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How to Reduce Car-Made Pollution? Tune Up the Existing Technology

It won't be hydrogen fuel cells or plug-in hybrids, but rather refinements to the internal combustion engine, aerodynamics, drivetrains and tires that reduce emissions and kick up mileage

By Carolyn Whelan

Projected carbon dioxide (CO_2) emissions from cars could remain level at three gigatons through 2050 despite many more personal vehicles on the road with only minor and affordable changes to existing engines, chassis and systems, according to a new report.

The study, unveiled today at the Geneva Motor Show in Switzerland, challenges auto- and policy-makers to push for technology and design changes to existing autos that could double today's average gas mileage of 26 miles per gallon (11 kilometers per liter) in the U.S. to 52 mpg (22 kpl) .

Those modifications include stop–start (idle-off) systems in which the engine shuts down when the car is stopped during driving; low rolling-resistance tires (which are harder and thus less flat, reducing friction); variable valve timing for engines, which increases gas consumption efficiency; and fuel economy computers or displays to encourage eco-driving, such as such as those in the Toyota Prius, which show miles per gallon averages for that moment, hour, week or month, or when riding downhill, so that drivers are more aware of how their driving impacts fuel efficiency.

Among other adjustments that could help double fuel economy are turbocharging with smaller, more efficient engines that produce the same level of power; advanced heat management and cooling systems, which reuse the heat produced in the engine for energy; weight reduction, including broader use of high-strength steel that is already in some cars today; better aerodynamics; more efficient air conditioners, transmissions and lighting devices (including headlights); and increased electrification leading to full hybridization with electric motor and regenerative breaking—all of which currently exist.

"We need to move towards new technology vehicles like EVs," or electric vehicles, says Lew Fulton, a transport energy specialist at the Paris-based International Energy Agency (IEA), which issued the report along with the U.N. Environmental Programme, International Transport Forum (ITF) and the FIA Foundation, an organization based in England that promotes environmental protection, road safety and sustainable mobility as well as funds specialist motor sport safety research. "But we can also can make today's vehicles more efficient, by speeding the uptake of existing technologies. This is relatively low-cost stuff."

The consortium's call to action is based on IEA's analysis of studies by engineers at Aston University in Birmingham, England, the Massachusetts Institute of Technology and other organizations, and suggests that by 2050 two gigatons of CO_2, six billion barrels of oil and $600 billion in fuel costs could be saved without radical

reengineering, or half of what is consumed and emitted by cars in the European Union today.

The initiative strives to trigger action among automakers that are rolling back plans for greener cars amid the economic crisis, particularly in fast-growing emerging markets like the Association of South East Asian Nations (ASEAN), a regional bloc that includes Indonesia and the Philippines and purchases as many cars as India today. The plan also proposes incentives like rebates, taxes, testing, labeling, import controls, emissions standards and conditional financing for struggling auto companies to make cars with many elements of niche hybrids like the Prius more mainstream and affordable. Data dissemination and workshops to develop national fuel economy policies with key stakeholders are on the consortium's agenda, too.

"We already have the technology and the means to get us on the road to making our cars 50 percent more fuel efficient," ITF Secretary General Jack Short said at the press conference releasing the report. "All that is needed are coordinated efforts and actions from both industry and governments."

The world's car fleet is set to triple by 2050 to two billion autos with 80 percent of that growth coming from rapidly industrializing nations like India that currently do not have fuel economy rules (although the fastest growing car market—China—has tougher regulations than the U.S.). Over that time, CO_2 output from autos is projected to double to six gigatons if it follows its current path. Cars account for nearly half of all CO_2 emissions from transport.

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