23E CONGRÈS MONDIAL DE LA ROUTE PARIS 2007

Climate Change and Transportation

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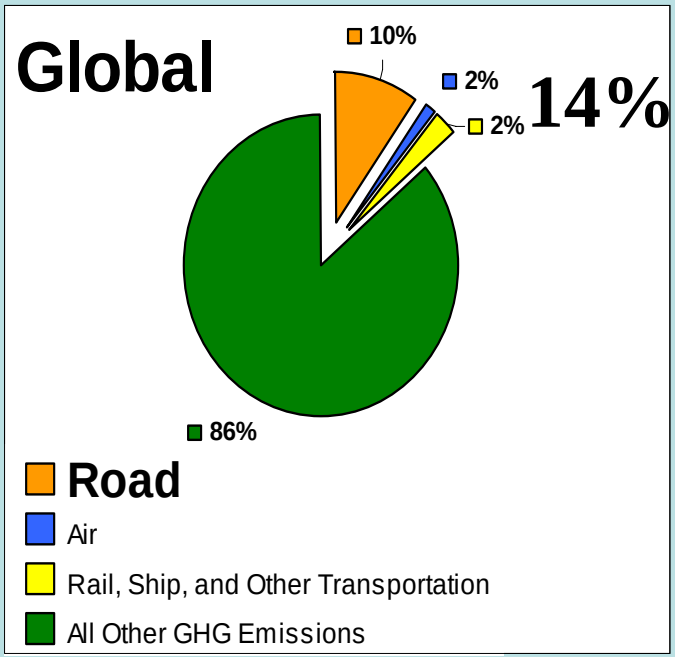
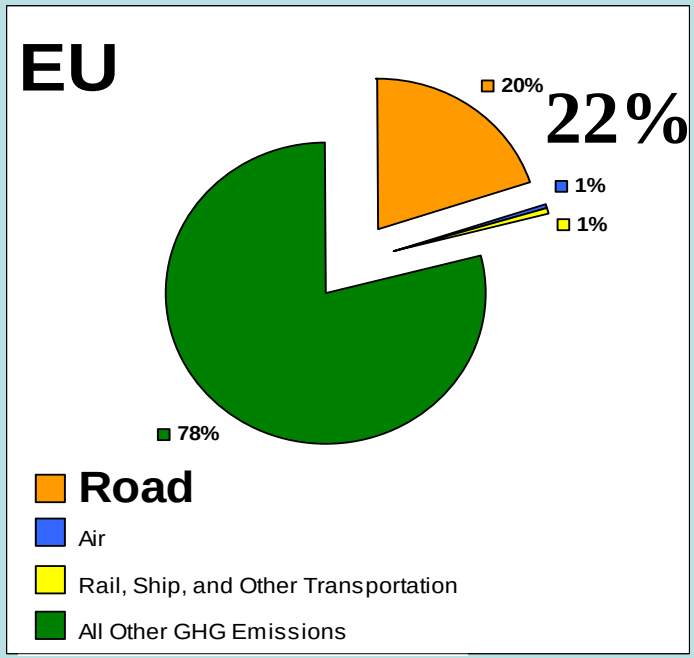
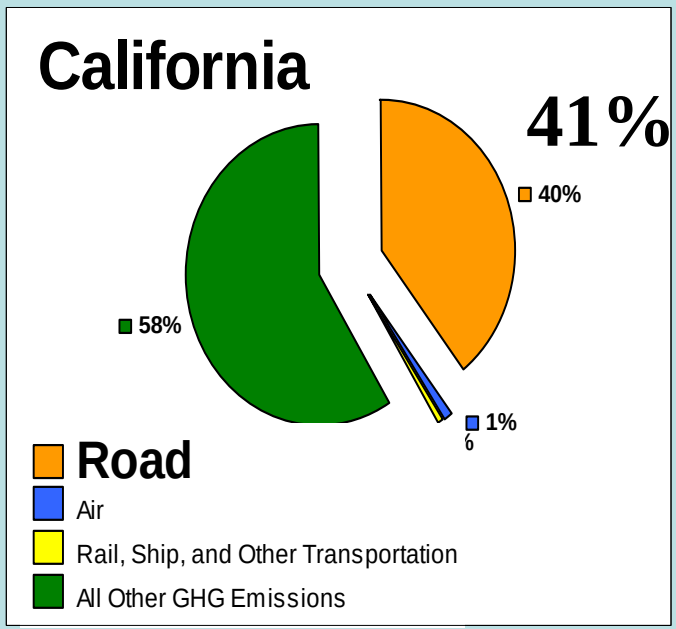
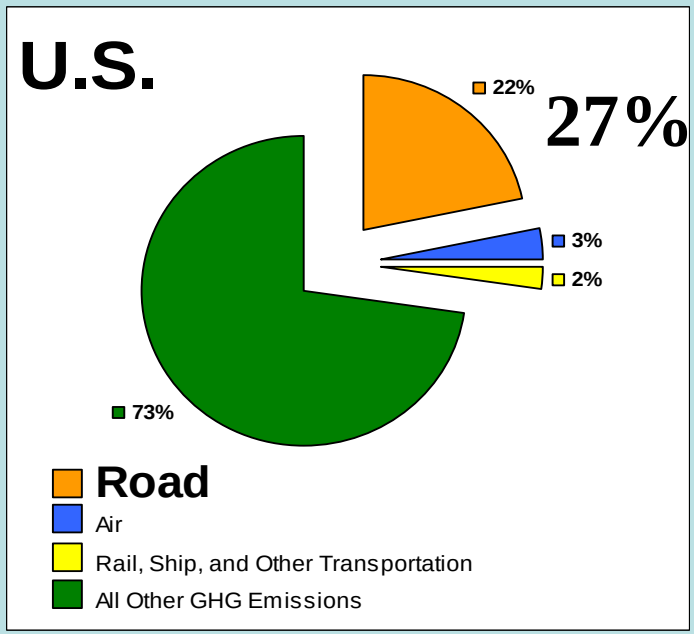
Carbon Dioxide from Transportation

