

# **GLOBAL CLIMATE CHANGE**

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# GHG TARGETS

<b>Scientists</b>	<b>60-80% below 1990 by 2050 to keep temperature increase at 2-2.4 degrees C</b>
<b>California, Montana, Florida</b>	<b>80% below 1990 by 2050</b>
<b>Massachusetts, Vermont, New Hampshire, Connecticut, Maine, Rhode Island</b>	<b>75-85% below 2001 by 2050</b>
<b>Colorado</b>	<b>80% below 2005 by 2050</b>
<b>New Mexico</b>	<b>75% below 2000</b>
<b>Climate Security Act (Lieberman-Warner) S.2191</b>	<b>Up to 70% below current levels by 2050</b>
<b>Global Warming Reduction Act (Kerry-Snowe) S.485</b>	<b>62% below 1990 by 2050</b>
<b>Climate Stewardship and Innovation Act (McCain-Lieberman) S.280</b>	<b>60% below 1990 by 2050</b>
<b>United Kingdom</b>	<b>60% below 1990 by 2050</b>

# CARBON FOOTPRINTS OF LARGEST 100 METRO AREAS

NY Metro Area rankings plus some others -- CO2/capita:

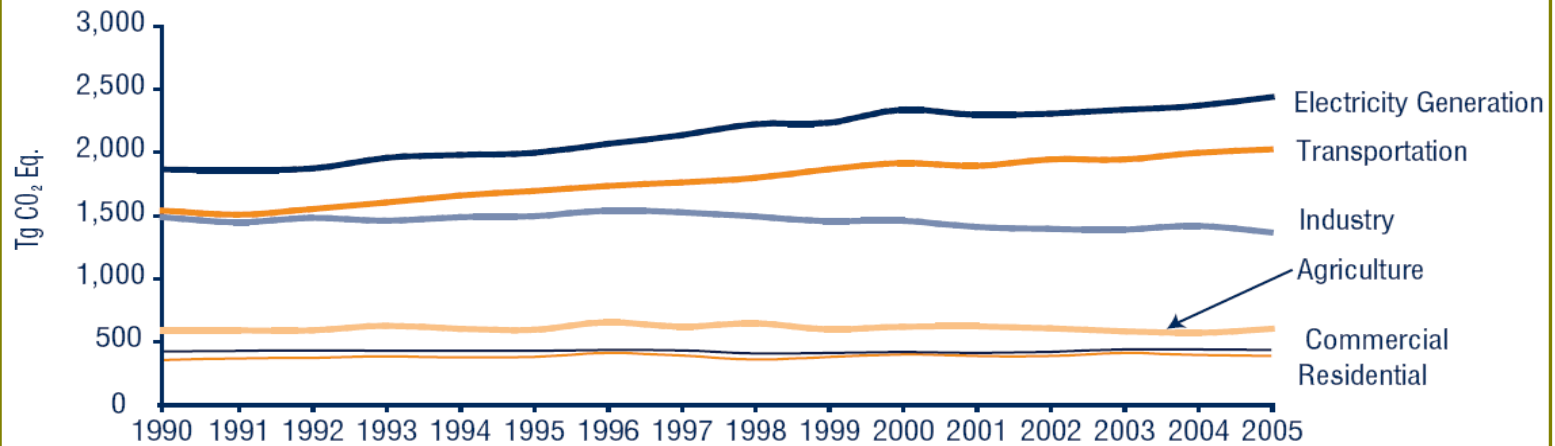
NYC	#1 T	#4 T/RC
Rochester	#3 T	#14 T/RC
Buffalo/Niagara	#4 T	#16 T/RC
Los Angeles	#5 T	#2 T/RC
Las Vegas	#9 T	#18 T/RC
Portland/Vancouver	#10 T	#3 T/RC
Poughkeepsie	#32 T	#25 T/RC
Albany-Schen-Troy	#60 T	#51 T/RC
Atlanta	#66 T	#67 T/RC
Syracuse	#76 T	#67 T/RC
Harrisburg, PA	#97 T	#92 T/RC

