



TRANSPORTATION EUROPE

Original Equipment – Where does the market go?



Michael Geiger, VP OE Sales
January 21, 2011

Exide Technologies

Total sales **\$ 2,7 billion**

Shares Traded on **NASDAQ** - **under XIDE**

Total n° of employees **10,000**

Sales split by division globally **65%** Transportation **35%** Industrial

Sales split by geographic area **57%** Europe + ROW **43%** Americas

33 Manufacturing Plants in 11 Countries

Lead-Acid Batteries for Transportation & Industrial Applications

Transportation: Automotive and Commercial Vehicles

Industrial: Network and Motive Power

Restore: Renewable Energy Storage

Automobile Industry, LV and LCV

Truck Industry

Off Road: Construction and Agriculture

#2 in EU – 25% Market Share

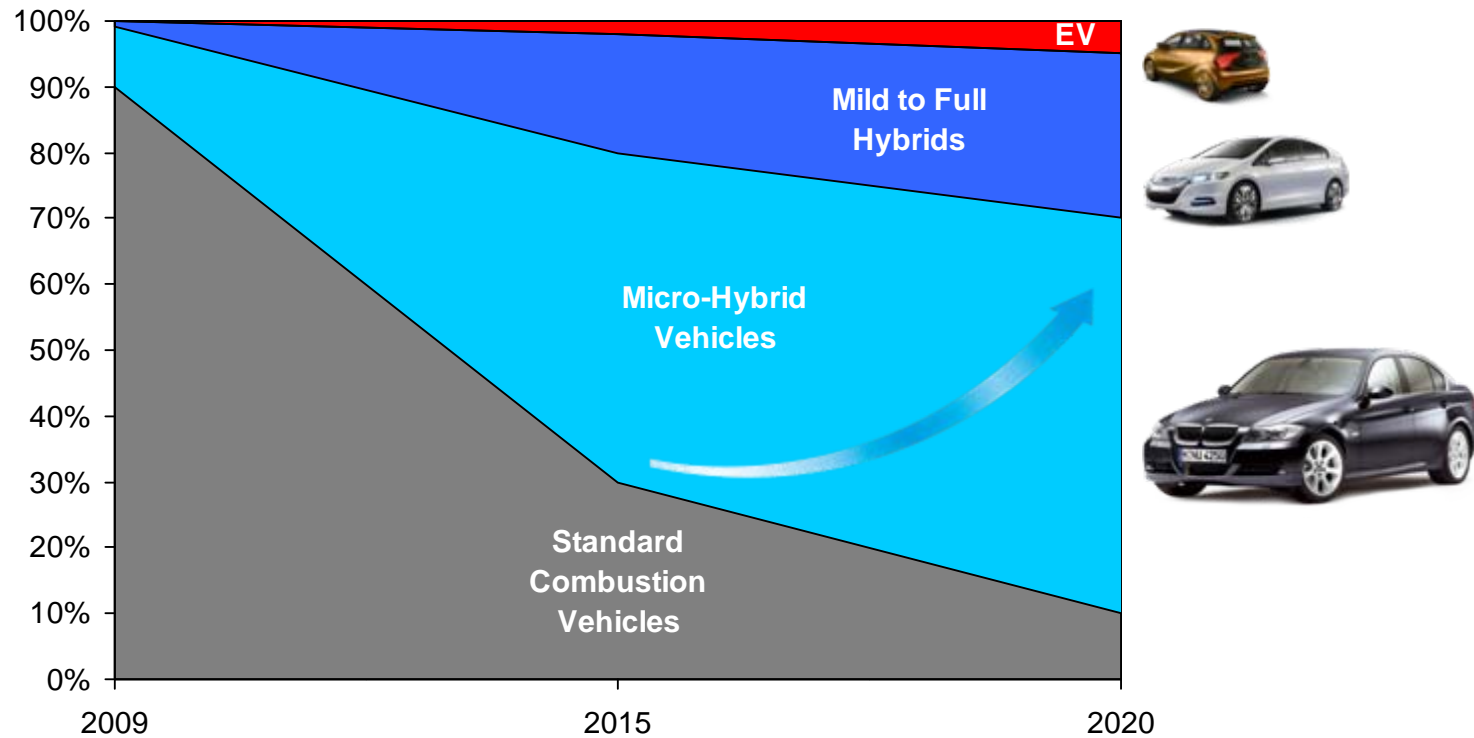


Clean Automobility, Total Cost of Ownership.

