

## IPMI European Chapter

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# 2022-2023: Challenges and Opportunities

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## PGMs in 2022-23 Macro challenges, supply/demand opportunities



### Challenges:

- **Strong USD** = weaker dollar PGM prices
- **High and rising USD rates** = higher financing costs, less attractive for non-yielding assets
- **Higher, longer, slower interest rate rises** bring risk of recession and damage to the PGM demand side
- **Euro 7 and ICE bans:** the endgame for automotive PGM demand?



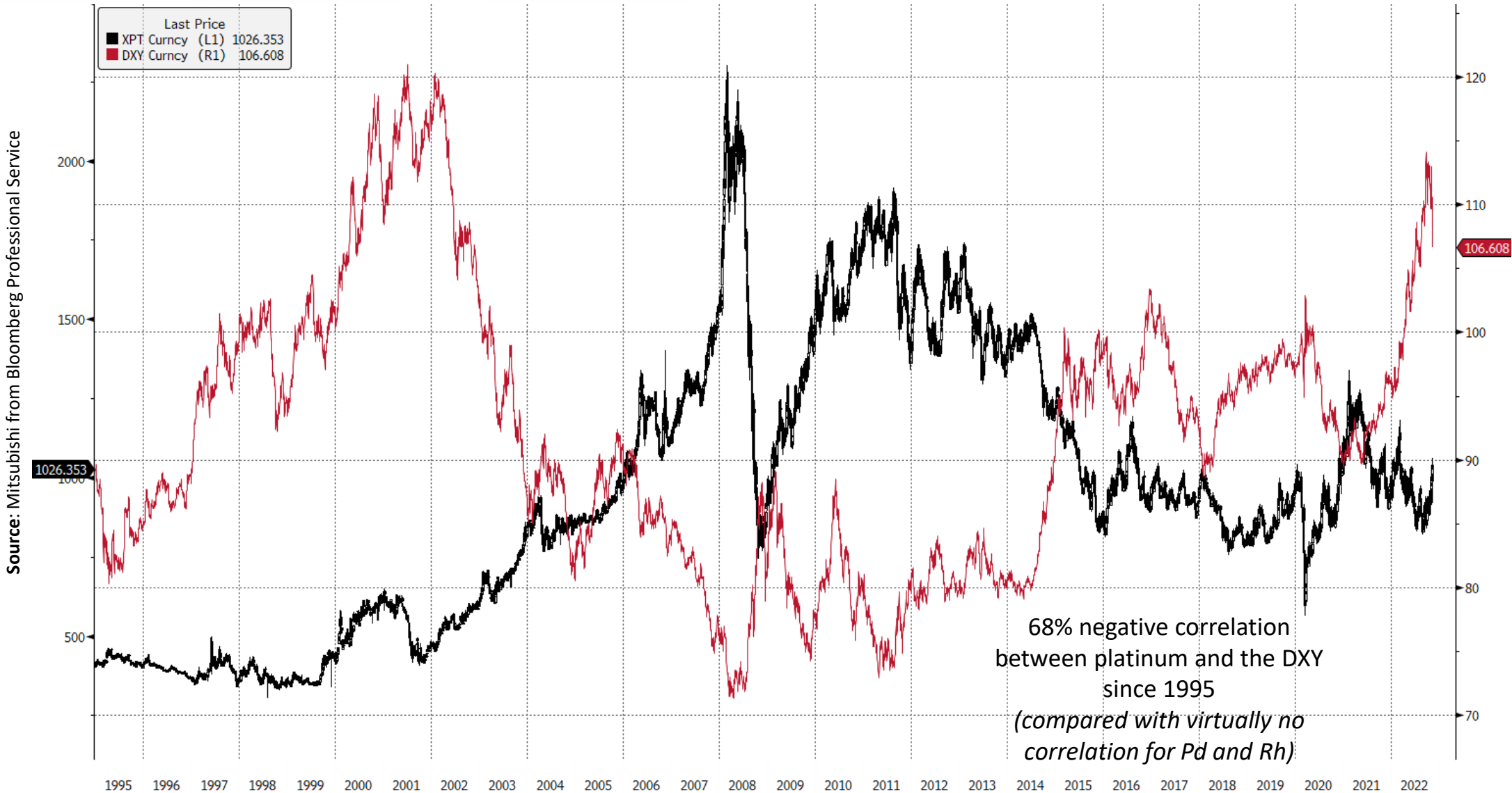
### Opportunities:

- **Peak dollar / Peak rates** = the only way is up for PGMs? Inflation / uncertainty hedging in hard assets
- **Physical markets continue to experience significant tightness** due to supply constraints and recovering demand
- **Supply chains** are recovering and China is undergoing a **post-COVID bounce**
- **Emerging PGM demand in hydrogen**

# Precious Metals in an era of 'King Dollar'

## Platinum (US\$/toz)

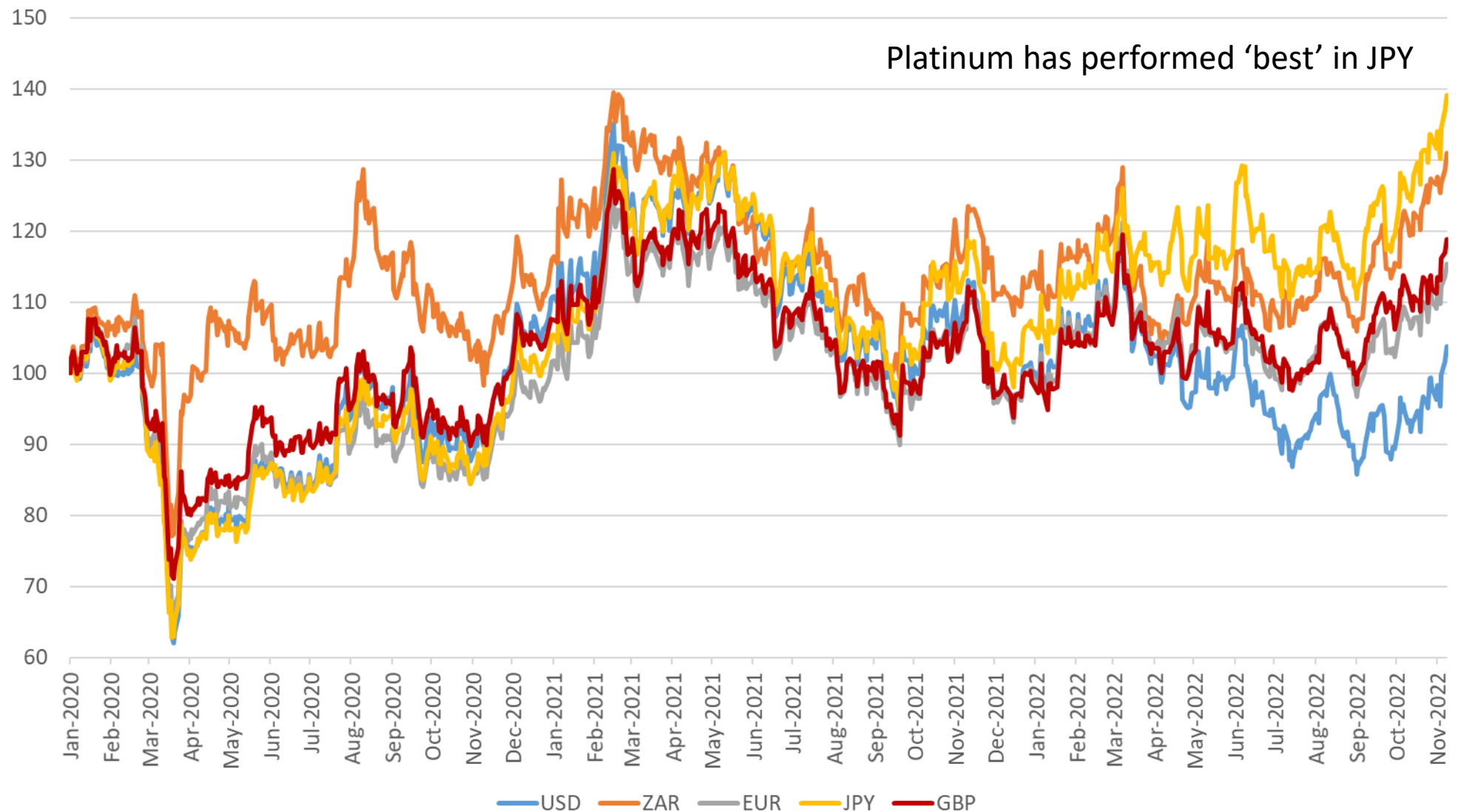
## US Dollar Strength Index (DXY)





