



European Strategy on Clean and Energy-Efficient Vehicles

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Answers to questions 2, 5 & 6

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Electric Vehicles:

Question 2: Potential



- **80% of car traffic: 1 person, < 60km, mainly in slow traffic**
Small Battery Electric Vehicles (BEVs) are ideal for this usage.
- **Well-to-Wheels, lithium BEVs are intrinsically far cleaner than *equivalent* ICVs:**
 - Primary energy: 1.5 to 1.8 times less consumption (better yield)
 - CO2 Emissions: 2 to 2.5 times less (with EU 2006 mix = 443 g CO2/kWh)
 - Significantly less urban pollutants
 - Petrol consumption: virtually none
 - Noise: very low
 - BUT: not suitable for long trips.
 - Note: BEV technology is 150 years old – with significant improvements in recent years.
- **Quadricycles and Ultra-Small Urban electric Cars can be up to twice as clean...**
... while significantly reducing traffic and parking congestion!
- **Well-to-Wheels, Extended Range EVs (EREVs) are nearly as good**
(assuming 80% mileage in electric mode & lithium batteries)... and are suitable for long trips.
- **Fuel Cell Vehicles (FCVs) are far from commercial; potential is yet to be assessed...**
 - WtW figures comparison needed: FCV's versus using Hydrogen for EV's Electricity production...
 - Note: Hydrogen powered ICV have THE WORSE well-to-wheel figures !
- **Impact if all EU car traffic was 50% ultra-small BEVs, 50% EREVs:**
 - **Global EU greenhouse gas (GHG) emissions:** around 7% reduction.
 - **Urban pollution:** significant reduction (20 to 50% depending on pollutants)
 - **Urban noise:** suppression of traffic noise
 - **Oil consumption:** around 20% reduction.

→ ***EVs are the cleanest vehicles available today.***



Comparison



- Promoting EVs (BEV & EREVs) would be very effective:

Effectiveness	GHG reduction	OIL consum.	Urban pollution
<i>Replacing ICVs by BEVs & EREV</i>	$\pm 7\%^*$	$\pm 20\%$	$X\%^{**}$
ICVs: 165g CO ₂ /km → 120	$\pm 3\%$	$\pm 6\%$	$\pm X\%/3$
10% Biofuels in automotive	<0.7%	$\pm 2\%$	$\pm 0\%$
Full wind turbines implementation	$\pm 6\%$	-	-
Ban incandescent light bulbs	$\pm 1\%$	-	-

* With European 2006 electricity mix (443 gCO₂/kWh). $\pm 10\%$ if charged with non-CO₂ electricity (nuclear, renewable).

** X% is around 20 to 50% for most urban pollutants.

→ EVs are *THE* key to a clean future



Question 5: EVs versus ICVs



- **Question 5:** How can a trade-off situation be avoided where electrifying the power train would reduce or reverse improvements made in conventional technologies in the framework of existing and upcoming legislation on the CO2 emissions of road vehicles?
- **Answer:**
 - EV generalisation would bring about twice the combined advantages of maximum ICV improvement + 10% biofuels.
 - EV's CO2 emissions will further decrease together with electricity emissions.
 - Therefore, EVs are undoubtedly the technology of the future, to be exclusively promoted.
 - Investing EU money in ICVs = investing in an obsolescent technology.

It is a waste of money.

It may seriously hamper the future of EU car industry!

***When the winning technology is clearly identified,
safeguarding the technology neutrality principle
Is counter-productive!***



Question 6: EVs promotion



- **Question 5:** What actions should be best taken at regional/ national /European or international level to promote technology development and market uptake of alternative powertrains (electric and hydrogen)?
- **Answer:**
 - EVs are a rather mature technology.
But promoting EU research in advanced batteries will give Europe a competitive edge.
 - Because of low volumes, EVs are temporarily more expensive.
They bring advantages to society, not to owners.
It is therefore the duty of governments to provide incentives to EV buyers.
 - EV buyers should temporarily benefit of:
 - Financial incentives: Tax/VAT reductions, purchase subsidies... (*until EVs are less expensive*)
 - Non-financial incentives: use of bus lanes, free unlimited public parking... (**most effective incentive**)
 - Charging infrastructure: **first priority is where EV owners live !**
 - Since small light vehicle are intrinsically cleaner while adequate for commuting and urban traffic:
 - **New car homologation norms, in-between quadricycles (L7e) and cars (M1), are needed** for Ultra-Small and Ultra-Narrow Urban electric Cars (allowing to make them lighter and cheaper).
 - Being cleaner, such cars, as well as electric quadricycle, should be further incentivised.
 - **If – and only if – it is established that FCVs have the potential of being cleaner and cheaper than EVs**, then FCV **research** should be promoted.



Thank you!



For more information and figures on EVs,
read Going-Electric's study:

***Energy consumption, CO2 emissions
and other considerations related to
Battery Electric Vehicles***

Freely available at www.going-electric.org/what/reports.htm

*To our knowledge,
it is the ONLY study where
all hypothesis, figures and computations are detailed!*
Anyone can verify them – comments welcome!
***This should be a requirement for any study
commissioned by an European institution.***