

PLATINUM PERSPECTIVES

Is China automotive a source of pt demand upside?

China's automotive industry is a modest consumer of platinum at c2% of total platinum demand, mostly in heavy-duty vehicles. We see platinum demand upside potential from emissions legislation and from switching.

Market assumption: China's emissions legislation will not be a significant driver of platinum demand upside near term, given 1) the next wave of emissions legislation (China VI) is from 2020; 2) China's vehicles are mostly gasoline, and 3) implementation of legislation is likely to be gradual (as it has been historically) rather than a step change.

Our view: China has recently introduced more stringent and supplementary on-road testing of heavy-duty vehicles (both new and in use). This aims to reduce NO_x emissions ahead of the implementation of China VI in 2020¹. The emissions limits under the new supplementary testing are less stringent than China VI or Euro 6. Nevertheless, this proactive approach, addressing known deficiencies in the current testing regimes, underscores China's commitment to reducing vehicle emissions as part of its 13th Five-Year Plan – and aligns with climate positive actions in other industries i.e. domestic aluminium and steel production capacity.

This is potentially relevant to platinum demand as heavy-duty vehicles usually have diesel engines, with higher platinum loadings and urea dosing a potential solution to lower NO_x. **Higher loadings earlier than expected could lead to additional platinum demand** vs expectations.

Trevor Raymond
Director of Research
+44 203 696 8772

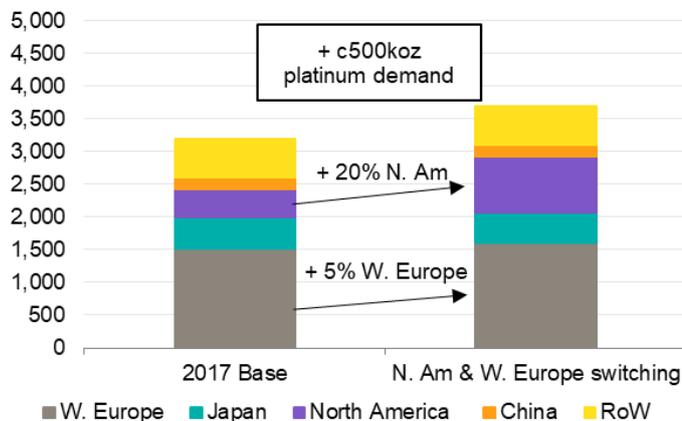
traymond@platinuminvestment.com

Danielle Chigumira
Manager, Investment Research
+44 203 696 8775
dchigumira@platinuminvestment.com

World Platinum Investment Council
www.platinuminvestment.com
64 St James's Street
London SW1A 1NF

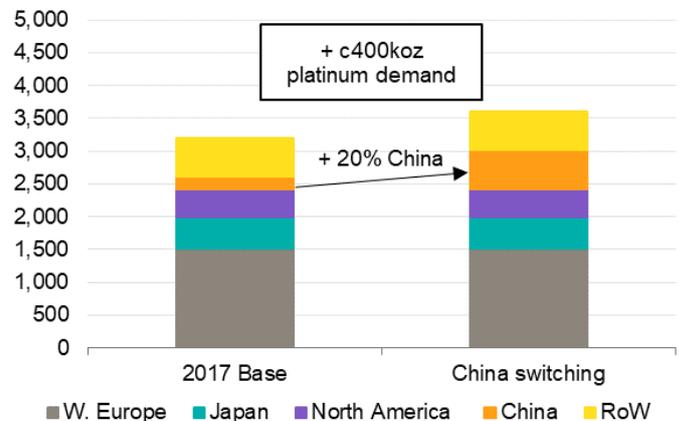
November 2017

Switching (platinum, koz) – North America, Europe



Source: Data – SFA Oxford; Scenarios - WPIC Research

Switching (platinum, koz) – China



Source: Data – SFA Oxford; Scenarios - WPIC Research

Market assumption: Switching is only relevant for European and North American automakers / autocat producers.

Our view: Anecdotal evidence suggests European and US automakers are considering re-introducing platinum into gasoline autocats ("switching"), a sentiment echoed by many investors. In our Q3 2017 [Platinum Quarterly](#), we outlined a scenario where 20% of North American palladium automotive demand and 5% of Europe palladium automotive demand is replaced with platinum, leading to c500koz demand upside.

However, the reasons that North American automakers would consider switching (a reliance on gasoline for passenger vehicles, palladium scarcity, platinum price now below palladium); are true of China's automakers. Therefore, it is also possible that **China's automakers could consider switching**; which, if implemented, could lead to **additional platinum demand upside of c400koz** under a 20% scenario.

