

Platinum's role in hydrogen and decarbonisation is a big driver of platinum investment demand

Green hydrogen has been thrust into centre-stage in 2020, as more than 70 countries, plus the EU, pledged to achieve carbon neutrality by 2050. Importantly, China which previously focussed on environmental policy measures to improve air quality, has now pledged to be carbon neutral by 2060. Hydrogen is highly versatile with applications as a feedstock, a fuel, an energy carrier and for storage of renewable energy. **Green hydrogen, produced by the electrolysis of water using renewable electricity as the power source, is key to decarbonisation across many industries, and is attracting significant policy interest.**

The EU is targeting 40 GW of green hydrogen electrolyser capacity over the next decade, as part of a wider €1.8 tn COVID recovery and green energy budget to expand renewable generation capacity to 32% of total by 2030. China has designated hydrogen as a key energy source for future energy security. However, China's current target* of c.15% renewable hydrogen generation (c.30 GW) by 2030 appears relatively modest, particularly in the light of aggressive targets to grow renewable generation capacity by more than 300 GW over the next 5 years.

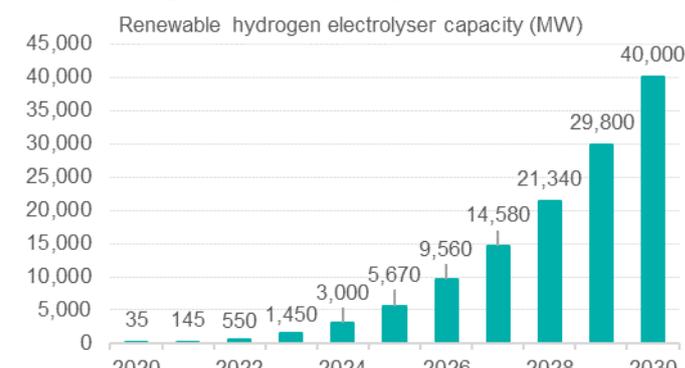
Platinum's role in the Hydrogen economy is crucial. It is used in fuel cells and in the electrolysis of water using renewable energy to produce green hydrogen, where it is used in conjunction with iridium as a catalyst during electrolysis. The current EU and China green hydrogen generation capacity targets alone would require, cumulatively, over 600 koz of platinum by 2030.**

North American investors have added 543 koz of platinum ETF holdings since March, on low price, as a proxy for gold and some due to hydrogen



Source: Bloomberg, WPIC Research. Note: Flows between March 17th and October 23rd

The EU hydrogen strategy includes building 40 GW of green hydrogen electrolyser capacity by 2030 to meet its ambitious targets from an already carbon-efficient base



Source: Hydrogen Europe, WPIC Research

Technological progress is ensuring that scarce iridium does not limit adoption of the preferred PEM (proton exchange membrane) electrolyzers. Previously, Johnson Matthey expected only 30% - 60% of electrolyzers to be PEM, but a breakthrough by Heraeus cuts iridium requirements by up to 90%, unlocking more widespread adoption and demand for platinum.

The platinum demand impact of announced green hydrogen policies is clearly significant over the longer-term. However, it appears platinum investors are already taking notice of green hydrogen as a strong driver of near and long term future platinum demand. **ETF holdings in North America have surged by 543 koz since March. Many investors see platinum as an undervalued gold proxy. But some are also seeing the strategic importance and growing demand for platinum from the burgeoning hydrogen economy.**

Continued proliferation of Government sponsored hydrogen economy initiatives globally will only add to platinum investment demand momentum

* EPPEI (China) / Energy Iceberg estimate ** Based on 60% PEM electrolyzers, 90% Heraeus loadings reduction with 0.45gPt and 0.15gIr per kw

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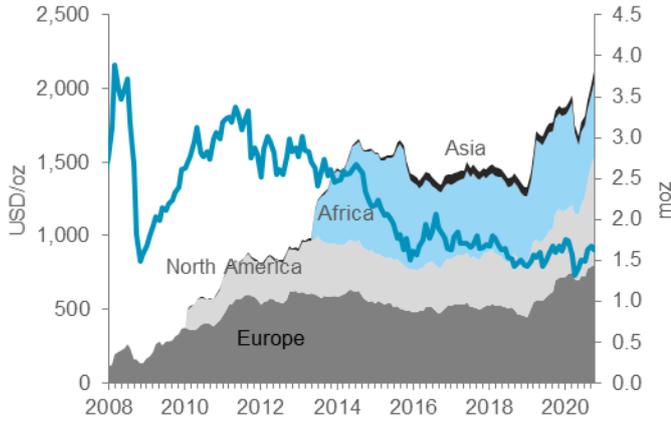
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Platinum's attraction as an investment asset arises from:

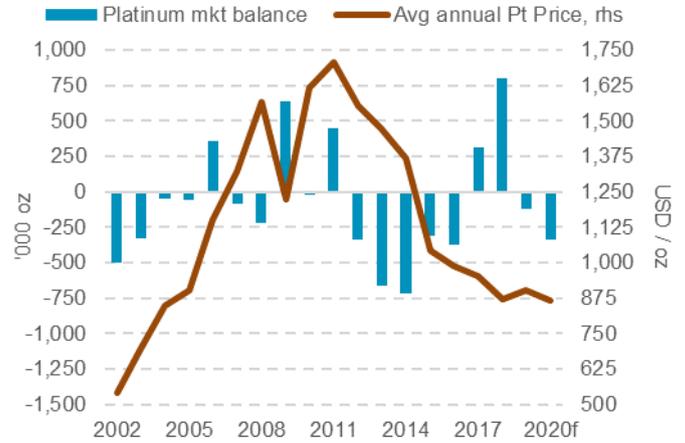
- Supply is relatively constrained with limited investment in new platinum group metal (PGM) mines
- Platinum price is near all-time lows relative to gold and at record lows relative to palladium
- Total PGM demand growth should continue due to increasingly restrictive emissions rules
- Market balance and price mismatches between palladium and platinum argues for substitution
- Investment demand has surged as institutions begin to factor low price and positive fundamental outlook

