

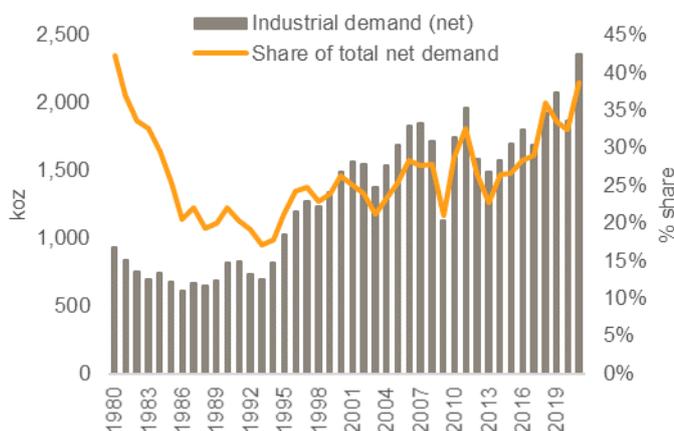
Platinum industrial demand, the largest net demand segment, & unsung driver of platinum demand growth

Analysis of platinum demand tends to focus on the automotive and jewellery sectors, with industrial demand often overlooked. However, in 2021, platinum industrial demand is expected to account for almost 40% of total platinum demand net of recycling supply. Platinum industrial demand has exhibited strong growth in recent years; at a compound annual growth rate (CAGR) of 6% between 2013 and pre-pandemic 2019, more than double the CAGR of global GDP, and triple the OECD Industrial Production CAGR, over the same period.

Diverse end-uses ensure that industrial platinum demand benefits from strong economic recovery (from pandemic lows) and fundamental growth from technological progress. Platinum industrial demand is typically price-inelastic, as metal cost is mostly a small fraction of the manufacturing cost. Platinum demand arises from three categories: products made from platinum (e.g. thermocouples and stents), small top-up requirements as industrial catalysts and manufacturing equipment wear out, and much larger amounts of metal when new process plant capacity is built.

Platinum industrial demand in 2021 is expected to rebound by 25% over the 2020 level, to 2.4 moz, 13% above pre-pandemic levels, driven principally by demand from the petroleum refining, chemical and glass sectors. Satisfying global glass demand growth, for example, requires significant glass manufacturing capacity expansion for: surging demand for glass fibre insulation in the construction sector, growing demand for automotive and renewable energy composite materials, and burgeoning demand for LCD screens in phones, TVs and computers.

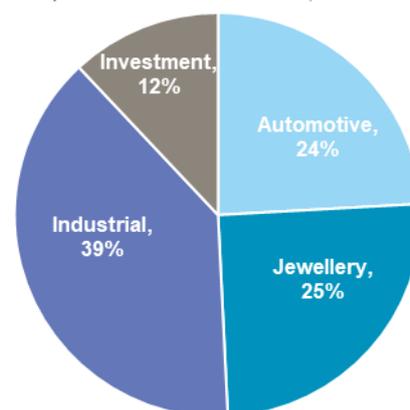
Platinum industrial demand has grown steadily since the early 1990's.



Source: JM (1980-2012), SFA Oxford (2013-2018), Metals Focus (from 2019) WPIC Research.

Platinum industrial demand is the largest segment again in 2021f, due to glass and petroleum end-uses

Net platinum demand 2021f - 6,066 koz



Source: Metals Focus, WPIC Research

Significant capacity additions in chemical, glass and petroleum production, notably in China, have historically increased platinum industrial demand growth materially. Indeed, Chinese petroleum refining capacity has almost tripled over the last 20 years to keep pace with the rapid growth in domestic energy demand. We believe capacity additions in these three areas will continue beyond 2021.

The associated platinum industrial demand growth from these capacity additions will continue to reinforce platinum's diverse industrial application-driven demand base. More investors are becoming aware of this and platinum industrial demand growth adds to platinum demand growth from automotive and investment to drive sustained platinum deficits in 2021 and beyond.

China will add c.15 million tonnes of paraxylene capacity in 2021 and 2022, with Africa and Asia adding an additional c4.9 million barrels per day of oil refining capacity over the same period, supporting further chemical and petroleum sector platinum demand growth

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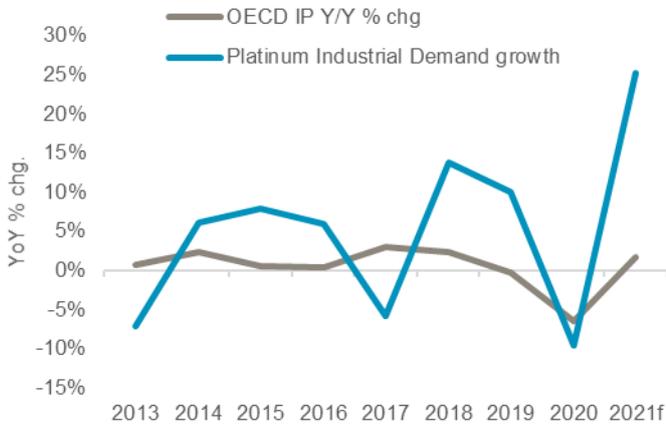
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Platinum's attraction as an investment asset arises from:

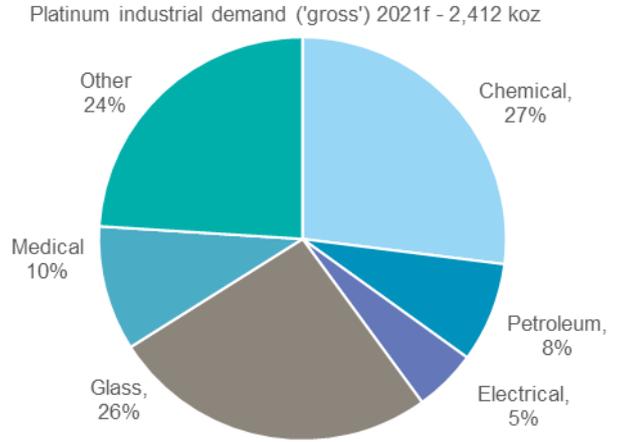
- Supply severely constrained for three more years despite some new investment in mining capacity
- Platinum price is near all-time lows relative to gold and at record lows relative to palladium
- Total PGM demand growth should continue due to increasingly restrictive emissions rules
- Market balance and price mismatches between palladium and platinum drives substitution
- Investment demand has surged as institutions begin to factor low price and positive fundamental outlook

Figure 1: Platinum industrial demand growth has grown at a CAGR of 6% since 2013, three times more than the OECD Industrial Production CAGR



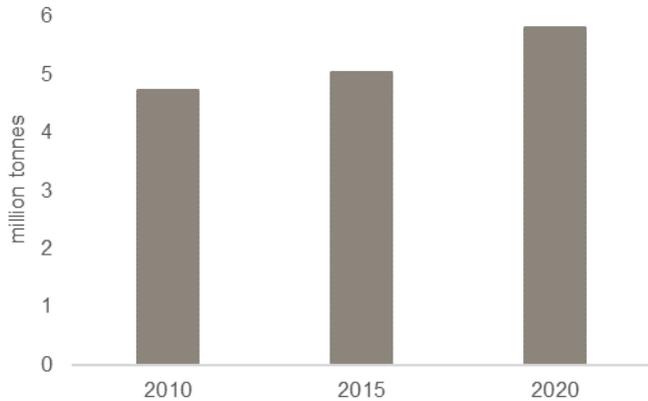
Source: OECD, WPIC Research

Figure 2: Industrial demand for platinum benefits from diverse end uses, with demand being driven by both economic recovery and technological progress



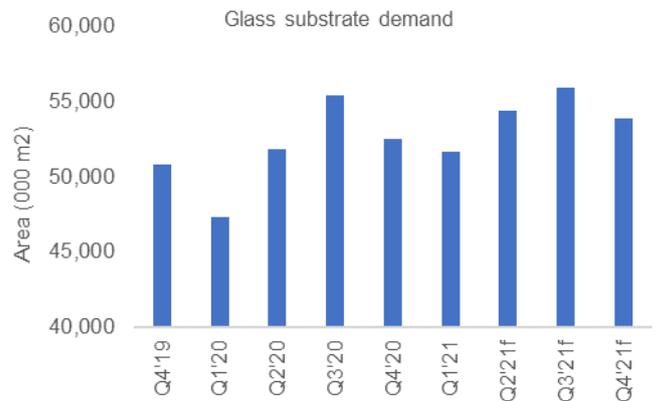
Source: Metals Focus, WPIC Research. Note. In 2021 58 koz of recycling supply is expected from open-loop industrial application recycling, published 'gross' demand is net of closed-loop recycling

Figure 3: Glass fibre manufacturing capacity has increased by almost 25% since 2010, driven latterly by Chinese capacity additions



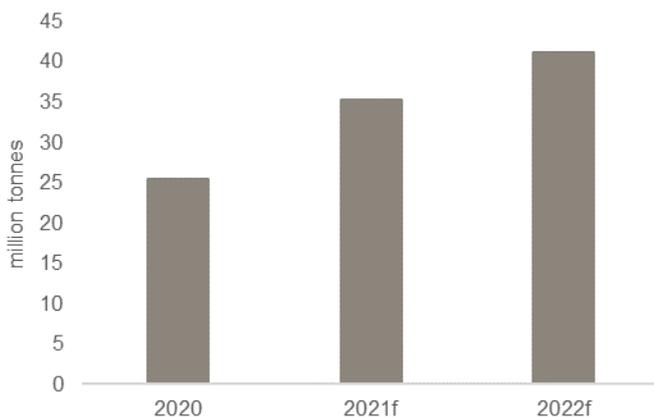
Source: Statista.com, WPIC Research.

Figure 4: Demand for glass substrate, used in TV/computer screens, accelerated rapidly from Q1'20 lows, and strong growth is forecast for 2021 and beyond



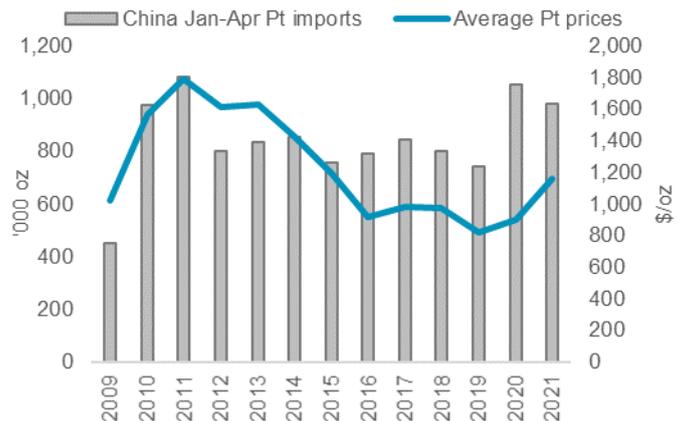
Source: Omdia, WPIC Research

Figure 5: China is projected to add almost 15 m tonnes of paraxylene capacity in 2021 and 2022, supporting chemical end-use demand growth for platinum



Source: Drewry Shipping Consultants, WPIC Research

Figure 6: China's strong platinum industrial and automotive demand growth continues to drive platinum import growth despite rising platinum prices



Source: China Customs, Bloomberg, WPIC Research

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