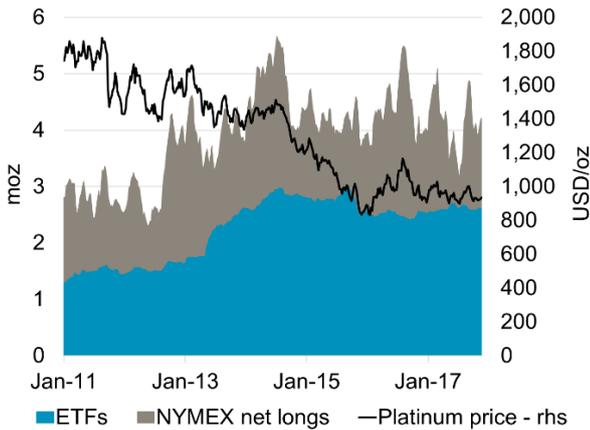
¹ ICCT – China's First National Portable Emissions Testing Standard for Heavy-Duty Vehicles (November 2017)

Platinum in six charts – November 2017

We believe there are many reasons supporting consideration of platinum as an investment asset:

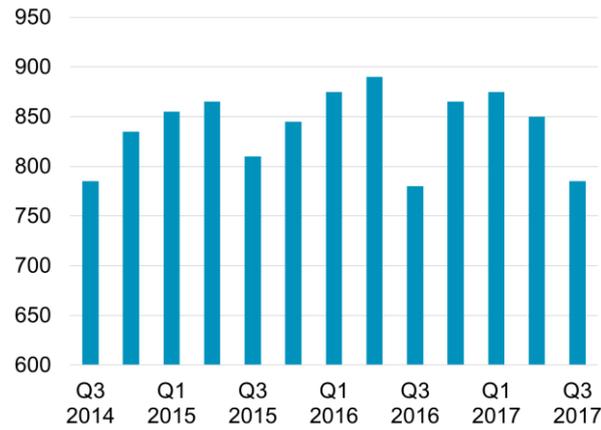
- Supply demand fundamentals are strong and ETF holdings are stable, despite price volatility
- Risks of supply declines are underestimated - cost pressure and falling mining investment continue
- Downside risks to platinum automotive demand are overestimated
- Futures positioning follows sentiment with high correlation to price
- Platinum is undervalued against its past, its production cost and against gold

Figure 1: ETF holdings stable despite price volatility; correlation between futures positioning and price



Source: Bloomberg, WPIC Research

Figure 4: Automotive demand starting to be impacted by European diesel share falls plus usual Q3 weakness (koz)



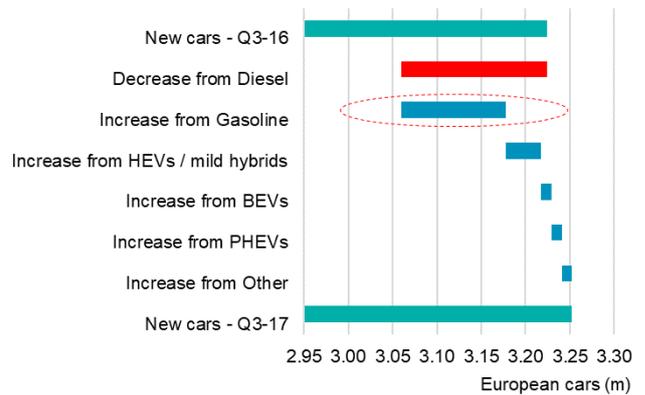
Source: WPIC Platinum Quarterly Q3 2017, SFA (Oxford)

Figure 2: Platinum discount to gold at an all-time high of c\$360/oz



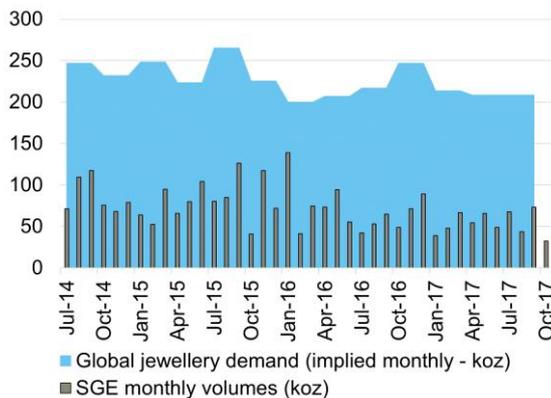
Source: Bloomberg, WPIC research

Figure 5: Diesel vehicles lost continue to be replaced by gasoline more than hybrid or battery vehicles



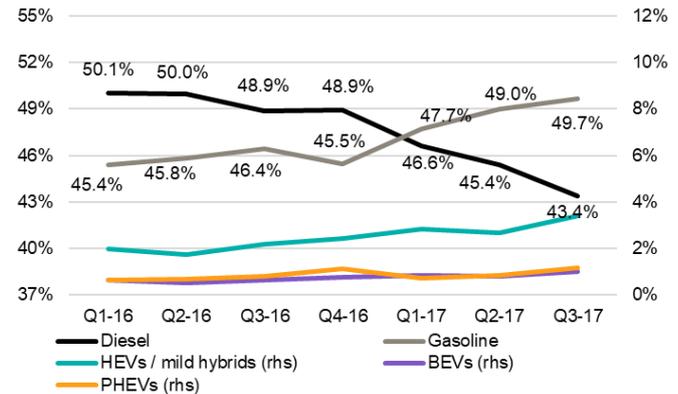
Source: LMC, ACEA, WPIC research

Figure 3: ROW platinum jewellery demand growth offsetting China demand



Source: Bloomberg, SFA (Oxford), WPIC research

Figure 6: European* passenger powertrain market share (%)



Source: LMC, ACEA, WPIC research.

* Europe includes passenger vehicles in Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, UK, Norway and Switzerland (based on the availability of both diesel market share data and Alternative Fuel Vehicle data). HEVs – Hybrid Electric Vehicles; BEVs – Battery Electric Vehicles; PHEVs – Plug-in Hybrid Electric Vehicles

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