- #1 = lowest carbon footprint/capita
- T = on-road transportation CO2/capita
- T/RC = on-road transportation + residential CO2/capita
- 2005 data; transit GHG / energy excluded
- Source: Brookings Institution, "Shrinking the Carbon Footprint of Metropolitan America," May 2008

# U.S. GHG Emissions by Sector (1990-2005)



## Emissions Allocated to Economic Sector



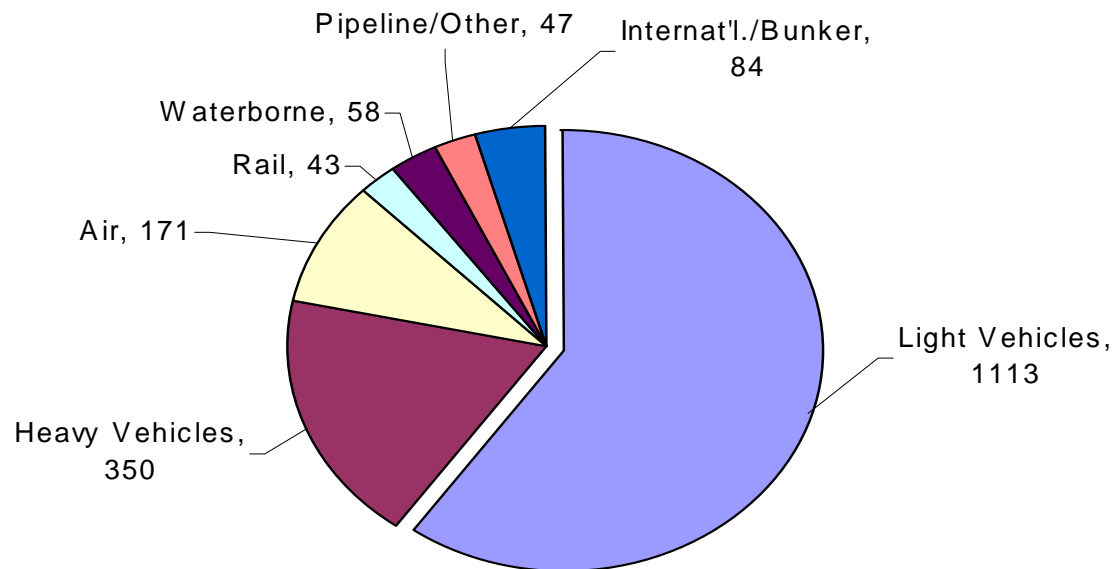
Note: Does not include U.S. territories.

Source: INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2005 (April 2007) Fast Facts USEPA #430-F-07-004

# TRANSPORTATION GHG

Highway vehicles, especially passenger cars and light trucks, account for most transportation C emissions.

