



**CLEPA**  
*European Association of  
Automotive Suppliers*

## eSafety RTD WG Workshop

Updating the Strategic Research  
Agenda ICT for Mobility

# **Session: ICT for the Fully Electric Vehicle**

27 April 2010

# CLEPA: Facts & Figures

- Created in the late 1950s, CLEPA (Comité de liaison des fabricants d'équipements et pièces automobiles) is the European umbrella membership organization representing the interests of the global Automotive supply industry
- 3000 member companies in total (direct and indirect), representing 3 Million employees
- 300 billion Euro sales



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# Suppliers: Facts & Figures

- ✦ 75% of the value of the car comes from suppliers
- ✦ 50% of the R and D spending comes from suppliers
- ✦ 12 billion EUR annual spending on R&D
- ✦ 500 billion EUR worth of annual turnover
- ✦ A majority of patents are from suppliers

Some examples:

- ✦ ABS
- ✦ Airbags
- ✦ Electronic stability programmes
- ✦ High pressure injection systems
- ✦ Diesel particulate filters
- ✦ Navigation systems



# RTD Working Group

The main tasks & objectives of the CLEPA RTD WG are:

- To maintain a Technology Strategy assisting and support the CLEPA members in RTD project development on European level;
- To act as the single interface to the EU and ACEA/EUCAR in RTD matters;
- To operate as an “Information and Communication” panel on RTD matters.



