

PLATINUM QUARTERLY PRESENTATION Q4 2019

London

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AGENDA: PLATINUM QUARTERLY – Q4 2019, 2019 AND NEW 2020 FORECAST

1. Introduction

Paul Wilson, CEO

2. Platinum Quarterly, fundamentals review

Trevor Raymond

3. Focus on fundamental drivers

Trevor Raymond

4. Questions

Paul Wilson

Trevor Raymond



AGENDA: PLATINUM QUARTERLY – Q4 2019, 2019 AND NEW 2020 FORECAST

1. Introduction

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Supply, demand and balance: Q4'19, 2019f
update and new 2020f

Trevor Raymond, Director of Research

3. Focus on fundamental drivers

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4. Questions

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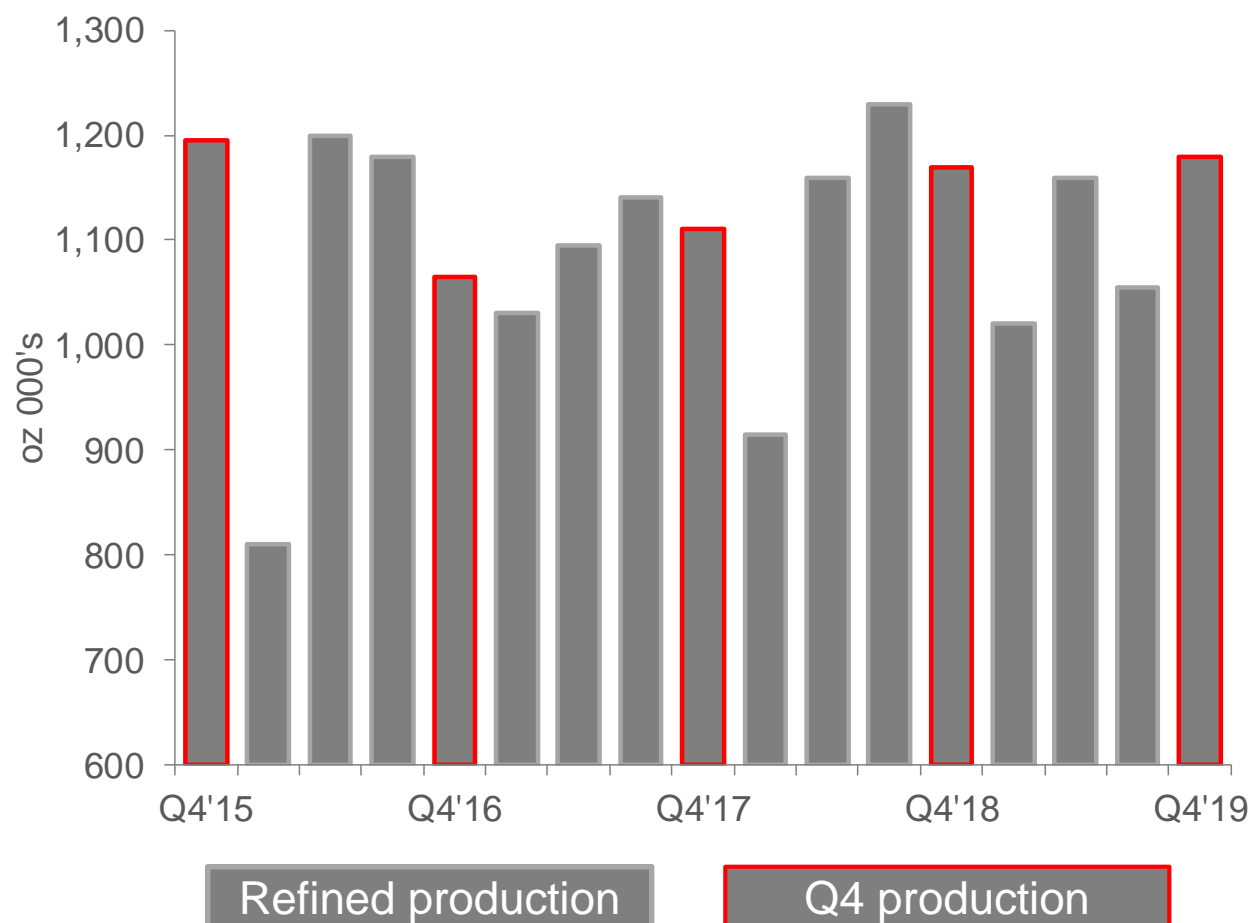
Q4 2019 SUPPLY: TOTAL SUPPLY UP 4% ON INVENTORY RELEASE AND HIGHER AUTOCAT RECYCLING