**U. S. Transportation Carbon Emissions by Mode, 2003  
(Million metric tons CO<sub>2</sub>)**



# GHG REDUCTIONS FROM TRANSPORTATION

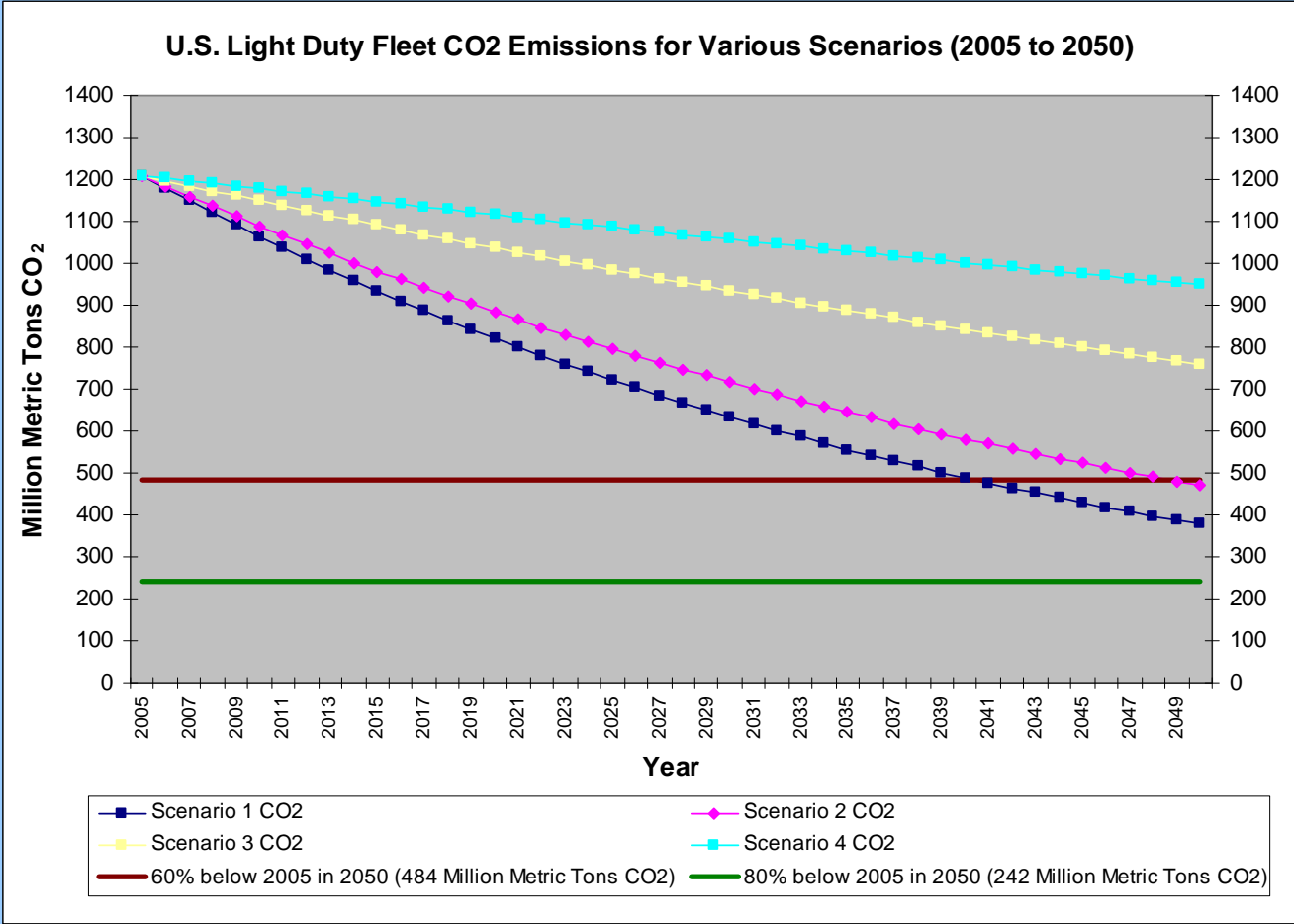
The 3-legged stool:

- Vehicles
- Fuels
- VMT

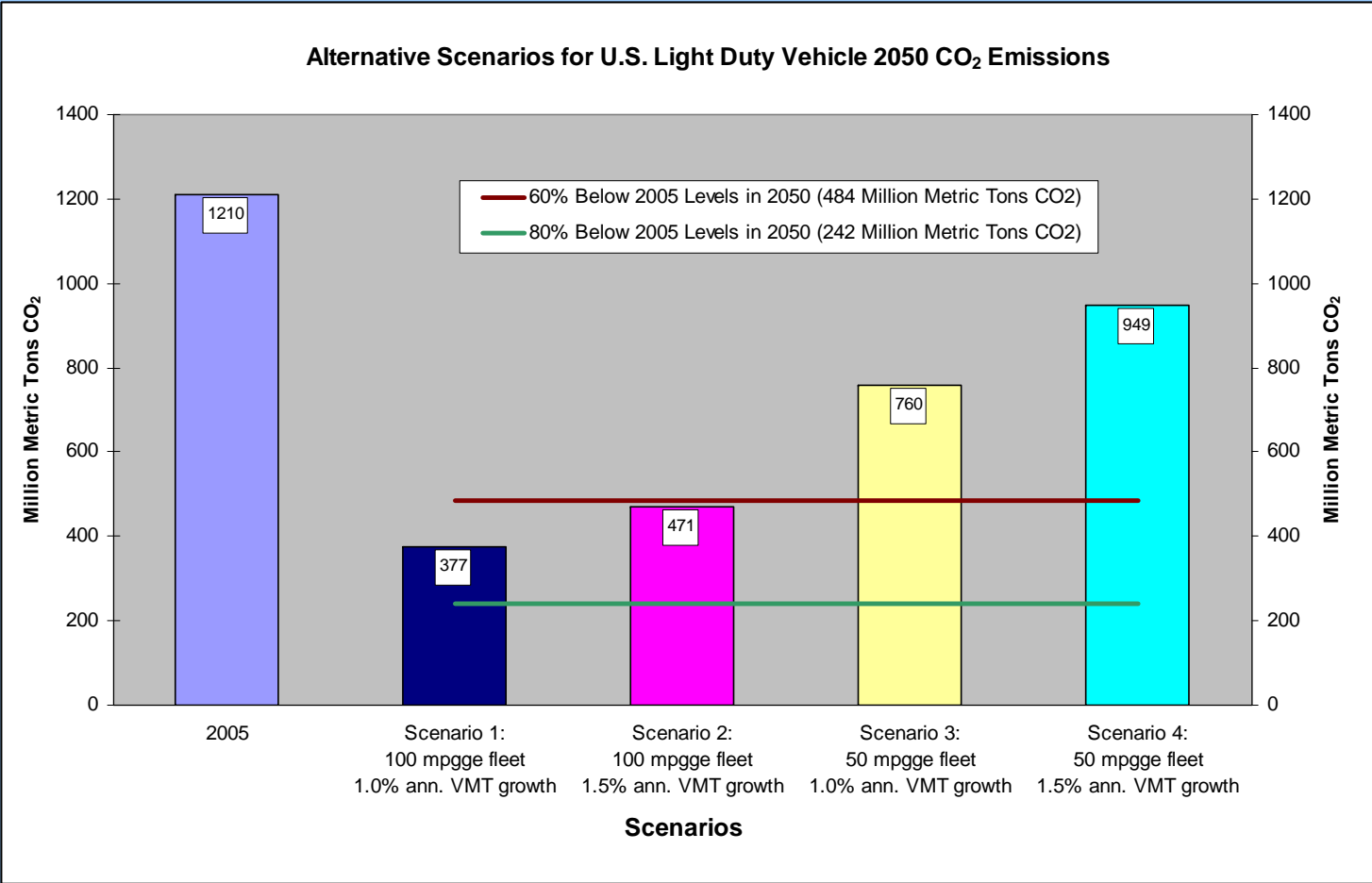
The 4<sup>th</sup> leg:

- On-road performance (20% GHG reduction potential)

# How can transportation achieve 70% GHG reduction by 2050?



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# NYS DOT CLIMATE CHANGE

## “Top 11” Actions

- Mass transit
- Emissions reporting
- Traffic signals
- Freight management
- Managed lanes
- Smart growth/land use
- Idle reduction
- Commuter Choice
- Air quality education
- Alternative fuels
- Research

*Already doing many of these*  
*Should be doing more*  
*Need to quantify reductions*  
*Need to institutionalize energy/  
climate change awareness*

»

