Automotive Catalysts: Capture peak profitability and maximize value
Agenda

1. Mobility transformation

ICE gradually declining, but remaining dominant powertrain for LDV and HDV by 2030

2. Emission control catalyst market

Attractive value to capture the next decade

3. Umicore

Well positioned to capture peak profitability and maximize value

4. RISE 2030
Accelerating mobility transformation
ICE remains dominant powertrain solution in 2030

Light-duty vehicles
Proportion by powertrain in global production
Source: Umicore market model – LDV

Heavy-duty vehicles
Proportion by powertrain in global production
Source: Umicore market model – HDV (incl. medium-duty vehicles, on-road vehicles only)

BEV: battery electric vehicle
FC: fuel cell vehicle
CNG/LNG: Compressed natural gas / Liquefied natural gas
PHEV: plug-in (hybrid) vehicle
ICE: internal combustion engine (gasoline/diesel) only

95% in 2021

66% by 2030

98% in 2021

78% by 2030
Light-Duty Vehicles

Peak in ICE car production expected in 2023

Light-duty ICE production volumes expected to grow until 2023 driven by post-COVID and post-chip shortage rebound as well as growth in emerging economies.

Beyond peak, initial slight market reduction, followed by sharper decline as of 2027 due to accelerating BEV penetration.

Light-duty diesel dropping faster between 2021 and 2030 especially in Europe.

Source: Umicore market model – LDV (ICE + PHEV)
Heavy-Duty Vehicles
Continued growth in ICE HDV towards 2030

Heavy-duty vehicles
Global vehicle production by region

Production volumes expected to recover and grow over the decade: total addressable emissionized market in 2030 ~25% bigger than in 2021

Lower growth rate from 2026 reflecting high penetration of emissionized ICE vehicles and increasing BEV and FC

Production expected to increase in China and India

Source: Umicore market model
HDV (emissionized Heavy-Duty and Medium-Duty Vehicles; on-road only)
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Light-Duty Gasoline Vehicles

Substantial tightening of emission norms in Europe and China

Ambitious Euro 7 & China 7 emission standards

<table>
<thead>
<tr>
<th>Expected implementation</th>
<th>Europe: earliest 2026, details to be announced July 20, 2022</th>
<th>China: earliest in 2027</th>
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<tbody>
<tr>
<td>Impact</td>
<td>Detailed specifications still under discussion; based on proposal, key impact on gasoline engine:</td>
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<td>• ~ 50% reductions in key criteria pollutant emission limits</td>
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<td></td>
<td>• More stringent cold start requirements</td>
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<td>• Secondary Emission TWC: e.g. ammonia</td>
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Euro 6 / China 6 system layout

- TWC
- GPF
- TWC

Potential Euro 7 / China 7 system layout

- EHC
- TWC
- GPF
- TWC
- SET

TWC: Three-Way Catalyst; GPF: Gasoline Particulate Filter; EHC: Electrical Heated Catalyst; SET: Secondary Emission TWC

CHINA & EUROPE LDG IN 2030 (ICE + PHEV)

16.2 million

7.8 million

20% value uplift vs. current Euro 6 / China 6 (based on proposal)
Heavy-Duty Vehicles
Upcoming tightening of emission norms in Europe and China

<table>
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**DOC**: Diesel Oxidation Catalyst; **DPF**: Diesel Particulate Filter; **SCR**: Selective Catalytic Reduction Catalyst; **ASC**: Ammonia Slip Catalyst

CHINA & EUROPE HDV IN 2030 (ICE ON-ROAD INCL. PHEV, CNG / LNG)

- **Europe**: earliest 2026, details to be announced July 20, 2022
- **China**: earliest in 2027 in Tier 1 cities

Impact:
- Detailed specifications still under discussion; based on proposal:
  - Tighter Particulate PN, NOx and ammonia standards
  - Increased cold start requirements
  - Extended durability
  - Additional pollutants such as N₂O

**20%** value uplift vs. current Euro VI / China VI (based on proposal)
Attractive value to capture the next decade

Emission catalyst market moving towards unprecedented value peak

Value growth driven by market rebound and tighter legislation for light-duty and heavy-duty vehicles

Total addressable market in 2030 still exceeding addressable market in 2021

Attractive market profile – Ability to capture peak profitability and afterwards generate significant amount of free cash flow

Source: Umicore market model – LDV and HDV (includes emissionized Heavy-Duty and Medium-Duty Vehicles; on-road only)
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Capture peak profitability and maximize value

Where to play

**Light-Duty Vehicles**
Maintain strong position in light-duty gasoline catalysts globally

**Heavy-Duty Vehicles**
Further growth in heavy-duty market share, with focus on China and Europe

Maximize business value throughout the plan

Historical focus on lean manufacturing and optimal operational costs, resulting in solid starting position today

Continued focus on efficiency and performance while adjusting operations in line with market development

How to win

**R** Reliable Transformation Partner

**I** Innovation & Technology Leader

**S** Sustainability Champion

**E** Excellence in execution
Capture peak profitability and maximize value

EMBARKING THE MOBILITY TRANSFORMATION TOGETHER WITH OUR CUSTOMERS

Reliable Transformation Partner

- Long-standing OEM relationships
- Maintain critical regional presence and capacity while optimizing global footprint
Unique position in clean mobility materials

Fully committed and trusted technology partner for car OEMs throughout their transformation journey