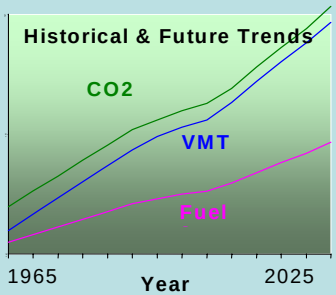








Global GHGs have been steadily increasing

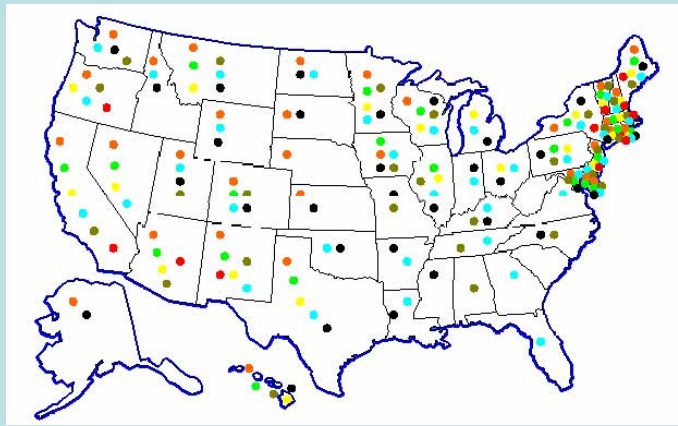


- Population Growth and Development
- Increases in personal travel (projected increase of 1.7% annually).
- Increases in Goods Movement (projected increase of 2.3% annually).
- Continued heavy reliance on fossil fuels.
- **Transit modal share has decreased due to lower density land use and greater convenience of private vehicles.**

State's Role in Climate Change

- **Global warming requires a concerted effort at the national and international levels.**

- **States and regions can be instrumental in developing models and lay the ground for broader action.**

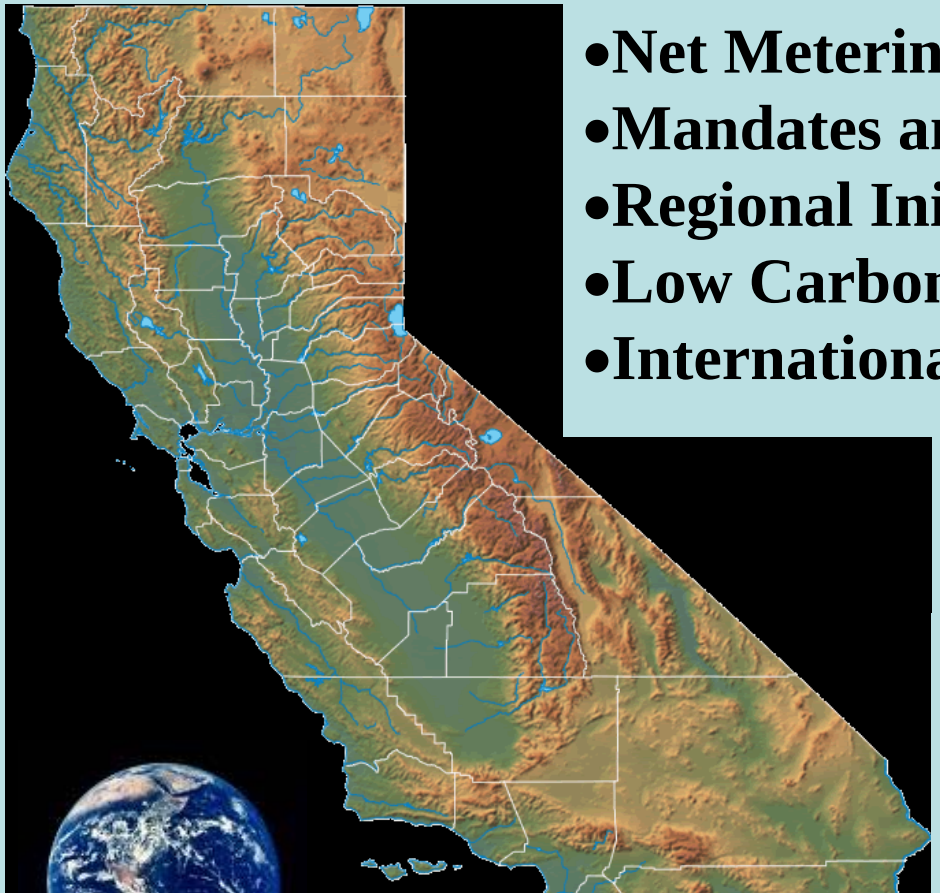


State's Role in Climate Change

States are taking action because:

- **Concern with potential long-term impact of changing climate on the socioeconomic viability and natural resources of the state.**
- **Recognize policies that protect the climate have multiple benefits.**

California Climate Initiative



- Net Metering
- Mandates and Incentives Promoting Ethanol
- Regional Initiatives (i.e. Western States)
- Low Carbon Fuel Standards for Transportation
- International Agreements (i.e. UK and Canada)

- Climate Action Plan
- State GHG Emission Targets
- Renewable Portfolio Standards
- Public Benefits Funds

California Assembly Bill (AB) 32

The "California Global Warming Solutions Act of 2006," is the first law to comprehensively limit greenhouse gas (GHG) emissions at the state level.