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# CLEPA Vision

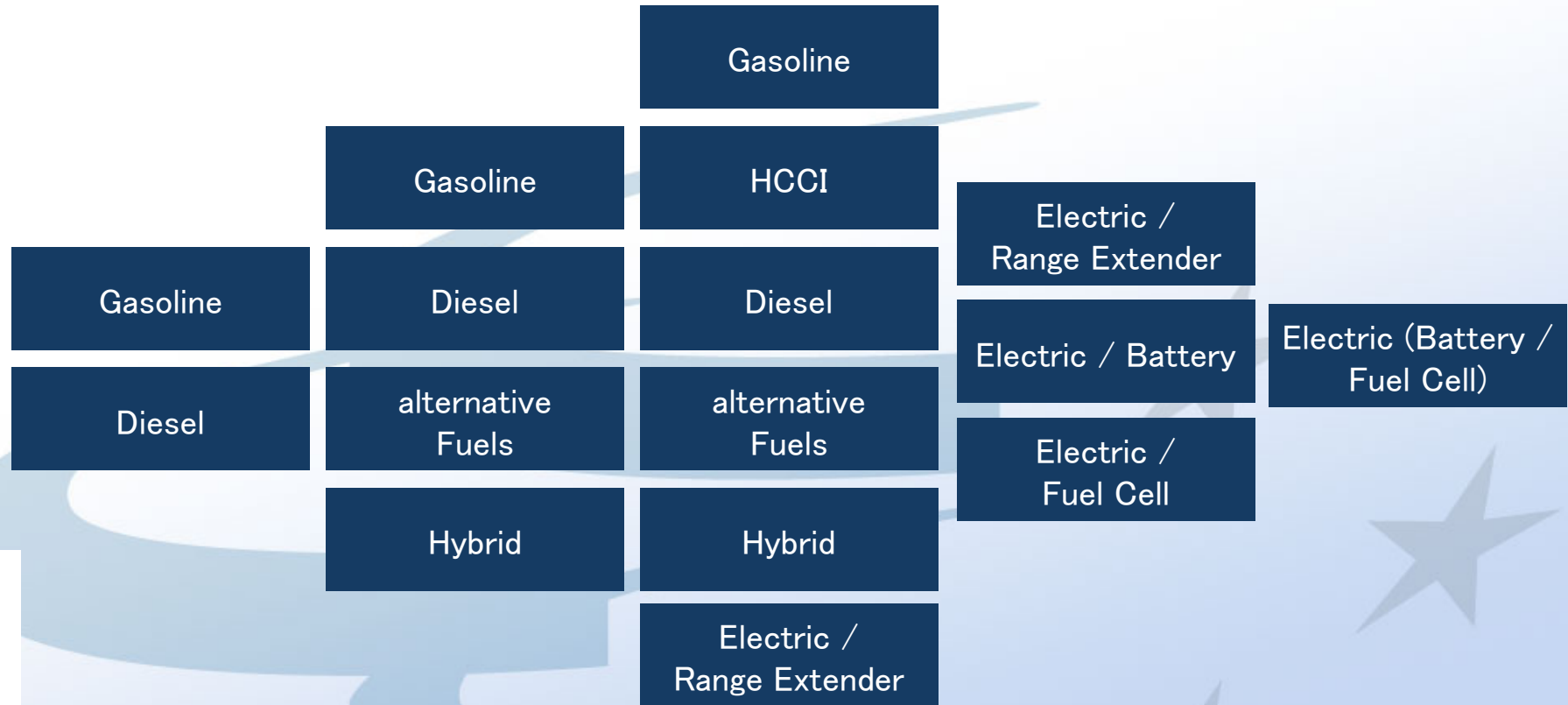


**Battery will drive the world ? but when ?**





# EV Roadmap





# EV Key Success Factors

## Lifetime

> 10 years  
> 250 000 km

## Safety

0 thermal incidents in field

## Performance

Power > 5000 W/kg (HEV)  
Energy > 200 Wh/kg (EV)

## Quality

Reliability  
Zero Fault

## Cost

< 30 \$/kW(HEV)  
< 300 \$/kWh (EV)

