

# Combinations of Instruments to Achieve Low-Carbon Vehicle-Miles

by

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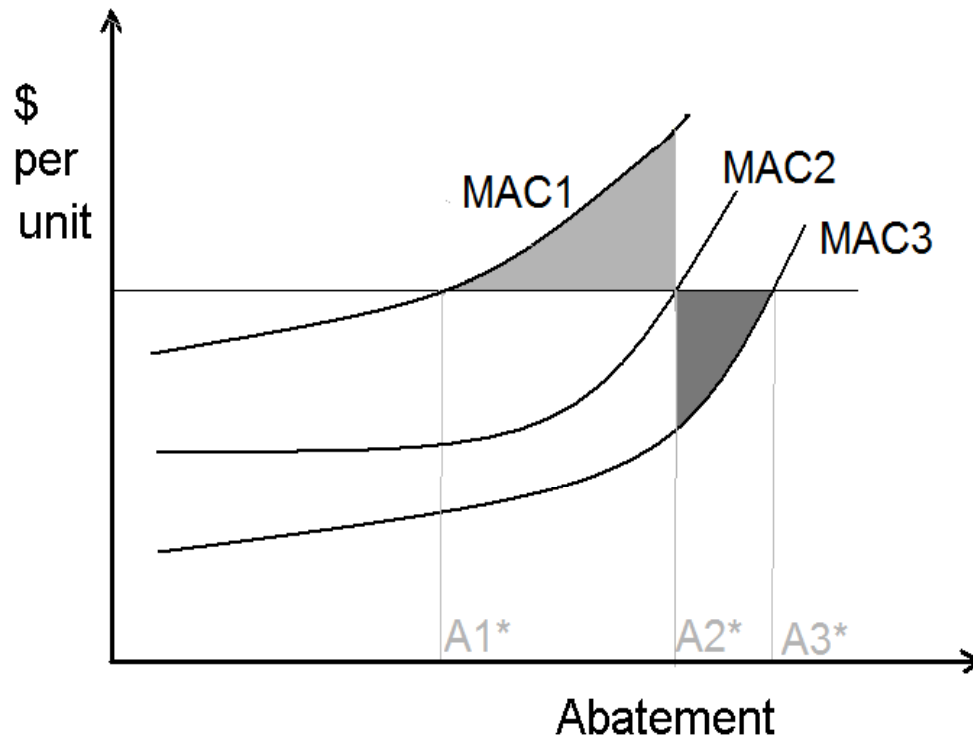
# Introduction & Motivation

- Significant carbon emissions from vehicles
- Positive trends on vehicle emissions, number of vehicles, and miles driven
- Ideal Pigovian tax is not always available due to problems monitoring, political constraints, equity, etc.
- **Main Idea:** Use combinations of other policy instruments in a holistic approach to mimic first-best carbon tax outcomes in a politically feasible framework
- Need both substitution effects and output effects

# Current Policy Examples

- United States
  1. Corporate Average Fuel Economy (CAFE)
  2. Renewable Fuel Standard (RFS)
  3. State level initiatives (e.g. California)
- Europe
  1. European Union Emission Trading System (not applied to residential nor transportation sector)
  2. High fuel taxes, but not proportional to carbon (so do not minimize cost of carbon abatement)

# The Ideal Pigovian Tax: Efficiency



1. mass transit
  2. telecommuting
  3. fuel efficiency
- OR
1. industry
  2. residential
  3. transport
- OR, ...

# Holistic Approach

1. Enforceability
  - Measurement and receipts necessary
2. Political feasibility
  - “Tax” = forbidden word; mandates and subsidies
3. Leakage
4. Heterogeneity
  - e.g. Fullerton & West (2010)
5. Equity

## Potential Instrument Combinations

Ex.	Carbon tax outcome	Alternative instruments	
		Substitution Effect	Output Effect
1	Replacing old vehicles with new hybrids	Mandate hybrid sales	Subsidize scrapping
2	Increase biofuel use	Subsidize blending	Tax mileage
3	Reduce solo commuting	Subsidize mass transit	Tax solo drivers

# Additional Complexity

1. Vehicle Portfolio Choice (a hybrid AND SUV)
2. Uncertainty and Learning (slow adoption)
  - Technological Change
3. Fleet Dynamics (mandate raises cost of new)
  - Durable Goods
4. Infrastructure (reduce congestion by new lanes?)
  - Urban Planning and Road Design

# Conclusion

- **Main Idea:** Use combinations of other policy instruments in a holistic approach to mimic first-best carbon tax outcomes in a politically feasible framework
- Questions and comments?