The Bill's stated objective is to return GHG emissions to 1990 levels, using some kind of cap and trade mechanism.

Negotiations on the precise mechanisms will take about two years, but salient features are already discernable.

California Department of Transportation Climate Action Program

Department is playing significant role in supporting California's Climate Action Program (AB 32 and Gov.'s Initiative)

Department Believes:

It is possible to reduce GHG emissions while expanding and creating an efficient and effective transportation system

California Department of Transportation Climate Action Program

<u>Short term</u>: concern with the impact of transportation on climate and mitigation measures to reduce GHG emissions.

<u>Long term</u>: concern with the impact of climate change on transportation system and the vulnerability of the transportation facilities and adaptation measures.

Vulnerability of Transportation to Climate Change

- California is one of the most diverse regions of the world – ecologically, geographically, and culturally.

- Climate Change:
  - Will generate new patterns of microclimate.
  - Could gradually change the characteristics of these regions, and
  - Will have important implications for California's vast transportation network and socioeconomic activities.

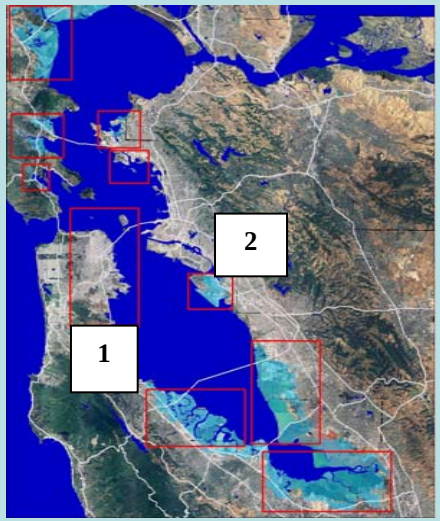
Adaptation Challenge

- **Averaging climate change impact globally is likely to obscure regional solutions.**
- **To evaluate Vulnerability of the transportation system, we need:**
  - **Reliable, comprehensive assessment of the microclimate changes,**
  - **Magnitude – Will these changes be moderate or severe?**
- **Then, the vulnerability of transportation systems or facilities can be assessed**
- **There no single or simple answer to these questions**

Climate Planning

- It is not too early to incorporate climate assessment into transportation planning and project development.
- The climate scenarios require consensus and high probability.
- Develop technical requirements to address climate change.
- Establish Climate Action Program and a focal point to coordinate climate activities.

Adaptation (Impact of Climate Change on Transportation)



San Francisco - Oakland Bay Area – One meter sea level rise scenario

Photo of Land Slide, February 2007 - Humboldt County, CA, State Highway 96

California Department of Transportation Climate Action Program

Objective:

- Stabilize CO2 Emission from Transportation

Approach:

- Vehicle and Fuel Technology
- Transportation System Efficiency
- Non-Vehicular Conservation Measures

Technology is Important

Transportation nearly entirely depends on fossil fuel (97%).

Direct combustion of fuels accounts for 2/3 of primary energy use & GHG emissions.

Number of vehicles projected to triple by 2050.

Fuel and Vehicle Technology

Fortunately, emerging technologies can help to meet the climate challenge.

- **Greater vehicle fuel economy (CAFÉ).**
- **Introduction of new fuel and vehicle types (i.e. biofuels, electricity, hydrogen, fossil fuel/low carbon).**
- **Combination of both fuel and vehicle changes (i.e. more efficient hybrid vehicles).**

California's Motor Vehicle Greenhouse Gas Emissions Regulations: Overview

AB 1493 Regulations: Fleet-Average Emission Standards

Tier	Year	CO_2-equivalent emission standards (g/mi)	
		PC/LDT1	LDT2
Near-term	2009	323	439
	2010	301	420
	2011	267	390
	2012	233	361
Mid-term	2013	227	355
	2014	222	350
	2015	213	341
	2016	205	332

~22% reduction in 2012

~30% reduction in 2016

California Environmental Protection Agency AIR RESOURCES BOARD

Transportation System Efficiency

1) **Institutional change – Integrating GHG reduction measures into transportation investments decisions (mainstreaming).**

2) **Strategic Planning**

Short Term:
- Congestion Relief
- Operational Improvements/ITS
- Alternative Modes
- Demand Management

→ **VMT Management**

→ **VMT Reduction**

Long Term:
- Urban Design

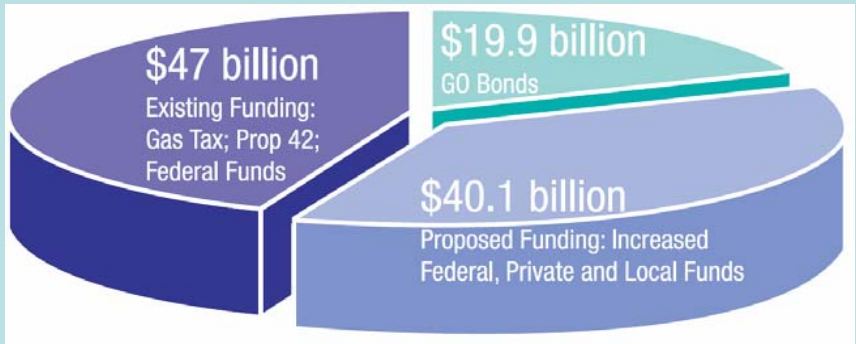
→ **VMT Reduction**

Governor's Strategic Growth Plan

$107 Billion transportation infrastructure investment

The SGP Targets:

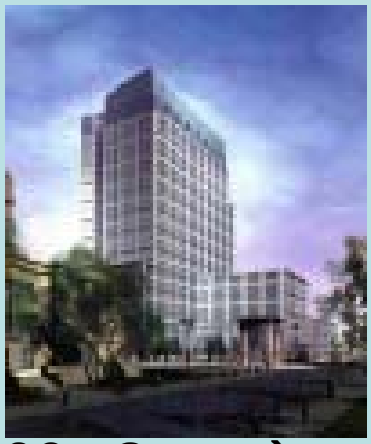
- **Significant decrease in congestion below today's levels**
- **600 miles new commuter lines**
- **150% increase in intercity rail ridership**
- **310,000 more transit ridership**
- **550 new HOV lanes miles**
- **750 new highway lane miles**
- **8500 miles of separated bike and pedestrian paths**



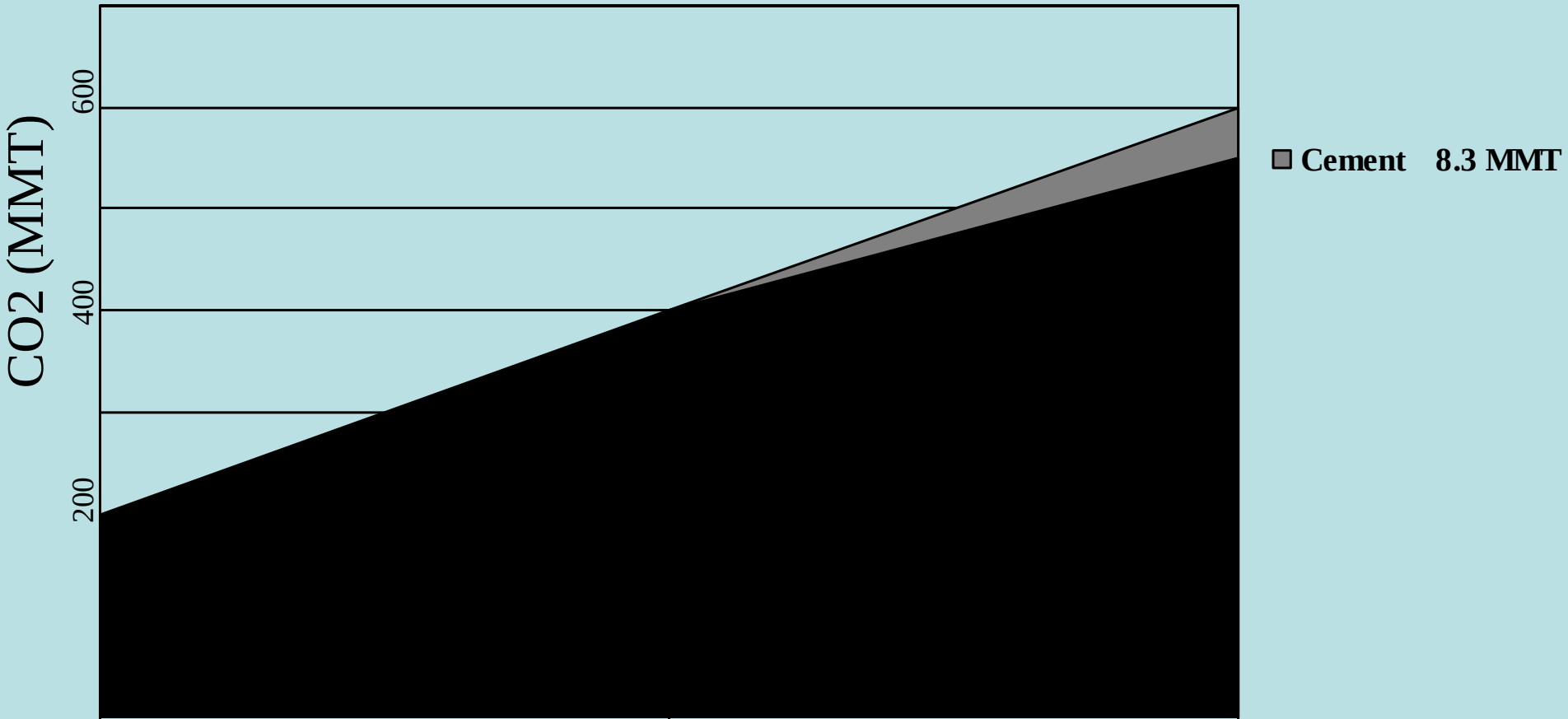