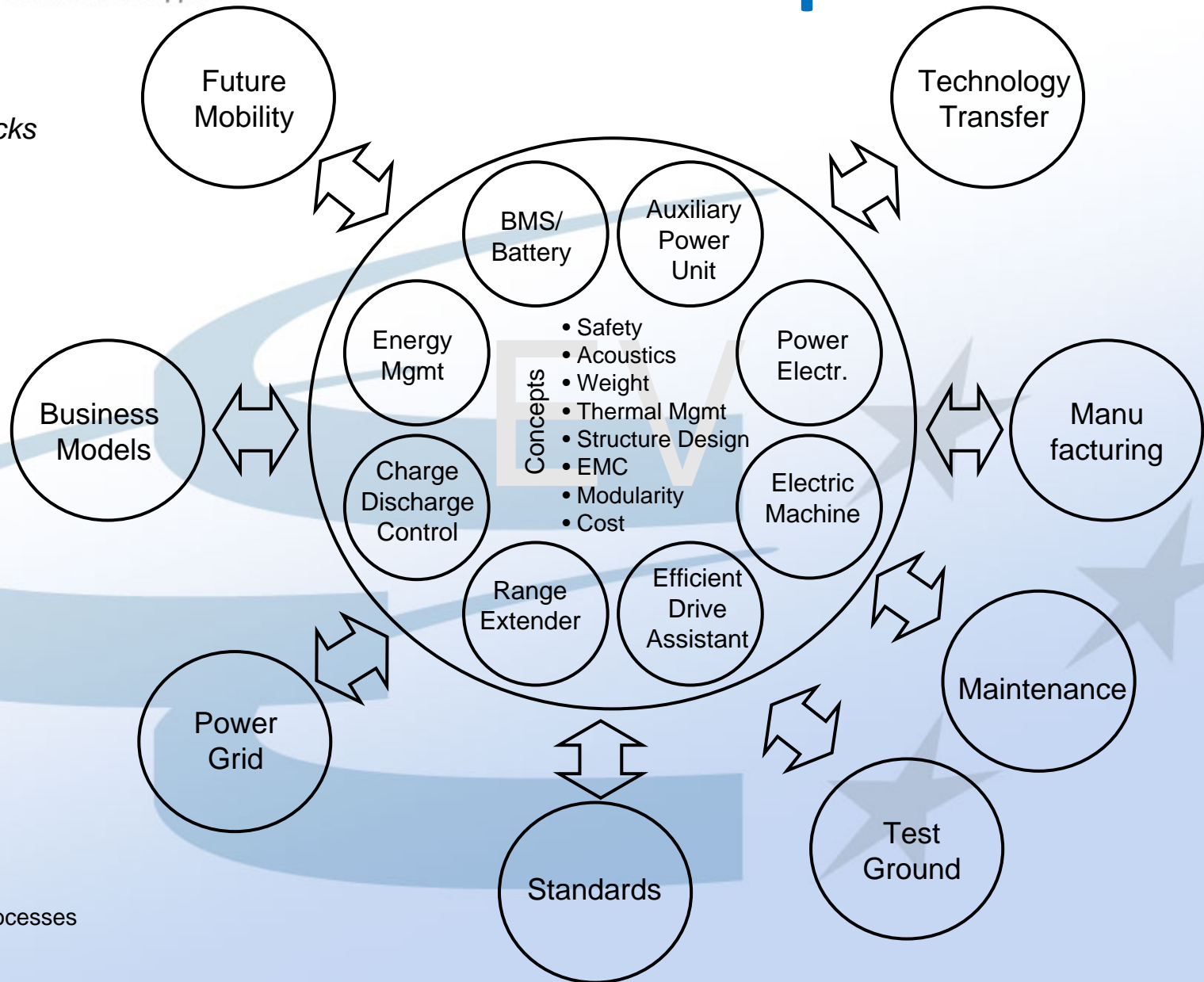
## Maintenance

Trained personnel



# EV Topics

- Features
- Building Blocks
- Concepts
- Interfaces
- Frameworks



Features

- Electrified
