TECHNOLOGY LEADERSHIP

Bank of America • 18 May 2021
WE ARE A HIGH TECH COMPANY

#1
In ELECTRIFICATION
Market Leader on 48V MHEV & BEV

#1
In ADAS*
First to market LiDAR & L3 autonomous

#1
In LIGHTING
First to market sensor cleaning system

#2
In THERMAL SYSTEMS
Leader in Battery thermal management & HVAC for EV
Leader in Bus climate solutions

*ADAS = Advanced Driving Assistance System
LEADERSHIP IN ELECTRIFIED MOBILITY

Bank of America - 18 May 2021
ELECTRIFICATION IS NOW ACCELERATING

**BEV sales**
- 21% by 2030
- 61% in 2040

**Regulations**
- ++
- ++
- +/-

**China**
- Push through NEV credits as well and strong infrastructure push

**City bans**
- +20 cities have announced banning plans

**EVs Launched**
- +500 from 2018 to 2023

source: McKinsey
THE NEXT DECADE WILL SEE A MASSIVE SHIFT

In 2030, 48V and BEV will take highest share of electrified powertrains.
OUR OBJECTIVE
LEADING THE ELECTRIFICATION REVOLUTION
ELECTRIC MOBILITY COVERS VERY DIFFERENT SEGMENTS

<table>
<thead>
<tr>
<th>Small Electric</th>
<th>Light Electric</th>
<th>Mild Electric</th>
<th>Hybrid</th>
<th>Plug-in Hybrid</th>
<th>Full Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW VOLTAGE (12V &amp; 48V)</td>
<td>Valeo</td>
<td>[Image]</td>
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</tbody>
</table>

HIGH VOLTAGE (60V+)

THERMAL MANAGEMENT

[Image] Valeo

[Image] Valeo

[Image] Valeo
ELECTRIC MOBILITY IS A FUNDAMENTAL TECHNOLOGICAL SHIFT

CONVENTIONAL

INCREASING ELECTRIFICATION

Mild Hybrid | Full Hybrid | Plug-in Hybrid | Full Electric

- 48V
- DCDC converter
- Inverter
- eMotor
- Generator
- Engine
- Gearbox
- Battery Thermal Mgmt
- Cabin Heating
- AC System

- 48V or High Voltage
- On-Board Charger
- 48V Battery
- HV Battery
- Battery Cooling & Heating
- Heat pump & HV Heater
- Electrical compressor 400V, 800V

- Full eDrive
- 48V
- HV
CAR ARCHITECTURES ARE COMPLETELY REDESIGNED

- Air grille shutter
- E-powertrain cooling module
- Inverter HW + SW
- Charger & DCDC
- HVAC with High voltage electric heaters
- High Voltage coolant heater
- Battery coolers & heaters
- Battery composite casing
- Battery chiller
- Heat pump system / e-compressor
- Motor & Transmission

VALEO RESERVED
WE HAVE COMPLETELY REVISITED OUR PORTFOLIO

WE HAVE DEVELOPED FULLY REUSABLE PLATFORMS WITH ELECTRONICS & SOFTWARE

- **POWERTRAIN ELECTRIFICATION**
  - Motors
  - Inverters
  - OBC* DC/DC
  - eDrive

- **SMART THERMAL MANAGEMENT**
  - Heat pump
  - Battery Thermal Management

- **CHARGING SOLUTIONS**
  - Coolant e-Heater
  - e-Compressor
  - Charging station

**ALL MOTORS, ALL ELECTRONICS, ALL THERMAL SYSTEMS, ALL SOFTWARE**
LEADER
IN
LOW & HIGH VOLTAGE SOLUTIONS
WE WALK THE TALK

eDrive systems
WE WALK THE TALK

- Front & Rear Inverters
- Battery Cooler & Chiller
- HVAC with HV air Heater
- R744 Heat pump exchangers
WE WALK THE TALK

Motor
Inverter
eCompressor
### MAJOR BEV, PHEV & 48V SOP’S RECENT GROWTH DRIVERS (2020-2021)