Non-Vehicular Resource Conservation

Reducing GHG Emissions through Energy Conservation

- Cement Mix
- HWY Lighting
- Green Building
- Landscaping



GHG Stabilization Wedges



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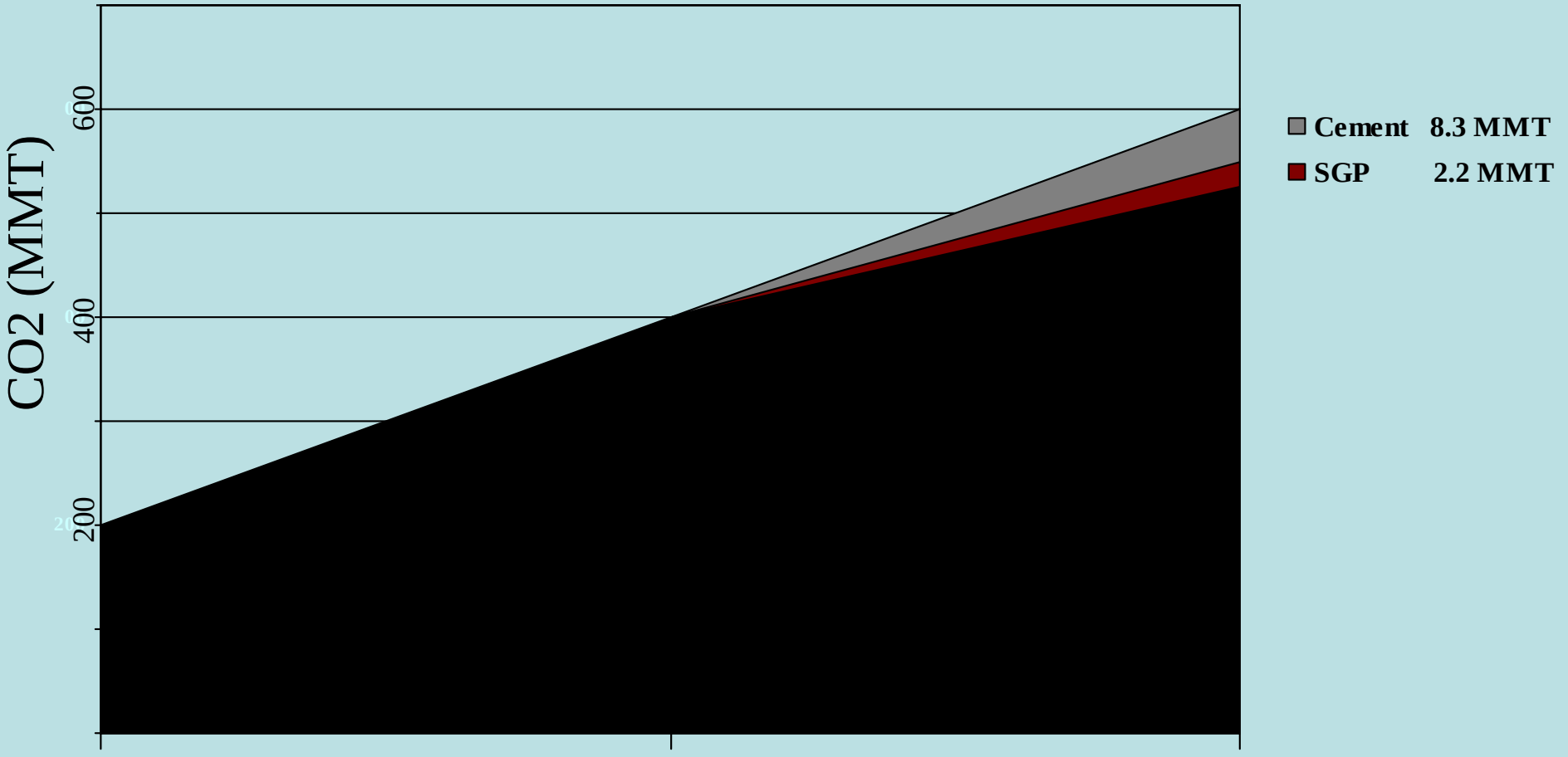

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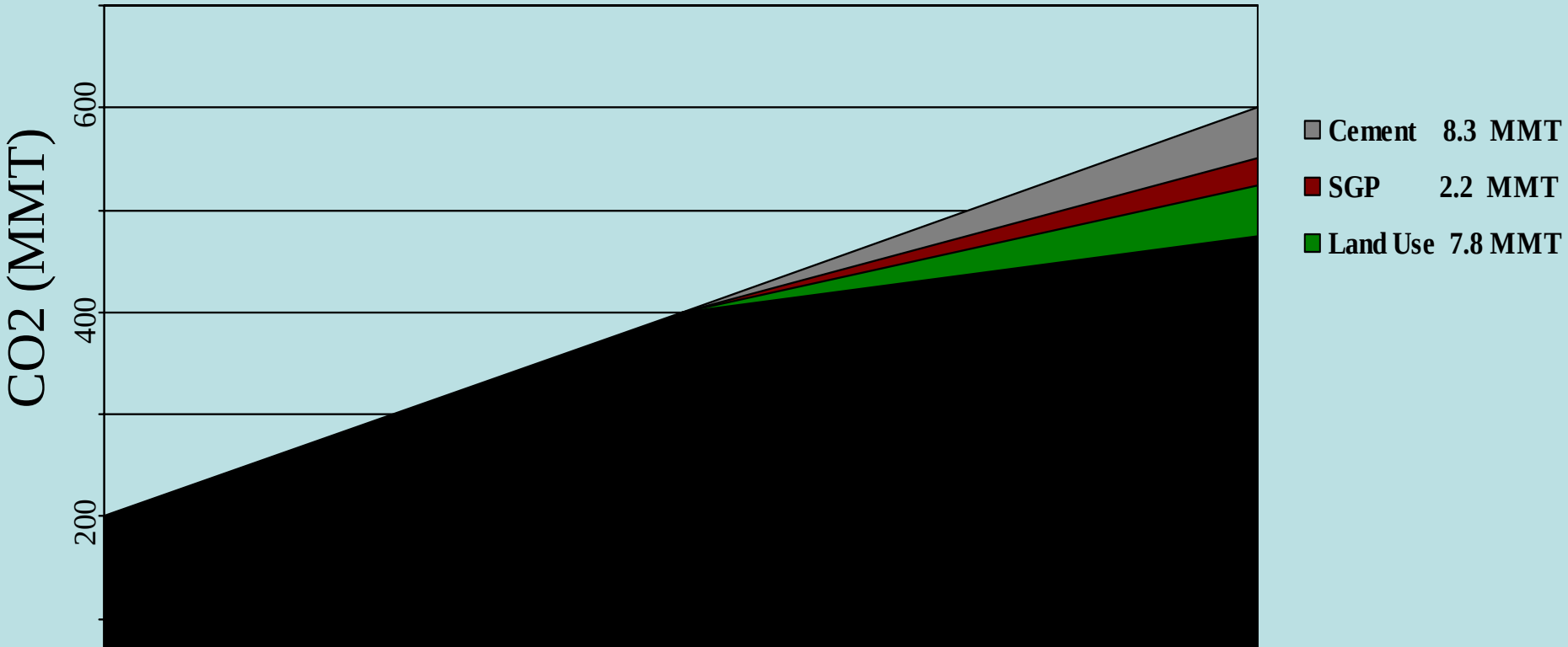