## Non-USD price appreciation highlights local currency weakness

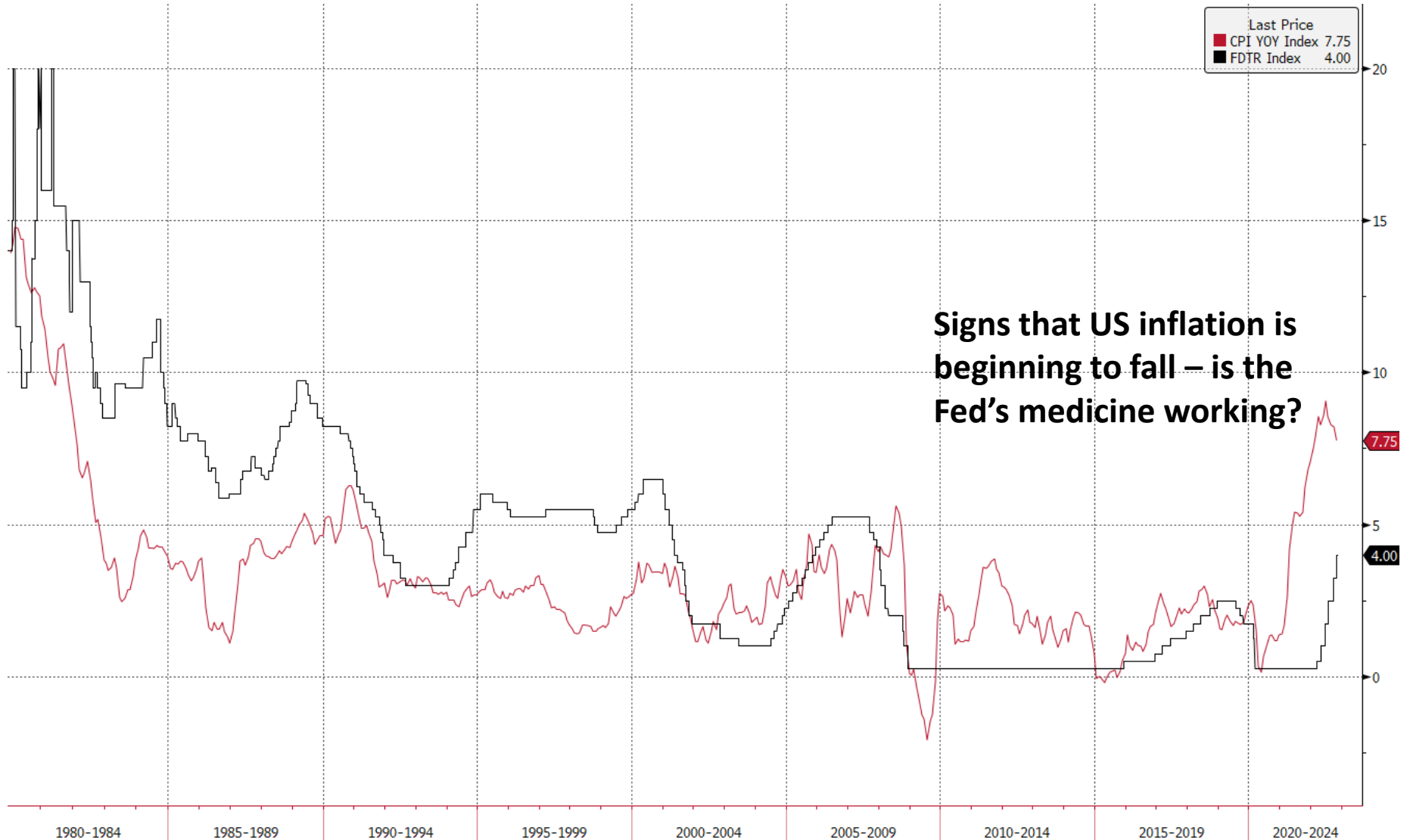
Platinum indexed price in various currencies (where Jan 2020 = 100)



