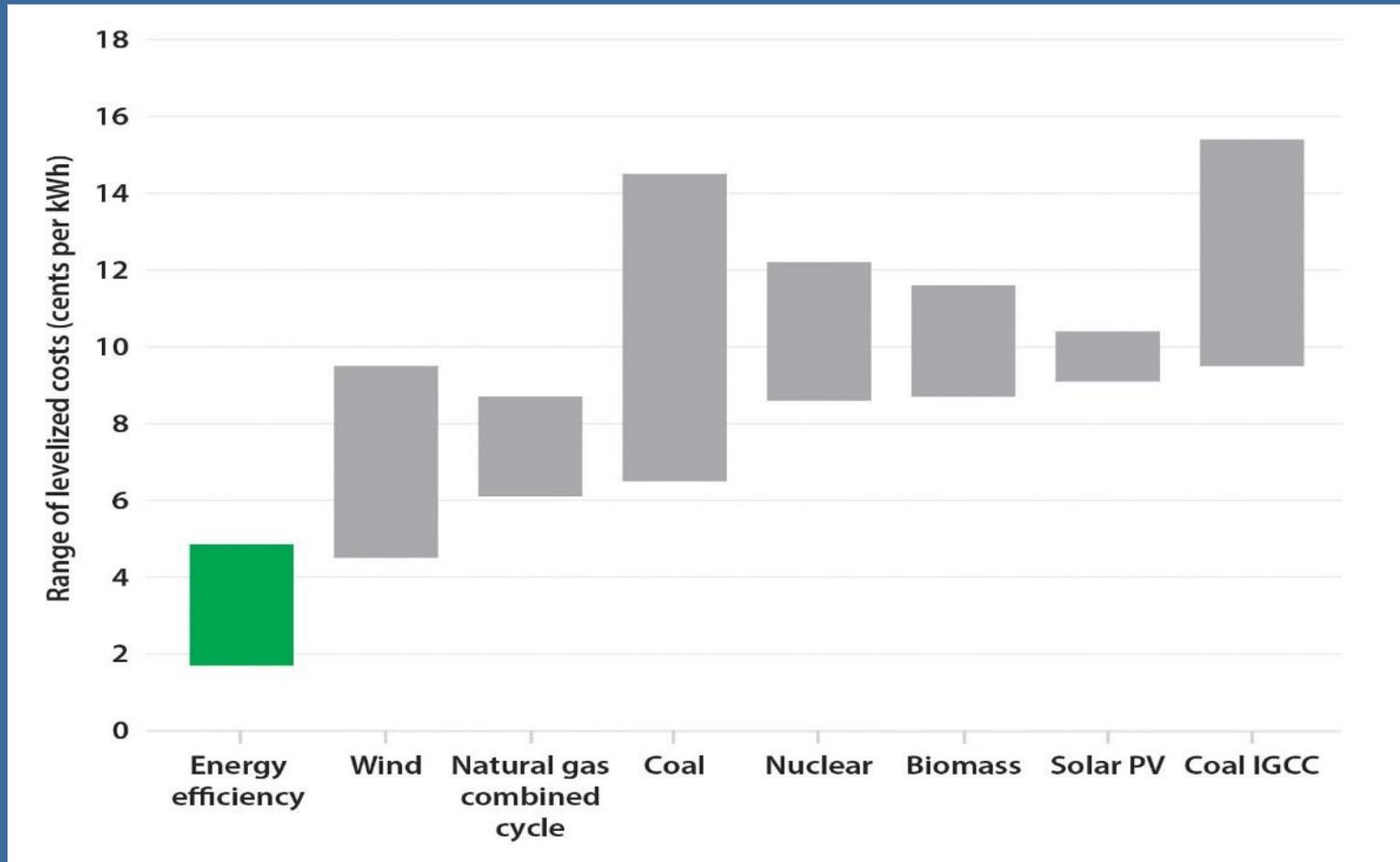
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# Advancing Emissions Reductions Through Energy Efficiency