Hybridisation of the Powertrain, combustion engines remain dominating for many more years.

LV & LCV Microhybrid (AGM, MHF = ECM) bies replacing Standard Flooded.

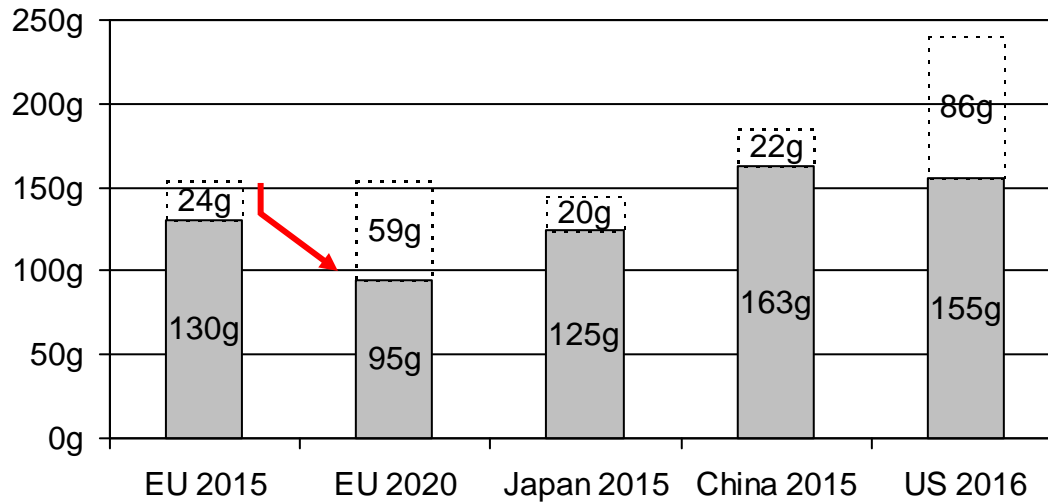
CV shift to Full Maintenance Free Ca/Ca and High Vibration Resistant programs.



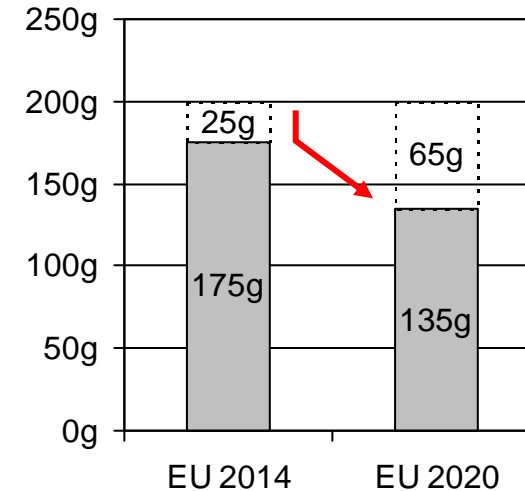
Exide Assessment, PRMT, R. Berger, JD Power

Combustion engine remains the dominant propulsion.
Full Hybrids also require a lead acid battery to crank.

CO2 Regulations LV



CO2 Regulations LCV (3,5t)



EU Regulation – in place for LV's

- 130g/km fleet avg, 65% compliance 2012, 100% 2015
- 95g/km fleet by 2020
- Manufacturer penalties for each gram above 130g per registered car starting 2012: 5€/g first g / 15€ second g / 25€ third g / 95€ each subsequent
- Starting 2019: 95€/g first g