Source: Mitsubishi from Bloomberg Professional Service

# US interest rates are rising at the fastest level since the early 1980s

## US CPI Inflation (%) Fed Funds Target Rate (%)



Source: Mitsubishi from Bloomberg Professional Service

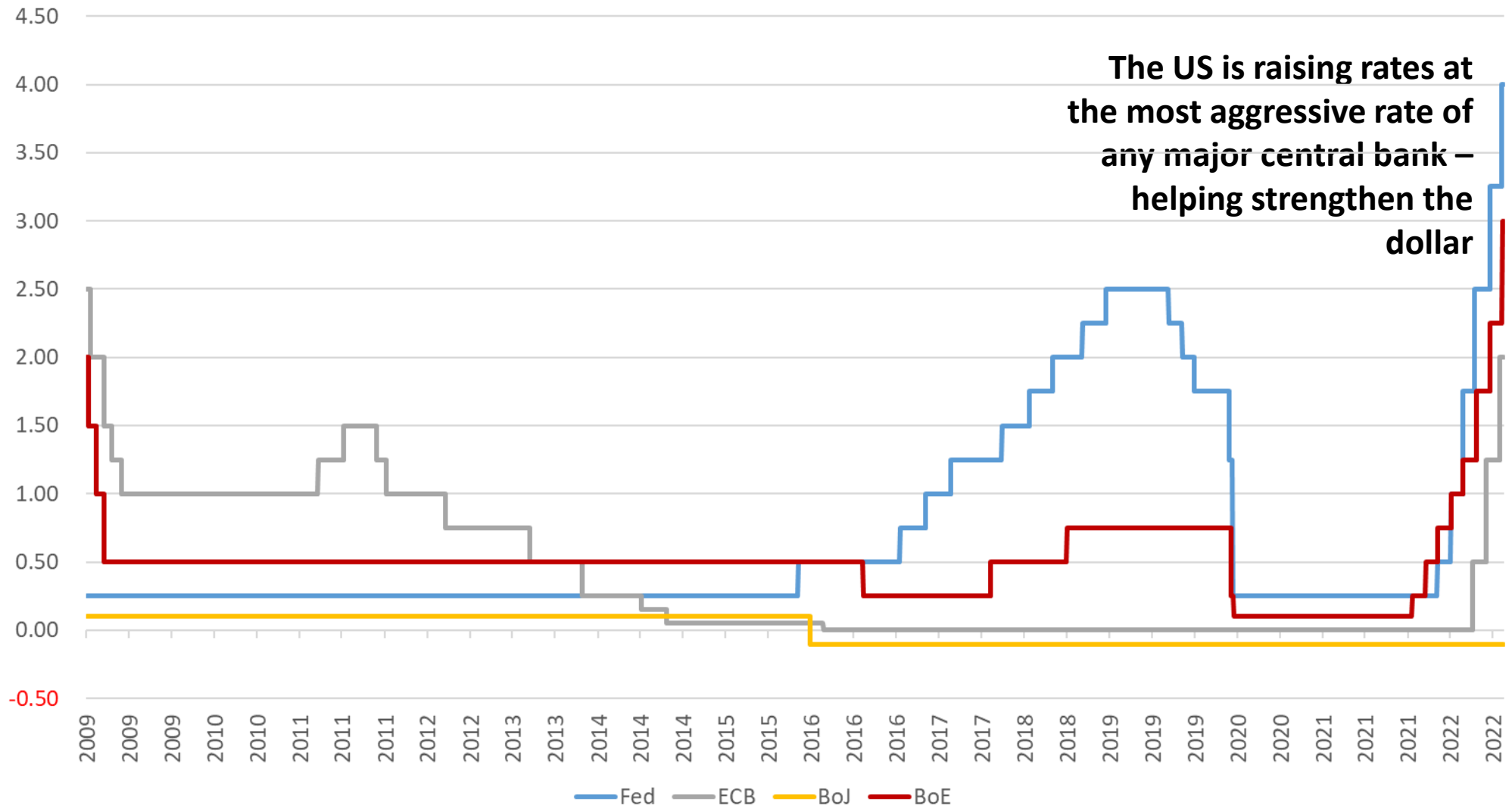
Signs that US inflation is beginning to fall – is the Fed's medicine working?

7.75  
4.00

## Other major economies still playing catch-up on rates

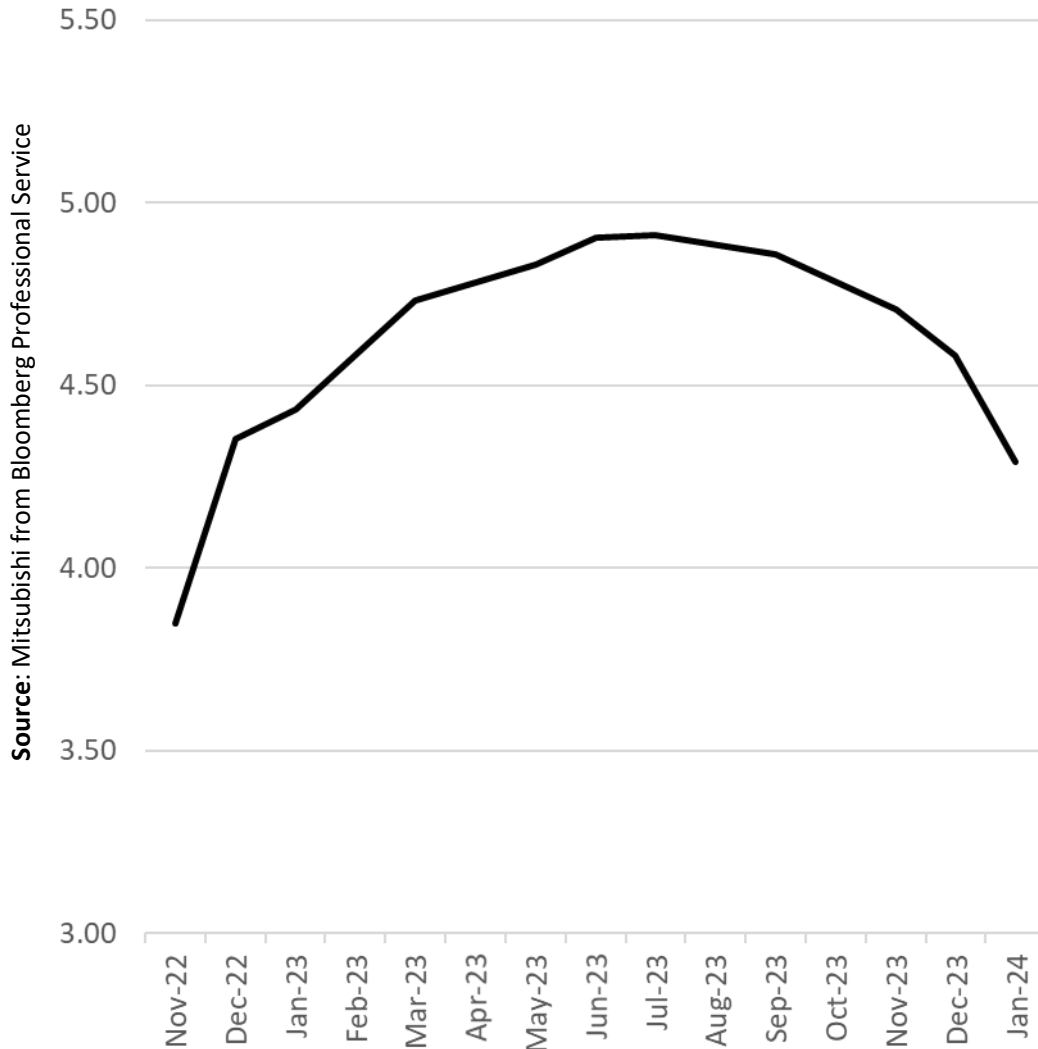
Domestic headline interest rates in various major economies (%)