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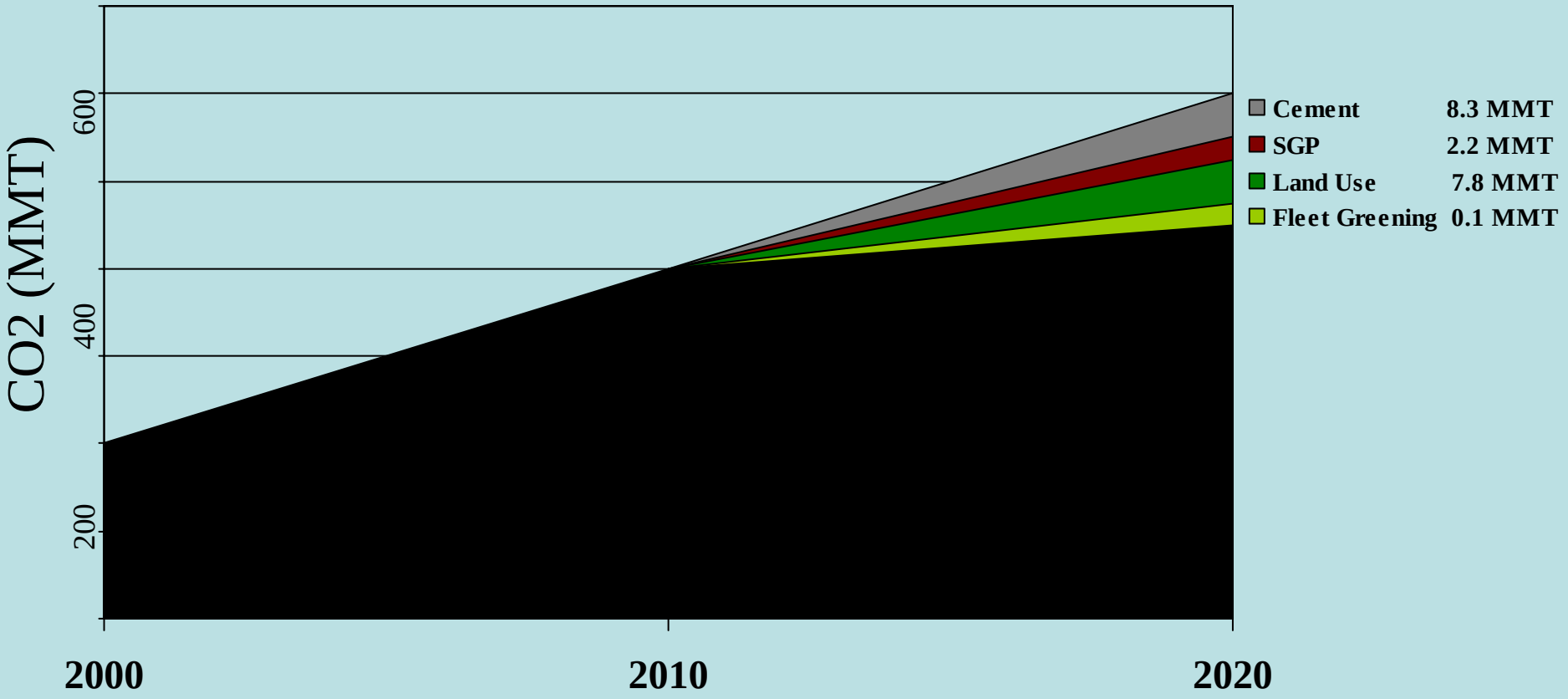
GHG Stabilization Wedges