SUPPLY	Q4 2018 // Q3 2019		Q4 2019
Refined Production	1,565	1,465	1,570
South Africa	1,170	1,055	1,180
Zimbabwe	120	115	115
North America	90	80	95
Russia	145	170	135
Other	40	45	45
Inc(-)/Dec(+) in Producer Inventory	-20	-40	+40
Total Mining Supply	1,545	1,425	1,610
Recycling	495	500	505
Autocatalyst	380	385	390
Jewellery	115	115	115
Industrial	0	0	0
Total Supply	2,040	1,925	2,115

- South African refined production up 1% (10 koz) YoY
- Sales higher than refined production from 40 koz inventory release
- Recycling supply up 2% (10 koz) YoY despite very high palladium and rhodium prices
- Total supply up 4% (75 koz) YoY

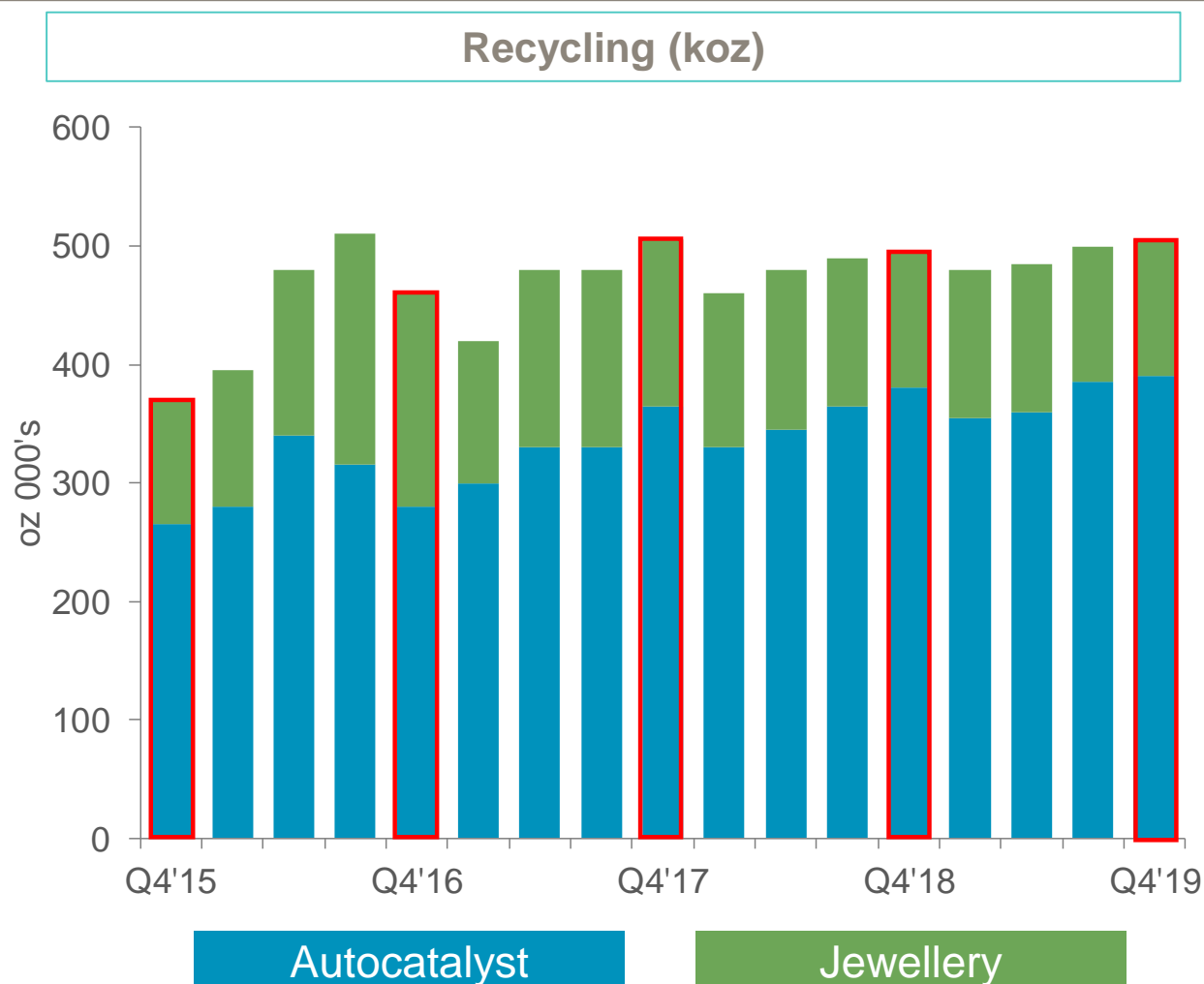
Q4 2019 MINING SUPPLY: STRONG SOUTH AFRICAN Q4 BUT FLAT YEAR-ON-YEAR

South African quarterly mining production (koz)