Source: Mitsubishi from Bloomberg Professional Service

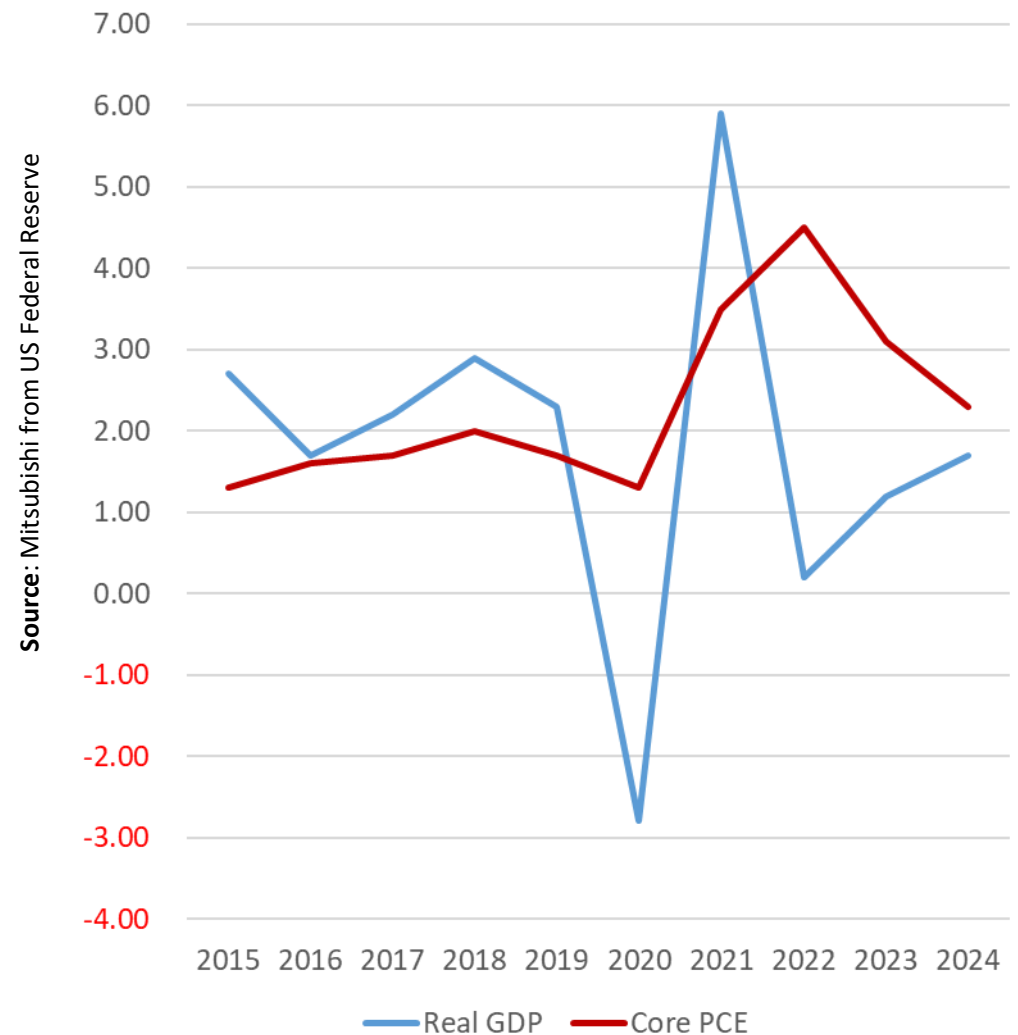


## US rate outlook: longer, higher, slower

**Implied interest rates from Fed Funds Futures Market (%)**



**Fed Projections of GDP growth and Inflation (%)**

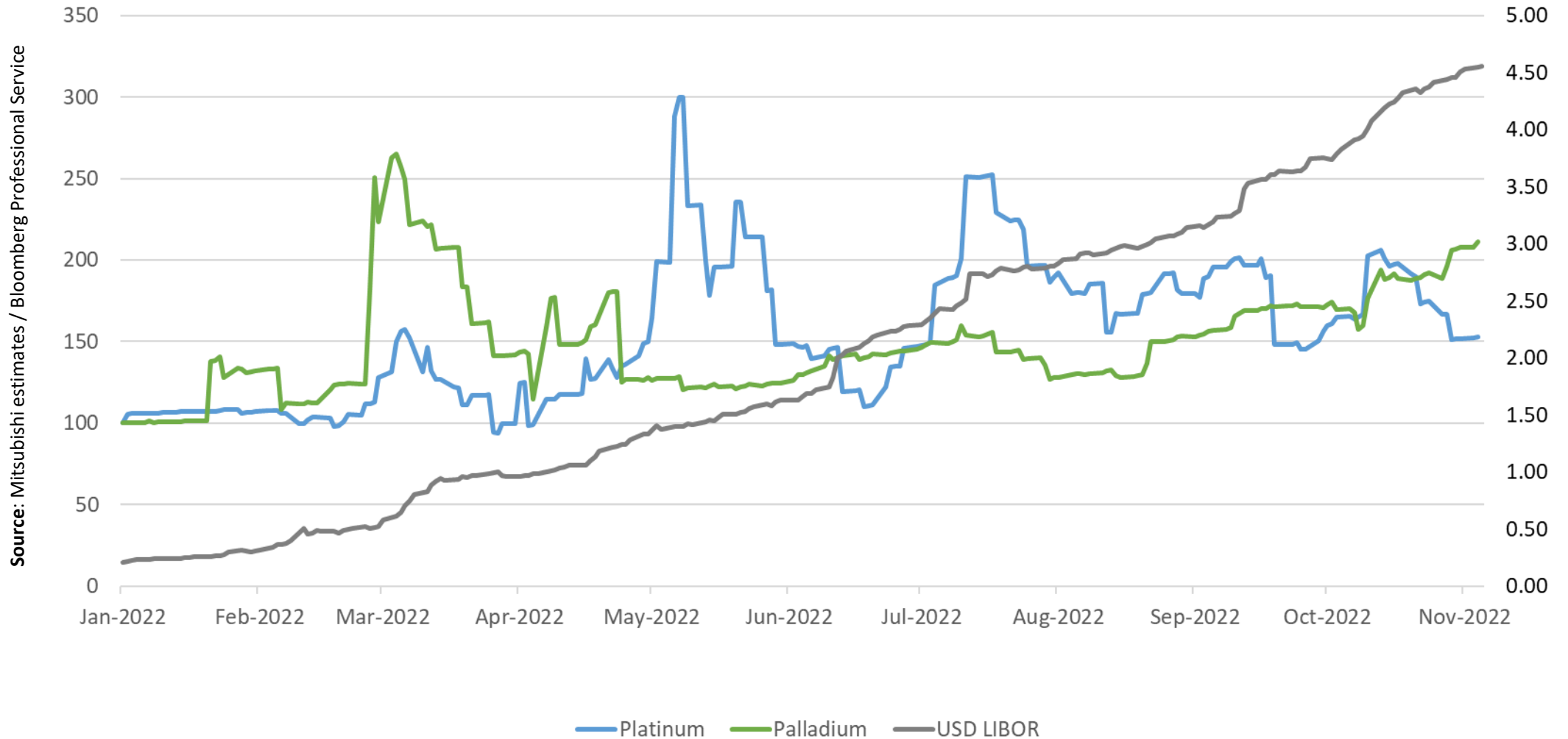




## Impact of rising interest costs on lease rates

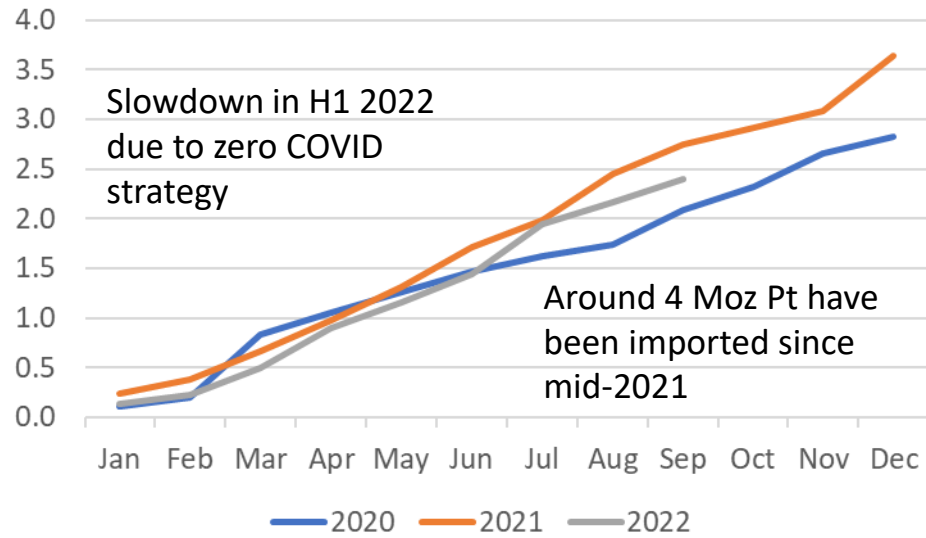