## Strategies

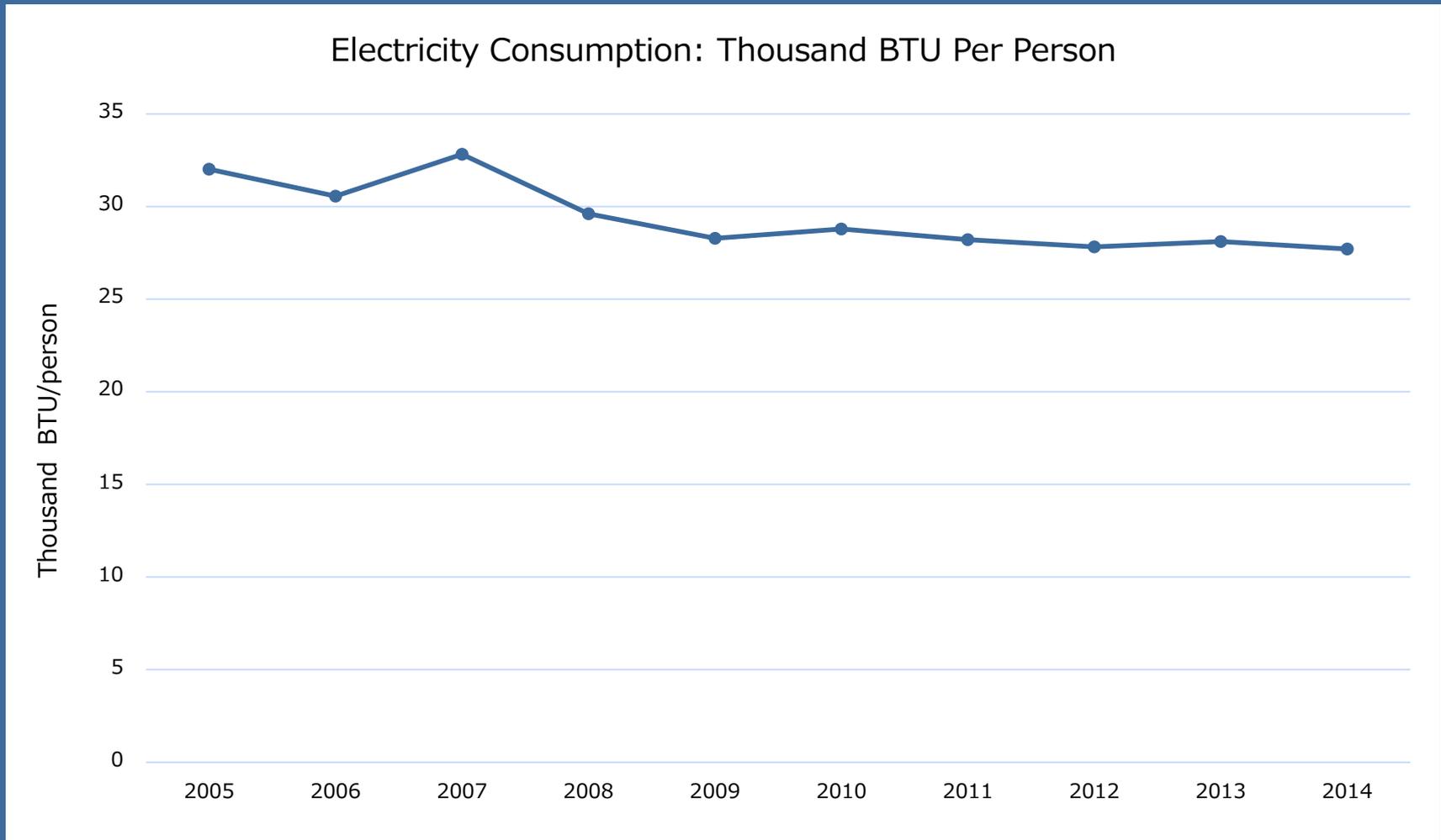
- Achieve increasingly targeted and deeper energy savings in our buildings through whole building-system approaches
  - [Home Energy Solutions](#), [Energy Conscious Blueprint](#), and more
- Leverage investments through efficiency financing and project brokering
  - [Lead By Example](#), [C-PACE](#), [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](#)