<table>
<thead>
<tr>
<th>Company</th>
<th>Model</th>
<th>Major Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volkswagen</td>
<td>ID.3 &amp; ID.4</td>
<td>Inverter, Battery Coolers, AC unit with HV electric heater, Battery Chiller</td>
</tr>
<tr>
<td></td>
<td>EQS</td>
<td>eDrive System</td>
</tr>
<tr>
<td></td>
<td>Clio, Megane, Captur</td>
<td>iBSG 48V</td>
</tr>
<tr>
<td>Stellantis</td>
<td>208, 2008, Corsa</td>
<td>Battery coolers, Heat pump system, Electrical compressor</td>
</tr>
<tr>
<td></td>
<td>DS7 Crossback, 3008, Grandland</td>
<td>eMotor &amp; inverter</td>
</tr>
<tr>
<td></td>
<td>XC40</td>
<td>eMotor, Dual Inverter, On-Board Charger, Dedicated hybrid transmission</td>
</tr>
<tr>
<td>Mercedes-Benz</td>
<td>EQS</td>
<td>eDrive System</td>
</tr>
<tr>
<td></td>
<td>Clio, Megane, Captur</td>
<td>iBSG 48V</td>
</tr>
<tr>
<td>Hyundai - KIA</td>
<td>Tucson, Sportage</td>
<td>iBSG 48V</td>
</tr>
<tr>
<td></td>
<td>XG40</td>
<td>eMotor, Dedicated hybrid transmission</td>
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<tr>
<td>Stellantis</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Li Auto</td>
<td>One</td>
<td>Battery cooler, Heat pump systems, Electrical compressor, Comfort controller</td>
</tr>
<tr>
<td>Volvo</td>
<td>XC40</td>
<td>eMotor</td>
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</tbody>
</table>
WE ARE A WORLD LEADER OF HIGH VOLTAGE SOLUTIONS

2020-2023: Valeo High Voltage solutions into 90 vehicles with 40% of market share
WE HAVE DEVELOPED SUCCESSFUL TECHNOLOGICAL PLATFORMS FOR ELECTRIFICATION

- 48V ELECTRIFICATION
- E- THERMAL SOLUTIONS
- HIGH VOLTAGE ELECTRIFICATION

GROUP CUMULATED OI (end of 2020)
23.7bn€
## COMPETITIVE POSITIONING OF POWERTRAIN & THERMAL SOLUTIONS

Global leader in Low & High voltage solutions as well as Thermal Management

<table>
<thead>
<tr>
<th></th>
<th>Competitor 1</th>
<th>Competitor 2</th>
<th>Competitor 3</th>
<th>Competitor 4</th>
<th>Competitor 5</th>
<th>Competitor 6</th>
<th>Competitor 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hybrid machines</td>
<td>+++</td>
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<td>--</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>ePowertrains</td>
<td>+++</td>
<td>+ ++</td>
<td>+ +</td>
<td>+ +</td>
<td>++</td>
<td>++</td>
<td>--</td>
</tr>
<tr>
<td>Electronics</td>
<td>+ ++</td>
<td>+ +</td>
<td>+ ++</td>
<td>+ +</td>
<td>++</td>
<td>++</td>
<td>--</td>
</tr>
<tr>
<td>Battery Cooler</td>
<td>++</td>
<td>+</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>+ ++</td>
</tr>
<tr>
<td>Heat Pump</td>
<td>+ ++</td>
<td>+ +</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>+ ++</td>
</tr>
</tbody>
</table>

(1) 48 belt starter generator & 48V eMotor  
(2) eMotor + Inverter + reducer  
(3) On Board Charger + DCDC converter

Non exhaustive list

- Leader
- Fast follower
- Player
KEY PLAYER
OF
NEW
MOBILITY
SOLUTIONS
NEW ELECTRIC MOBILITY OPPORTUNITIES

- 2 WHEELER
- 3 WHEELER
- DROIDS
- SHARED MOBILITY
- LAST MILE DELIVERY
- DIGITAL
- LOW SPEED EV
NEW ELECTRIC MOBILITY IS A (BIG) MARKET OPPORTUNITY

2030 ADDRESSABLE MARKET FOR VALEO TECHNOLOGIES

- 100 (Traditional Valeo scope)
- 156 (Traditional Valeo scope + eMobility, +56%)