Indexed 3m lease rates (where 1<sup>st</sup> Jan 2022 = 100)

USD 3m LIBOR (%)

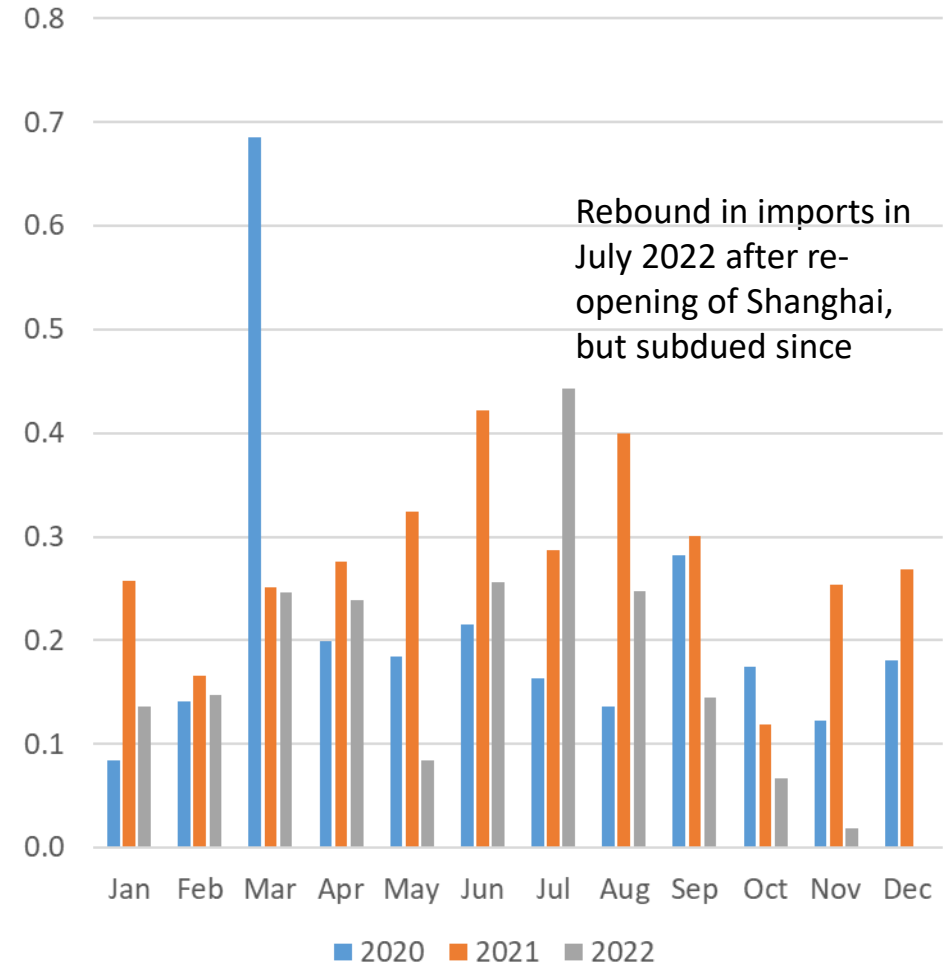


# Physical PGM demand in China impacted by Zero COVID strategy

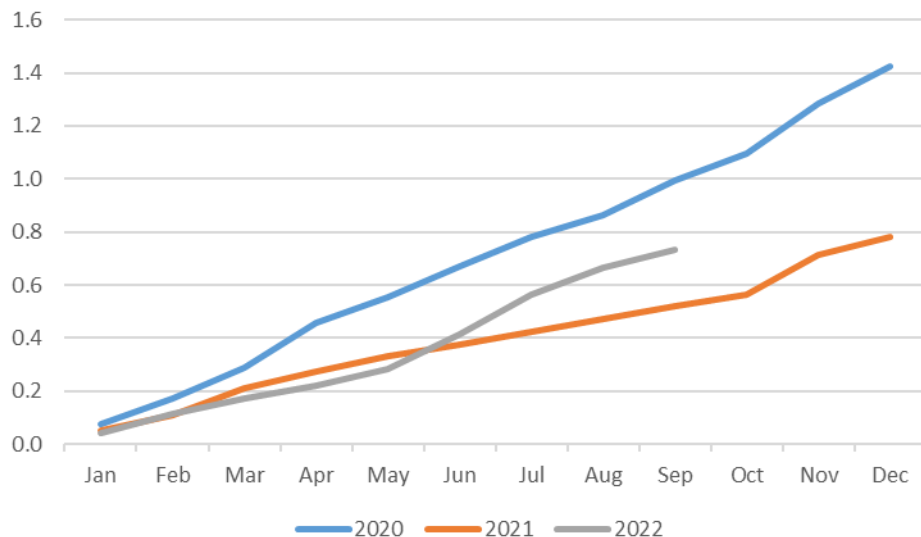
Cumulative imports of Platinum into China (Moz)



Monthly sales of Platinum on SGE (Moz)



Cumulative imports of Palladium into China (Moz)



