



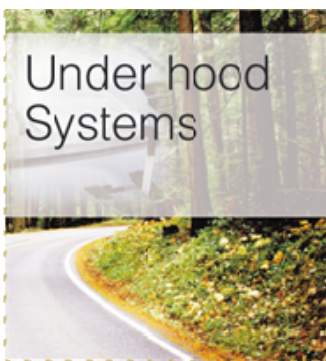
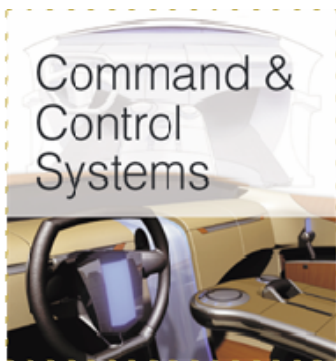
EV, what changes must address
the automotive supplier?

Zaragoza, 24th March 2009

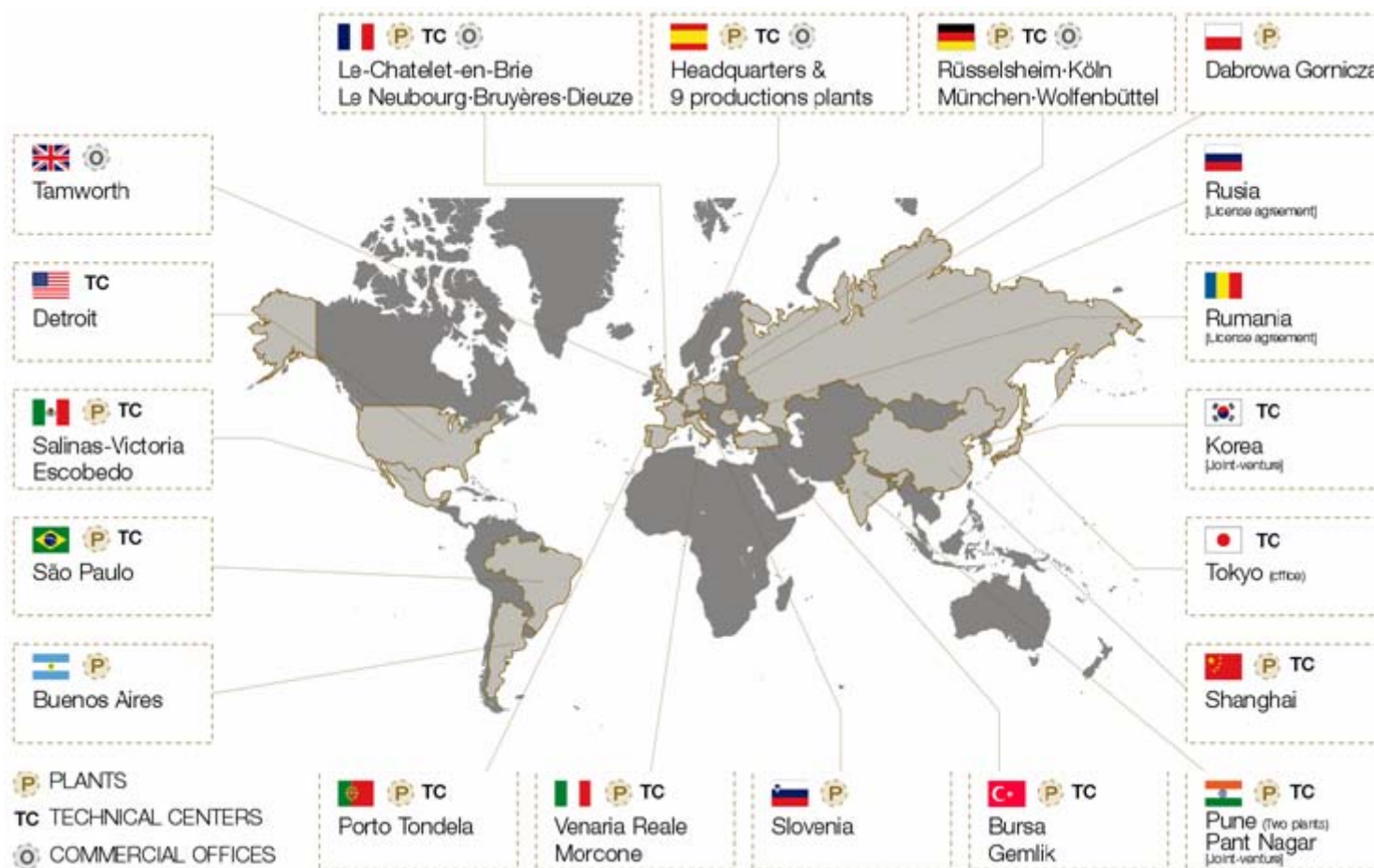
Ficosa Business Units



Business: **Global Automotive Supplier**
