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**Energy and Climate Policy Briefing
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Carbon Pricing and GHG Emissions Reductions from Transportation

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**Transportation:
substantial emissions, smaller reductions**

- **Transportation sector is responsible for:**
 - 31% of U.S. emissions of CO₂
 - ⅔ of that is from passenger vehicles (cars, light trucks)
- **Pricing carbon would achieve relatively little in emissions reductions from transportation**
 - Reductions in other sectors would be several times greater in proportion to total emissions in those sectors

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Comparative effects of a price on carbon emissions: an illustrative example

- Pricing carbon is cost-minimizing, inducing reductions in emissions where they are easiest, cheapest
 - Small response in transport sector implies that it is relatively costly to reduce GHG emissions there
- Illustration: Suppose \$17 CO₂e allowance price
 - Expected response to a 15¢/gallon carbon price (a 5% increase if gasoline price is \$3 per gallon) added to transportation fuels:
 - By current estimates, that would induce
 - Short Run: ~0.25% decrease in gasoline consumption, emissions
 - Long Run: ~1.25% decrease in gasoline consumption, emissions

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The transportation response to a carbon price: why its emissions reductions are relatively costly

- Short Run: Adapt driving behaviors
 - Drive less, Drive more slowly, Shift some driving off-peak
 - *Observable (but small) response to \$4 gasoline prices*
 - *Limiting factor: value of time*
- Long Run: Increase vehicle fuel economy
 - If \$17 allowance price maintained, small permanent increase in average fuel economy
 - 15+ years to achieve full response, as older vehicles retired
 - *Consumers appear to value fuel economy less than other vehicle characteristics.*
 - *If so, a carbon price will be ineffectual here*

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Transportation adaptations are relatively costly (II)

- Long Run: Reduce commute distance
 - Relocate home or work location, as opportunity arises
 - *Existing land-use patterns will be long-lived*
 - *These arose partly in response to past (low) gasoline prices*

- (Medium Run: Mode choice for freight hauling)
 - Shift toward less carbon-intensive modes, e.g. RR
 - *Effect would likely be small unless carbon price substantial*
 - *Limiting factors:*
 - *value of time (inventory costs)*
 - *quality of service (flexibility, reliability)*

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Although a carbon price would have a limited effect on transport emissions:

- Announced CAFE standards should reduce GHG emissions by about 25% per vehicle-mile, on average, by 2030
 - *(holding gasoline prices, incomes, congestion, fleet mix constant)*
 - But long-run trends suggest VMT could be 1/3 greater by then

- At current gasoline prices and planned CAFE standards, \$17 carbon price would have no add'l effect on average fuel economy, but:
 - Would stimulate demand for fuel-efficient vehicles
 - *easing automakers' vehicle-pricing constraints, costs of compliance*
 - Would encourage efficient decisions about driving
 - *A counterbalance to CAFE effect of encouraging driving*

- If gasoline prices were much higher, this carbon price:
 - Would begin to encourage greater fuel economy
 - *Europe in 2006: ~\$6/gallon, ~38 MPG fleet average fuel economy*

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*See these CBO Publications for more on
CAFE, Gasoline Taxes, Driving Responses*

- **Issue Briefs:**
 - Fuel Economy Standards Versus a Gasoline Tax (March 9, 2004)
 - Climate Change Policy and CO2 Emissions from Passenger Vehicles (October 6, 2008)

- **Studies:**
 - The Economic Costs of Fuel Economy Standards Versus a Gasoline Tax (December, 2003)
 - Effects of Gasoline Prices on Driving Behavior and Vehicle Markets (January, 2008)

- www.cbo.gov