Agenda

1. **Mobility transformation driving exponential growth in hydrogen fuel cell catalysts**

2. **Umicore’s Fuel Cell activity well positioned to capture emerging growth as leading fuel cell catalyst provider**

3. **RISE**
PEM catalyst market to witness exponential growth towards 2040

Global PEM catalyst demand per application (t)

- HDV catalyst demand tons
- LDV catalyst demand tons
- Electrolysis catalyst demand tons

Source: Umicore market model (HDV incl. MDV)

Strong regulatory support for hydrogen economy in Europe and APAC region

PEM catalyst demand to grow exponentially as of 2025 driven by increasing penetration of fuel cell HDV as well as electrolysis

Global addressable market of 90t for Umicore by 2030
1. Mobility transformation driving exponential growth in hydrogen fuel cell catalysts

2. Umicore’s Fuel Cell activity well positioned to capture emerging growth as leading fuel cell catalyst provider

3. RISE
Capture emerging growth as leading fuel cell catalyst provider

Where to play

<table>
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<tr>
<th>Near-term growth in fuel cell-based mobility</th>
<th>Adjacent opportunities</th>
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<td>Capture growth in long-haul HDV as well as long range LDV and MDV</td>
<td>Market potential for green hydrogen electrolysis</td>
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<td>Further footprint expansion</td>
<td>Well positioned based on strong expertise in automotive PEM catalysts</td>
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<td>Maintain technological lead through next generation products</td>
<td>Continued collaboration with best-in-class research institutes</td>
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How to win

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<td>Innovation &amp; Technology Leader</td>
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PEM: Proton-exchange membrane
Capture emerging growth as leading fuel cell catalyst provider

BUILDING CUSTOMER COOPERATIONS ACROSS THE VALUE CHAIN

Reliable Transformation Partner

Long-term OEM relationships and understanding

Global leader in PEM fuel cell catalysts with footprint at industrial scale
Focus on customer intimacy to further grow customer base

- **Internal Combustion Engine**
  - Emission control catalyst

- **Plug-in Hybrid Electric Vehicle**
  - Battery active materials and emission control catalysts

- **Full Electric Vehicle**
  - Battery active materials

- **Fuel Cell Vehicle**
  - Electro-catalyst and battery cathode materials

Fully committed and trusted technology partner for our customers throughout clean mobility transformation on all drivetrains.
30 years of experience in fuel cell catalysts, serving the full value chain

- **First developments of Platinum Black as Fuel Cell Catalysts** (1990)
- **Catalysts for PEM Electrolyzers** (2003)
- **Creation of SolviCore JV with Solvay on MEA** (2006)
- **Creation of Co-development with HMC on catalyst** (2009)
- **Focus on PEM fuel cell catalysts: sale of SolviCore JV** (2015)
- **First mass production catalyst plant in Korea** (2019)
- **Mass production catalyst plant in China** (2024)

**Timeframe**
- 1990
- 2003
- 2006
- 2009
- 2015
- 2018
- 2019
- 2024

**Processes**
- Catalyst powder manufacturer
- Catalyst coated membrane (CCM)
- Membrane electrode assembly (MEA)
- Cell manufacturers
- End users

**Clear focus on PEM catalysts**

**Umicore targeting all supply chain players**

HMC: Hyundai Motor Company; PEM: Proton-exchange membrane
Working with customers at the forefront of fuel cell technology

HMC one of the first hydrogen fuel cell vehicle OEMs

2018 launch of NEXO, the only fuel cell SUV in the world, with 135kW powertrain and range of 665km

Key HMC development partner and supplier for PEM fuel cell catalysts since 2009, providing durable high-performance catalysts

HMC: Hyundai Motor Company

Joint Development Contract with HMC
2009

949 HMC vehicles with Umicore catalysts
2018

~ 10,000 HMC vehicles with Umicore catalysts
2021
Leading supplier of fuel cell catalysts