-- John Zamurs, NYSDOT, 6/9/08

# NYS DOT CLIMATE CHANGE

## Other Actions To Date

- NY is only state to report energy and GHG emissions for TIPs and long range plans
- Results to date ~ 11% improvement compared to BAU
- NY also looks at GHG/energy during project selection
- Collaboration with NYSDEC, NYSERDA, FHWA
- TIP guidance/direction to include explicit climate change/energy efficiency consideration
- Recommendation for NYS version of Gulf Coast Study, funding being sought
- Recommended compressed work week for NYSDOT

-- John Zamurs, NYSDOT, 6-9-08

# NYS DOT CLIMATE CHANGE

## “Under Consideration”

- Revised vehicle registration fee structure that considers energy and environmental costs of less fuel efficient vehicles
- Fuel efficiency as basis for all vehicle and equipment purchase
- Priority to projects that employ TDM principles
- Interagency VMT reduction workgroup (outgrowth of Governor’s Renewable Fuels Task Force – NY air agency in lead)

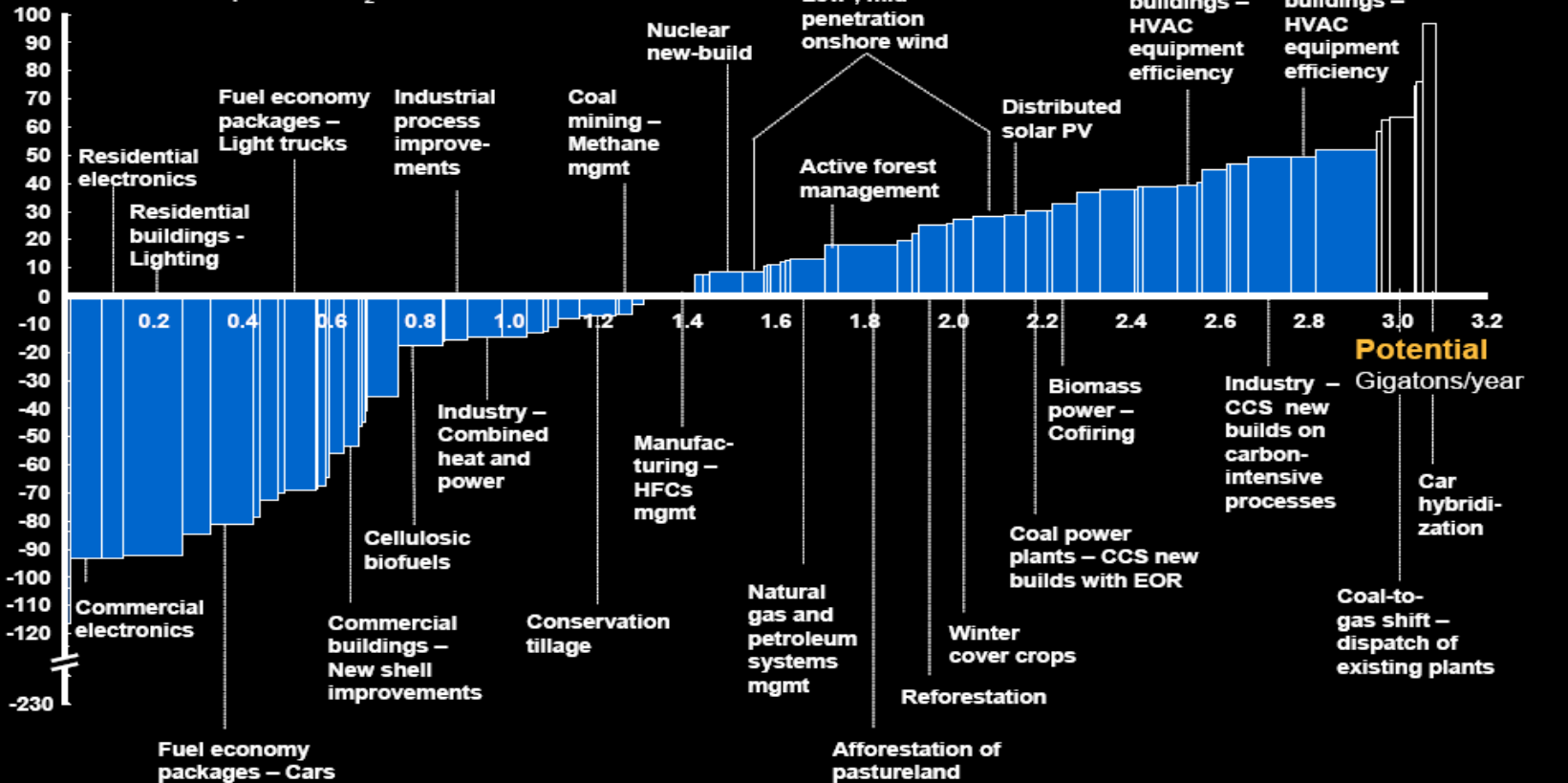
-- John Zamurs, NYSDOT, 6/9/08

# COST-EFFECTIVE GHG REDUCTIONS

## GHG reduction opportunities widely distributed – 2030 mid-range case

### Cost

Real 2005 dollars per ton CO<sub>2</sub>e



# CUTTING TRANSPORTATION GHG

- “Transport is one of the more expensive sectors to cut emissions from because the low carbon technologies tend to be expensive and the welfare costs of reducing demand for travel are high.”
- “Transport is also expected to be one of the fastest growing sectors in the future.”
- “Transport will be among the last sectors to bring its emissions down below current levels.”
- “Whilst transport is likely to be largely oil-based in 2050, it is important for it to decarbonize in the longer term.... [I]n the period beyond 2100, total GHG emissions will have to be just 20% of current levels. It is impossible to imagine how this can be achieved without a decarbonized transport sector.”

**-- Stern Review on the Economics of Climate Change**

# “GROWING COOLER”

“... smart growth could, by itself, reduce total transportation-related CO2 emissions from current trends by 7 to 10 percent as of 2050. This reduction is achievable with land-use changes alone.”

