

- Focus on transport sector –1/3 of CO₂.
- Use of (very simple) analytical models and computational models to measure effects of fuel taxes.
- Measuring cost effectiveness.

Federal Taxes

- Gasoline: 18.4 cents/gallon (passenger vehicles).
- Diesel: 24.4 cents/gallon (heavy-duty trucks).
- Fixed since 1993.

Other Tax Provisions May be Redundant

With binding CAFE standards....

Gas guzzler tax and hybrid subsidies have minimal effect on emissions.

With binding biofuel mandates...

Ethanol tax credits have no effect.

Fuel taxes reduce CO_2 through

- reducing vehicle miles travelled
- increasing fuel economy

*Disentangling effects tricky—baseline
fuel use varies with*

- volatile oil prices
- fuel economy standards for
passenger vehicles

Analytical Approach

--specify fuel demand function

$$F = F_0 \left(\frac{p_0 + t}{p_0 + t_0} \right)^\eta$$

F = fuel use

p = fuel price w/o federal tax

t = federal tax

0 = current value

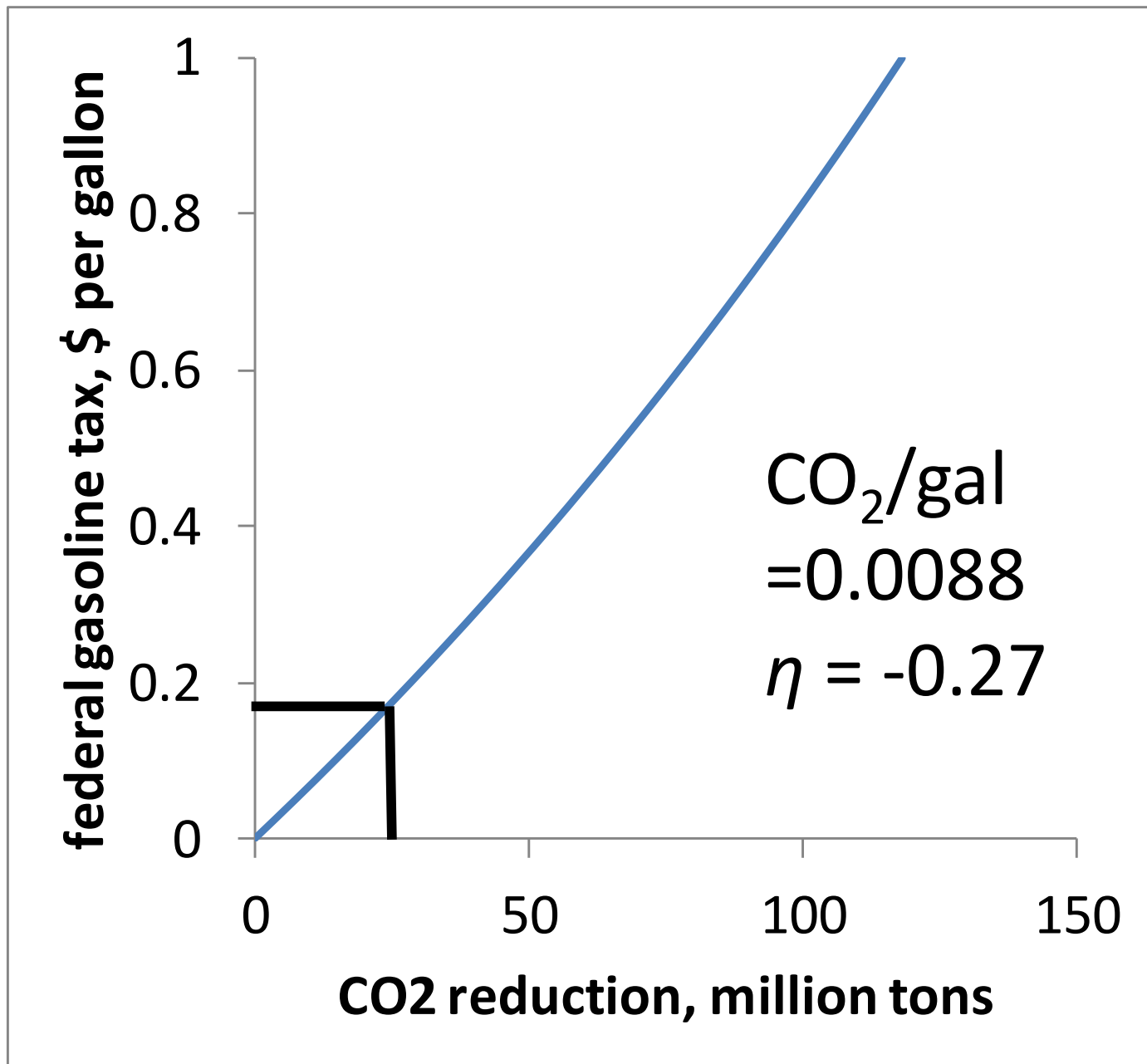
η = fuel demand elasticity

Gasoline Demand Elasticity

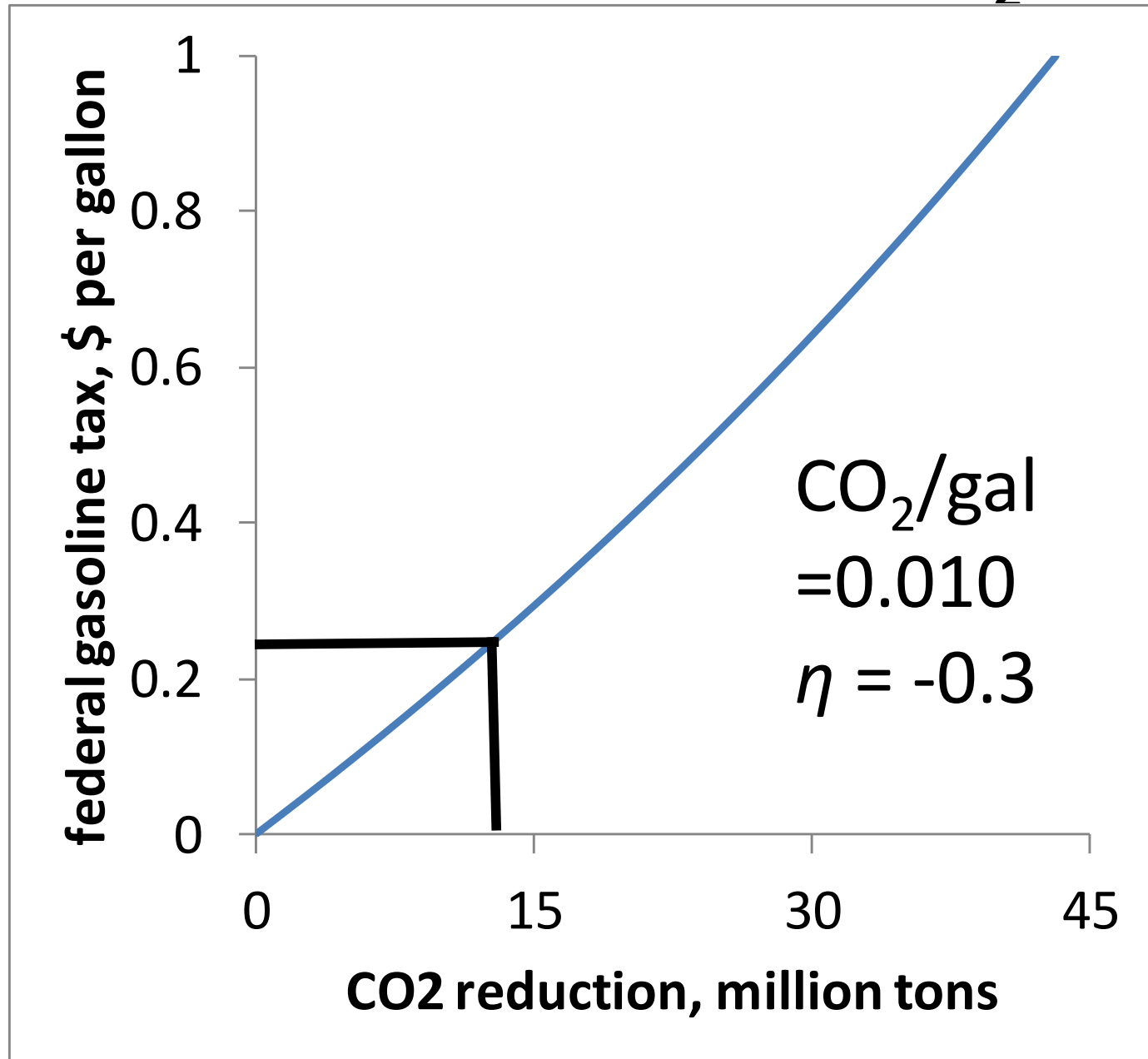
Prior to new CAFE: ≈ -0.4
(Small/van Dender 2006)