40% market share in the mobility segment in 2021

Qualified supplier of more than 10 OEMs (LD and HD OEMs as well as stack producers and system manufacturers)

Ramp-up timeline for already qualified business awards …

… and ongoing engagements for new platforms globally

Ramp-up = start of serial production on platforms (LD = light-duty, HD = medium- and heavy-duty, S = stack/MEA producers)
Expanding global footprint to serve growing customer demand

- Copenhagen, Denmark
  - R&D
  - Applied technology
  - Production
  - Marketing & Sales

- Hanau, Germany
  - R&D
  - Applied technology
  - Production
  - Marketing & Sales

- Olen, Belgium
  - R&D

- Tokyo, Japan
  - Applied technology

- Incheon, Korea
  - R&D
  - Applied technology
  - Production
  - Marketing & Sales

- Suzhou, China
  - Headquarters
  - Applied technology

- Changshu, China
  - Production

Mass production plant commissioned in Korea in 2019

New greenfield expansion in China to serve growing global customer demand

Supported by Catalysis’ in-depth know-how in PGM sourcing

Capability to close the loop through PGM recycling
Capture emerging growth as leading fuel cell catalyst provider

**MARKET-LEADING TECHNOLOGY**

- Industry-leading materials in terms of durability, performance and PGM loading
- Research and innovation at the heart of the fuel cell growth strategy
Benchmark PEM catalysts for Heavy-Duty

- **Efficiency advantage**: ~3% better fuel stack efficiency at start of run versus closest peer
- **Durability advantage**: #1 durability after end of run versus closest peer
- **Cost advantage**: ~25% lower PGM use versus industry average

Umicore’s PEM catalyst technology enables increased range and lower TCO which are the key sourcing criteria for OEMs.

**PEM**: Proton-exchange membrane
**Source**: Customer benchmarks
Benchmark PEM catalysts

Roadmap to reduce PGM loading and make fuel cell applications more cost competitive

Reduce PGM content at high durability

2022
Gen 1
Gen 2
Gen 3
Gen 4
2030

Research and innovation at the heart of Umicore’s fuel cell strategy

> 250 Fuel cell patents filed over the world

6 R&D and applied technology centers

Open innovation with best-in-class academia and research institutes
Capture emerging growth as leading fuel cell catalyst provider.

KEY PARTNER FOR THE TRANSITION TO ZERO-EMISSIONS MOBILITY

- Embedded sustainability value
- Delivering high performance solutions for zero emissions transport
Embedded sustainability value
Through sustainable operations & closed loop services

Managing climate and environmental impacts
Low-carbon footprint activity
Focused energy saving, on-site generation and renewable energy purchase
Ecodesign at the heart of new sites

Leveraging the closed-loop
Sustainable sourcing, recycling PGMs and feeding our input mix with recycled content

Addressing resource scarcity
Already ~25% lower PGM use vs industry average
Delivering high-performance solutions
For zero emissions transport

Umicore PEM catalysts already prevented 147,000 tons of GHG emissions from being emitted into the air in 2021

PEM: Proton-exchange membrane
Using average personal vehicle lifetime of 200,000 km
Capture emerging growth as leading fuel cell catalyst provider.

SCALABLE VOLUME PRODUCTION

Scaling-up production footprint in most cost-efficient way.
Scaling-up of production footprint in most cost-efficient way

Umicore’s PEM catalyst production plant in China, the biggest PEM catalyst production facility in the world

Proven mass production processes with scalable low cost base

Investment in new Chinese production plant driven by growing customer demand

Modular investment approach for stepwise capacity expansion

PEM: Proton-exchange membrane
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3. RISE
**Fuel Cells – RISE**

Capture emerging growth as leading fuel cell catalyst provider

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Capture near term growth in fuel cells for HDV/MDV and long range LDV

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Adjacent opportunities - market potential for green electrolysis

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Head start, based on proven technology leadership
Profitable today and value accretive throughout period
materials for a better life