2008 Sales: around 870 M €
2008 Team: 6.000 people worldwide



Ficosa Global Reach

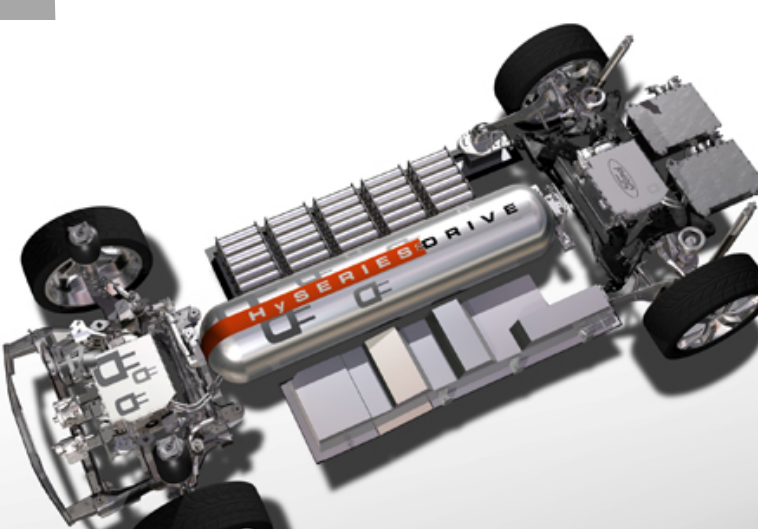


Our **R & D** investment represents 4% of our total Group's sales.
 Intellectual Property of Ficosa Group: 600 active patents