With new CAFE: $\approx -0.27??$

Effect of Gasoline Tax on CO₂



Effect of Diesel Tax on CO₂



Simulation Models: NEMS

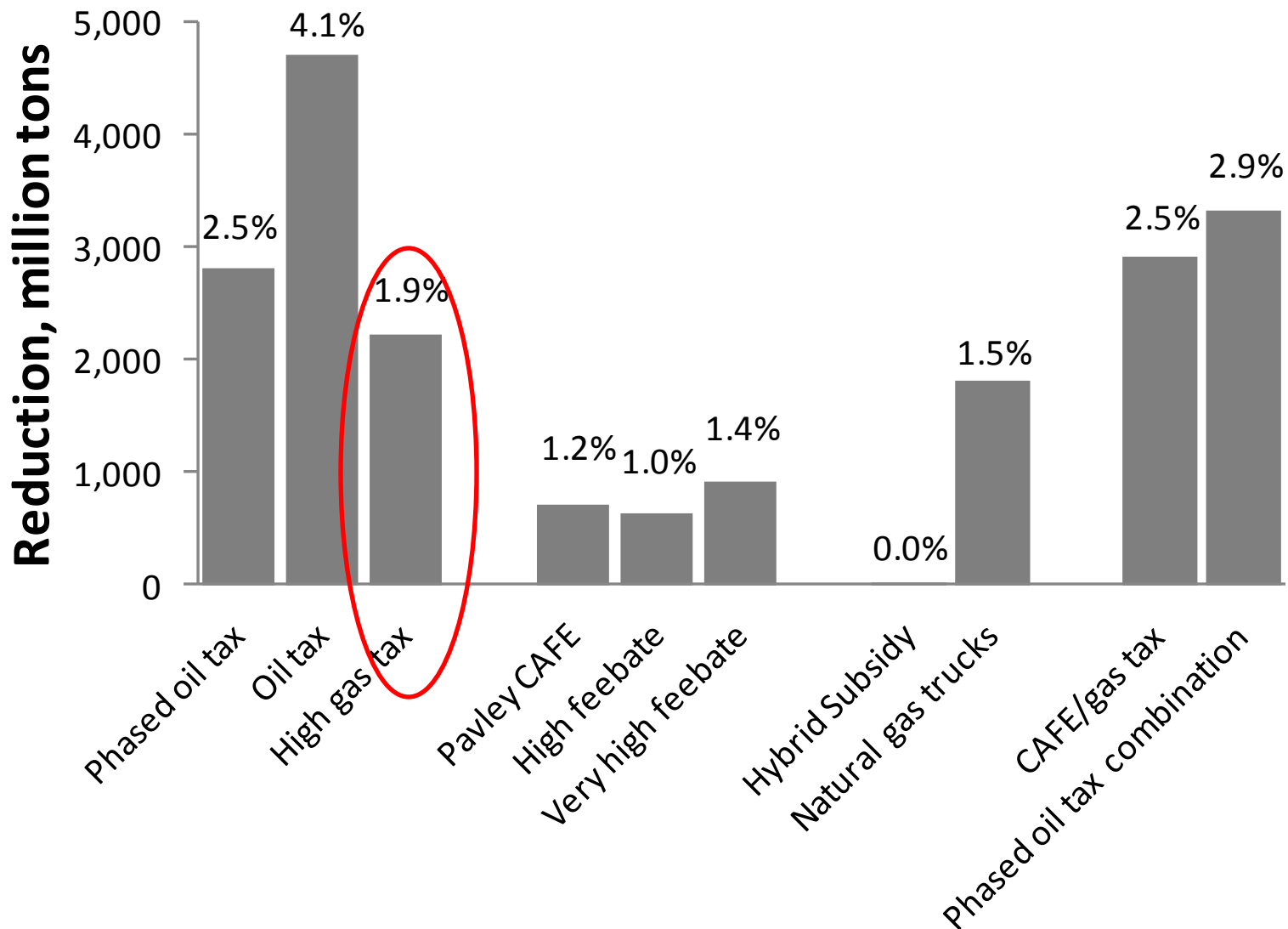
Captures

- transitional dynamics
- “state of the art” costs and emissions effects of emerging fuel-saving technologies
- Detailed representation of pre-existing policies— e.g., CAFE
- Changing fuel prices in the future