DRIVEN BY
- REGULATIONS
- NEW BUSINESS MODELS
- CONSUMER ACCEPTANCE

NEW ELECTRIC MOBILITY IS A (BIG) MARKET OPPORTUNITY
NEW ELECTRIC MOBILITY OPPORTUNITIES

WE ADAPT/DEVELOP OUR PORTFOLIO

2 Wheeler
- eBike
- eMotor
- Lighting
- Skateboard
- Full AD
- Sensor cleaning
- Thermal management
- Sanitization

3 Wheeler
- eScooter
- eMotor
- Lighting

4 Wheeler
- eRickshaw
- eMotor
- Lighting
- eDroid & eVans
- 48V eDrive
- Healthy Car
- Connectivity
- Smart Access
- Full AD

Robotaxis
- Small EV
- Healthy Car
- Connectivity
- Full AD

2 Wheeler
- eBike
- eMotor
- Lighting

3 Wheeler
- eScooter
- eMotor
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Robotaxis
- Small EV
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MARKET PERSPECTIVE IN 2030

<table>
<thead>
<tr>
<th>2 Wheeler</th>
<th>3 Wheeler</th>
</tr>
</thead>
<tbody>
<tr>
<td>eBike</td>
<td>eRickshaw</td>
</tr>
<tr>
<td>eScooter</td>
<td></td>
</tr>
<tr>
<td>eMotorcycle</td>
<td></td>
</tr>
</tbody>
</table>

- **11 to 14M** Annual volumes\(^{(1)}\)
- **25M** Annual volumes\(^{(2)}\)
- Up to **2M** Annual volumes\(^{(3)}\)

Sources:
- (1) Sport Marketing Surveys & Valeo - 2030 annual volumes in EU & USA
- (2) Motor Cycle Data & Valeo - 2030 annual volumes globally
- (3) Valeo estimations - 2030 annual volumes in India
NEW ELECTRIC MOBILITY OPPORTUNITIES

MARKET PERSPECTIVE IN 2030

<table>
<thead>
<tr>
<th>Category</th>
<th>eDroid</th>
<th>eVans &amp; LCVs</th>
<th>Small EV</th>
<th>Robotaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goods delivery</td>
<td>Up to 600k</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human transportation</td>
<td>Up to 2M</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Up to 5M</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>500k to 1M</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources:
(1) Valeo estimations - 2030 annual volumes globally
(2) IHS & Valeo - 2030 annual volumes globally
(3) McKinsey - 2030 annual volumes globally
(4) Valeo estimations - 2030 annual volumes globally
KEY FIGURES ABOUT ELECTRIFICATION AT VALEO

€131B
2030 Electrification market*
* Valeo addressable market, excluding batteries

>5000
Engineers worldwide

> 35
Sites in 15 countries

Smart e-Mobility

2030

>3000
Patents

>2M
Lines of code in our software

And it’s just a start !...
LEADERSHIP IN DRIVING ASSISTANCE

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OUR MARKET

WAVE 3:
AUTOMATED DRIVING
2025 platforms are Level 3 ready

WAVE 2:
LEVEL 2+ ADAS SYSTEMS
Focus on enhanced user experience

WAVE 1:
SAFETY & ACCIDENT REDUCTION
Standard on new vehicles

Amount of Level 2 and Level 2+ systems to quadruple by 2025
## OUR MARKET

<table>
<thead>
<tr>
<th>Active Safety systems will be standard equipment</th>
<th>Level 2 ADAS functionality as the dominant segment</th>
<th>Level 3 automation enabling unique experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>3- or 5-Star NCAP compliance</td>
<td>Vision-only entry solutions</td>
<td>First applications in 2021</td>
</tr>
<tr>
<td>Front Camera as basic sensor</td>
<td>L2+ functions as transition to L3</td>
<td>2024/25 platforms are L3 capable</td>
</tr>
<tr>
<td>Safe reversing gaining importance</td>
<td>First L4 function will be in Parking</td>
<td>Highway Pilot as main target</td>
</tr>
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</table>

| >75% of new cars worldwide by 2025 | 50% of new cars with ADAS by 2025 | 5% of new cars worldwide by 2030 |

*Added value through ADAS features to help offset the cost of the safety systems*
We are a **LEADER** in parking, safety & driving automation

