The future of mobility

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Dr. Stephan Herbst
Technical General Manager
Toyota Motor Europe
The mobility system is changing rapidly
This is a once in a lifetime challenge

- Automated driving
- Connectivity
- Shared mobility
- Electrification
90% CO₂ reduction*

*90% reduction of new vehicle CO₂ / KM emissions by 2050 compared to 2010
Electrification will dramatically increase early 2020.

Mix of powertrains required to achieve 90% CO2 reduction.

Sales volume

<table>
<thead>
<tr>
<th>Year</th>
<th>HEV</th>
<th>PHEV</th>
<th>BEV</th>
<th>FCEV</th>
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<td>2010</td>
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<td>2020</td>
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<td>2050</td>
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2030 Sales target
>5,5 million electrified vehicles, including 1 million ZEVs (BEVs, FCEVs)
Electrification will dramatically increase early 2020

Mix of powertrains required to achieve 90% CO2 reduction

Sales volume

2010 2020 >2025 >2030 2050

Engine HEV PHEV FCEV BEV

2025 Sales target >5,5 million electrified vehicles
Diversification of HEV, PEHV, BEV, and FCEV

- **BEVs**: Small home-delivery vehicles, Personal mobility
- **HEVs/PHEVs**: MaaS Applications, Short-distance use
- **FCEVs**: Full-size trucks, Delivery trucks, Route buses, Forklifts

- **Applications**:
  - Full-size trucks
  - Delivery trucks
  - Route buses
  - Forklifts
  - Passenger cars
  - HEVs
  - PHEVs
  - MaaS Applications
  - Personal mobility
  - Small home-delivery vehicles
  - Short-distance use
More than 20 years of Hybrid EVs leadership

~15 1997

Million Hybrid EVs sold since 1997

>36

Hybrid EV models

>90

Countries & Regions

Prius concept @ 1995 Tokyo Motor Show
HEV: In Zero Emission

Rome Study Results with 4th Generation Toyota Prius HEV

- 37km in sub-urban and urban traffic
- Average trip duration 95min
- 60 trips (AM, midday, PM)
- 20 drivers (M/F, <35y/35y, HEV experience Y/N)

Urban drive in zero emissions mode

79.4% TIME
76.3% DISTANCE

Total journey - drive in zero emissions mode

73.2% TIME
62.5% DISTANCE

- Total journey time in ZEV mode
- Total journey distance in ZEV mode
- Urban area time in ZEV mode
- Urban area distance in ZEV mode

- 73.2% TIME
- 62.5% DISTANCE
- 79.4% TIME
- 76.3% DISTANCE

37km in sub-urban and urban traffic
Average trip duration 95min
60 trips (AM, midday, PM)
20 drivers (M/F, <35y/35y, HEV experience Y/N)
Main zero-emission vehicles

(Including development concept, driving demonstrations, and system provision)

- **FCEVs**
  - Passenger vehicles
  - Commercial vehicles
  - Lunar Rover

- **BEVs**
  - Walking area
  - Ultra-compact
  - Compact and midsize

- **Maas**
  - Passenger vehicles
  - Commercial vehicles
  - Lunar Rover
Hydrogen a cost competitive option by 2030

1. Hydrogen is the only alternative and low-carbon/renewable hydrogen competing with grey (optimal renewable or low-carbon shown)
FC system: further cost reduction

- Resolve technical issues
- Reduce cost
- Production technology
  Design
- Mass production

2008 Prototype MODEL

- 1st Generation Mirai: -95%
- Generation 2
- Generation 3

Limited Sales
- Market Entry
- Widespread use

Further cost reduction efforts are ongoing
MIRAI: first mass-production Fuel Cell sedan

- Launch in Japan: 2014
- Launch in US and Europe: 2015
- 2,000 Mirai/year: 2016
- 3,000 Mirai/year: 2017
- 30,000 FC stacks/year: 2020+

- >9500 sold globally
- >600 sold in EU
FCEV growth through diversification

Passenger Vehicles
- Performance improvement and cost reduction
- FC technologies

Increase demand

Commercial Vehicles
- Substantial hydrogen consumption
- Industrial use

Contribution to infrastructure development
CaetanoBus is first FC system customer in Europe
Small Trucks & Stationary fuel cells in Japan
Zero Emission Truck prototype in US

Feasibility Study: Toyota Project Portal Hydrogen Fuel Cell Truck
And we’re even going to the moon
Energy Observer
Cost of H2 production & distribution is critical success factor esp. for heavy-duty
80 year’s of Toyota history
From looms to mobility for all