- Safe
- Validated
- Intelligent
- Green Parts & Processes



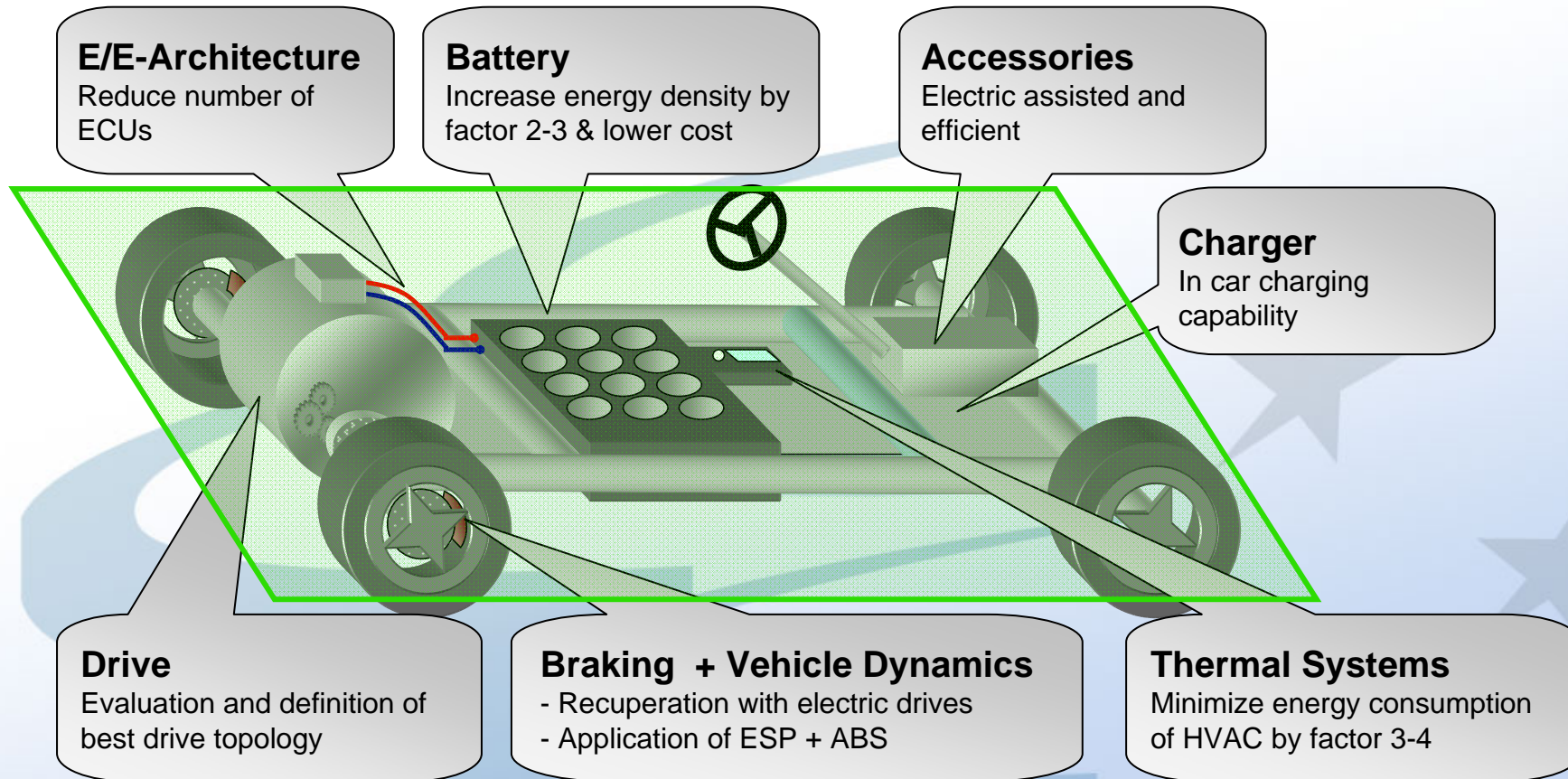
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# EV Main ICT Challenges