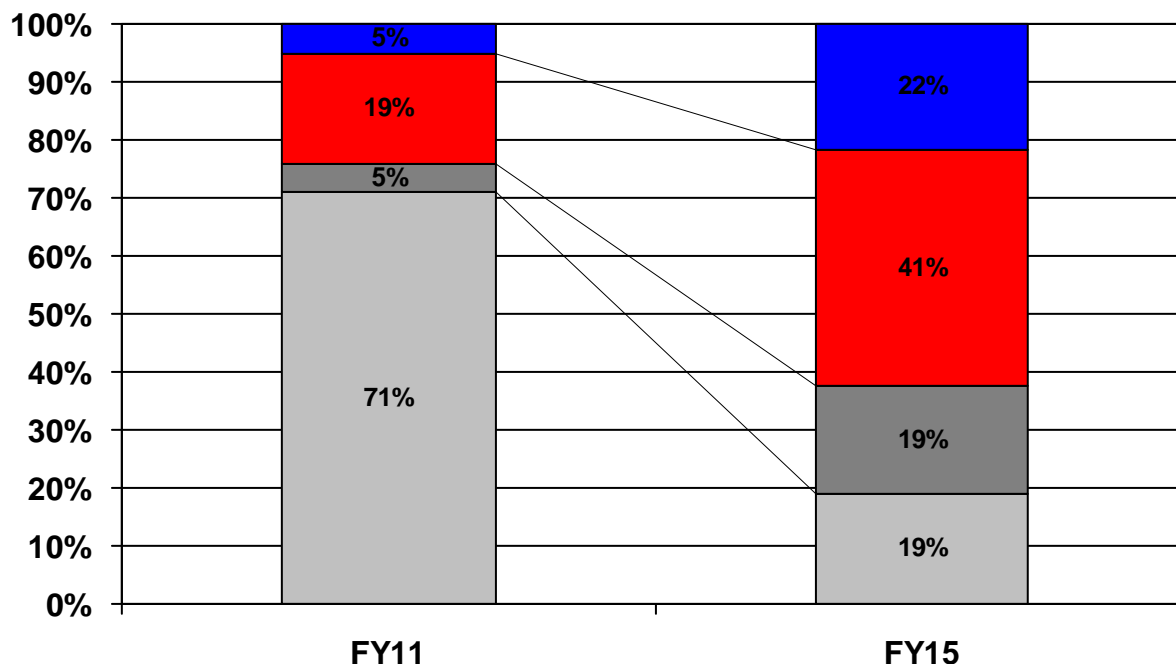
EU Regulation – expected for CV's

- 175g/km fleet avg, 75% compliance 2014, 100% 2016
- 135g/km fleet by 2020
- Manufacturer penalties for each gram above 175g per registered vehicle starting 2014: 5€/g first g to 120€ fourth g



Global strict CO2 Regulations in all Segments require efficient Powertrains & Battery Technologies

OEM LV and LCV Technology Change



Microhybrid MHF
Quadruplicating



Microhybrid AGM
Doubling



Downsized Flooded
Tripling



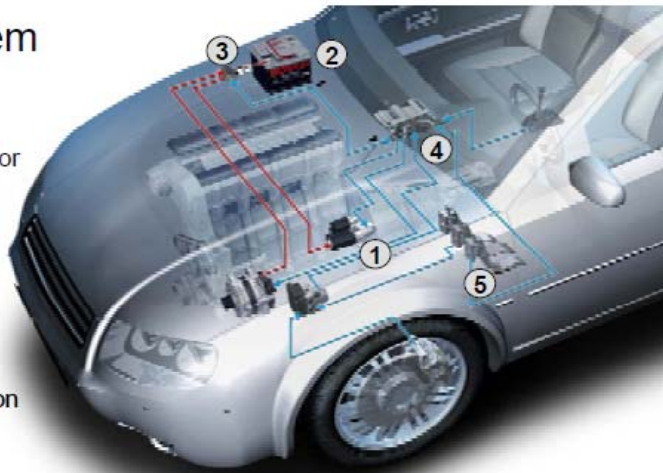
Standard Flooded
Quartering



Technology Change driven by CO₂ Legal Requirements
Outlook Europe OEM CY14 ~15Mu Microhybrid Batteries
(9Mu AGM / 6Mu MHF)

Start/Stop System

- ① Start/Stop Starter Motor
- ② Improved Battery
- ③ Electronic Battery Sensor
- ④ Engine Control Unit incl. Start/Stop Function
- ⑤ Pedals and Sensors



Picture: Source Bosch

Scalable System, next steps

- Intelligent Generators
- Automatic Transmission
- Wider Operating Window (temperature, number of engine shut downs)
- Sailing (shutdown engine and sail e.g. to a red light)

- Engine shutdown during idling, reactivated by hitting the clutch / take foot of the brake pedal
- Electrical consumer units supplied during the stop by the battery – energy consumption monitored
- Battery continuously monitored
- Energy Recuperation – battery operates in low state of charge and only charged during overrun conditions, or if needed

**Specified Microhybrid batteries are needed – MHF / AGM
compliance with car manufacturer spec mandatory to ensure
operation and fuel / CO₂ savings**