We offer best-in-class **SENSORS & PERCEPTION SYSTEMS**

We provide **FUNCTIONS & MODULES** for private & commercial mobility

We support our customers to make mobility safe & more pleasant for everyone
OUR COMMITMENT & STRATEGY

We are a **LEADER** in parking, safety & driving automation

- Innovative Mindset for a global customer base
- Worldwide Mechatronics and Software Competence
- Global Production Network for volume manufacturing

We offer best-in-class **SENSORS & PERCEPTION SYSTEMS**

- Wide Technology Portfolio for Ranging, Viewing and Computer Vision
- Covering 360° from Near-field to Long-range
- Standard Product Platforms

We provide **FUNCTIONS & MODULES** for private & commercial mobility

- Robust and Scalable System Architectures
- Turn-key systems up to L2+ Driving and L4 Parking
- Modules for L3 Automation and L4 Driverless

We support our customers to make mobility safe & more pleasant for everyone
LEADER IN PARKING, SAFETY & AUTOMATION
INNOVATIVE MINDSET

30 years of innovation with 15 world’s first in the past 10 years
GLOBAL FOOTPRINT
Driving Assistance

America
- USA: Troy, San Mateo
- MEXICO: Rio Bravo
- BRAZIL: São Paulo

Europe
- GERMANY: Bietigheim, Kronach, Wemding
- FRANCE: Paris, Créteil, Nogent
- IRELAND: Tuam
- CZECH REP.: Prague, Milovice, Rakovník
- HUNGARY: Veszprém

Asia
- CHINA: Shenzhen, Wuhan
- JAPAN: Tokyo, Tsukuba, Tamatsukuri
- S. KOREA: Anyang, Daegu, Kyong Ju
- INDIA: Chennai, Sanand

Africa
- EGYPT: Cairo

Worldwide network of production facilities and 4,000+ engineers (incl. 1,800+ in SW)

Figures: 2025 target
Over 1 billion sensors shipped • Another 1 billion to be shipped in the next 5 years
### System Solutions for All ADAS Segments

#### One stop solutions for Automated & Safe Parking
- Complete software stack from sensor to end-user function
- Near-field sensors, cameras and control units

#### Mass market solutions for 5-star NCAP and L2 ADAS
- In-house software for Emergency Braking, Lane Centering, Adaptive Cruise Control, Traffic Jam Assist, Intelligent Speed Assist, ...
- Smart front camera platform

#### Perception solutions for first L3 functions
- Software for optimal perception results and data fusion
- Ensuring functional safety
- 3D lidar, cameras and control units

---

**Offering the full software stack incl. tool chain and system validation**
TECHNOLOGY FOR RANGING, VIEWING AND COMPUTER VISION

Covering 360° around the vehicle from Near-field to Long-range

- Ultrasonic Sensors
- Near-field Cameras
- Near-field Radar
- Near-field Lidar
- Rain/Light Sensors
- Long-range Cameras
- Mid-range Radar
- Long-range Lidar
- ADAS Control Units
STANDARD PRODUCT PLATFORMS

SYSTEMS & FUNCTIONS

Driving Automation

Computer Vision

Active Safety

Surround View

Parking & Maneuvering

SIGNAL PROCESSING • SENSOR CONTROL

Long-range Cameras

Rain/Light Sensor

Mid-range Radar

Long-range Lidar

Near-field Cameras

Ultrasonic Sensors

Near-field Radar

Near-field Lidar

SENSORS

MIDDLEWARE

AUTOSAR • BASIC SOFTWARE

Single Control Unit

Parking / Vision Controller

Domain / Zonal Controller

CONTROL UNITS
VALEO SCALA®: WORLD’S FIRST AUTOMOTIVE GRADE 3D LIDAR

Over **125,000 SCALA®** delivered worldwide

Improved **SECOND GENERATION** in 2021

**SOFTWARE STACK** for optimal perception

- Range Estimation
- Blockage Detection
- End of Line Calibration
- Free Space
- Ego Motion
- Road Markings
- Interference Suppression
- Rain/Spray Detection
- Online Calibration
- Noise Suppression
- Ground Topology
- Static Objects
- Heating & Cleaning Control
- OTA Capability
- Misalignment Detection
- Point Cloud
- Map Matching
- Dynamic Objects
Hardware and software out of one hand for an optimal system integration.
PARTNER FOR FUNCTIONS & MODULES
SOFTWARE AND SYSTEM COMPETENCE