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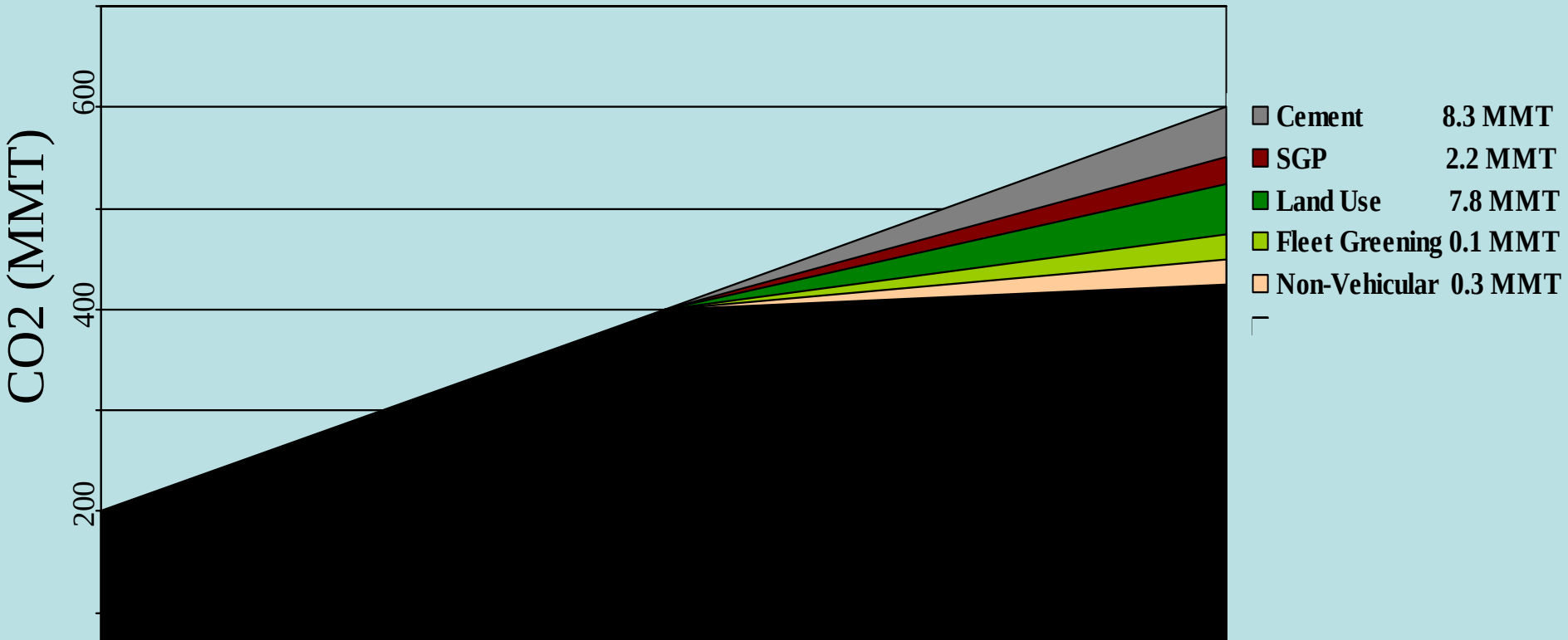

