Innovating our mobility

L-category vehicles: smaller, lighter, more specialised

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Smaller, Lighter, and Specialized Powered Two-Wheelers (PTWs)

Jacques Compagne
ACEM Secretary General

PTWs: a SMART Choice For Mobility

Responding to the objective of EC White Paper:

- Smaller, PTWs use land more efficiently
  - Optimize existing infrastructures
  - Produce less damages to roads
- Lighter, PTWs are cost efficient
  - Cheaper to produce and operate
  - Fuel efficient
  - Agile in congested areas
- More specialized, PTWs responds to well defined practical mobility needs
  - In the EU 27, over 60% of journeys are for commuting, with an average occupancy rate of 1.1 per vehicle.

Future Trends Will Boost Modal Shift

Main development trends will

- Reduce environmental impact through cleaner PTWs and a higher proportion of ultra low and zero emission vehicles

- Improve Road Safety

- Offer more convenience

Powertrains: from Cleaner Engines...

Optimization of ICEs through

- Sophisticated engine management
- Deployment of low friction techniques
- Downsizing

Honda 125cc scooter engine:
A 25% more fuel efficient

Piaggio 350cc scooter engine
Power output similar to the 460cc engine 30.5 km/l

Powertrains: from Cleaner Engines...

- Development of hybrid propulsion

Key figures
- *PTW contribution to CO2 emissions of transport <2% (LAT 2008)*
- *PTWs emit 50% less CO2 than passenger cars (ADEME 2008)*

Piaggio hybrid electric scooter
Fuel consumption 60km/l CO2 emissions 40 g/km

Powertrains: to Zero Emission Engines...

- Deployment of electric propulsion
  - From moped and scooter electric powertrain

Key figures
- *L-Cat. eVehicle Market near 15,000 units in 2011*

Yamaha electric moped
56 kg 1.4kW 40+ km range

Honda EV-neo scooter
2.8 kW 34 km range

Piaggio Liberty eMail
2.6 kW 60-80 km range

Powertrains: to Zero Emission Engines...

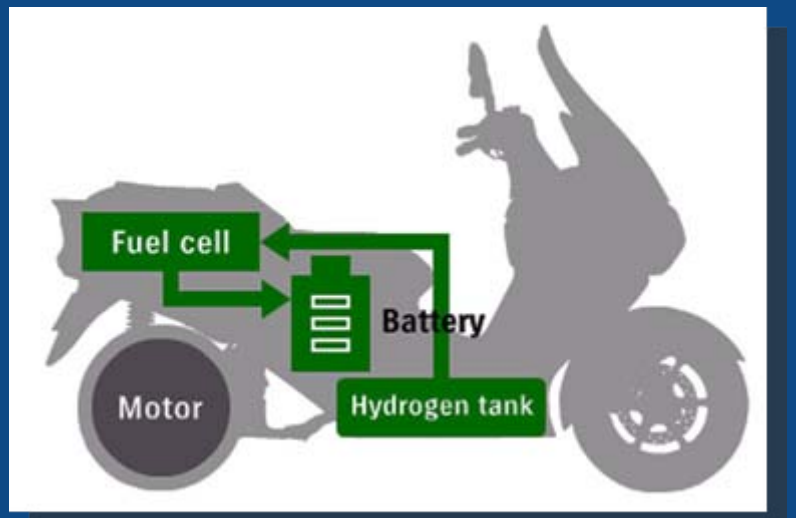
- Deployment of electric propulsion
  - To maxi scooter electric powertrain

BMW eScooter project
Dynamic behaviour of ICE maxi scooter

Powertrains: to zero emission engines...

- Application of fuel cell

Suzuki scooter fuel cell technology concept
Range of 350km comparable to a conventional Burgman scooter



Yamaha concept of Direct Methanol Fuel Cell (DMFC) System
Eliminates the need for a converter and a pressurized (fuel) tank

Safety & Security Systems: Deployment

- Existing systems will be progressively deployed from larger leisure motorcycles towards smaller urban vehicles

SIM Project: Integrated Safety Concept
Piaggio partner of the EU co-funded project

Safety & Security Systems: Deployment

- New systems will be developed
  - Autonomous
  - Cooperative

BMW Advanced Safety Concept

V2V Use Case demonstrated by Honda

Architecture: enhanced stability & convenience

- From two wheels...
  - Work out centre of gravity on scooters

Yamaha Tmax
Aluminium frame
Central engine

  - Scooter/motorcycle hybrids with gear automation

Honda Integra
Automatic/sequential gear shift

Architecture: enhanced stability & convenience

- To three wheels...

Piaggio MP3 Yourban

Peugeot HYbrid3 concept
Hybrid

Honda 3RC concept
Electric

Architecture enhanced stability & convenience

- To four wheels...

Yamaha Tesseract concept
Hybrid

Mega City Lithium
Engine 6 kW, 100 km range

Goupil G32
Engine 12 kW, 100 km range

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