Source: Mitsubishi from China Customs Data / Shanghai Gold Exchange / Bloomberg

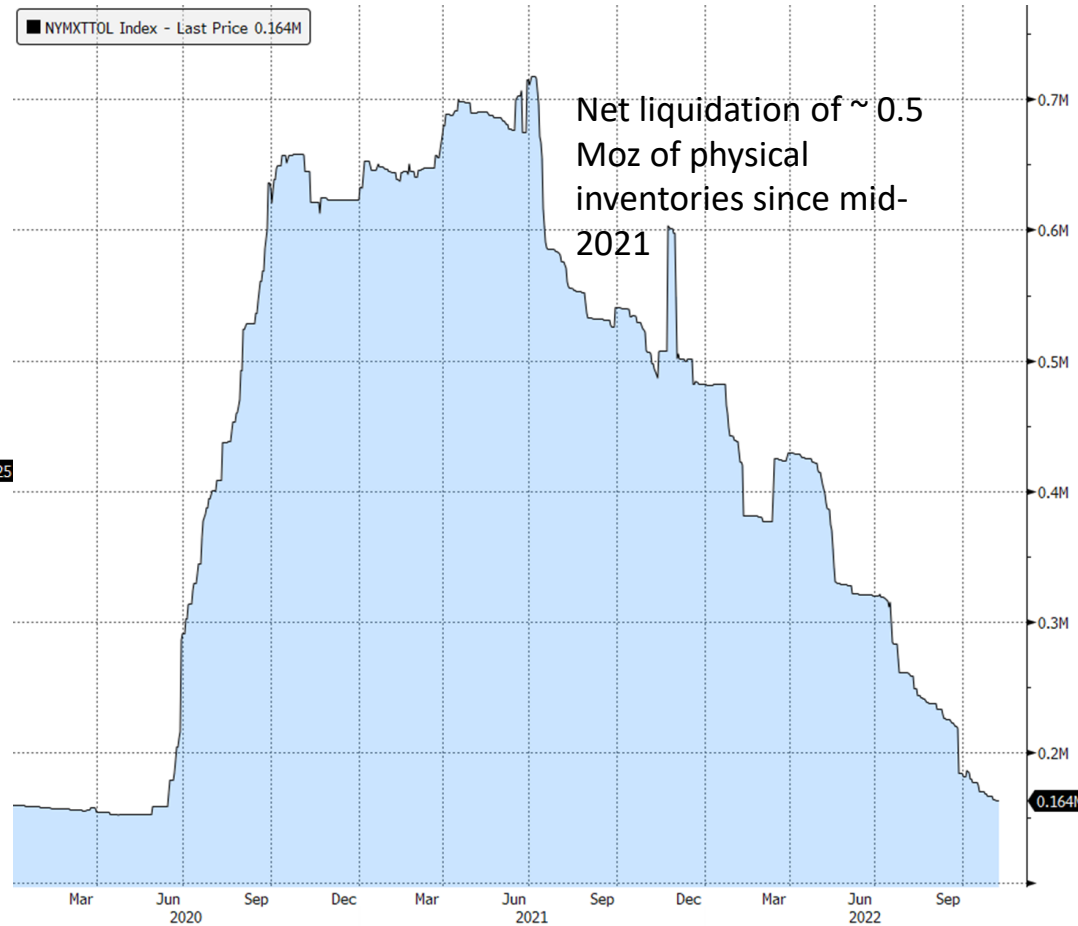
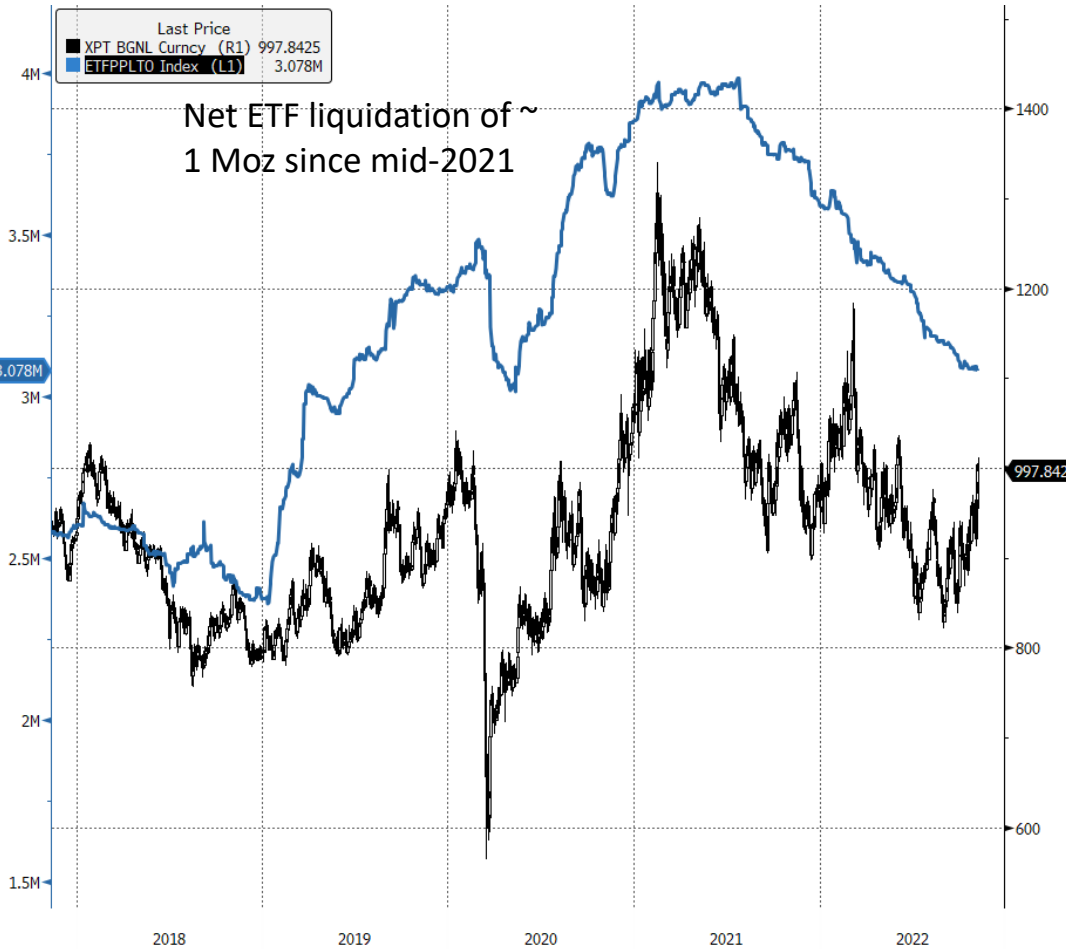
# Net Pt ETF and exchange disinvestment = movement to China

Platinum ETF holdings (toz)

Platinum (US\$/toz)

NYMEX physical platinum warehouse inventories (toz)

Source: Mitsubishi from various ETF providers / CFTC / Bloomberg Professional Service



# Palladium price performance

Palladium prices (US\$/toz)



