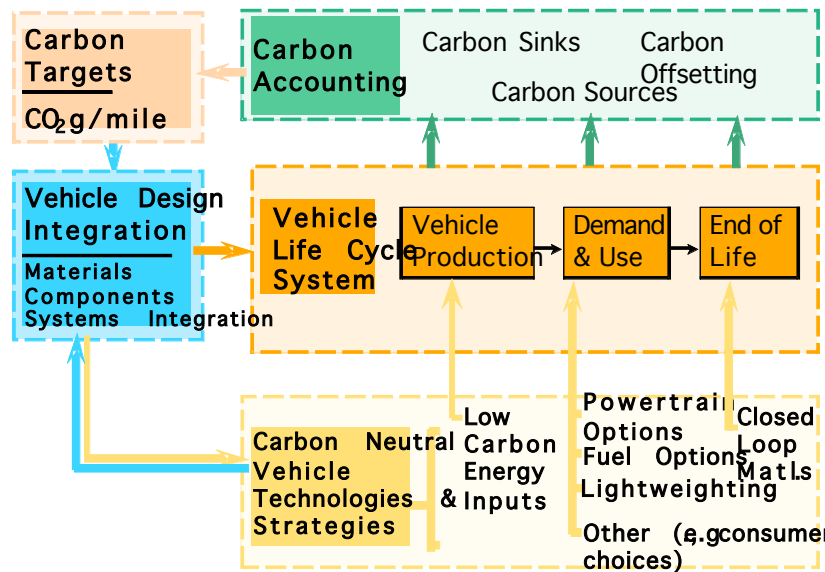


Curbing vehicle carbon emissions

Role for technology, consumers and alternative fuels



Objective:

Develop and apply life cycle-based system models to

- evaluate sustainability performance and
- guide technology improvement, design, strategy and policy

Approach:

- Define sustainability metrics and targets
- Construct life cycle based models of alternative vehicle technologies (e.g., PHEV's) and fuel sources/fueling strategies (e.g., renewable energy sources) based on different scenarios for market penetration, driving and charging behavior
- Evaluate life cycle energy, carbon footprints, and other environmental, economic and social indicators
- Optimize system parameters to improve sustainability performance

Impact:

IPCC indicates that global carbon emissions should be reduced between 50 and 85 percent to stabilize greenhouse gas concentrations at levels to avoid serve adverse effects of climate change. Our modeling indicates that **U.S. automobile carbon emissions must be reduced from 160 g/mi to 20 g/mi** by 2050; This would require:

- improving fuel economy from 20 mpg to 136 mpg
- cutting driving in half
- switching to low carbon fuels
- or a combination of strategies

Life cycle models are valuable in evaluating alternative technologies, design, consumer patterns and policy

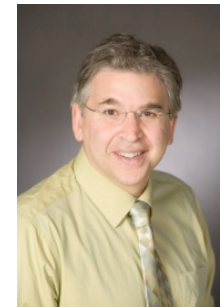
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Facilities and infrastructure

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