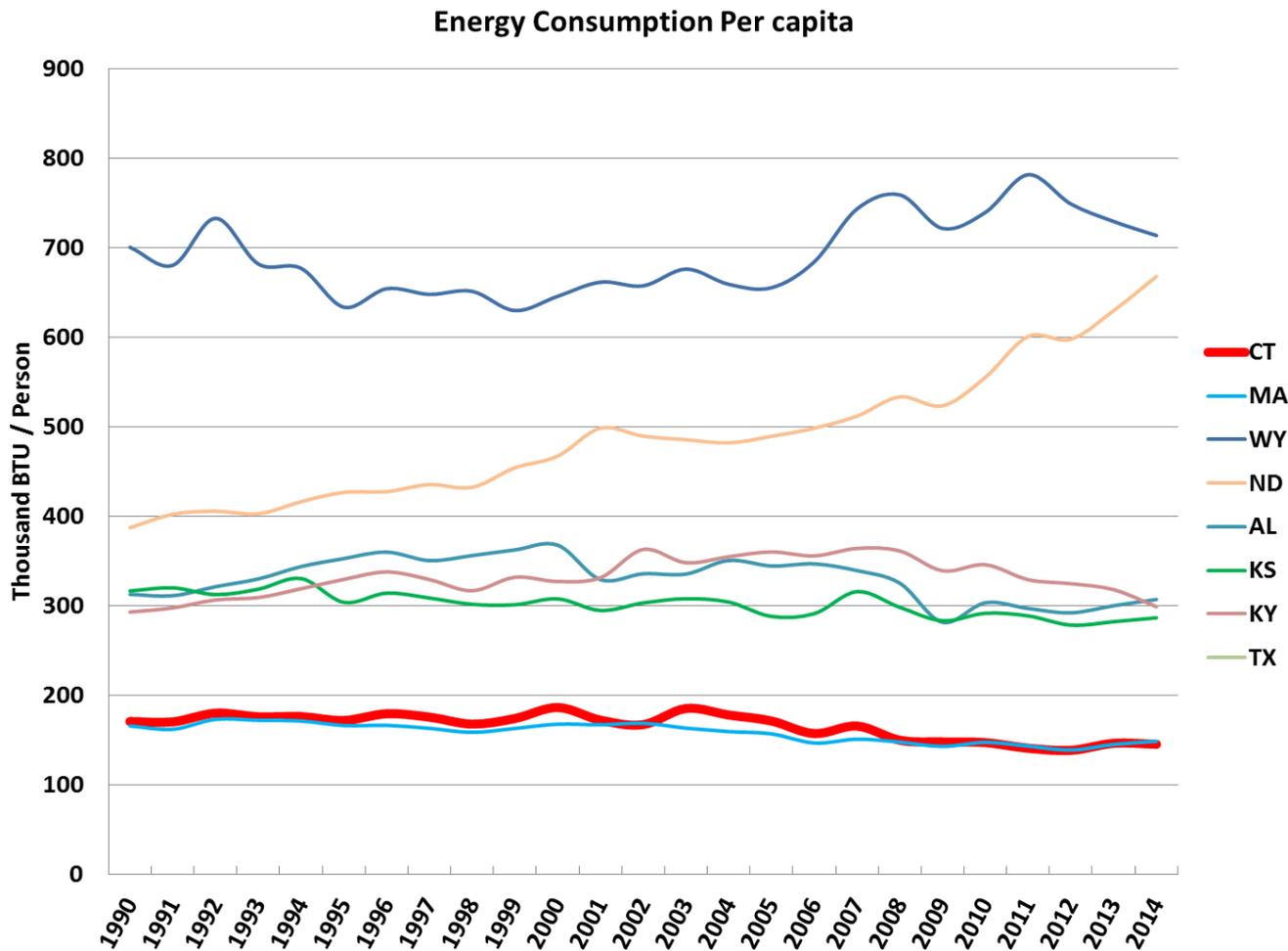
# Energy Intensity of Electricity Consumption