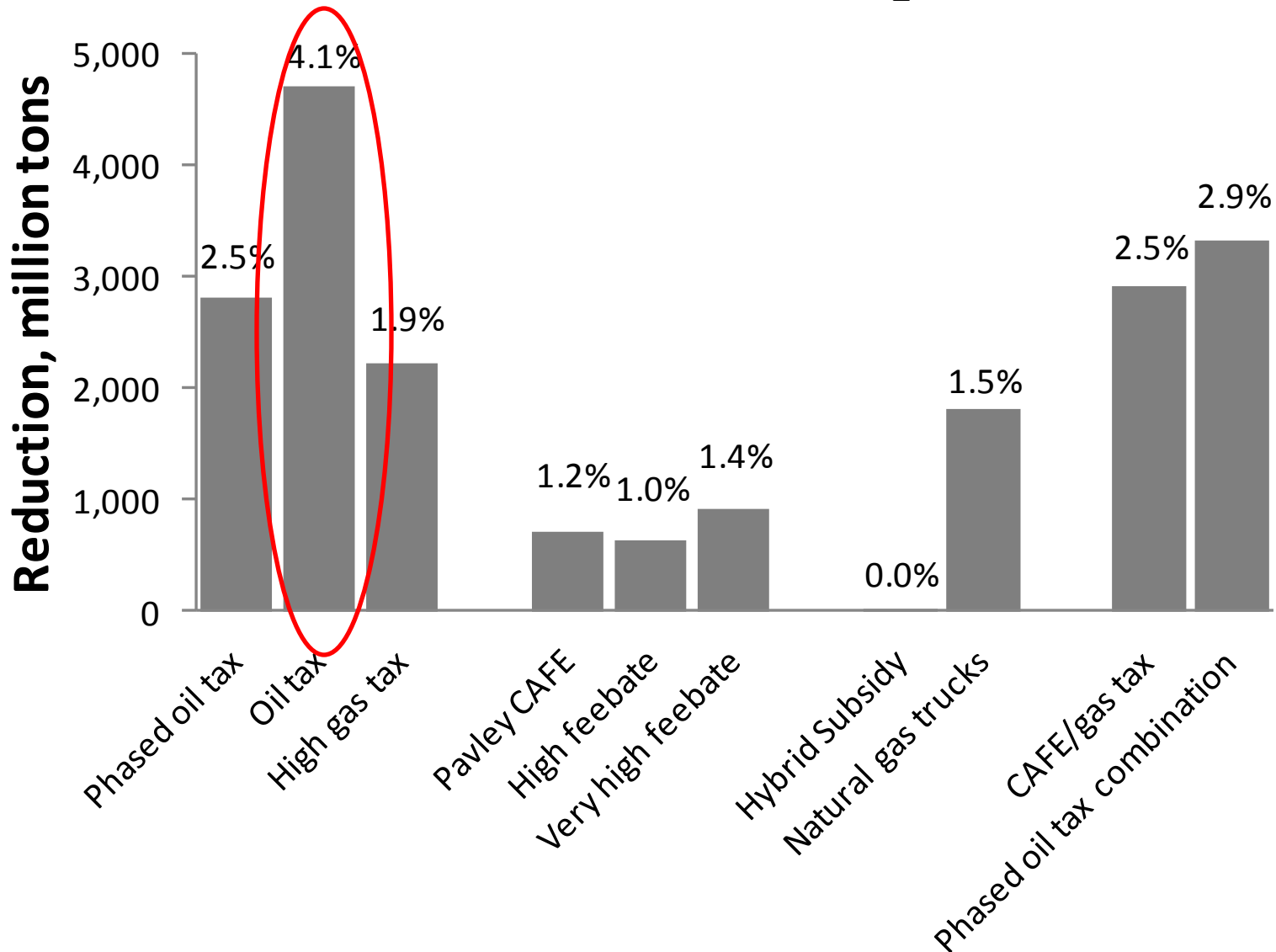
One drawback

- Unrealistically limited responsiveness to diesel taxes.