1. In-Vehicle systems
2. Vehicle to GRID
3. Vehicle to Vehicle and Infrastructure



# EV In-vehicle Challenges

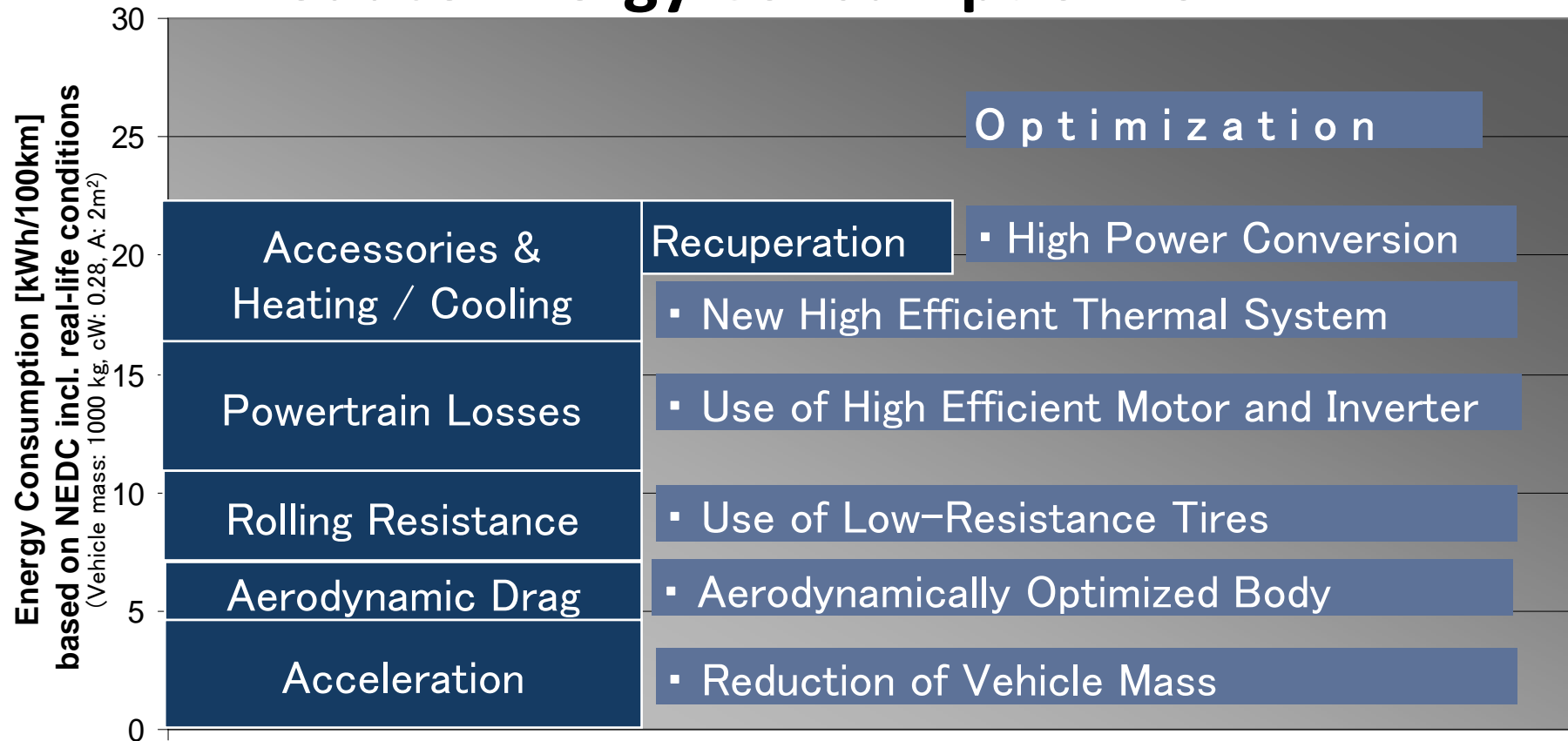


**Efficiency and weight influence the vehicle range**  
**Cost and vehicle range are the success factors of the EV**



# EV In-vehicle Challenges

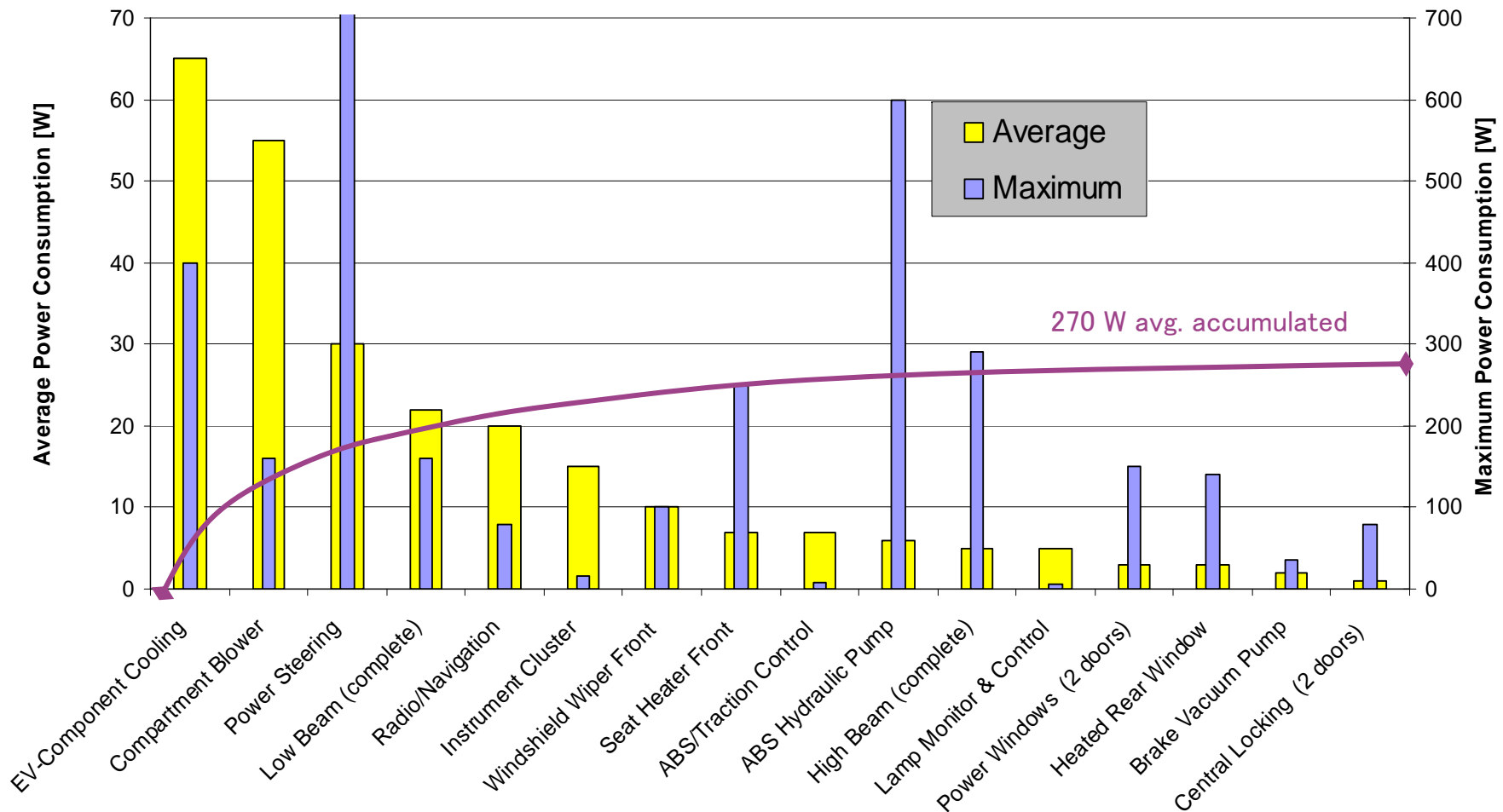
## Reduce Energy Consumption for EV



**Significant energy consumption by HVAC and accessories**  
**New system and component development necessary!**



## Exemplary Power Consumption of Auxiliaries



Based on average daily drive cycle

## In-vehicle systems

1. Advanced energy storage cells and systems
- 2. Architectures for adaptive energy management**
- 3. Standardized interfaces and bus systems for reliable and efficient in-vehicle communication**
4. Smart, durable and safe EV components providing better performance at reduced need for rare materials
- 5. Methods for the design, simulation, prototyping, and testing of EVs and their components**

Europe must become a leader in the production and commercialization of energy storage in order to remain industrially and environmentally competitive in the Automotive Industry and to reduce its oil dependency

- This means major coordinated ***R&D investments***
- U.S. Government spending more than ***US\$ 5 billion***
- Similar programs in Japan, China, Korea, India

## Vehicle-to-GRID

1. V2G interfaces and data protocols for safe, secure, energy efficient and convenient transfer of electricity and information
2. Availability of charging infrastructure
3. Common plug standards, billing processes (“roaming”) and CO<sub>2</sub> certification of energy
4. Fast and safe charging

## Vehicle-to-Vehicle (V2V) & Infrastructure (V2I)

1. Safe, seamless and power efficient integration of electric vehicles in global systems for mobility, energy and data
2. Adaptive, standardized real time information on traffic and scheduling for charging
3. Efficient integration of electric vehicles with long distance transport modes (rail, air, coach)
4. Effective V2X communications networks, sensor technologies and navigation tools for autonomous and safe operation of the EV

## Lighthouse projects

1. European electric vehicle development and reference centers (virtually) bringing together knowledge from classic automotive engineering with the concepts of the ICT and energy sectors
2. Regional electric vehicle manufacturing clusters representing significant parts of the (new) value chains with strong international market relevance
3. Corridors and mode interfaces for electric vehicles



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Cooperative Systems for ICE “nice to have” for FEV an  
absolute **MUST**