Source: EIA State Energy Data System, 2016

13% reduction in electricity consumption per person from 2005

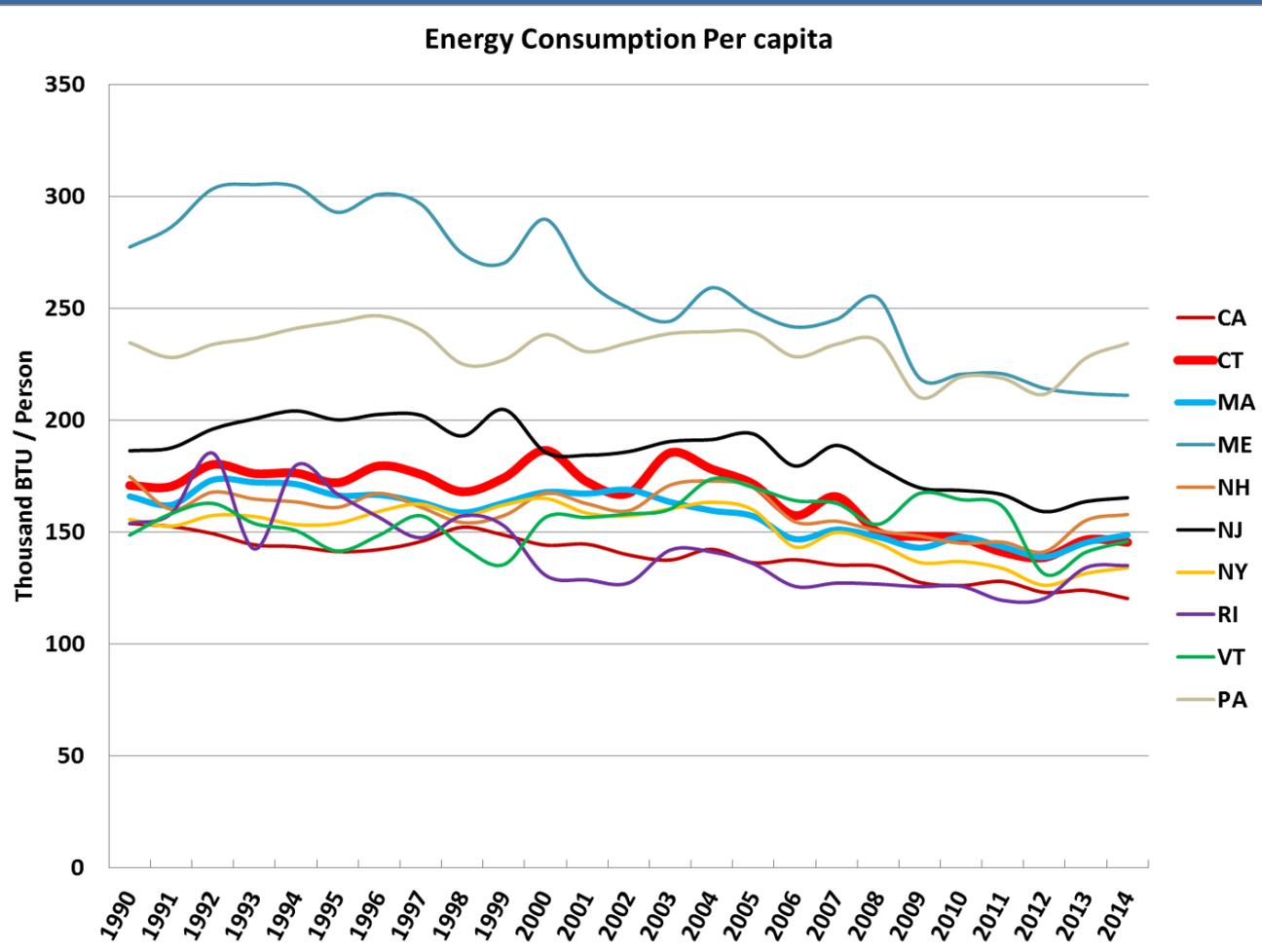
# Residential, Commercial and Industrial Energy Consumption Trends



Northeast states use energy more efficiently compared to other regions

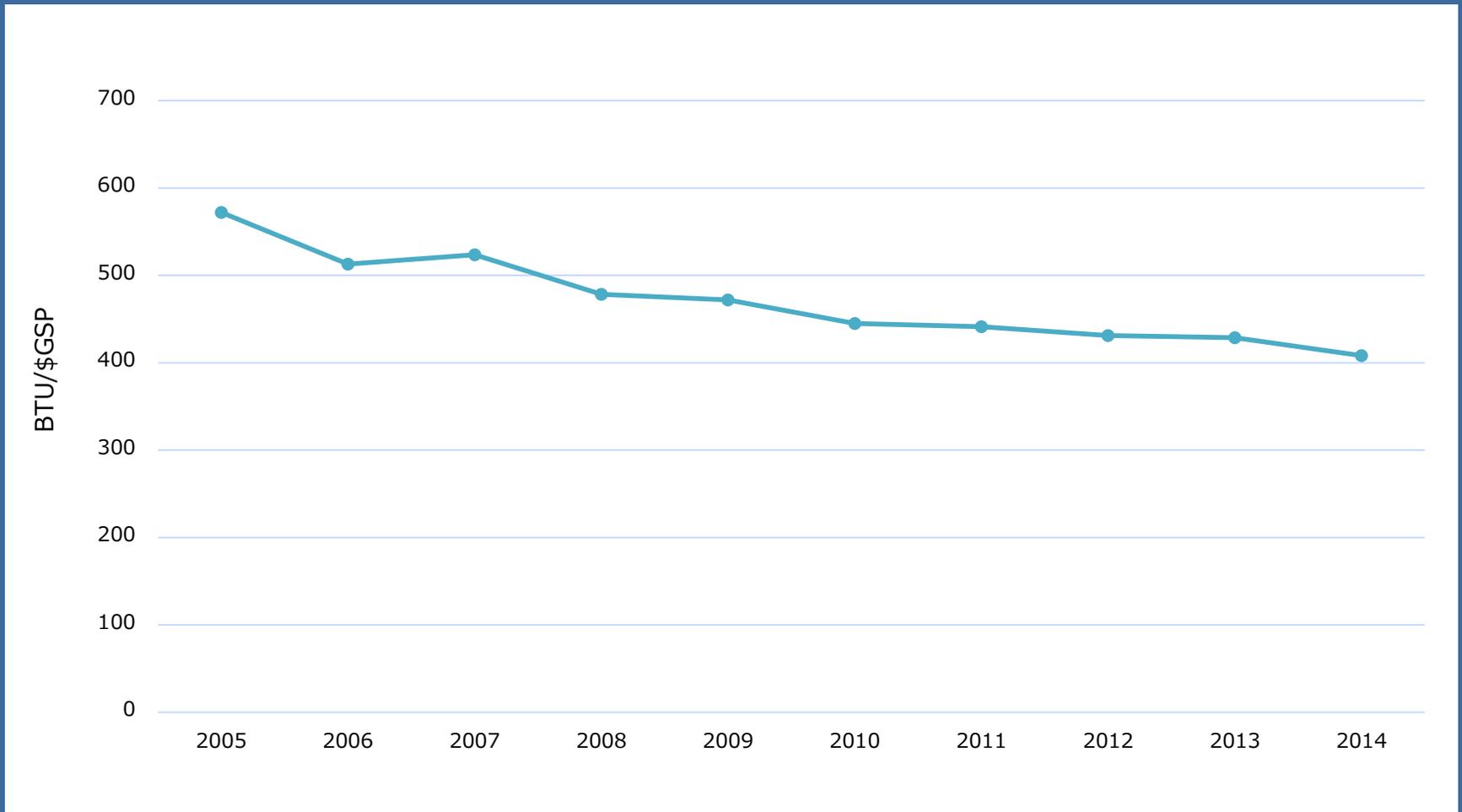
Source: EIA State Energy Data System, 2016

