

What does improved fuel economy cost consumers and taxpayers? Some illustrations

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What does improved fuel economy cost consumers and taxpayers? Some illustrations

1. Context and Scope

2. An example

Highlights from results

3. Discussion

Context and Scope

Green growth in transport?

One element: reduce fossil fuel use (F)

$$F = M * E$$

$$(I = km * I/km)$$

Reduce driving M and/or **reduce fuel intensity E**

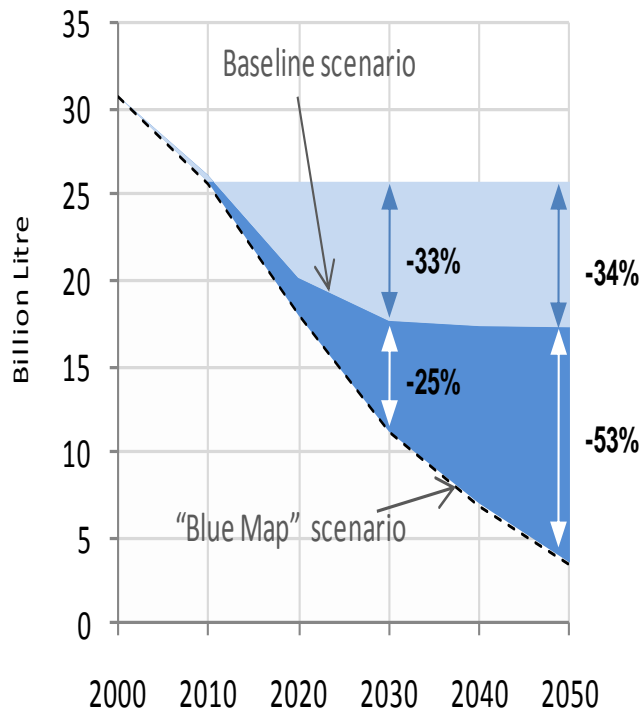
Context and Scope

Reduce fuel intensity E

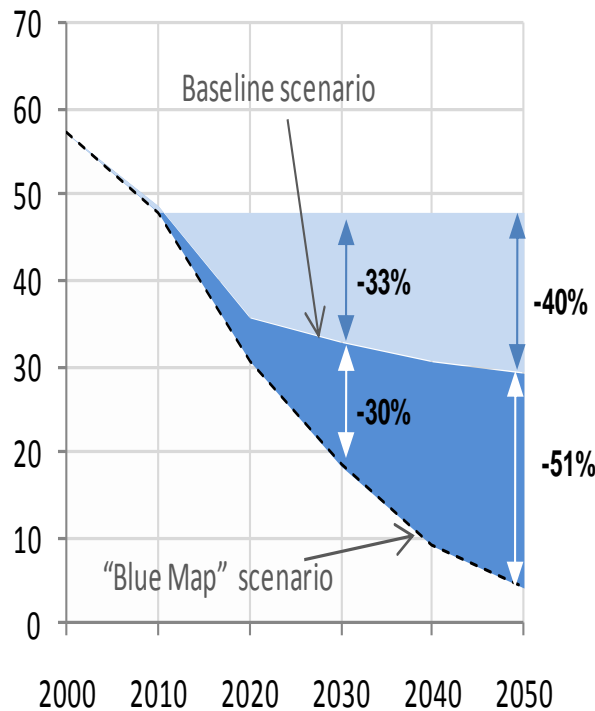
- Reduce greenhouse gas emissions (benefit)
- **More expensive or less desired car, cheaper driving (all else equal)**
- **Reduction in fuel tax revenues (all else equal)**

Context and Scope

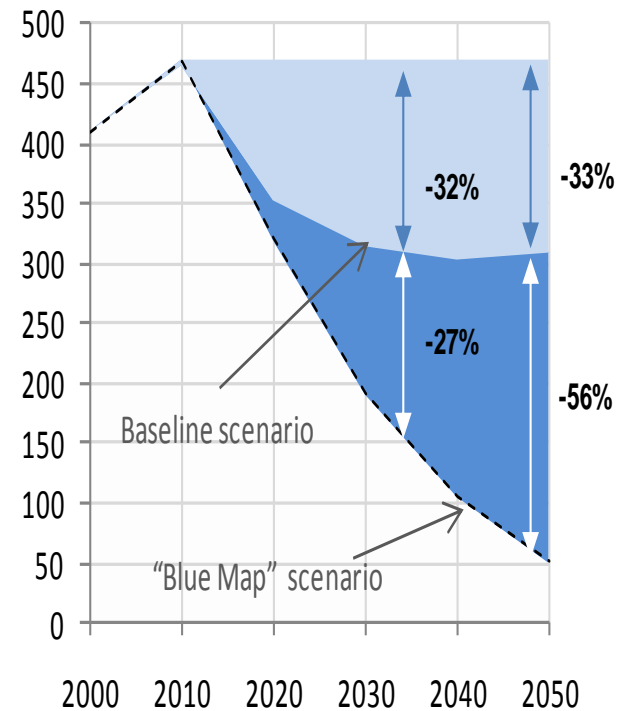
Reduce fuel intensity E → Reduction in fuel tax base



France



Japan



USA

An example: “modal French car”, reduce GHG emissions from 160g/km to 130g/km

Lower E → more expensive or less desired car

- **Technology costs to reduce fuel intensity
ex ante: [1,000€ - 2,500€]; ex post: zero?**
- **Payback for investment:
hidden amenities or not? [3y, 15y]**

An example: “modal French car”, reduce GHG emissions from 160g/km to 130g/km

Lower E → cheaper driving → more driving?

Rebound effect [0, 20%]

An example: “modal French car”, reduce GHG emissions from 160g/km to 130g/km

Lower E → lower F → lower fuel tax revenue

Cost per € of lost fuel tax revenue [1€, 1.3€]

1.3€ ?!?

All taxes carry efficiency costs, but these of transport taxes are relatively low.

Why? “relative complementarity to leisure” (C&H, 1953)

An example: “modal French car”, reduce GHG emissions from 160g/km to 130g/km

Middle case: payback 9y, rebound effect 10%, MCPF 1.15

→ Effect of better fuel economy on consumer surplus and tax revenue?

Increase in consumer surplus (+1,226€) and reduction in fuel tax revenue (-1,133€) just about cancel out.

An example: “modal French car”, reduce GHG emissions from 160g/km to 130g/km

- **Effect of better fuel economy on consumer surplus and tax revenue: about neutral**
- **Probably bad idea after accounting for external costs and technology costs.**
- **So can we do better?**

...introduce kilometre tax

An example: “modal French car”, reduce GHG emissions from 160g/km to 130g/km

- **Effect of better fuel economy and revenue neutral kilometre tax on consumer surplus and tax revenue: no change in revenue, increase in consumer surplus**
- **Better balance, but still a bad deal in a broader sense.**
- ... **Let's increase the kilometre tax to 0.05€/km, to reflect driving related marginal external cost (excl. congestion).**

An example: “modal French car”, reduce GHG emissions from 160g/km to 130g/km

- **Effect of better fuel economy and 0.05€ kilometre tax on consumer surplus and tax revenue**
- **Consumer surplus declines (-3,363€) but weighted revenues increase (+6,187€), so net gain – also after accounting for technology and marginal external costs.**

Discussion

- Proposed fuel economy improvement does not look too appealing, unless:
 - Long paybacks, low rebounds, low technology costs, high implicit values of carbon.
 - Combined with kilometre tax.
- But:
 - Kilometre taxes are expensive to raise;
 - Driving may decline (“saturation”)

Bottomline: greening is costly, no easy win-win policies.