- South African mining production flat YoY
- Seasonally strong quarter as expected despite power outages
- Industrial action risk reduced as 3-year wage agreements signed by largest producers

Q4 2019 RECYCLING: JEWELLERY FLAT, AUTO INCREASE MODEST



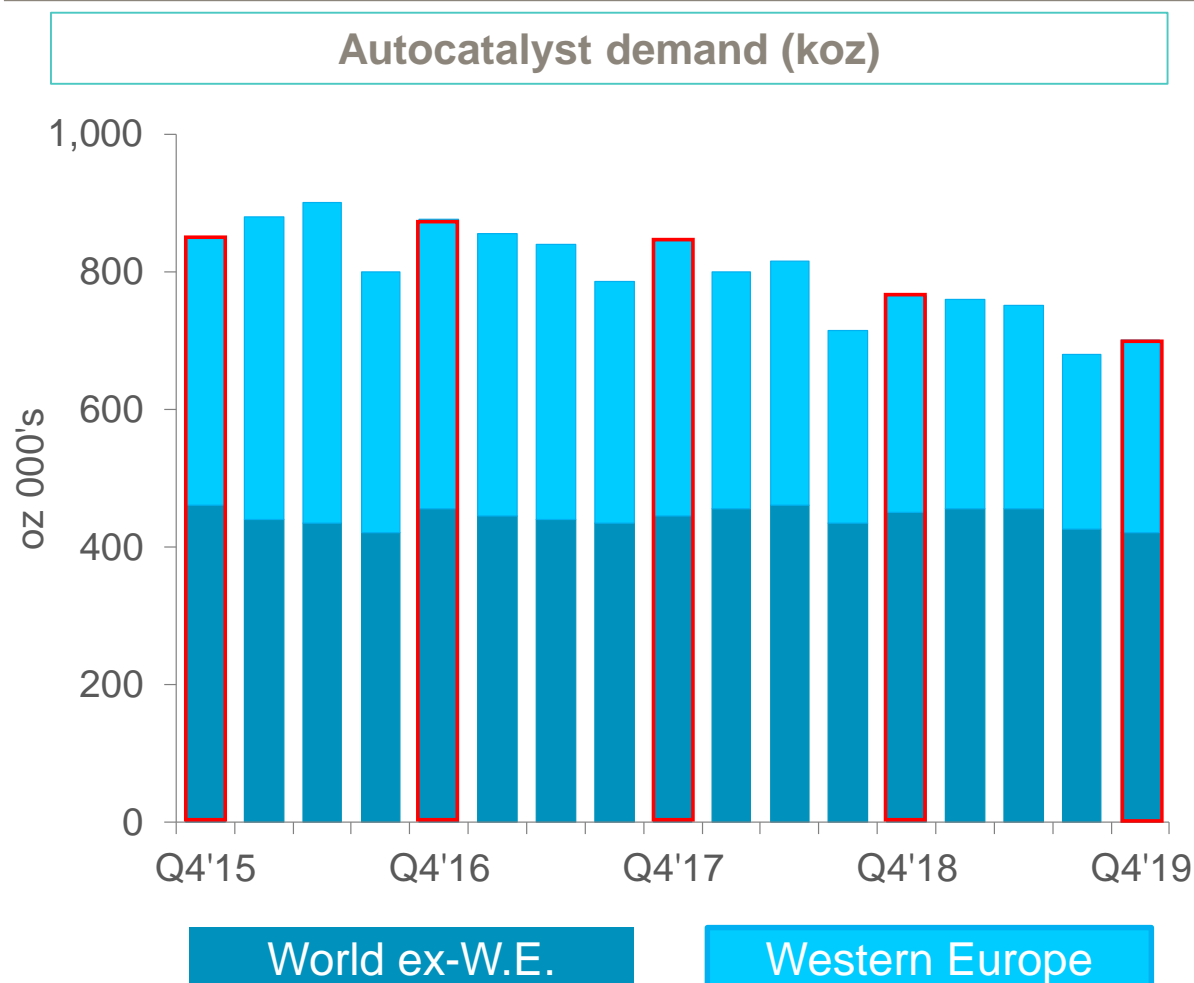
- Q4'19 recycling up 2% (10 koz) YoY
- Jewellery recycling flat YoY on low platinum price and weak jewellery sales in China
- Despite very high palladium and rhodium prices, autocatalyst recycling only up 3% (10 koz) YoY

