Sector call - Platinum Group Metals Services
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Cautionary statement

This presentation contains forward looking statements that are subject to risk factors associated with, amongst other things, the economic and business circumstances occurring from time to time in the countries and sectors in which Johnson Matthey operates. It is believed that the expectations reflected in these statements are reasonable but they may be affected by a wide range of variables which could cause actual results to differ materially from those currently anticipated.
JM is a world leader in platinum group metal refining

**Platinum group metals**

- Ru (Ruthenium)
- Ir (Iridium)
- Os (Osmium)
- Rh (Rhodium)
- Pd (Palladium)
- Pt (Platinum)

**Efficient Natural Resources**

- Pgms used in Catalyst Technologies for manufacture of chemical catalysts

**Clean Air**

- Pgm metal salts used in washcoats for autocatalysts

**Health**

- Foundation of Health was pgms

**New Markets**

- Fabricate precious metal tubing used in production of medical devices
Market dynamics

Primary supply declining

Legislation driving increased demand

Secondary sources of pgms to become more important as the world moves towards a sustainable and circular economy
Platinum Group Metal Services (PGMS)

2017/18 ENR sales: £956m¹

- Offer customers a holistic service, satisfying all their metal needs
  - We refine, trade and hold metal
- PGMS generates attractive returns and generally delivers negative working capital
- Strategically important
- Investing in efficiency and resiliency of our refining assets

Ensures secure supply of pgms to internal and external customers

¹ Sales excluding precious metals
Competitive advantage: a leader in pgm chemistry

Technology
- Efficient processes for refining and fabrication
- Refine to market-grade 99.95% purity

Trusted partner
- Understand customers’ needs
- Hard to replicate
- Trust us to assay

Scale and flexibility
- £5bn of metal flowing through refineries p.a.
- One-stop shop
- Flexible offering

Security of supply
- Uninterrupted pgm supply to JM and customers
- Crucial part of JM’s supply chain

Circular economy
Platinum Group Metal Services

2017/18 sales: £253m¹

- Refining and chemical products
- Fabrication
- Precious metal management

**Refining and chemical products**
- Recycling and refining of pgms
- Production of chemical compounds

**Fabrication**
- Fabrication of pgm products

**Precious metal management**
- Metal trading activities

¹ Sales excluding precious metals
Refining and chemical products

World’s largest secondary refiner of platinum group metals

- 4 refining operations in the UK, US and China

Transform refined pgms into chemical compounds

- Selection of over 200 chemical compounds
Recycling and refining process

A five stage process

Collection of scrap
- Utilise semi-refiners and collectors
- Biggest single feed is spent autocats

Evaluation
- Sample bulk material
- Assay to determine pgm content

Smelting
- High temperature fusion
- Two-layer melt: slag and pgm bullion

Chemical leaching
- Further concentrate pgms
- Extract gold and silver content

Chemical separation
- Complex, multi-stage process
- Convert pgms to final forms

Highly advanced techniques for extracting and separating pgms
Fabrication and Precious metal management

**Fabrication**
Supply a range of fabricated pgm products

- **Wire**
  - Airbag initiators
  - Gas sensors

- **Sheets and foils**
  - Rh foils used in medical scanners

- **Ignition products**
  - Wire or pre-cut electrode tips

**Precious metal management**

- Centre of metal liquidity
- Underpins PGMS business
- Enables flexible customer offering
A strategically important business

Generates attractive returns

Generally delivers negative working capital

Remain focused on current working capital challenges
A great business for JM

Market leader

Generates attractive returns

Expertise, technology and competencies underpin JM

Crucial to JM’s future success