

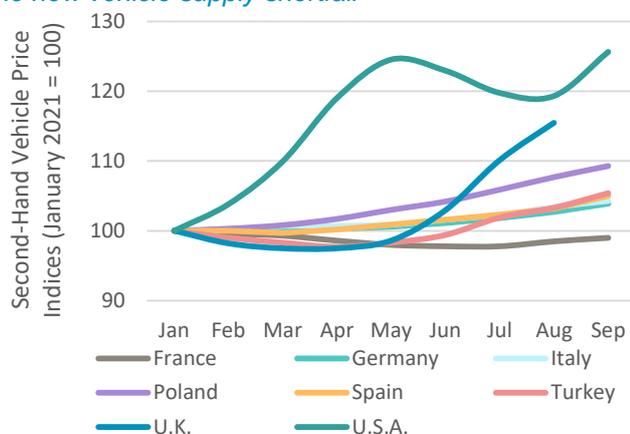
## Reduced platinum recycling could help offset chip-related platinum automotive demand losses

**Reduced vehicle production and sales due to global semiconductor constraints results in delays to end-of-life vehicle scrappage. This reduces platinum recycling supply and partially offsets chip-related platinum automotive demand losses.**

The impact of semiconductor shortages on new vehicle output is still being debated, resulting in a wide and volatile range of production forecasts from market commentators. **What is clear, however, is the impact the shortage of new vehicles is having on the used vehicle market, where steeply rising prices, increasing sales volumes and falling inventories point to increased consumer demand.** This results in existing vehicles being run for longer, pushing out scrappage curves and reducing the flow of catalytic converters to recycling facilities (see charts on page 2). **Thus, whilst constrained production of new vehicles reduces PGM automotive demand, we expect this to be partially counterbalanced by lower autocatalyst recycling supply.**

In our [September Platinum Perspectives](#), we examined a scenario in which 2021 total global vehicle production (HD + LV) might reduce further by 3.4M vehicles to 82M. We estimated a reduction in platinum automotive demand of 34koz per million vehicles not produced, for a total demand reduction of 116koz.

*Second-hand vehicle prices are increasing in response to the new vehicle supply shortfall*



Source: WPI Research, Indicata, Office of National Statistics, Mannheim, Bloomberg

**However, 3.4M fewer new vehicles also means c.3.4M existing vehicles are run for longer and not scrapped.** We estimate a corresponding cut to automotive recycling supply of 21koz/M vehicles, for a total of 73koz. **This means that the net chip-related impact on the supply/demand balance could be only 13koz/M vehicles for a net increase to the platinum surplus of only 44koz (<1% of total demand).** Using Johnson Matthey's 2021 palladium estimates, the corresponding numbers are 46koz/M vehicles, for a net reduction to the palladium deficit of 157koz.

In our previously published disruption scenarios, we assumed consumer demand for new vehicles remains unchanged and there will be a pick-up in future vehicle production to meet pent-up demand. If correct, this also means we should expect a corresponding increase in future scrappage volumes. However, we believe that refining capacity constraints will at that point limit the maximum flow-through of platinum returned to the market via recycling, limiting the increase in automotive recycling supply.

*Reduced car scrappage cuts platinum recycling supply, materially offsetting platinum automotive demand losses*

		2021F
Vehicle production - starting estimate	M	85.4
Downside scenario	M	82.0
Change in production	M	3.4
Change in platinum automotive demand	koz	-116
- Platinum demand Change per million vehicles	koz/M	-34
Change in palladium automotive demand	koz	-361
- Palladium demand change per million vehicles	koz/M	-105
Expected scrappage volume	M	54.3
Change in scrappage volume	M	3.4
Reduction to platinum recycling supply	koz	73
- Platinum recycling change per million vehicles	koz/M	21
Reduction to palladium recycling supply	koz	204
- Palladium recycling change per million vehicles	koz/M	59
<b>Net platinum change per million vehicles</b>	<b>koz/M</b>	<b>-13</b>
<b>Net palladium change per million vehicles</b>	<b>koz/M</b>	<b>-46</b>

Source: Metals Focus, LMC Automotive, Johnson Matthey, Fitch Solutions, WIPIC Research

*A shortage in new vehicle production versus demand is forcing consumers to run existing vehicles for longer, reducing the supply of catalytic converters to recyclers. We estimate that a 3.4M reduction in new vehicles equates to scrappage curves being extended by around two weeks globally. Constrained automotive recycling supply could reduce the impact of lower automotive demand, moderating the increase to our forecast platinum surplus from 116koz to only 44koz.*

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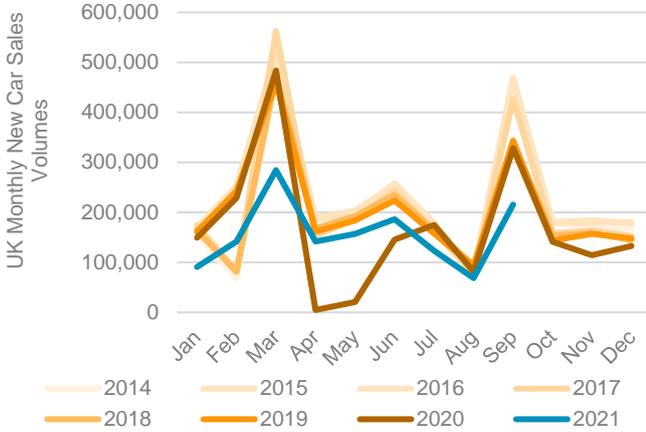
London W1J 9EF