# 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?

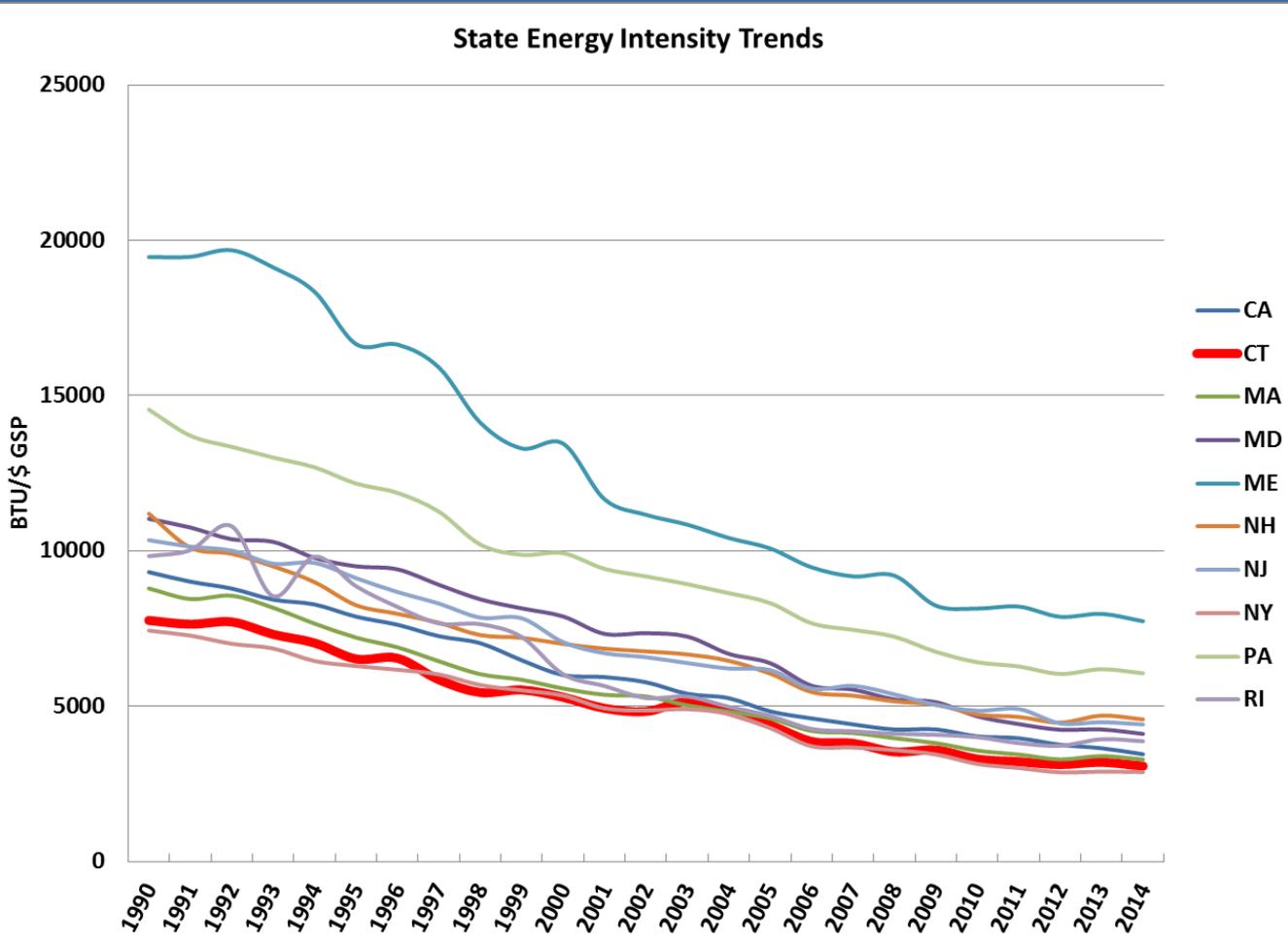
# Energy Intensity of CT Gross State Product