Source of talent and know-how for Umicore Group to enable OEM transformation
Committed and reliable partner for our customers

Track record: > 50 years of close customer relationships with all major OEMs; well-established broad customer base across the globe today

Close customer collaboration throughout transformation

Entering new types of partnerships with customers, focused on long-term collaborations to jointly manage the transition

Global supplier
Strong commitment to continue serving our customers’ needs local-for-local in key regions

Technology leader
Ensured investments in product innovation to help meet coming legislative requirements

Reliable & credible partner
Active dialogue with customers on transformation roadmap and catalyst supply chain securitization

Sustainable footprint
Global, sustainable supply footprint and recycling services
Capture peak profitability and maximize value

STRONG TECHNOLOGY POSITION IN LIGHT OF UPCOMING EMISSION LEGISLATION

- Proven track-record
- Technology to remain key driver in years to come
Proven innovation leadership …

**Light-duty vehicles**

- **Leading gasoline catalyst player** in Europe and China based on industry-benchmark technologies
- Disproportionate share of **GPF platforms** won in Europe and China in recent years
- **Co-development partnerships** with leading OEMs (e.g. with Volkswagen: *GPF technology for closed-coupled exhaust aftertreatment*)

**Benchmark gasoline technology**

**Heavy-duty vehicles**

- **Competitive portfolio** as development partner of major OEMs
- **Expansion of supply share** in China and Europe – HDD growth regions
- **Co-development partnerships** for advanced HDD Aftertreatment solutions (e.g. with Scania: *next-generation global emission solution platform with dual urea dosing*)

**Successful track record**

GPF: Gasoline Particulate Filter
... with the right technology to grow

**Light-duty vehicles**
- Reduced Rhodium and Palladium utilization through FlexMetal TWC – qualified at major OEMs globally
- Secondary emission TWC for ammonia emissions abatement
- High filtration efficiency for GPF

**Heavy-duty vehicles**
- Even lower NOx emissions at optimized fuel economy with UmiCOR® catalysts
- Washable particulate filter with ultra high filtration efficiency

Next generation technology focused on critical aspects for upcoming emission norms

TWC: Three-Way Catalyst; GPF: Gasoline Particulate Filter
Capture peak profitability and maximize value

LONGSTANDING PARTNER IN DELIVERING CLEANER AIR

Embedded sustainability value through sustainable operations

Cleaner air at the core of our business
Embedded sustainability value
Through sustainable operations & closed loop services

**Sustainable operations**
Many plants already fully powered by renewable electricity
Ecodesign at the heart of new sites, with flagship in Americana, Brazil

**Longstanding closed-loop offer**
Recycling millions of automotive catalysts & PGMs per year

**Tackling resource scarcity**
Technology focusing on PGM reduction
Cleaner air at the core of our business
Delivering to the strictest emissions standards

Preventing
2.8 million tons of NOx emissions
from being emitted into the air every year through
Umicore catalyst technologies

Using average lifetime of 200 000 km including NOx, HC, CO, excluding PM
Capture peak profitability and maximize value

E
Excellence in execution

ORGANIZATIONAL AGILITY

Operational agility through the different transformation stages

Agility mindset to manage the transformation
Organizational agility to manage the different transformation stages

**Growth**
- Agile footprint: Targeted expansions with business awards
  - Capex ~20% above 2021
  - Utilization target > 85%
- Costs reductions: Stable
- Net working capital evolution: Up

**Peak**
- Adjustments in line with customer demand
  - Maintenance Capex, < depreciation as of 2025
  - Utilization target > 85%
- Efficiency gains
- Declining

**Maturity**
- Adjustments in line with customer demand
  - Maintenance Capex, > 50% below depreciation in 2030
  - Utilization target > 85%
- €100M reduction versus 2021
- 40% reduction in net working capital vs 2021

~€3 Bn cash delivered between 2022 and 2030, supporting Umicore growth
Fostering an agility mindset throughout the different transformation stages

**Cultural transition**
- **Growth (2024)**: Transfer from growth mindset towards efficiency and agility

**Leveraging capabilities**
- **Peak (2028)**: Increase performance and efficiency focus
- **Maturity**: Cash excellence mindset throughout the organization
  - Continue to foster and develop critical PGM chemistry and automotive industry know-how
  - Leverage critical know-how within Automotive Catalysts and Umicore Group

**Critical talent pool to be leveraged within Umicore Group**
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Automotive Catalysts – RISE

Capture peak profitability and maximize value

**Capture maximum value from market peak**
- Maintain strong position in light-duty gasoline catalysts globally
- Continued growth in heavy-duty catalysts in China and Europe

**Maximize business value throughout the plan**

**R**
Reliable Transformation Partner

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**Throughout period:**
€ ~3 Bn total cash delivered and critical talent pool, supporting Umicore growth
ROCE ~20% in 2030 and adj. EBITDA margin ~20%
**Decarbonizing the battery value chain**

Accelerating our journey towards net zero & transforming our rechargeable battery materials business

**Scope 1:** identifying and implementing energy efficiency improvements

**Scope 2:** Signing long-term PPAs
- Cathode plant in Poland to operate on 100% renewable electricity

**Scope 3:** Securing a supply of sustainable battery materials
- Sourcing low-carbon Nickel & long-term supply agreements for zero-carbon Lithium

Umicore cathode materials prevented over 9.5 million tons of GHG emissions from being emitted in 2021

Considering recycling, production, processing into batteries and the use of batteries in full EVs