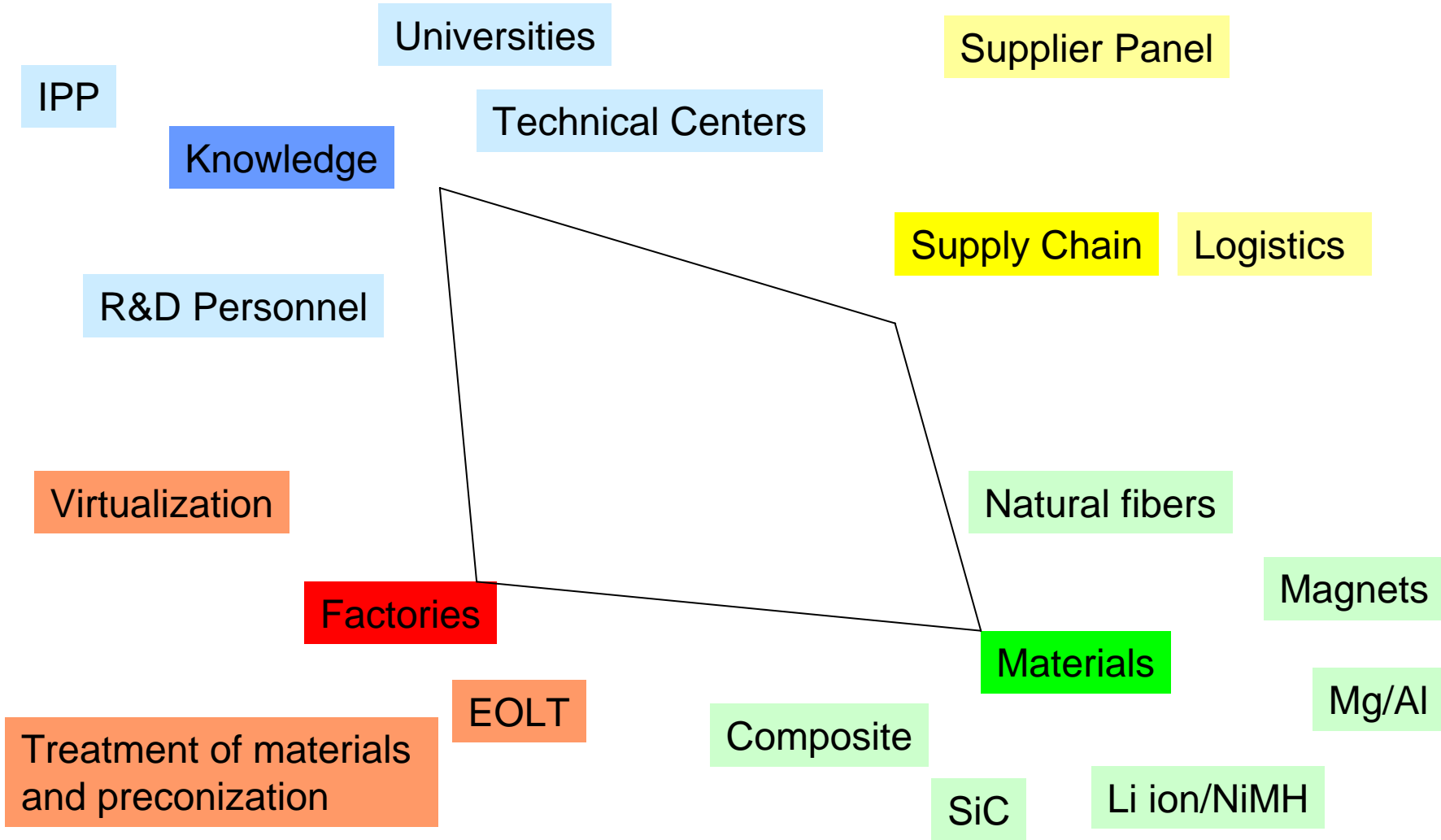
“Yogurt syndrome”



ICE's, Mild Hybrids, Micro Hybrids, EV,
PHEV, Range Extenders, Fuel Cell,....



Fields where the industry must intensify efforts to address the vehicles's electrification



EV Research needs



Algorithms and sensors (including semiconductors and new materials)

Electric Machines

Electrical Architecture (EMC / EMI)

Topics

Energy and Environment,
Safety and Comfort
Competitiveness
Mobility and Transport

Thermal management

Recharge Energy

Energy Management

Materials (“nano, green & lightweight”)

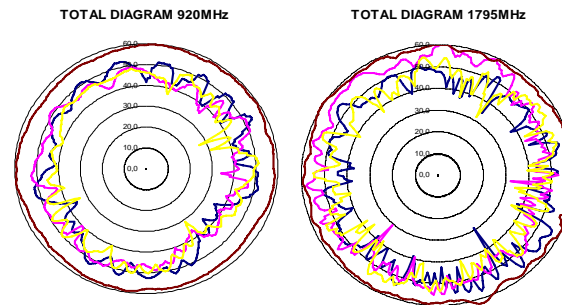
Storage Systems

Auxiliary energy efficient

Grid connection

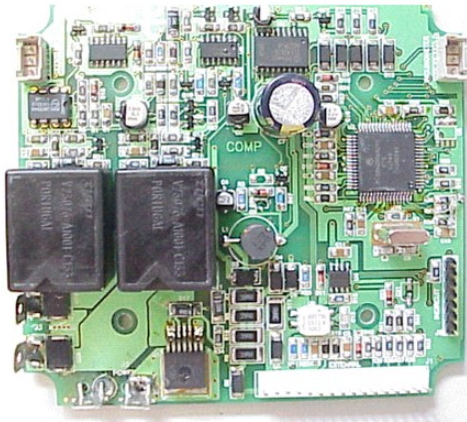
Ficosa in EV (I)