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**Platinum's attraction as an investment asset arises from:**

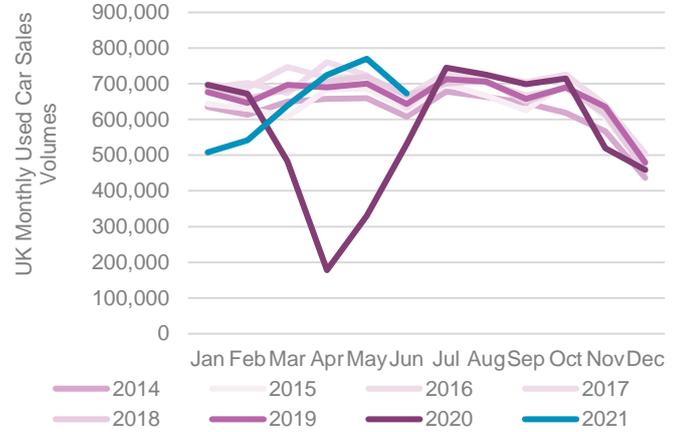
- Supply severely constrained for three more years despite some new investment in mining capacity
- Platinum price is near all-time lows relative to gold and near record lows relative to palladium
- Automotive PGM demand growth should continue due to increasingly restrictive emissions rules
- Market balance and price mismatches between palladium and platinum drives substitution
- Investment demand is softer after two record years but price and fundamentals remain attractive

Figure 1: A shortfall in new vehicle supply...



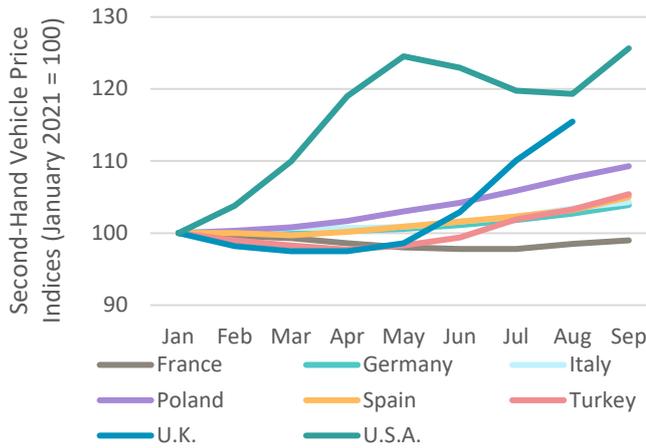
Source: SMMT

Figure 2: ...is pushing up demand for second-hand vehicles...



Source: SMMT

Figure 3: ...despite steep increases in market prices.



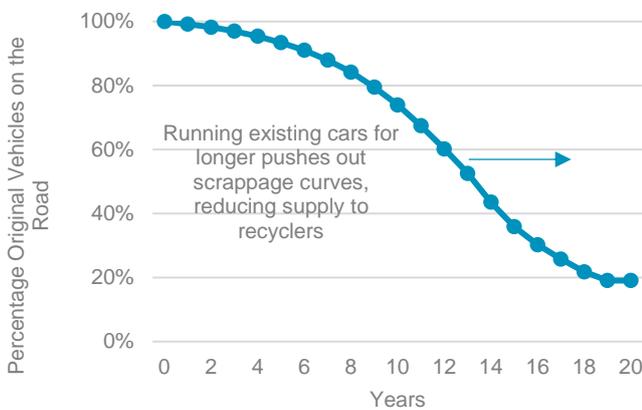
Source: WPIC Research, Indicata, Office of National Statistics, Manheim, Bloomberg

Figure 4: As a result, used vehicles are selling faster and inventories are falling



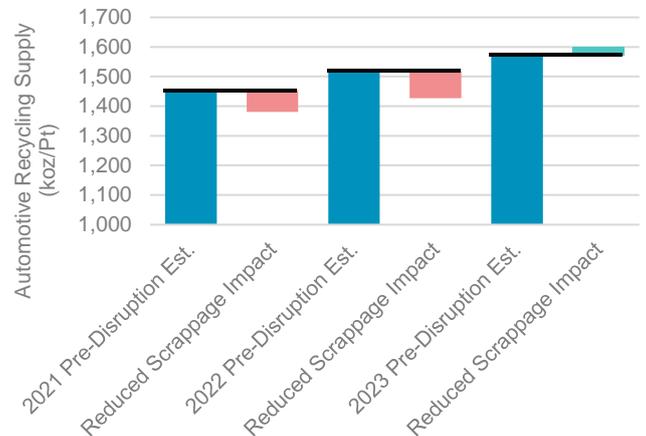
Source: CarGurus

Figure 5: We estimate that running 3.4M existing vehicles for longer pushes the scrappage curve out by ~2 weeks



Source: WPIC Research

Figure 6: Potentially reducing platinum autocatalyst recycling supply by 73koz in 2021



Source: Metals Focus, WPIC Research

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