

The 'big four' — assessing the impacts of 'green' vehicles

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'Green' vehicles like hybrids and diesels are touted as better for you and the environment. They usually emit less greenhouse gases per kilometre than conventional cars.

But when comparing different types of cars, GHGs are not the only criterion for "green." Policy-makers also have to think about air pollution, traffic safety and energy security.

Together with GHGs, these are the most important vehicle impacts — we'll call them the "big four." Providing the right incentives to reduce all "big four" impacts can be tricky, but it can be done.

Before we look at what can go wrong and how to avoid pitfalls, let's first briefly review the "big four."

It is no longer a secret that GHGs contribute to global warming. Premier Gordon Campbell said we will cut GHGs to 10 per cent below 1990 levels by 2020. It's no surprise that car GHGs are proving to be the most difficult to cut. Hybrids and diesels are supposed to help, but our own research shows

that buying bigger, more powerful hybrids and diesels eats away most, if not all, the GHG savings.

Tailpipe emissions are the biggest source of urban air pollution. Pollutants such as ground-level ozone and microscopic particles are linked to a variety of health problems ranging from wheezing to cardiac arrest. While diesel cars like the tiny Smart Car are fuel efficient, they still emit more health-damaging particles than a gasoline Hummer.

Traffic safety captures our concerns about the 3,000 Canadians who die in vehicle collisions annually. Risks depend on your driving behaviour and road design, but also vehicles. Heavier, taller, and stiffer vehicles (like SUVs) can often reduce your own risks, but impose more risk on other road users.

Energy security describes our aspirations for affordable ways meet our demands for energy services. Policy-

makers are trying to figure out how to meet our mobility demands as conventional oil supplies dwindle. More than a few people have linked the quest for oil to social and political upheaval around the world, so burning less fuel per kilometre is crucial.

It would be nice if all "big four" concerns could be fixed with one green vehicle. Unfortunately it's not that simple. Our research shows that green is not always as it seems, and integrating policies is important.

The market share of diesels in the United Kingdom has gone from 15 per cent to 40 per cent in a few years, reducing annual oil use by about one million barrels and GHGs by about 400 million kilograms. This sounds like a lot, but is less than one per cent of oil and GHG from all cars. Fuel and GHG savings are less because efficiencies have been eroded by sales of larger and heavier diesels. And because gasoline and diesel cars have different emission standards, the extra diesel particles add about 90 air pollution-related deaths each year.

The policy lesson is to ensure air pollution standards are coordinated with GHG policies.

Diesels are not the only cars getting larger and heavier. Hybrids, the poster-child of the green car revolution, consume about 30 per cent less fuel than conventional cars of the same weight and power — like a toned athlete, they carry the extra weight better. But North American buyers are not choosing the same weight and power: Trucks and SUVs now make up about half of all new sales. The average new hybrid SUV may be no better than the average compact gasoline car in terms of fuel efficiency and GHGs.

Lighter cars emit less GHGs and impose less traffic safety risk on pedestrians, cyclists, and occupants of other cars. But all factors being equal, these "green" car buyers subject themselves to higher risks than buyers of heavier cars. The heavier cars impose relatively more traffic safety impacts, as well as climate change, energy security, and sometimes even air pollution — that's four strikes against them.

Yet there are solutions. Consumers want their cars larger, but do not care about weight. Engineering research shows we can have larger, but lighter vehicles with advanced materials and design. History shows that these advances will not be made without strong policies aimed at weight. If governments provide strong disincentives for the heaviest cars, then all road users should have lower traffic safety risks, and GHGs will also be reduced.

In summary, it is important to highlight that greener cars are not the only option to be mobile. There is compelling research showing our health, the environment, and traffic congestion will all improve if more of us switch to bikes, public transit, and walking.

Nonetheless, green vehicles can play a role in our quest to reduce the impacts of transportation as long as we are not blind to their limitations.

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