## Key Assumptions:

- 67% of all development in 2050 is new/rebuilt after 2005
- 60-90% of that development is highly compact smart growth (13 housing units/acre)
- 30% lower VMT/capita in compact/smart growth areas
- 80% of US VMT occurs within urban areas
- -- “Growing Cooler,” by Urban Land Institute, Smart Growth America, and Center for Clean Air Policy, 2007

# EUROPEAN COUNCIL OF MINISTERS OF TRANSPORT

- “For the short and medium term, policies that target fuel efficiency offer most potential for reducing CO2 emissions. The most effective measures available include fuel taxes, vehicle and component standards, differentiated vehicle taxation, support for eco-driving and incentives for more efficient logistic organization, including point of use pricing for roads. “
- “For the long term, more integrated transport and spatial planning policies **might** contain demand for motorized transport.”

# EUROPEAN COUNCIL OF MINISTERS OF TRANSPORT (cont.)

- “Modal shift policies are usually weak in terms of the quantity of CO<sub>2</sub> abated .... Modal shift measures can be effective when well targeted, particularly when integrated with demand management measures. They can not, however, form the corner-stone of effective CO<sub>2</sub> abatement policy and the prominence given to modal shift policies is at odds with indications that most modal shift policies achieve much lower abatement levels than measures focusing on fuel efficiency.”
- “Ultimately higher cost energy sources .... will be required if there are to be further cuts in transport sector CO<sub>2</sub> emissions. Major R&D programs will be required to bring these technologies to commercial viability.”

# CLIMATE ADAPTATION

- “Climate change will affect transportation primarily through increases in several types of weather and climate extremes... very hot days; intense precipitation events; intense hurricanes; drought; and rising sea levels, coupled with storm surges and land subsidence.”
- “The impacts .... will be widespread and costly in both human and economic terms and will require significant changes in the planning, design, construction, operation, and maintenance of transportation systems.”

- TRB Special Report, March 2008