VALEO
Electrification: a key pillar of our growth

HSBC MARCH 22nd, 2021

SMART TECHNOLOGY FOR SMATER MOBILITY
ELECTRIFICATION IS NOW.. AND NO LONGER AN OPTION

Reason #1
CO₂ REGULATION

Reason #2
DIESEL ban in cities
BIG CITY pressure to clean-up inner city air pollutions

Reason #3
Countries BAN all thermal engines

Reason #4
CHINA wants to take leadership
NEV (BEV + PHEV) targets

VALEO RESERVED
The 2020-2030 decade will see a massive shift. By 2030, 68% of WW cars produced will be electrified. **Vehicles < 6 Tons**

<table>
<thead>
<tr>
<th>Year</th>
<th>Conventional</th>
<th>12+12V</th>
<th>48V HEV</th>
<th>FHEV</th>
<th>PHEV</th>
<th>BEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>91%</td>
<td>3%</td>
<td>3%</td>
<td>2%</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>2025</td>
<td>91%</td>
<td>42%</td>
<td>5%</td>
<td>8%</td>
<td>17%</td>
<td>9%</td>
</tr>
<tr>
<td>2030</td>
<td>91%</td>
<td>32%</td>
<td>32%</td>
<td>11%</td>
<td>6%</td>
<td>27%</td>
</tr>
</tbody>
</table>

In 2030, 48V and BEV will take the highest share of electrified powertrains.
Technology also will experience a fundamental shift

<table>
<thead>
<tr>
<th>CONVENTIONAL</th>
<th>INCREASING ELECTRIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILD HYBRID</td>
<td>FULL HYBRID</td>
</tr>
<tr>
<td>PLUG-IN HYBRID</td>
<td>ELECTRIC</td>
</tr>
</tbody>
</table>

- **Engine**
- **Gearbox**
- **Battery 12V**
- **48V Battery**
- **HV Battery**
- **Battery cooling system**
- **Cabin heating**
  - ICE heater core
  - Heat pump & HV heaters
- **AC system**
  - Mechanical compressor
  - Electrical compressor

**On-Board Charger**
- 48V / HV

**DCDC**
- 48V
- 48V / HV

**Generator**
- 48V

**eMotor**
- 48V
- 48V / HV

**Full e-drive**
- 48V
Car architectures are completely redesigned
But no “one size fits all”. Different uses, different solutions

<table>
<thead>
<tr>
<th>Low Voltage (12V &amp; 48V)</th>
<th>High Voltage (60V+)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Small Electric</strong></td>
<td><strong>Full Electric</strong></td>
</tr>
<tr>
<td>Zero emission zone</td>
<td>Zero CO₂ emission</td>
</tr>
<tr>
<td>Small mobility</td>
<td>Performance</td>
</tr>
<tr>
<td>≤ 100km</td>
<td></td>
</tr>
<tr>
<td>≤ 50km/h</td>
<td></td>
</tr>
<tr>
<td><strong>Light Electric</strong></td>
<td></td>
</tr>
<tr>
<td>Zero emission zone</td>
<td></td>
</tr>
<tr>
<td>Zero emission zone</td>
<td></td>
</tr>
<tr>
<td>≤ 100km – 150km</td>
<td></td>
</tr>
<tr>
<td>Up to 100 km/h</td>
<td></td>
</tr>
<tr>
<td><strong>Mild hybrid</strong></td>
<td></td>
</tr>
<tr>
<td>4 to 6%* CO₂ benefits on WLTP</td>
<td>4 to 15%* CO₂ benefits on WLTP (up to 20% in HV)</td>
</tr>
<tr>
<td>First level of hybridization</td>
<td>Diesel alternative</td>
</tr>
<tr>
<td></td>
<td>Affordable cost</td>
</tr>
<tr>
<td><strong>Hybrid</strong></td>
<td></td>
</tr>
<tr>
<td>Up to 15%* CO₂ benefits on WLTP (up to 20% in HV)</td>
<td>Up to 70%* CO₂ benefits on WLTP (up to 40% in 48V)</td>
</tr>
<tr>
<td>Diesel alternative</td>
<td>PHEV over 50 km (City 25km in 48V)</td>
</tr>
<tr>
<td></td>
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<tr>
<td><strong>Plug-In Hybrid</strong></td>
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<td></td>
<td></td>
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<tr>
<td><strong>Full Electric</strong></td>
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</table>

* Non binding data, depending on baseline application  March 2021
We transform totally out product portfolio: 48V

**Fully re-usable platforms**

**Full powertrains**

**All motors**

**All electronics**

**All softwares**

**Thermal systems**
Our 48V customer portfolio

2020 - 2022 : VALEO 48V INTO 60 VEHICLES
40% market share = Worldwide leader
We transform totally out product portfolio: 400-800V

Fully re-usable platforms
Full powertrains
All motors
All electronics
All softwares
Full thermal system
A/C compressors
Battery cooler
Heat pumps
Electric Heaters
Our high voltage customer portfolio

2020 - 2023: VALEO HV INTO 90 VEHICLES

40% market share = Worldwide leader
But also …

- e-City cars
- e-Delivery Droïds
- Last Mile delivery e-City Truck
- e-Moped
- e-Rickshaw
- e-4 Wheeler
- e-Bike
Some key figures about electrification at VALEO

> 5000 Engineers worldwide

> 3000 Granted patents

> 2,000,000 lines of code
In our softwares

> 35 sites
In 15 countries

And it’s just a start !...