Figure 1: Global platinum ETF holdings have rebounded 792 koz* from year lows in May, to 3.8 moz on impetus from low price, gold and some hydrogen



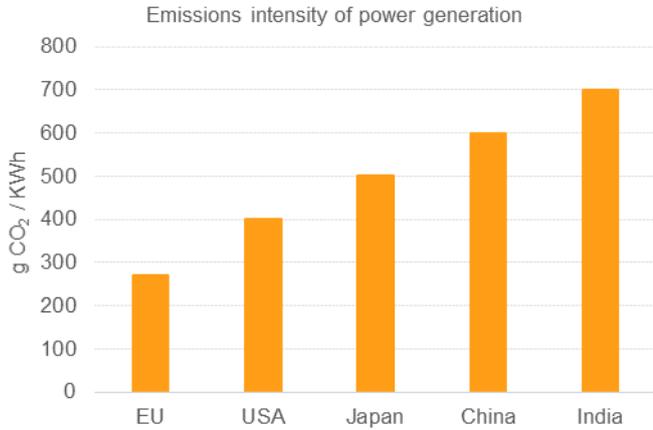
Source: Bloomberg, WPIC Research. Note: * between May 12th and October 23rd

Figure 2: Green hydrogen production could help to increase future platinum supply/demand market deficits



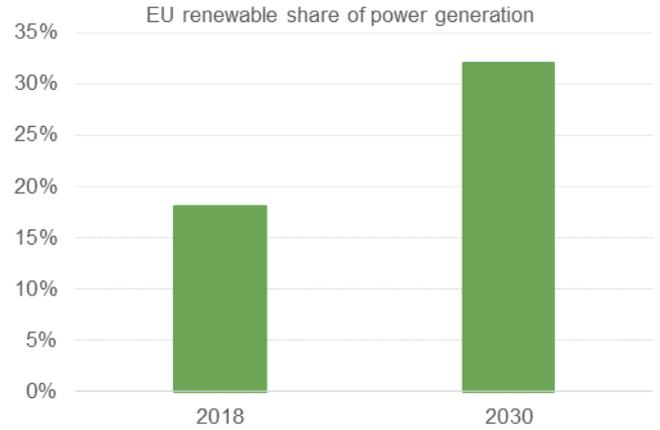
Source: JM (to 2012), SFA Oxford (2013-2018), Metals Focus (from 2019), WPIC Research

Figure 3: EU green hydrogen is more crucial as its ambitious targets must be achieved from its low carbon emissions intensity base



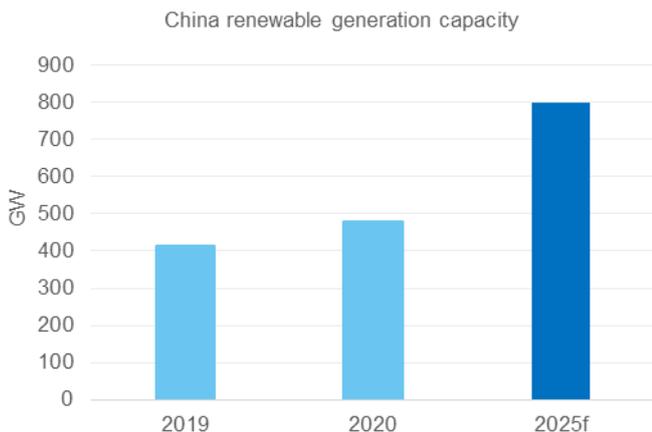
Source: IEA, WPIC Research. Note: IEA data for 2018

Figure 4: Under the European Green Deal (EGD), the renewable share of power generation will expand to 32% by 2030



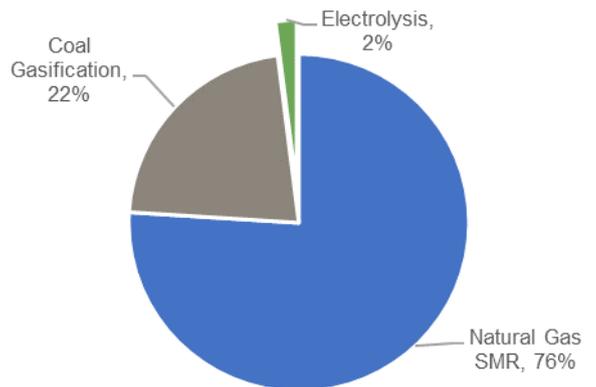
Source: IEA, WPIC Research.

Figure 5: Estimates of China's renewable generation capacity added by 2025 is over 300GW providing significant capacity for green hydrogen



Source: Electric Power Planning & Engineering Institute (EPPEI), WPIC Research

Figure 6: Currently less than 2% of the c.70 million tonnes of hydrogen produced annually is via electrolysis, a share that will grow significantly by 2030



Source: US Dept. of Energy, WPIC Research. Note: SMR is Steam Methane Reforming

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