Source: EIA SEDS data

29% reduction in electricity consumption per \$ of GSP

# Economy Wide Energy Consumption Trends

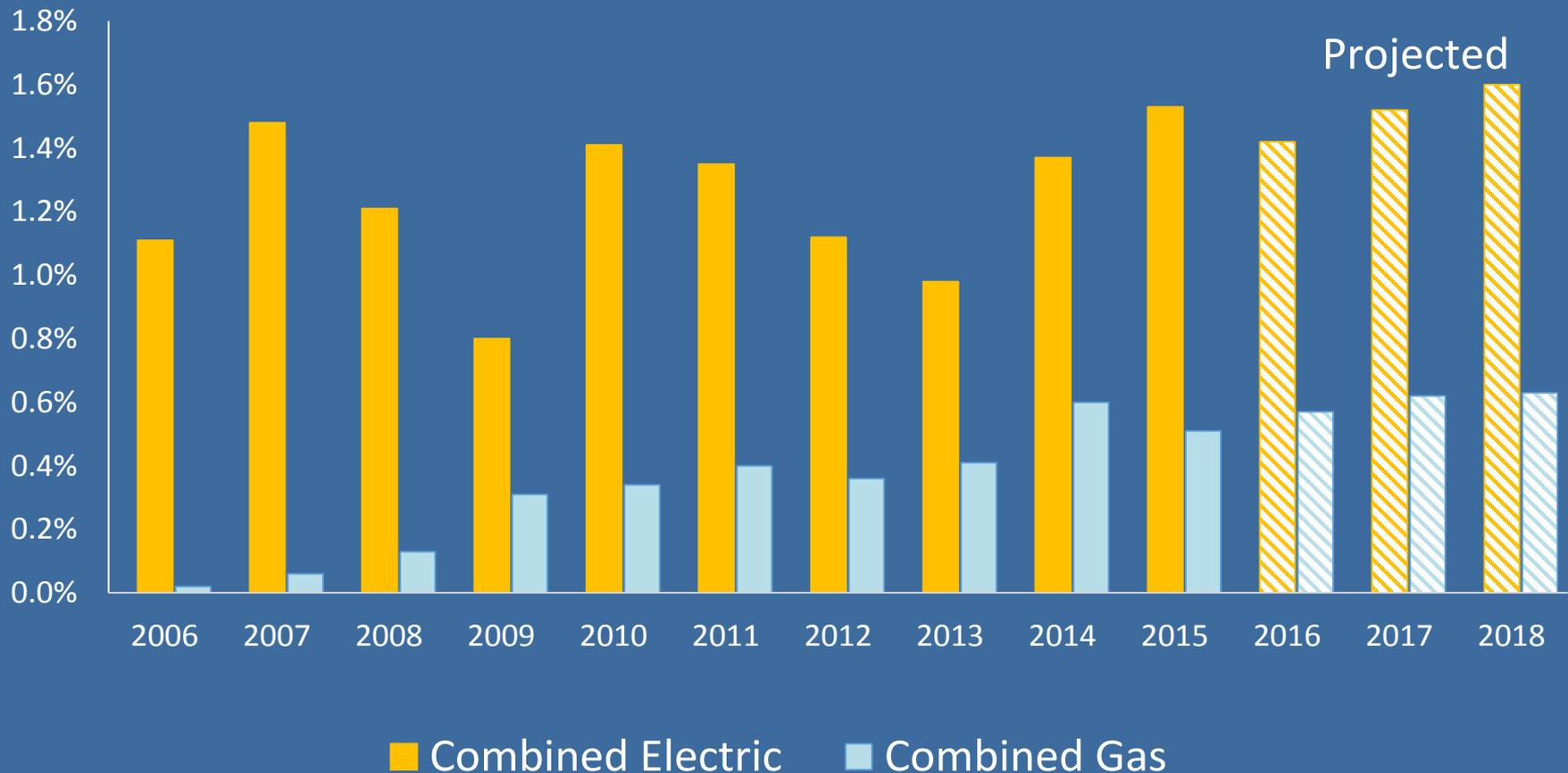


- Consumption per \$ Gross State Product
- Declining trend since early 2000s
- Trend is flattening out for most Northeastern states