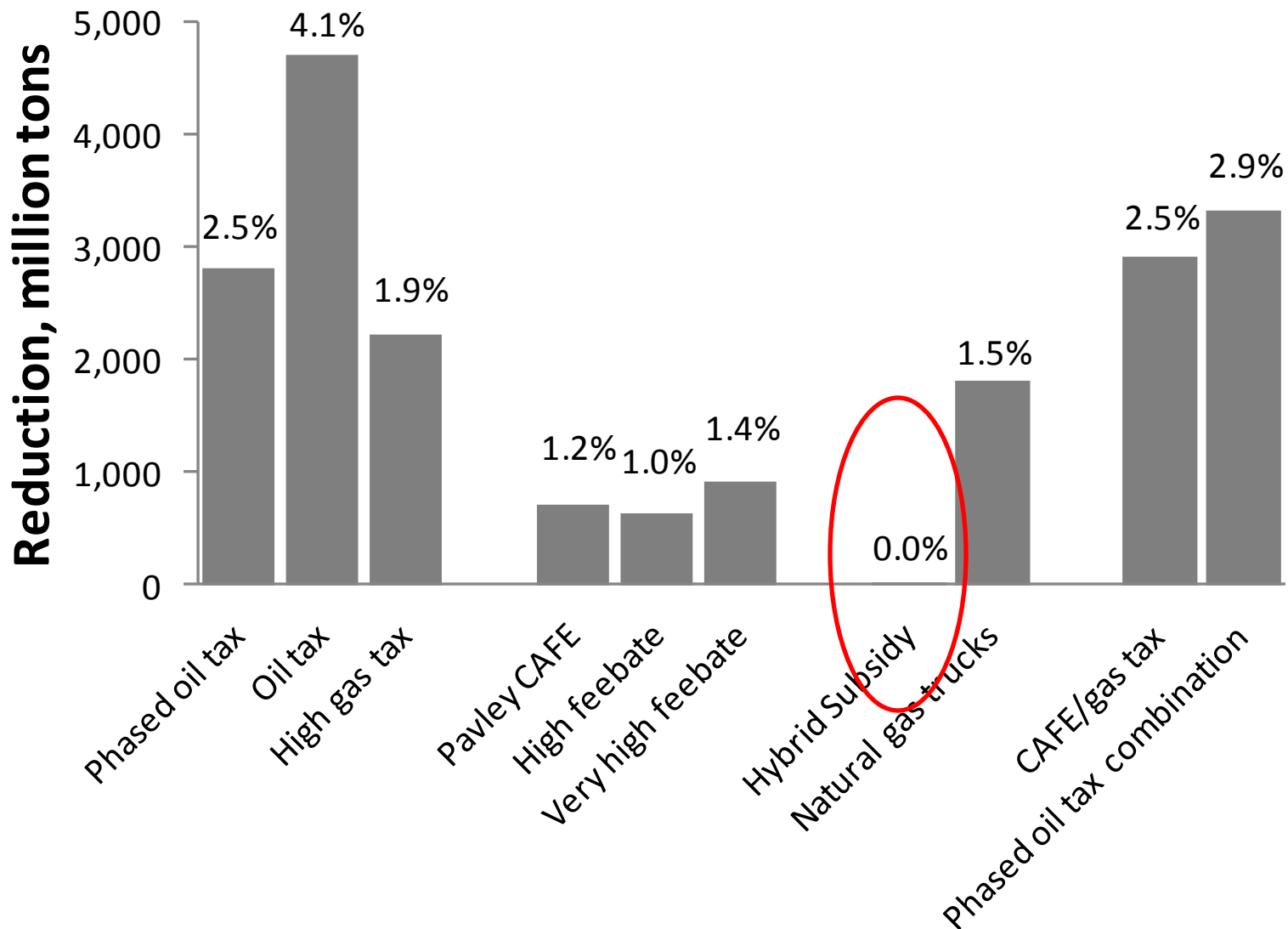
Cumulative Reductions in CO₂ 2010-2030



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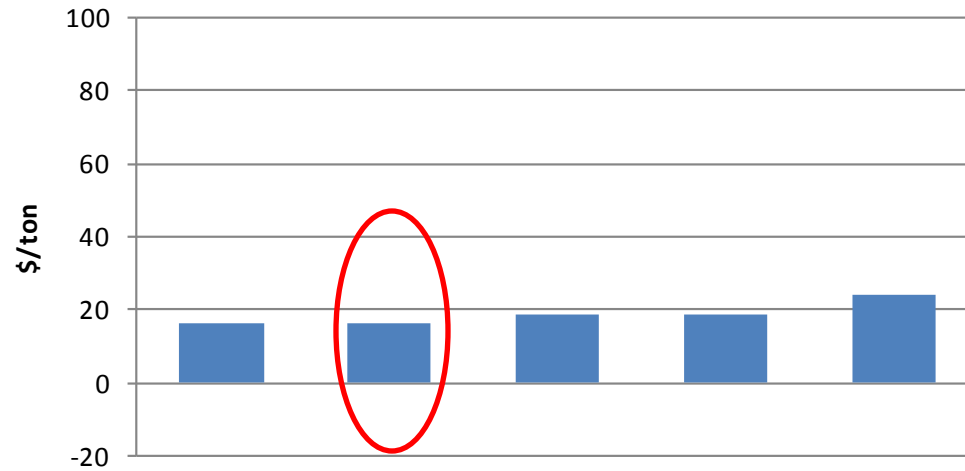
Cost Effectiveness

- important for gauging which tax provisions should be expanded/cutback.

