

The European Market for Full and Mild Hybrid Electric Vehicles To Exploit Afghan Lithium

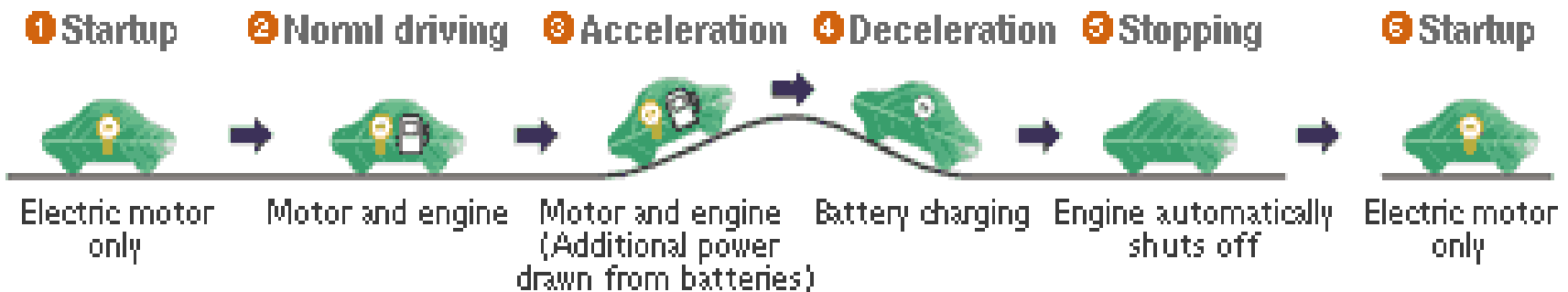
Interactive Analyst Briefing
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Agenda

- Hybrid Electric Vehicles Defined
- Market Overview
- Key Market Drivers and Restraints
- Market Size and Forecasts
- Vehicle Manufacturer Analysis
- Strategic Conclusions and Recommendations
- Report Highlights
- Questions and Answers

Hybrid Electric Vehicles Defined

- Hybrid Electric Vehicles (HEVs) combine **2 sources of power**:
 - a conventional ICE and an electric motor
- Depending on the degree of hybridisation (balance between ICE and motor) HEVs can be broadly categorised into:
 - MILD** HEVs (functionality: start/stop + boost), e.g. Honda Civic
 - FULL** HEVs (functionality: start/stop + boost + pure electric drive), e.g. Toyota Prius



Source: Toyota

Market Overview

- HEV market is expected to grow from approximately 900 units in 2000 to about **450,000 units by 2010**
- **Mild HEVs** will make up the lion's share of the European hybrid market
- VMs and suppliers will compete to be seen as **pioneers**
- HEVs will be part of the product portfolio of all major car manufacturers
- **Pricing of components** is a major issue that both drives overall costs and hampers mass production of HEVs

Key Market Drivers and Restraints

Drivers

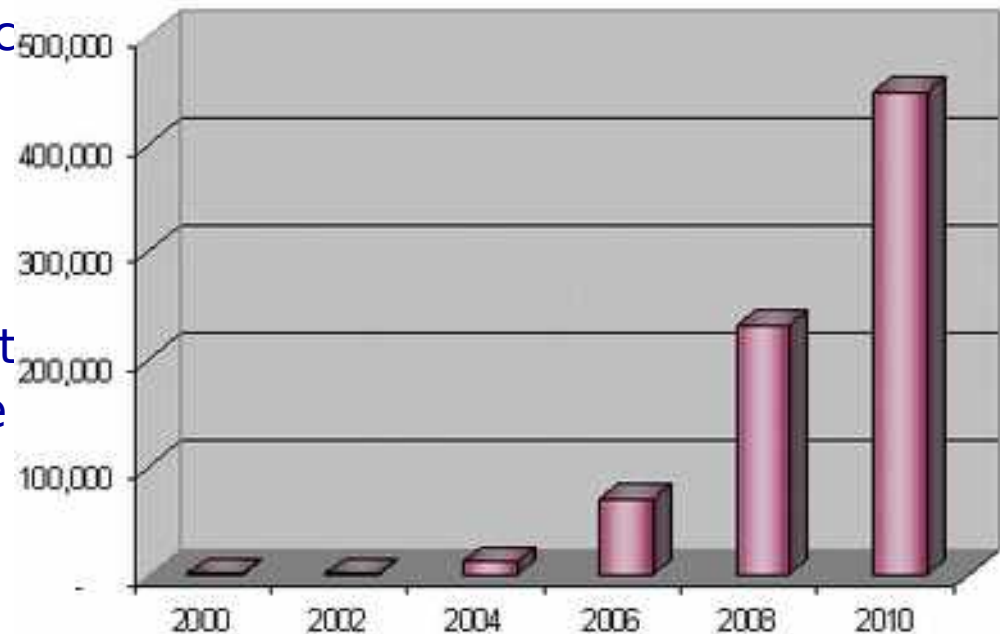
- Reduction of CO2 emissions
- Reduction of fuel consumption
- Enhancement of VMs green credentials
- Introduction of city congestion schemes
- Engine downsizing potential

