



Vehicle scrappage impact on emissions reductions

Peter Boag, President & CEO

September 2018

On average, between four and five percent of the registered light duty vehicle (LDV) fleet in Canada is retired every year. This so called 'scrappage' rate has been fairly consistent in recent years. It peaks at over 15 percent per year for vehicles that are between 15 and 25 years old. But these vehicles aren't simply being removed from the roads, they're also being replaced with newer, more efficient models. From a GHG emissions perspective, this is good news.

Over the past decade, the fuel efficiency of every class of vehicle in Canada has improved about two percent per year. Virtually every new vehicle in the fleet is 20 percent more fuel efficient today than 10 years ago. The average is actually closer to 26 percent, according to Dennis DesRosiers, President of DesRosiers Automotive Consultants.

Using data generously provided by DesRosiers Automotive, we recently did some modelling to quantify the potential emissions reductions of scrapping older vehicles and replacing them with new, more fuel efficient ones.

For the modelling, we used:

- detailed annual LDV fleet census data (by model year),
- data on total annual kilometres driven by model year,
- NRCan fuel efficiency data by model year, and
- forecast scrappage rates by vehicle age.

Using this information, we projected the emissions reductions that could be achieved by the replacement of scrapped vehicles for the 2018 to 2025 period.

Our model assumed the scrapped vehicles were between 15 and 28 years old (17 percent of the current vehicle fleet is 15 or more years old, and generally the least fuel efficient). For each year, we then added the emissions from a comparable number of current model year vehicles we assumed necessary to replace the kilometres driven by the 'scrapped' vehicles, to determine the net emissions reductions achieved by replacing the old 'gas guzzlers' with new fuel efficient vehicles. We also assumed continuation of the fleet-wide two percent per year fuel efficiency improvement experienced over the past decade.

Here's what we found:

- In the early years of our model (2018 – 2021), the annual first year emissions reductions amount to about 1 million tonnes (MT).
- After 2021, this first year reduction gradually declines to about .5 MT as the 'scrapped' vehicles get progressively newer, and the magnitude of the fuel efficiency difference between the scrapped and replacement vehicles gets smaller.



- The 8-year (2018 – 2025) cumulative reduction from vehicles ‘scrapped’ in 2018 is about 7 MT.
- For vehicles ‘scrapped’ in 2019, the 7-year (2019-2025) cumulative reduction remains close to 7 MT.
- For each successive year, the cumulative emissions reductions from scrappage declines as the accumulation period reduces by one year, as our model only goes to 2025.

The sum of these annual (2018 – 2025) cumulative emission reductions over the 8-year model time frame is about 32 MT.

Coincidentally, that’s roughly the same as the federal government’s 30 MT reduction target for its proposed Clean Fuel Standard. Of course, the emissions reductions achieved through scrappage don’t end in 2025. That’s only the end year of our model. In reality, emissions reductions from scrappage will continue to accumulate indefinitely. To be sure, different model assumptions could produce different results. However, whatever the assumptions, it’s safe to conclude that as long as vehicle fuel efficiency continues to improve, vehicle scrappage will pay material emissions reduction dividends for the foreseeable future.

Our analysis confirms that replacing an old vehicle with a new vehicle is one of the most effective ways for Canadians to personally contribute to emissions reductions. And it’s a cost effective way of making a difference, because reducing fuel consumption saves money at the gas pump – savings that can help offset the cost of acquiring a new vehicle. There is an impressive array of fuel efficient vehicles to choose from in any vehicle class and brand, plus all the other benefits of a new vehicle.

For governments, promoting and incenting Canadians to trade in their old vehicles for new ones sooner rather than later makes good policy sense - especially at a time when Canadians are holding on to their vehicles longer than ever. Increasing the scrappage rate by ten, twenty or even thirty percent would deliver a corresponding increase in the emissions reductions as governments strive to achieve their 2030 Paris targets.

For further information, please visit canadianfuels.ca | info@canadianfuels.ca | 613.232.3709

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