

# Modified diesel engines and a discussion on fuel economy

November 8 2012, by Anthony Raap

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Steve Ciatti, a mechanical engineer at Argonne National Laboratory outside Chicago, modifies diesel engines. By the time he's finished, emissions are reduced 66 to 95 percent. Credit: Argonne National Laboratory

Steve Ciatti, a mechanical engineer at Argonne National Laboratory west of Chicago, modifies diesel engines.

By the time he finishes, emissions are reduced 66 to 95 percent and [gas mileage](#) improves.

Ciatti, who has a doctorate in [mechanical engineering](#) from the University of Wisconsin, often hears people grumble about [fuel economy](#) in U.S. vehicles.

[Automakers](#), under pressure from Washington and consumers, agreed this year to an auto efficiency standard of 54.5 [miles per gallon](#) by 2025.

But frustration lingers over how slow change is coming about.

The problem extends beyond efficiency. [Carbon dioxide emissions](#) from vehicles, linked to [global warming](#), have largely gone unchecked.

**Q: Why hasn't there been more progress in fuel economy for cars sold in the U.S. despite the high price of gas?**

A: It's very simple. There isn't much demand for [fuel efficiency](#). Most people are not willing to pay extra for fuel-efficient technologies. Some people are, but in general the answer is "no." So, short of mandating that people buy fuel-efficient vehicles—which traditionally Americans don't like; they don't like being told what to buy—don't hold your breath.

**Q: Eventually, though, Americans will have to get serious about curbing carbon emissions, which are driving climate change. Don't you think so?**

A: Why? Where's the market driver for it? There isn't one. The only way you're going to get people serious about cutting carbon-based emissions is if it's regulation imposed. If regulations come out saying we are going to limit CO<sub>2</sub> emissions, then you have a driver for why people will need to purchase vehicles that emit less CO<sub>2</sub>. But that hasn't happened yet.

The CO<sub>2</sub> fairy isn't going to come down and tap us on the head and say, "We're all going to collectively reduce [carbon emissions](#) because it's the right thing to do." Nobody's going to go ahead and do that.

**Q: So any change would probably be regulation-based rather than market-based?**

A: CO<sub>2</sub> would be tied to fuel efficiency. They're not exactly the same, but they tend to trend with one another. If you make an incentive for increasing fuel efficiency, you are de facto making an incentive to drop carbon-based emissions. Right now, that market-based incentive simply doesn't exist. Fuel is not expensive enough at this point, with the current state of the American economy, to drive people into significantly changing their driving habits. All you have to do is look at the evidence in front of you. What kind of vehicles are being sold? It's not hard to figure.

**Q: Do you think we'll all be driving cars based on clean-diesel, hybrid or electric technology anytime soon?**

A: When fuel prices get expensive enough to make those technologies financially worthwhile, the answer is yes. At the moment, fuel prices are not such. Even at \$4 a gallon, you don't see a flood of consumers going into the showroom demanding clean-diesel, hybrid or plug-in. The technology that goes into those vehicles is not cheap. As a result, they compare those technologies and the price it takes to purchase them versus the fuel-efficiency savings they would be gaining. Most people decide a conventional technology vehicle makes the most financial sense to them. There's no market driver at the moment, even at \$4 a gallon, for people to purchase the extra technology to save fuel. That has to change. Otherwise what you're describing to me makes no sense. Nobody does

this out of the goodness of their heart. Everybody listens to the wallet. Everybody pays attention to what they're spending. If you're not giving people an incentive to spend less, they're not going to do it.

Provided by Northwestern University

Citation: Modified diesel engines and a discussion on fuel economy (2012, November 8)  
retrieved 20 September 2024 from  
<https://phys.org/news/2012-11-diesel-discussion-fuel-economy.html>

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