Source: Mitsubishi from Bloomberg Professional Service

# Rhodium price performance

## JM Rhodium base prices (US\$/toz)



Source: Mitsubishi from Bloomberg Professional Service

## PGM Demand side: Autocatalysts



- Ongoing **supply chain issues** combined with **high inflation, high interest rates** and possible **economic slowdown**
- Platinum is benefitting from additional demand in the **heavy duty truck market** and from **substitution** in light duty gasoline
- Challenges on the horizon in the form of **new ICE car ban in Europe**, and **Euro 7** as well as the wider move to **electrify** the vehicle fleet

US new car inventories (thousands)

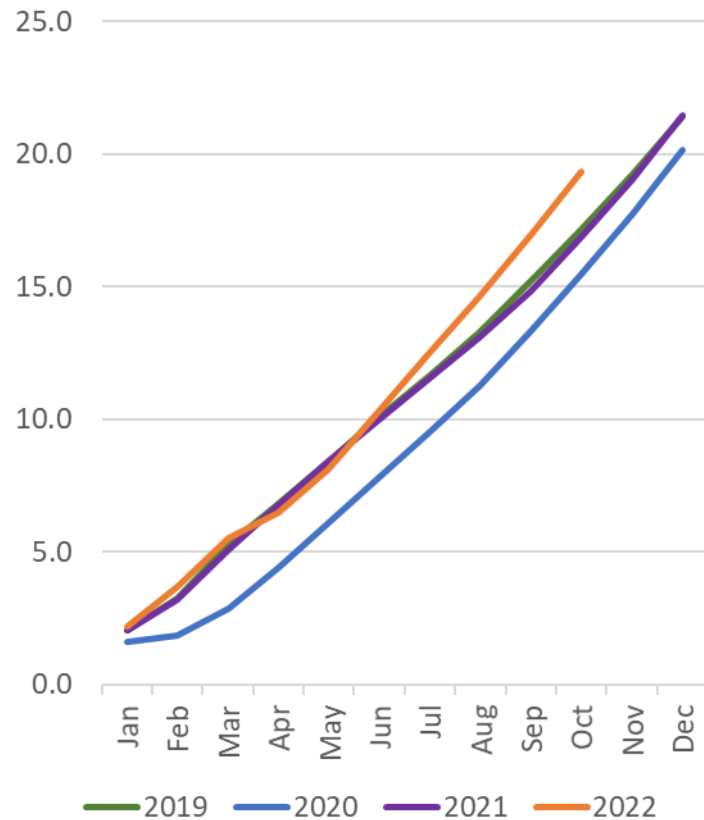




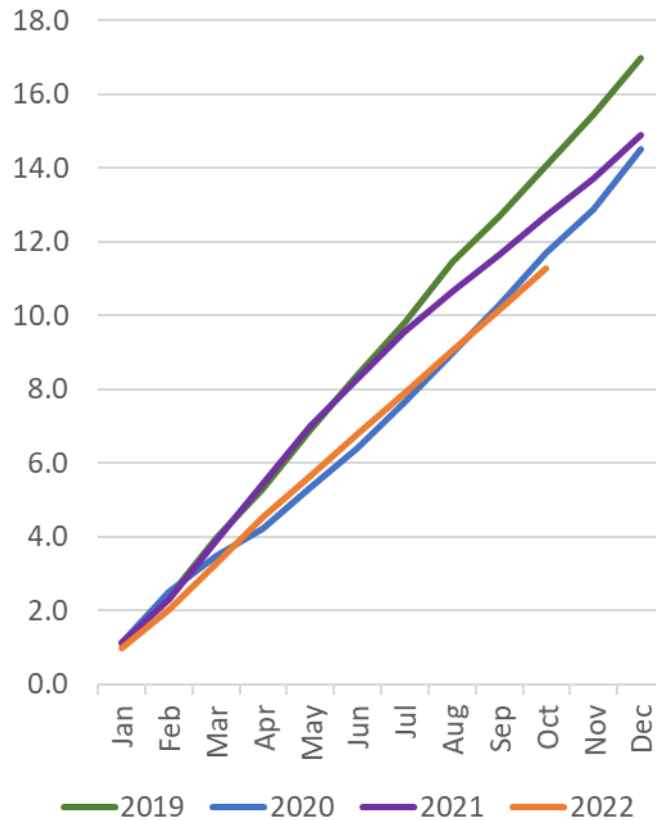
## Auto demand has recovered strongly in China, mixed elsewhere

Cumulative monthly car sales (millions) in selected markets

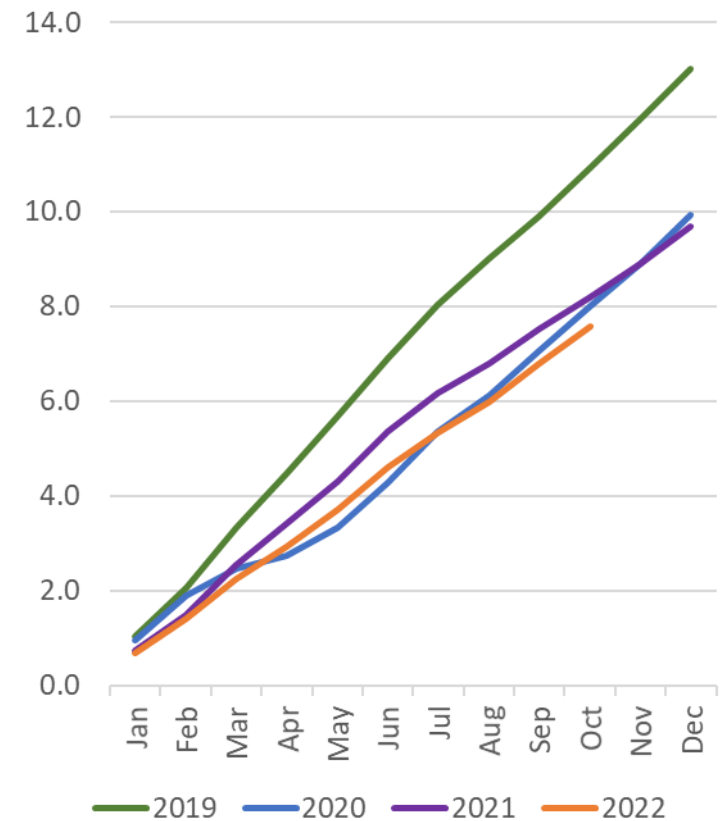
### China



### USA



### EU



Source: Mitsubishi from various national auto trade bodies, Bloomberg Professional Service

## Euro 7: Hot off the press – potential impact on PGMs

### STOP PRESS STOP PRESS STOP PRESS... NOV 10<sup>TH</sup> 2022 UPDATE

- **Euro 7** will take effect from July 2025 for cars and vans and July 2027 for heavy-duty vehicles. It represents the final generation of emissions rules before the phase-out of internal combustion engines, in the 2030s
- **NOx limits from diesel light duty** will be lowered to 60 mg/km (from 80 mg/km) – the same as for gasoline. There is no change for gasoline vehicles compared with Euro 6
- It will lower total **NOx** emissions from cars and vans by 35% compared to Euro 6, and by 56% compared to Euro VI from buses and lorries
- **Particulate matter** will be lowered by 13% from cars and vans, and 39% from buses and lorries