- *V2X (vehicle communications / infrastructure / network) "Must enabler"*
- *New RF architecture more efficient placing and receiving antennas in one device*
- *Antennas with adaptive bandwidth and multiband systems*
- *"Onboard Communications Unit" (exchange of specific information V2G SW, immune and real time)*



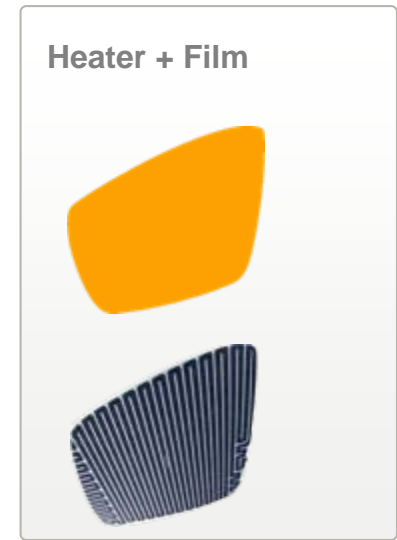
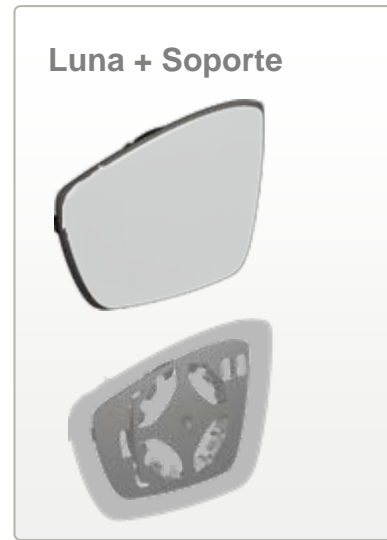
Ficosa in EV (II)

- Battery peripherals and battery management
 - Package anticrash
 - Cooling System
 - Electronic battery management and monitoring
 - Configuration charge / discharge
 - Electrical safety in case of crashes, high temperature, fire, ...
 - Communication with the rest of ECU's



Ficosa in EV (III)

- Lightweight Materials
 - Plastic glass (nanostructures)
 - Magnesium Structures

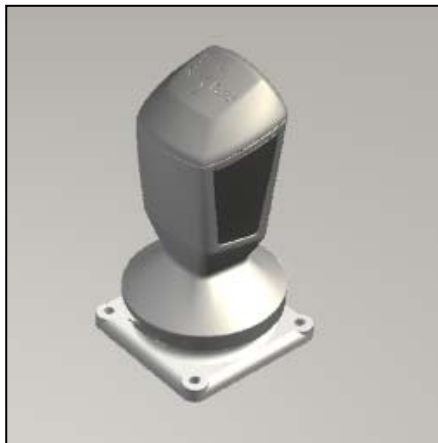


- Holders with natural fiber reinforced polymer



Ficosa in EV (IIII)

- Shift by Wire
 - Configurability to any transmission
 - Small package
 - Reduced weight



- Visualization "EV" in Product Roadmap
- Recruiting experts
- Simultaneous engineering OEM (during the first vital steps - Partnering with "key players")
- Cooperation with Technical Centers/Univerities highly specialized
- Materials
- To keep high level of IPP ("patent first")
- Prepare plants to the future (flexible manufacturing to combine high / low volumes; extended manufacturing, ICT manufacturing)
- Rethink strategies "make or buy" for certain components. Partners.
- R&D challenges through cooperative programs



FICOSA

leading the future by innovating

Thank you!

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