- How much further down can this trend go and at what cost?

Source: EIA State Energy Data System, 2016

# CT Energy Savings Are Growing Through Increased Energy Efficiency Investment

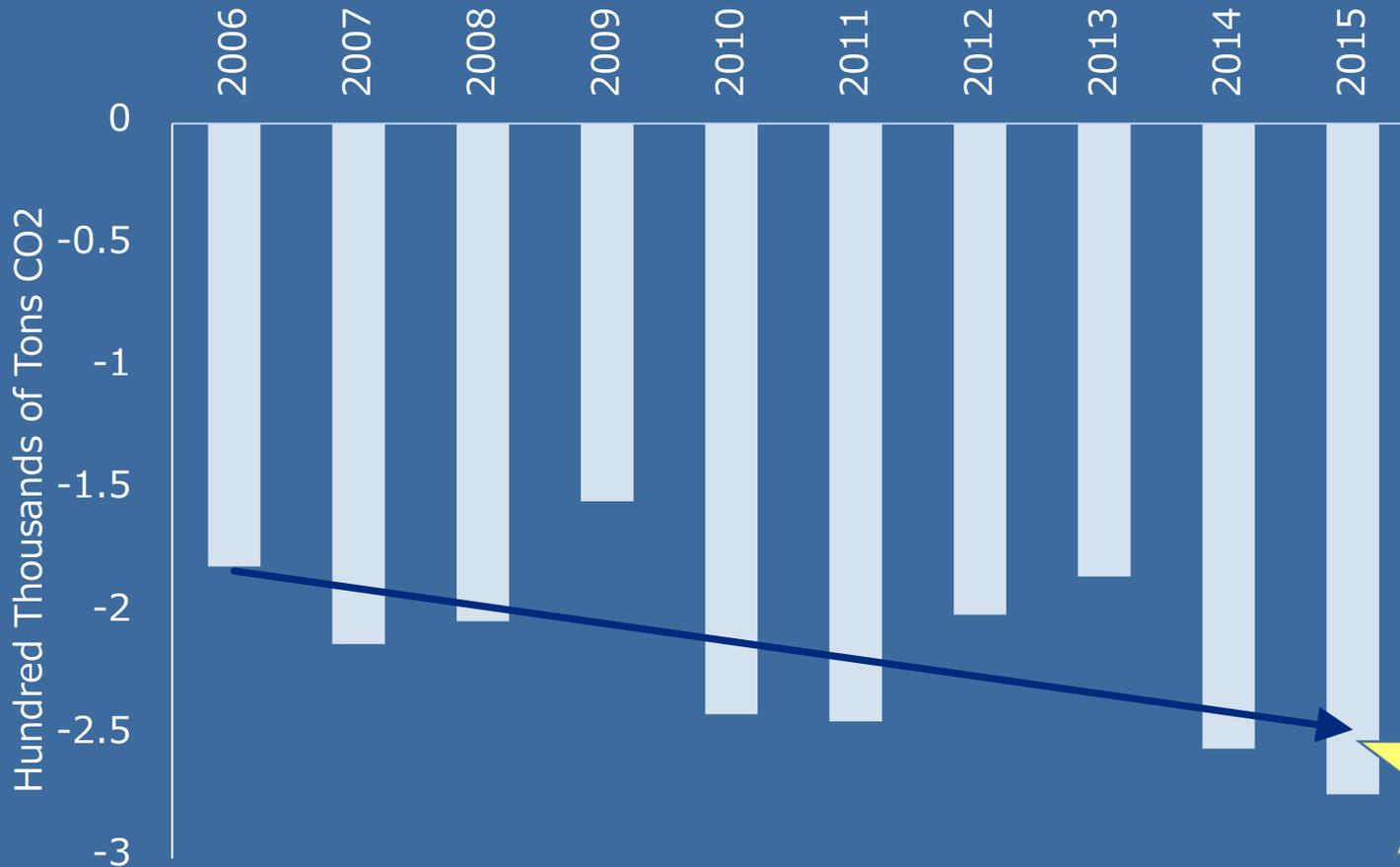
## Annual Energy Savings (% of Sales)