#### Potential impacts:

- Positive for PGM demand in **NOx control of light duty diesel** vehicles by bringing the NOx limits into line with those of gasoline vehicles
- Introduces emissions limits for **ammonia** for the first time (which require a small amount of Pt to reduce ammonia slippage from diesel SCR catalysts)
- Introduces tighter NOx, particulate and CO limits for **heavy duty vehicles**
- Removes **conformity factors** for both gasoline and diesel light duty emissions, so emissions limits have to be met under all driving conditions
- The rules are **less stringent than expected**, with no changes to existing Euro 6 limits on NOx and particulate numbers for gasoline vehicles and only really apply under extreme driving scenarios
- **It is widely thought to presage the phase out of ICEs and promote electrification, however OEMs have complained it diverts investment from electric powertrains**

PGM demand:

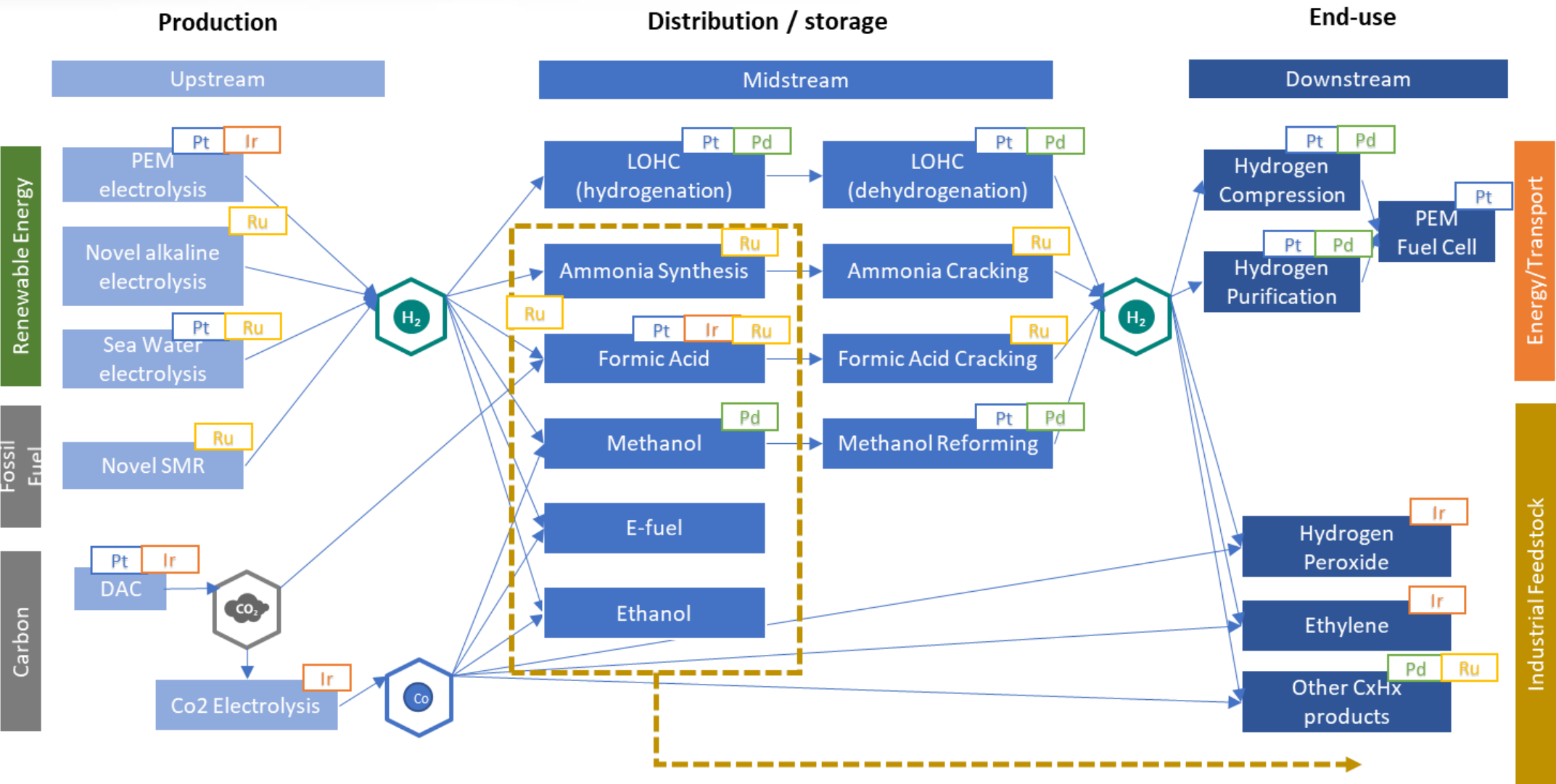


## 2035 ICE ban: the end game for PGM emissions control?

- On October 27<sup>th</sup>, the EU Parliament and member states agreed to require automakers to reach a **zero-emission target by 2035**. This effectively means a ban on new gasoline and diesel cars from that date – **the rules will also be subject to review in 2026**
- This will accelerate the move to pure electric vehicles **but also creates opportunities for hydrogen fuel cell vehicles** which have zero tailpipe emissions (other than water)
- There is a possibility that **e-fuels** (synthetic fuels manufactured from carbon and green hydrogen) could still be used post-2035, which would still require PGM emissions control, though such vehicles are likely to be niche
- The new rule is undoubtedly negative for PGM use in emissions control, but it is important to remember that the EU only represents around 15% of the global car market and uptake of such measures outside of Europe may be limited, at least by 2035. **California** is considering similar measures, though with a greater role for hybrids
- One possible impact of the new ICE car ban may be to keep **older** petrol and diesel cars on the road for longer, for reasons of affordability and consumer preference, resulting in distortions to the end of life vehicle **recycling** market and ultimately less PGM supply
- Note that this does not impact **heavy duty vehicles** and **non-road** engines which generally remain difficult to electrify, and in which hydrogen fuel cells are making inroads.



# Hydrogen: opportunities for PGMs



## Beyond 2023



### Challenges:

- **Palladium** and **Rhodium** demand are negatively and disproportionately impacted by electrification. **Euro 7** represents a mixed blessing
- Advent of **ICE car bans** lead to distortions in the used vehicle market, and ultimately secondary material recovery
- Material availability issues in **minor metals** (Ru and Ir) is felt as demand grows in new applications but supplies flatline



### Opportunities:

- **Platinum** moving into deficit, supplies remain constrained, demand side recovers with **greater interest from the hydrogen industry**
- **Outside of Europe**, automotive PGM demand recovers
- **Investor** interest picks up as demand side prospects and yield environment improves
- Inflation, rates and growth **normalise**, the start of a new economic cycle?