One stop solutions for Automated & Safe Parking

**Full system responsibility**

- **Vehicle Control**
  - Traffic Jam Assist
  - Adaptive Cruise Control
  - Lane Centering
  - Emergency Braking

- **Functions**
- **Environment Model**
- **Computer Vision**
- **Signal Processing**
- **Sensors / Cameras**
- **Processing HW**

**Mass market solutions for 5-star NCAP and L2 ADAS**

**Function responsibility**

Offering the full ADAS software stack incl. tool chain and system validation
SOFTWARE AND SYSTEM COMPETENCE

Software stack for optimal perception for parking and driving applications

- Vehicle Control
  - Localisation
  - 3D Reconstruction
  - Free Space
  - Road Markings
  - Object Classification
  - Dynamic Objects
  - Static Objects
  - Motion over Ground
  - Obstruction

- Environment Model
- Computer Vision
- Signal Processing
- Sensors / Cameras
- Processing HW

- Surround Visualization
- Automated Parking
- Reverse Emergency Braking
- Park Distance Alert

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Providing complete »perception systems« incl. tool chain and system validation
Worldwide network of test tracks with on-site facilities for vehicle modifications
SYSTEMS & MODULES FOR PRIVATE AND COMMERCIAL MOBILITY

Park4U platform
- High Objects & Underbody
- Side Protection
- Trained Parking
- Surround View

Safe4U platform
- Beyond NCAP / GSR
- Emergency Evasion
- CMS class III
- V2V and V2X
- Blind Spot
- 5-star AEB

Cruise4U platform
- Auto Lane Change
- Highway Pilot
- Voyage® ready
- Construction Zones
- Hands-off
- ACC Stop&Go
- Lane Centering

Full ADAS stack up to L2+ driving and L4 parking

Drive4U platform
- Driving Policy
- Precise Localisation
- Perception & Data Fusion

Mobility kits
- SCALA® Long-range Lidar
- Near-field Lidar
- Near-field Camera
- Ultrasonic Sensor

Beyond NCAP / GSR
Emergency Evasion
CMS class III
V2V and V2X
Blind Spot
5-star AEB
3-star AEB / GSR
Rear AEB
Rain Sensor
ACC Stop&Go
Lane Centering

Modules for L4 driverless

VALEO RESERVED

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VALEO DRIVE4U™ AUTOMATED DRIVING PLATFORM
Test Cars and Test Campaigns all over the world

Automated Driving on Highways
Test campaigns in US, Europe and Japan

Automated Driving in Urban Environment
Test campaigns in US, France, Germany and Japan

The only AD platform worldwide relying on automotive production sensors
We are working very closely with our friends at ... Valeo that are helping us get up and going.
VALEO DRIVE4U™ AUTOMATED DRIVING PLATFORM

The only AD platform worldwide relying on automotive production sensors

- Full software stack for urban automated driving
- Fully redundant 360 degree perception
- Deep learning 3D objects detection
- Robust and precise localization and mapping
- Motion prediction for dynamic objects
- Dynamic driving policy and decision making
- Vehicle control and redundant supervision
VALEO MOBILITY KITS FOR NEW PLAYERS AND MARKETS
ALL NEEDS • ALL VOLUMES • ALL FOR YOU

OFF THE SHELF sensors & perception systems

Conquer new VALUE SPACES beyond the car

Automotive QUALITY for science and start-ups
CONCLUSION

LEADER IN PARKING, SAFETY & AUTOMATION
LEADER IN PARKING, SAFETY & DRIVING AUTOMATION

30

YEARS of ADAS volume production experience

MILLION ADAS systems delivered in 2020

PERCENT of new cars come with Valeo ADAS
More than €12bn ORDER INTAKE 2018-2020
Our ADAS Market
[in Billion Euro]

CAGR >10%

2019: 13.0
2026: 26.4

Valeo continues to OUTPERFORM the market

Complete SOFTWARE STACK and tool chain

Clear LEADER in ultrasonic, cameras and lidar