4 BALANCED, COHERENT BUSINESS GROUPS WITH STRONG MARKET POSITIONS

Comfort & Driving Assistance
- €2.7 billion Sales
- 18% of Group total
- 15,300 Employees
- 26 production sites
- 8 development centers
- 9 research centers

Powertrain Systems
- €3.8 billion Sales
- 26% of Group total
- 19,400 Employees
- 36 production sites
- 15 development centers
- 6 research centers

Thermal Systems
- €4.1 billion Sales
- 28% of Group total
- 20,100 Employees
- 48 production sites
- 10 development centers
- 3 research centers

Visibility Systems
- €4.2 billion Sales
- 28% of Group total
- 26,300 Employees
- 35 production sites
- 15 development centers
- 5 research centers

2015 figures
POWERTRAIN SYSTEMS

**Electrical Systems (PES)**
- Alternators
- Starters
- Belt Machine
- Beltless Machine

**Electronics (PEL)**
- Electronics for e-Machines
- High Power Electronics for HEVs & EVs
- Control & Electric Network

**Transmission Systems (PTR)**
- Manual Transmissions
- Hydraulic Clutch Actuation
- Friction Materials
- Automatic Transmissions

**Combustion Engine (PCE)**
- Mechanical Actuators
- Powertrain Sensors
- Air Charging Systems
- Ignition & Injection

System Engineering & Transversal Innovation
- CO₂ Emission Reduction
- Pollutants Emission Reduction
- Hybrid and Electric
REGULATION REMINDER IN EU AND CHINA

Worldwide regulations are converging at the same pace.
Efficient CO₂ reduction solution required for China and Europe

Source: ICCT
REAL LIFE CONSIDERATION IN EU

- From 2017,
- WLTP as reference cycle
- Reinforcement of regulation towards pollutants with real road measurement
508 E-AWD 48V DEMO VEHICLE

Electrified rear axle in 48V for Hybridization and e-AWD
# 48V Battery Pack: 20AH (NMC/Graphite) Air Cooled

## Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cell chemistry</strong></td>
<td>NCM-Graphite</td>
</tr>
<tr>
<td><strong>Capacity (Ah)</strong></td>
<td>20</td>
</tr>
<tr>
<td><strong>Nominal voltage (V)</strong></td>
<td>44.4</td>
</tr>
<tr>
<td><strong>Configuration</strong></td>
<td>12s2p</td>
</tr>
<tr>
<td><strong>Size (L<em>W</em>H, mm)</strong></td>
<td>430<em>400</em>125</td>
</tr>
<tr>
<td><strong>Weight (kg)</strong></td>
<td>18.5 kg</td>
</tr>
<tr>
<td><strong>Operating voltage (V)</strong></td>
<td>33.6 – 50.4</td>
</tr>
<tr>
<td><strong>Maximum Current (A)</strong></td>
<td>600</td>
</tr>
<tr>
<td><strong>DCIR (10s /35°C/ SOC50%)</strong></td>
<td>5.9 mOhm</td>
</tr>
<tr>
<td><strong>Cooling</strong></td>
<td>Active by air (fans)</td>
</tr>
<tr>
<td><strong>Control interface</strong></td>
<td>CAN 2.0 500kb/s</td>
</tr>
<tr>
<td><strong>Operating T° (°C)</strong></td>
<td>-30 to 55</td>
</tr>
</tbody>
</table>
LSEV (Low Speed EV) MARKET

China market of NEVs: LSEVs volume = x3 BEVs volumes in 2015
CONCLUSIONS

► 48V architectures represent significant share in the market forecast

► Currently, major markets for 48V are in Europe and China with numerous OEMs already decided for serial production

► Promising lower cost applications are being studied in 48V: city pHEV & LSEV, suggesting even higher market share in the near future

► Valeo proposes the right solutions for all 48V applications