E-vehicles for a smarter mobility

Demand and business models, outlook and future perspectives
Gabriele Grea

Brescia, October 1st 2014
Premise: vehicles, which future

«The emergence of a new automobile DNA (...) promises a renaissance in vehicles design. It will open up for exploration spaces of design possibilities that have never before seriously considered.

(Mitchell W. J. et. Al, Reinventing the automobile, MIT Press 2010)

Energy efficient *
Eco-friendly *

*IBM Automotive Global Study 2020

Driverless
Modular
Specialized
Connected
Evolution and trends

Automotive sector:
- New products
- New services
  - Business models
  - Supply chains

Service providers:
- Specific services (e.g. fleet management, car rental, etc.)
  - Wider range of (sustainable) mobility services, B2B and B2C

Users:
- CAR OWNERS
- MOBILITY CONSUMERS
An idea coming from far away...

“Within a year, I hope, we shall begin the manufacture of an electric automobile. (...) Mr. Edison and I have been working for some years on an electric automobile which would be cheap and practicable. Cars have been built for experimental purposes, and we are satisfied now that the way is clear to success. The problem so far has been to build a storage battery of light weight which would operate for long distances without recharging. Mr. Edison has been experimenting with such a battery for some time.”

... will be possible tomorrow?

Source: M. de Saint-Chéron, Mobilitytech Milan, Oct 19th 2010
European and Italian outlook

- **Strategy:** Europe 2020, Transport 2050 (CO2 -60%, 100% low emission vehicles)
- **2010** Communication from the Commission: A European strategy on clean and energy efficient vehicles
- **White Paper 2011** - Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system (reduce oil dependency)
- **2013** Proposal for a Directive on the deployment of alternative fuels recharging and refuelling infrastructure

**Clean fuels for transport:** Member States now obliged to ensure minimum coverage of refuelling points for EU-wide mobility - European Commission - IP/14/1053 29/09/2014

- **Legge del 7 agosto 2012, n. 134 Capo IV bis - Mobilità sostenibile**
- **Piano nazionale infrastrutturale per la ricarica dei veicoli alimentati ad energia elettrica, MIT 2013**
Which factors are driving the system?

- VEHICLES (supply)
- USERS (demand)
- HARDWARE INTERACTIONS (networks)
- SOCIOECONOMIC BACKGROUND (models)
- INSTITUTIONAL CONTEXT (rules)
Users - Electro mobility strategic Diagram

**Variables:**

**Demand side**
- Market availability
- Infrastructures
- Costs
- Range

**Supply**
- Provisioning mode
- Who’s the “provider”? 
- Technologies

**Policy**
- Infrastructures (ICT, Etc.)
- Integrated approach (mobility planning)
- Standards
- Incentives (cars/charging)

**Diagram Elements**

- **Co2 Vehicles**
- **ENERGY-MIX MOBILITY (not only electrical)**
- **COMBINING MOBILITY (Beyond the geeks /New model?)**
- **SECOND CAR**
- **FULL ELECTRICAL MOBILITY (not only car)**

**Market share:**
- **80/90%**

**Range:**
- **Short range**
- **Long range (Kms)**

**Today:**
- **10/20%**

**Electrical Vehicles:**
- **S0**
- **S1**
- **S2**
- **S3**
- **S4**
Users - the chance

2006

“Honestly, why are you driving a BMW?”

Olof Johansson-Stenman and Peter Martinsson Department of Economics, Göteborg University

TODAY

“Hey, will you still buy a car with no plug?”
Vehicles - Batteries and OEMs plans

**Batteries:**
Performance 150 km to 300 km.
Duration from 3 years (1000 deep discharge) to 10 (in ten years).
Costs from 700-1000 $/kWh, to 300$-400$.

**OEMs plans:**

<table>
<thead>
<tr>
<th></th>
<th>BEV</th>
<th>PHEV</th>
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<tbody>
<tr>
<td><strong>Small size</strong></td>
<td>This is the immediate candidate for BEV. Most of early models fall in this category</td>
<td>Vehicle packaging problem and excessive price are obstacles.</td>
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<td><strong>Medium size</strong></td>
<td>Very few model are expected in the short term. This would however emerge later with battery cost decline and increased performance</td>
<td>Privileged segment, but marketing is unlikely before 2020</td>
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<td><strong>Large size</strong></td>
<td>Large car are usually used for long distance trip. Battery capacity is an obstacle. This would be limited to specific market (e.g. luxury cars)</td>
<td>Privileged segment, but marketing is unlikely before 2020</td>
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*Source: JRC ipts 2010, Nemry F., Brons M., Plug-in Hybrid and Battery Electric vehicles*
Scenarios and forecasts

Comparison of scenarios in terms of vehicle sales (EU level)

Source: JRC ipts 2010, Nemry F., Brons M., Plug-in Hybrid and Battery Electric vehicles
## Scenarios and forecasts

New car sales shares in 2020 and 2030

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Conclusions

- Strong connection with sustainable mobility strategies involving behavioral change, innovative services and business models

- Not only niches and experiments, but market approach building a comprehensive vision

- A broad range of vehicles, services, technologies

- Better exploitation of renewable sources, higher interactions with the grid, storage as a need and opportunity as well
THANK YOU FOR YOUR ATTENTION!

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