Q4 2019 DEMAND: STRONG INVESTMENT DEMAND OFFSETS LOWER OTHER SEGMENTS

DEMAND		Q4 2018 // Q3 2019		Q4 2019
Automotive		765	680	700
	Autocatalyst	735	645	665
	Non-road	40	35	40
Jewellery		560	525	485
Industrial		490	475	465
	Chemical	135	175	145
	Petroleum	55	50	50
	Electrical	55	50	55
	Glass	65	65	35
	Medical & Biomedical	70	45	75
	Other	110	90	105
Investment		-65	230	80
	Change in Bars, Coins	50	35	40
	Change in ETF Holdings	-115	205	45
	Change in Stocks Held by Exchanges	0	-10	-5
Total Demand		1,750	1,910	1,730
Balance		290	15	385

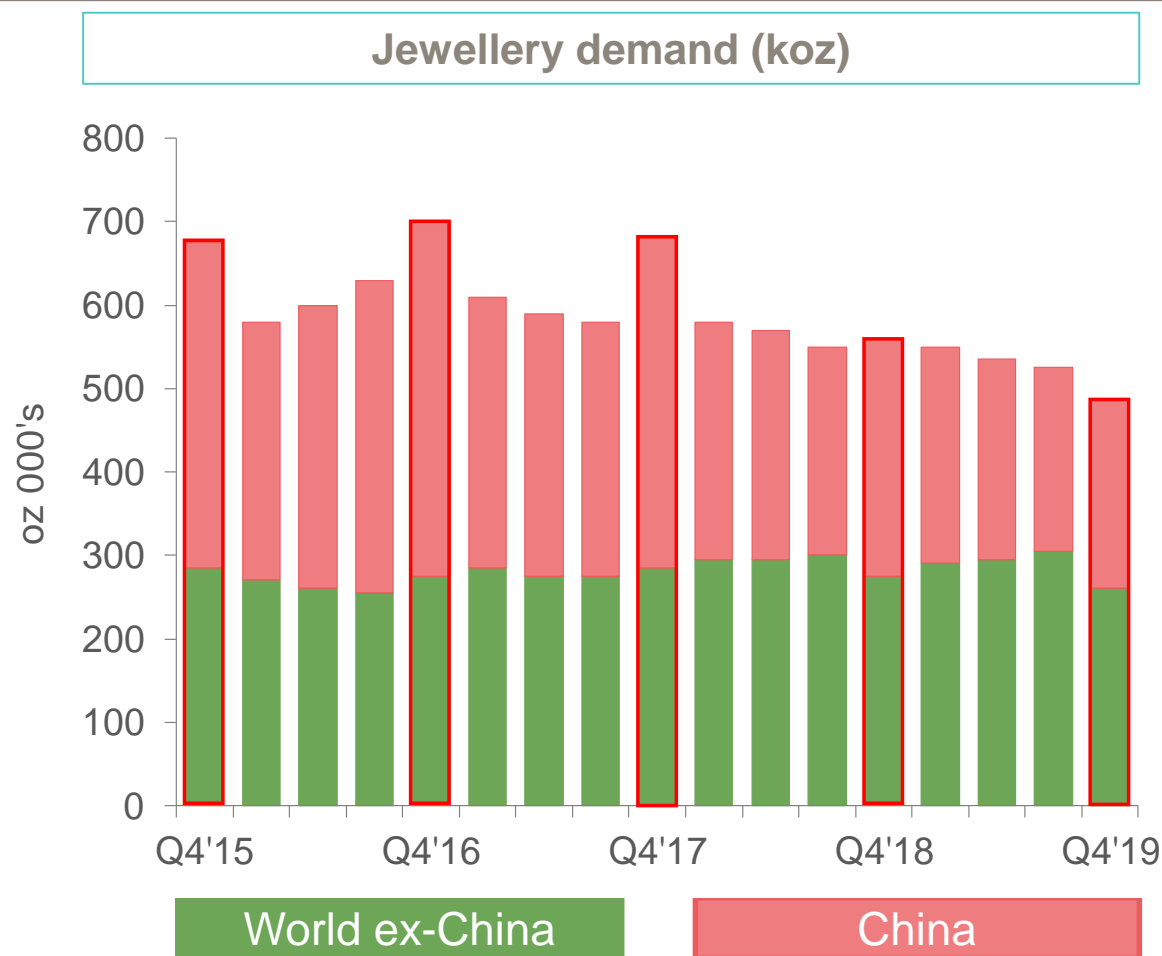
- Automotive demand down 8% (65 koz) YoY on reduced rate of decline in Western European diesel sales
- Jewellery down 13% (75 koz) YoY on weaker Chinese demand
- Industrial down 5% (15 koz) YoY on lower Glass sector demand
- Strong investment up 145 koz YoY
- Market surplus of 385 koz