Technology

- Very effective at relatively cheap system cost
- Integration in existing architecture and board nets
- Scalable System
- Remove auxiliary equipment from the combustion engine and go electric: water pump, steering, Air Condition ...
- Reliable, battery lifetime expected above 4y (today ~6y+)



Benefits

- 5% - 15% and beyond Fuel Savings & CO₂ savings. ADAC estimated annual savings for Germany with 585 Mio liters of fuel and 1,5 Mio tons of CO₂.
- Image – green and economical
- Compliance with Global regulations

AGM Absorbent Glass Mat

- #2 in EU
- First in the Market
- Individual Specifications
- “EU” VDA Specification
- More than 500.000 OE batteries sold



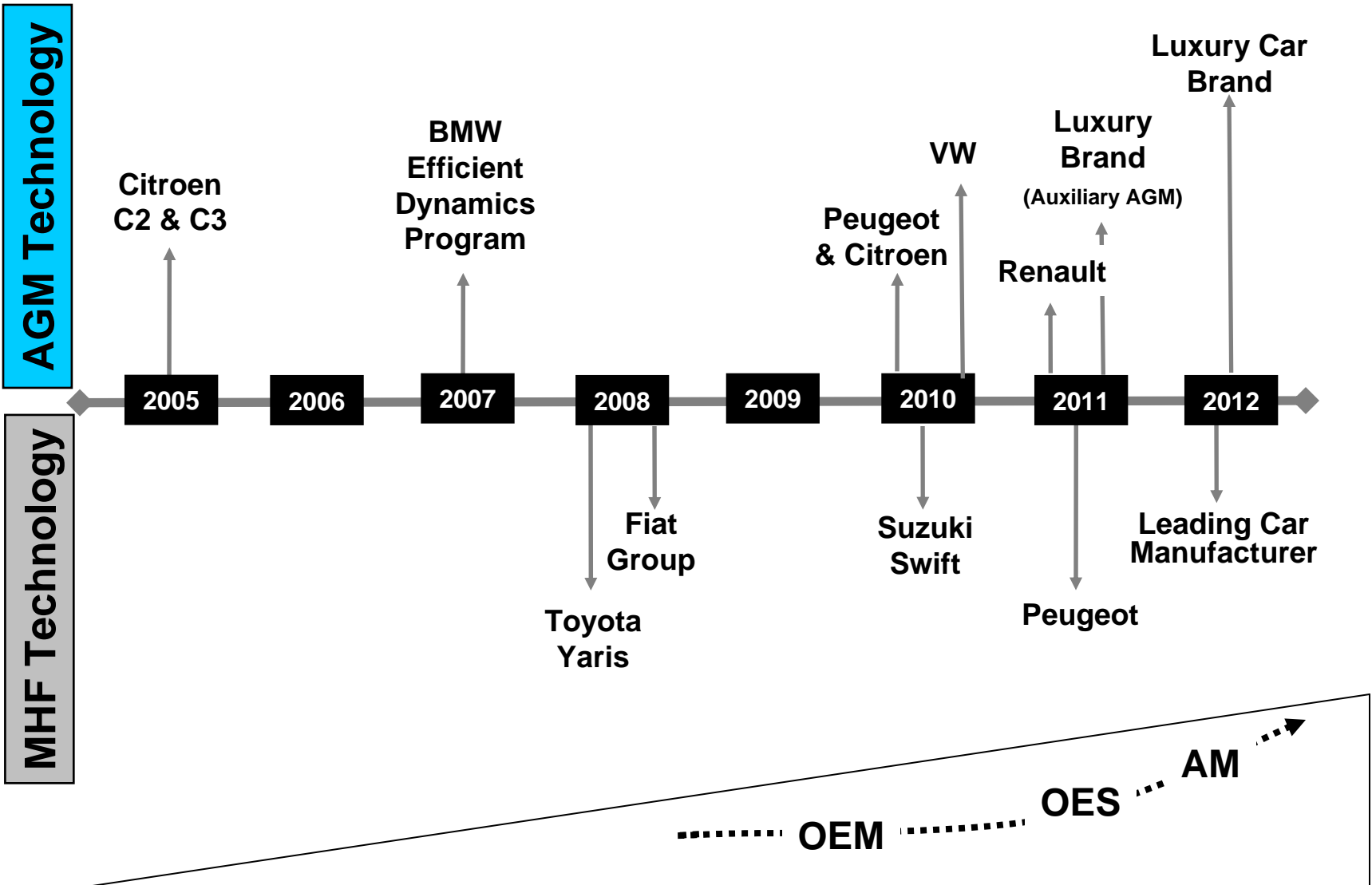
AGM – the premium solution
Heat sensitive – trunk / isolation