Source: [Connecticut Energy Dashboard](#)

# Energy Efficiency in CT Reduces Emissions

## Annual CO2 Emissions Reductions



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

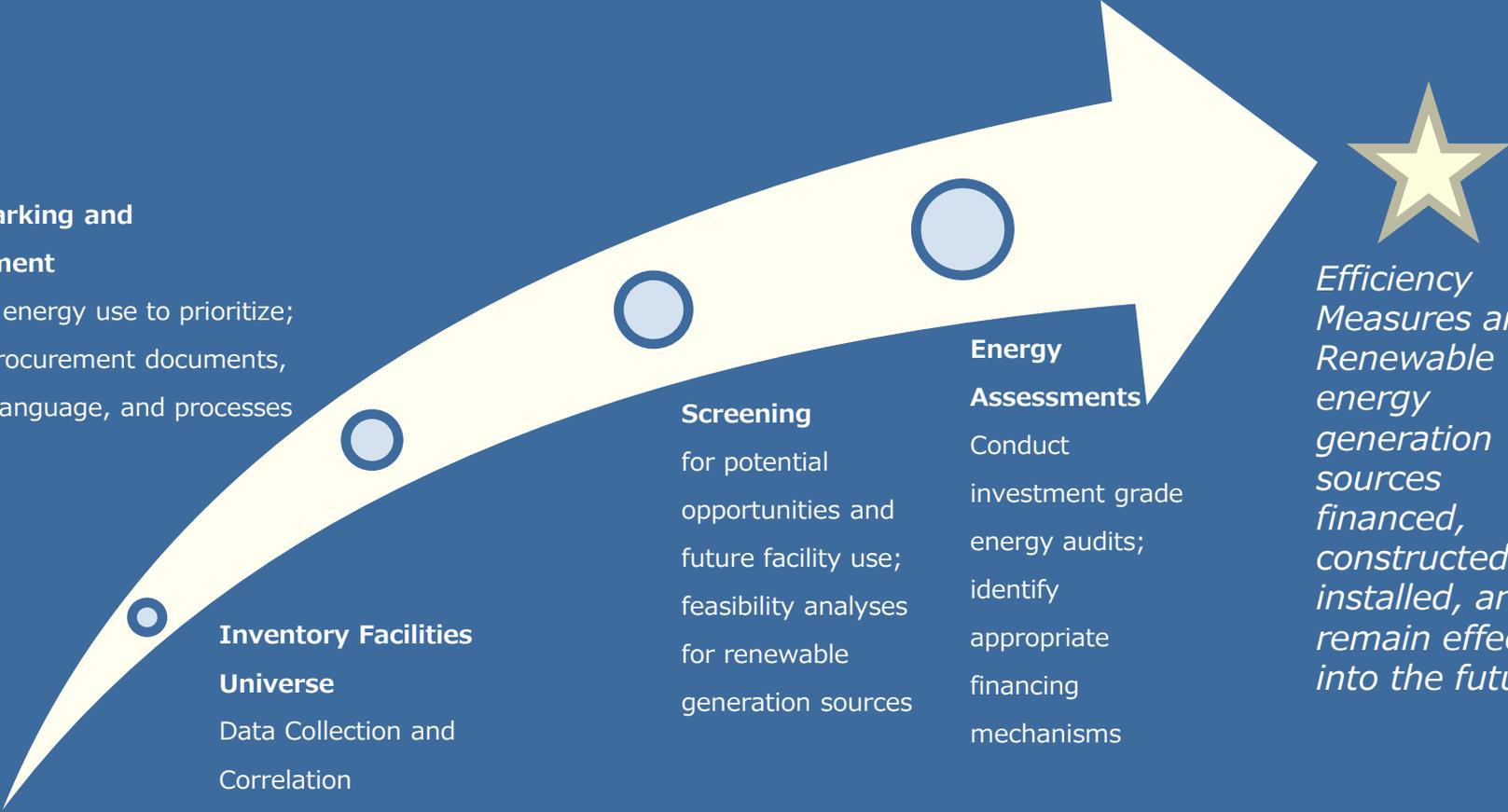
Data Collection and  
Correlation

## 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

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graph TD; A[56 completed projects to date] --> B[14 projects are in construction/design phase]; B --> C[Estimated annual cost avoidance $2.8M];
```

**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



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