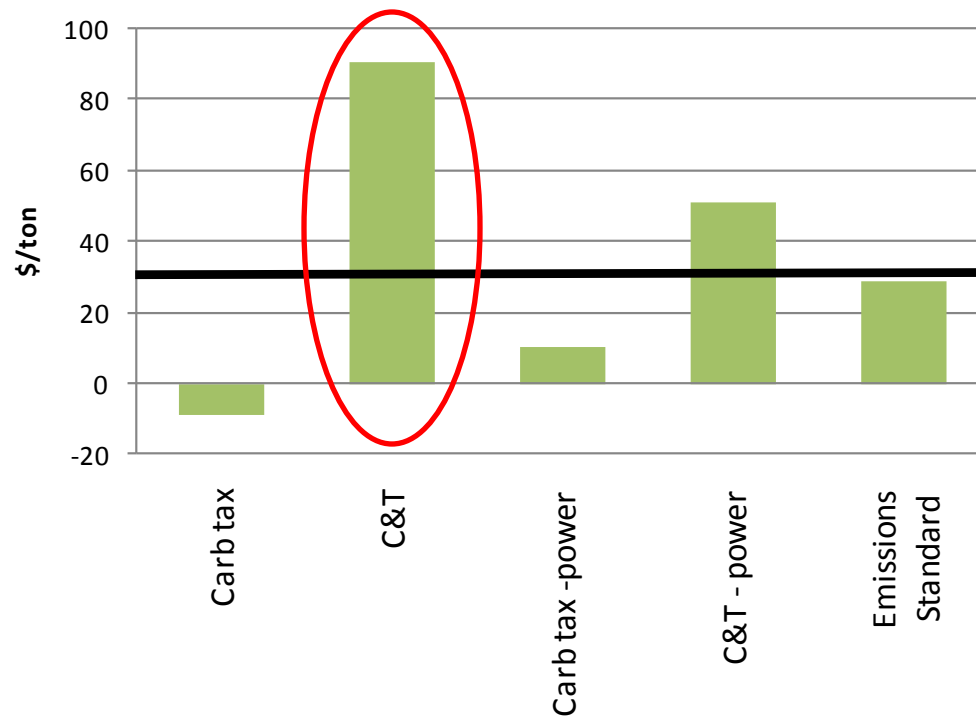
But must account for...

- Non-CO₂ externality benefits → MC's of higher fuel taxes are *negative*.

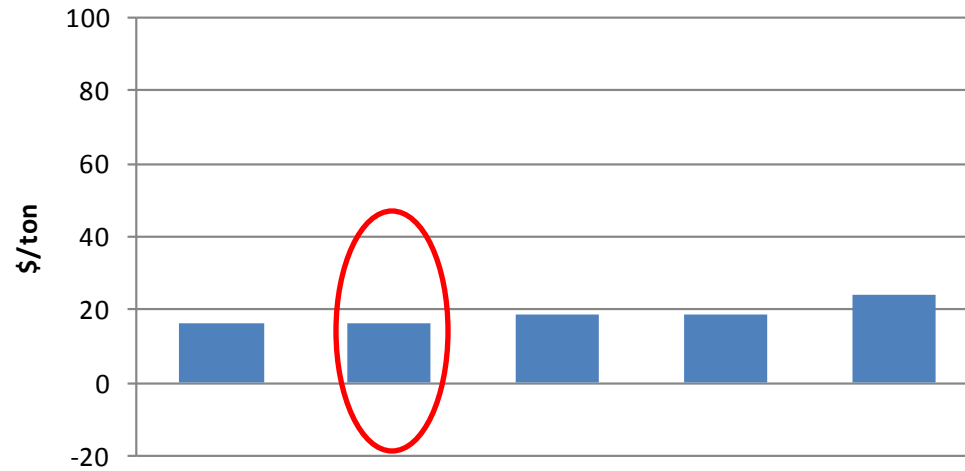
(a) Cost with no Tax Distortion



(b) Cost with tax Distortions



(a) Cost with no Tax Distortion



(b) Cost with tax Distortions

