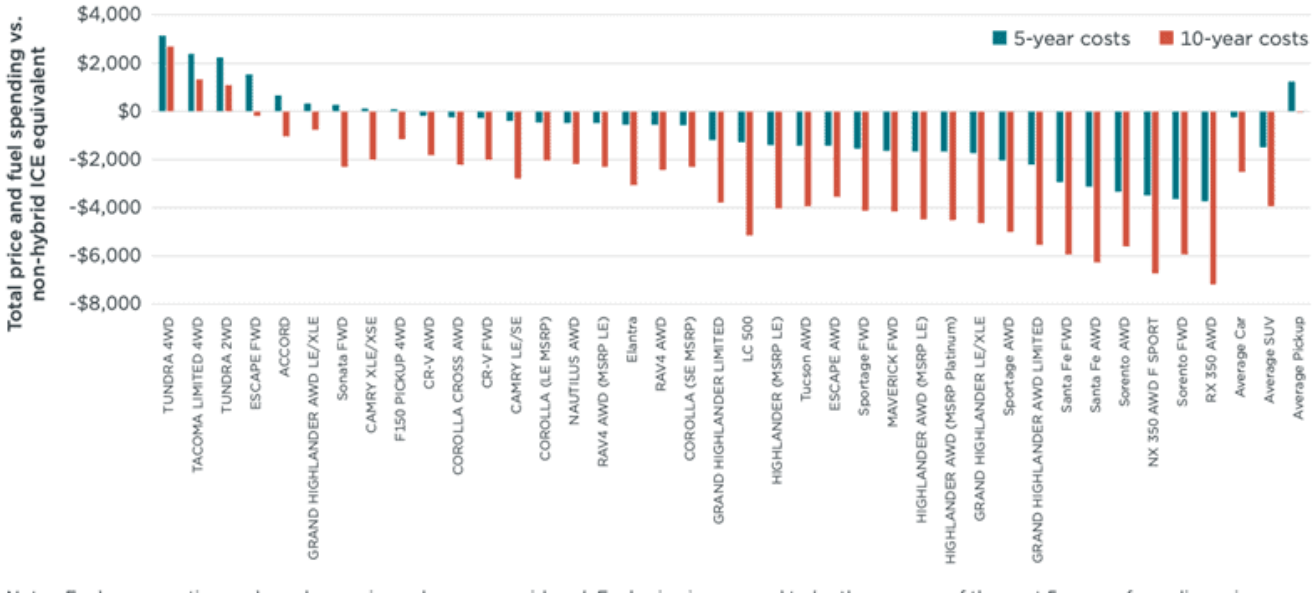

Hybrid Technology: The Most Effective and Cost-Efficient Path to Rapid Emissions Reductions

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Picture: ICCT

A new ICCT working paper (Feb 2025) delivers one of the clearest messages yet for policymakers and industry leaders: **hybrid technology is not only here to stay — it is one of the most powerful, scalable, and cost-effective tools available to cut emissions this decade.**

Across more than 100 pages of data, the report shows that strong hybrids and plug-in hybrids can deliver substantial CO_2 reductions, real consumer savings, and rapidly falling technology costs. For regions aiming to reduce fleet emissions without slowing down consumer acceptance, hybrids have become the logical backbone of the transition.

1. Hybrids Are Today’s Most Efficient Combustion-Based Vehicles

The report is unequivocal: **no other combustion technology delivers as much CO_2 reduction per euro as full hybridization.**

Key findings include:

- **Strong hybrids cut CO_2 emissions by an average of ~30%** compared with their non-hybrid combustion counterparts.
- For some models, the reduction reaches **up to 40%**.
- These efficiency gains are visible **across all vehicle classes** — from sedans to SUVs to pickups.

Plug-in hybrids (PHEVs) also deliver clear benefits:

- In charge-sustaining mode, **PHEVs emit only slightly more than HEVs**, but still
  11–32% less CO_2 than conventional combustion vehicles.
- Their full climate impact, however, depends on **regular charging** — a well-known behavioural factor that can unlock even deeper reductions.

In short: **hybridization is the most effective way to reduce real-world emissions from the combustion fleet today.**

2. Hybrids Will Become Even Cheaper — and Faster Than Regulators Expect

One of the most striking findings of the ICCT analysis concerns cost.
For years, regulatory models—especially the U.S. EPA's OMEGA model—have **overestimated the cost of hybrid technology**, sometimes dramatically.

The study shows:

EPA overestimates hybrid costs by an average of $1,382 per vehicle.

This systematic error has major policy implications, because it understates how affordable hybridization already is.

Even more important is the forecast:

Future advanced hybrids (by ~2030) are expected to cost only $340–$730 more

than today’s HEVs — despite being significantly more efficient.

This means:

- Hybrids are becoming **cheaper**, not more expensive.
- Next-generation designs (dedicated hybrid engines, improved power electronics, more efficient batteries) will reduce costs further.
- Hybrids will remain one of the **lowest-cost compliance strategies** for automakers under tightening CO_2 rules.

The report is unusually clear: **hybrids are not a cost burden — they are a cost advantage.**

3. Hybrids Deliver Thousands of Dollars in Consumer Savings

Beyond the manufacturing side, hybrids generate substantial benefits for drivers.

According to the study’s 10-year analysis:

Over 70% of all hybrid models save consumers between $2,000 and $7,000

compared with equivalent gasoline vehicles.

These savings come from:

- Reduced fuel consumption
- Lower maintenance costs (less brake wear, fewer mechanical loads)
- Proven high reliability (hybrids report fewer issues than ICE vehicles in Consumer Reports data)

Combined with lower upfront costs, hybrids offer something rare in the clean-mobility debate:

A climate solution that actually saves consumers money — both immediately and over time.

Conclusion: Hybrids Are the Immediate, Scalable Climate Tool Policymakers Have Been Missing

The ICCT’s analysis confirms what many in the industry have long understood:

- **Hybrids deliver the largest CO_2 reductions of any combustion technology today.**
- **They are becoming cheaper, not more expensive.**
- **They save consumers thousands.**
- **They complement electrification instead of competing with it.**

For countries aiming to reduce emissions quickly, maintain affordability, and avoid the “backsliding” seen in unregulated combustion fleets, hybrids are not a compromise — they are an essential part of the solution.

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