MHF Micro Hybrid Flooded (ECM Enhanced Cycling Mat)

- #1 in EU
- First in the Market
- Individual Specifications
- More than 1.000.000 OE batteries sold



MHF – engineered to purpose
A-/B-Segments, engine compartment




AGM Technology

BMW S: 61 21 7 575 575
 AW: 61 21 6 924 022
 525679 - 10 IT

12V 90Ah 900A (EN)
 160 RC 900 CCA (SAE)

Verschlussene Batterie - Nicht Öffnen!
 Sealed Battery - Do Not Open!

EXIDE
 TECHNOLOGIES




DANGER/POISON

SHIELD EYES
 EXPLOSION
 SULFURIC ACID
 CORROSIVE


NO OPEN FLAME

SULFURIC ACID
 CORROSIVE

FLUSH EYES IMMEDIATELY WITH WATER
 GET MEDICAL HELP FAST



Pb



MHF Technology



MAGNETI MARELLI

Dis. FIAT:
 51778211



12V 50Ah 350A
 436350-ES

LANCIA FIAT ALFA ROMEO

77710974-03

Currently Technology etc. not mentioned on OE labels

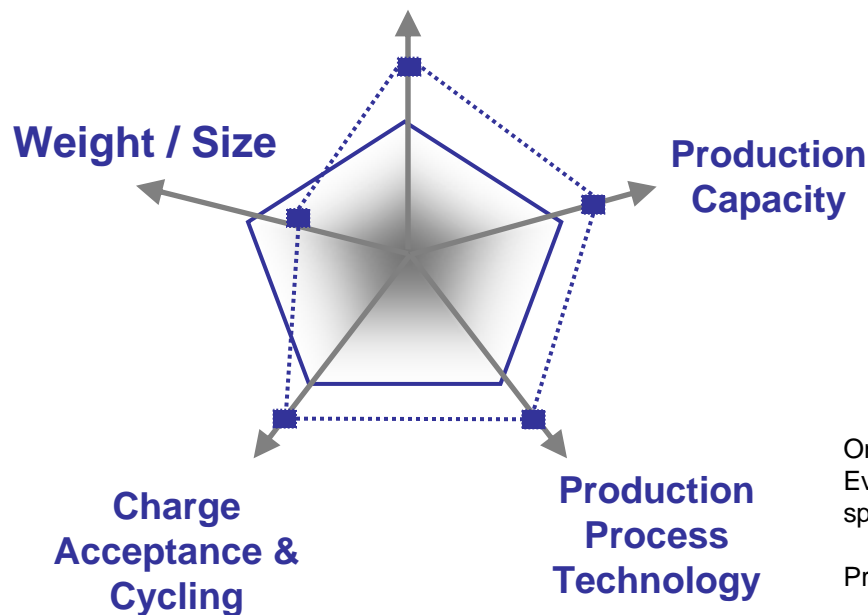
1 Production Capacity

2 Design

3 Process

Taylor made batteries.
Customer and Application specific AGM and MHF Programs. Fulfilling the individual OE customer specifications. E.g. L6 105Ah AGM ...

Product Ranges



Further improved energy density thru design and advanced materials as ceramics and carbons.

Key for further fuel savings – high tech additives as carbons. Next separator generations.

Multi Million Euro Invests

Availability in Exide plants across Europe, close to our customers

Ongoing Design and Performance Evolution. New and tough specifications ahead.

Process and Tolerances are key.

Additives, Curing, Filling & Forming...

— Today Next Generations



2-Cylinder Downsize Engine

- Start/Stop with Exide MHF/ECM
- 985ccm Cylinder Capacity
- 20% less weight and package
- Electro Hydraulic Valve Control
- Turbo Charged (65/85/105 HP)
- 85 HP: 95g CO2 (85 HP), 4,0l/100km, 59 mpg

Carbon Lead Acid AGM

- Generation 2: 45kg/100lbs
- Generation 3 (CY11): 20kg/44lbs
- Microspheres
- Power Density 800watts/kg, close to NiMH