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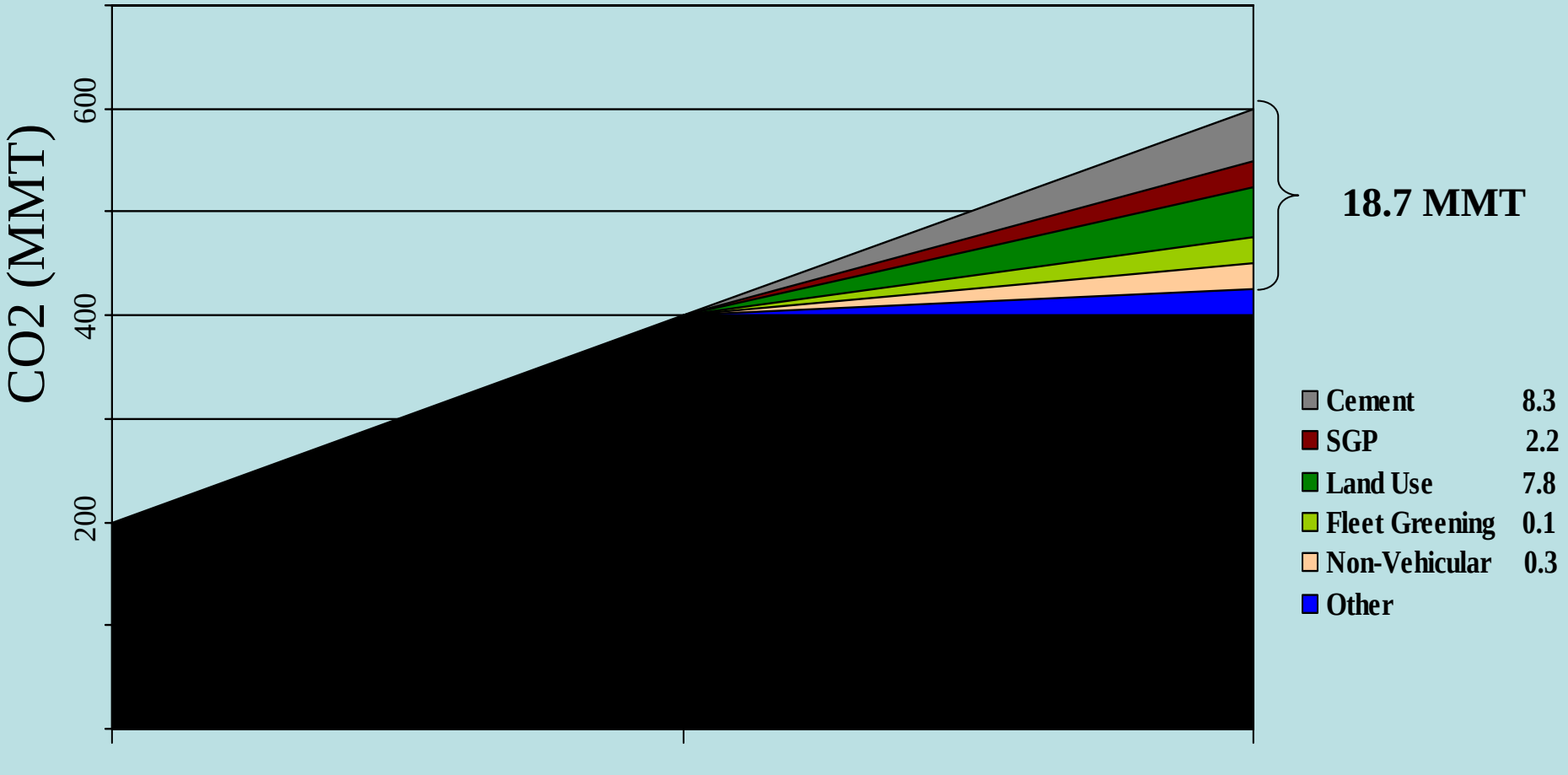
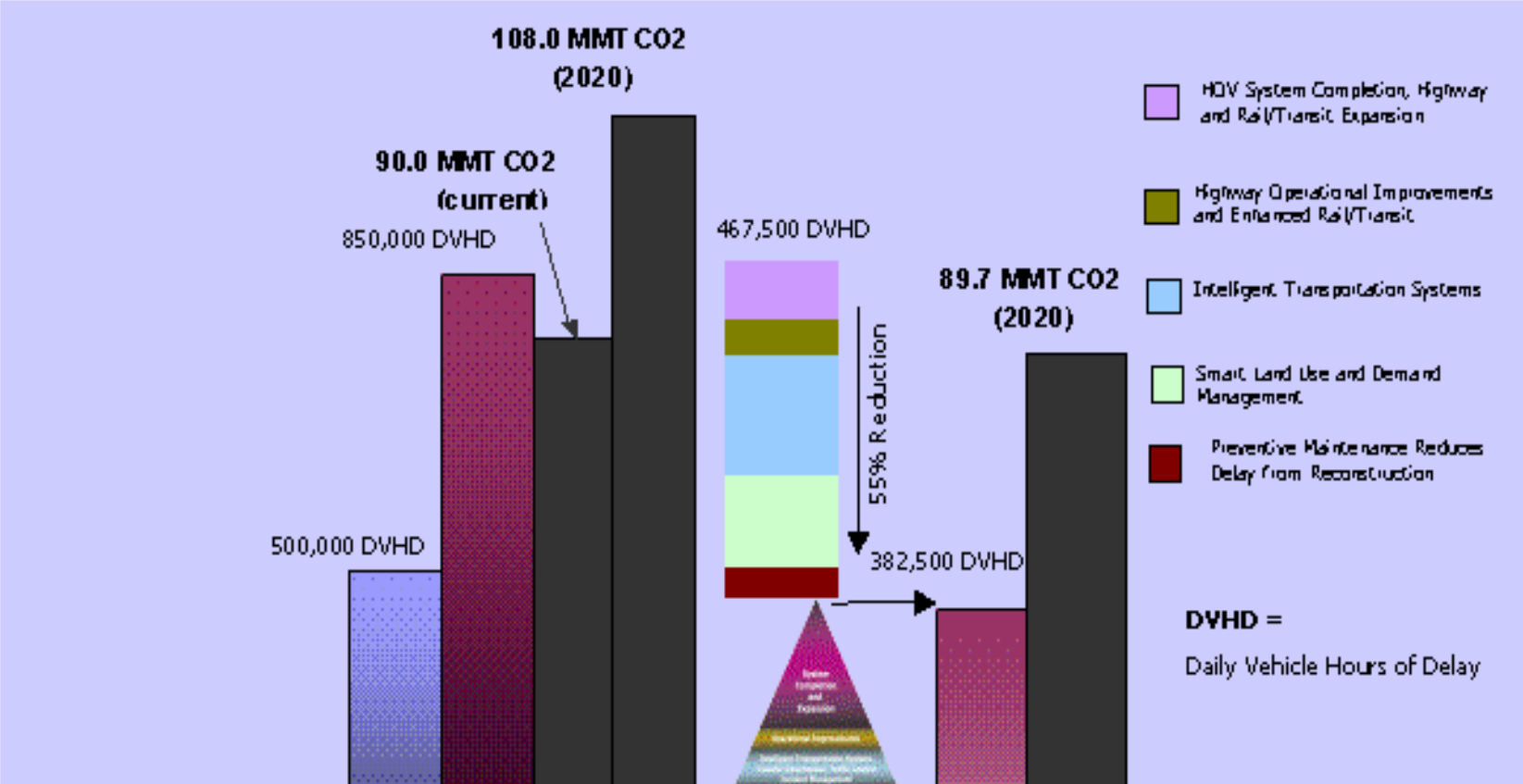


Outcome of Strategic Growth Plan



Conceptual Framework for Reducing Congestion that Needs to be Verified Through Experience

* Numbers reflect SHWY system

Climate Change and Transportation

Thank You