Restraints

- VMs are selling HEVs at a loss
- High retail prices
- Lack of customer awareness
- Threat from diesel engines
- Heavy depreciation

Market Size and Forecasts

- By 2010: total market penetration of 2.7 percent, number of vehicles sold estimated around 450,000 units
- Full HEVs: uptake rates slow throughout the decade
- Mild HEVs: sales to increase around mid decade and to pick up decisively by 2008. Estimated penetration by 2010: over 2%
- By 2015 the total HEV market penetration is expected to be around 8 - 10 percent



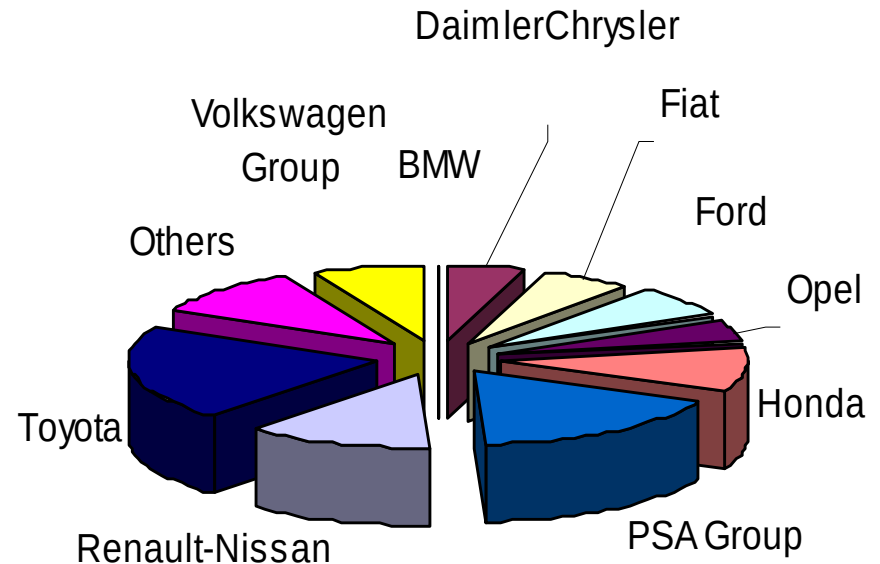
Source: Frost & Sullivan

Vehicle Manufacturer Analysis

Market participants choose diverse HEV strategies

- Honda is expected to lead the European mild HEV market until mid decade
- Toyota is plans to target the European market with full HEVs
- Renault and Fiat Auto plan to focus on mild HEVs
- Volkswagen AG regards 15 percent of fuel economy as the optimum degree of hybridisation
- BMW will follow the hydrogen path

HEV Market Shares of VMs (2010)



Strategic Conclusions and Recommendations

- Focus on mild hybrid technology
- Petrol HEVs as mainstream configuration in Europe
- Increase in Alliances
- 42v to drive growth of hybrid technology
- Interaction of ICCS and HEVs
- UK, France and Germany are expected to be the key markets
- Increase in customer awareness to promote HEV market
- Jockeying for market positions between VMs

Report Highlights

- Market sizes, forecasts and penetration rates by technology type (full and mild HEVs)
- Competitive and strategic analysis, with market positioning and forecasts for penetration levels for 10 key VMs, including their profiles (by technology type)
- Market drivers and restraints and market challenges by individual technology
- Cost-Benefit analysis of full and mild HEVs for VMs and customers
- Based on extensive primary research (“bottom-up-approach”)

Any Questions?

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