Q4 2019 DEMAND: WESTERN EUROPE AUTOMOTIVE DECLINE CONTINUES BUT AT A SLOWER RATE



- Automotive demand down 8% (65 koz) YoY
- W. Europe diesel share decline slowed on increased evidence of cleaner diesel
- Diesel vehicles still key for automakers to avoid or reduce heavy CO₂ fines
- German diesel car market share recovering (2019 average up 1% to 33%*)

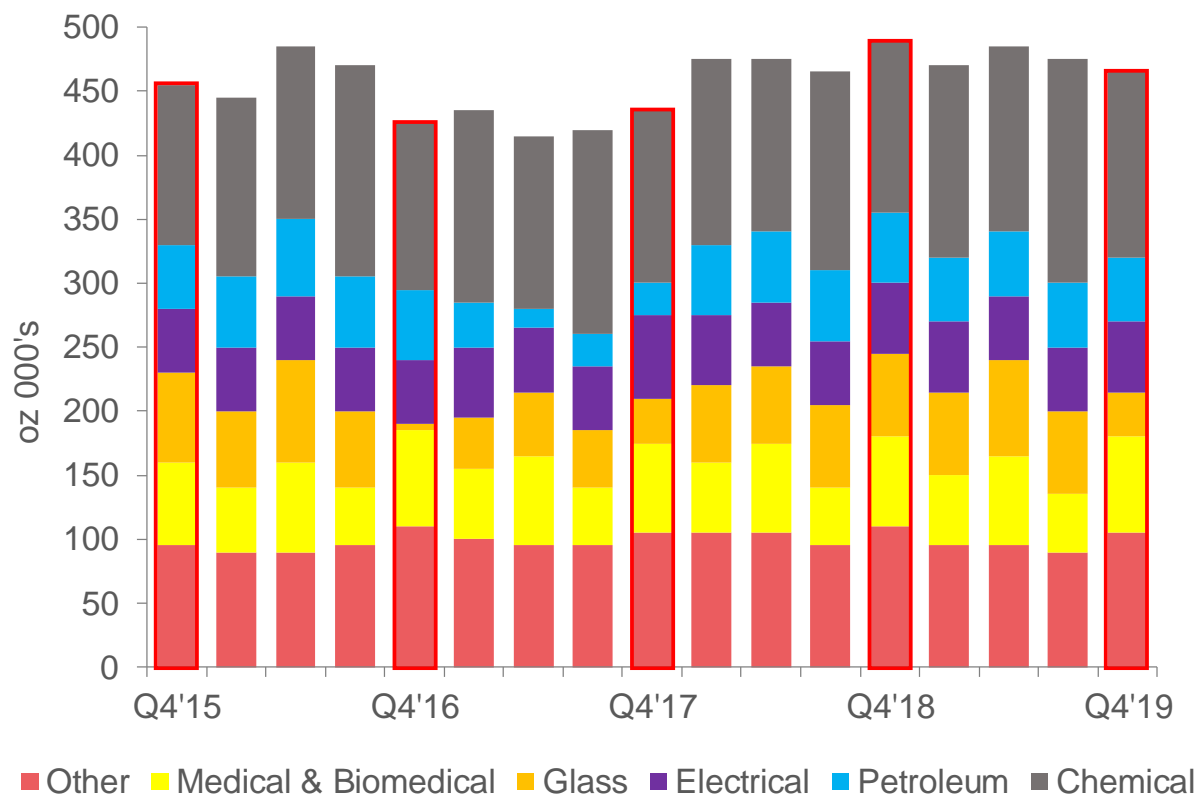
Q4 2019 DEMAND: JEWELLERY REMAINS WEAK IN CHINA – SOME GROWTH IN OTHER REGIONS



- Jewellery demand down 13% (75 koz) YoY as all jewellery segments in China fell
- Japan down 24% (20 koz) YoY on consumption tax change
- India strong despite economic slowdown

Q4 2019 DEMAND: INDUSTRIAL DEMAND STABLE, CHEMICAL UP, GLASS AND OTHER DOWN

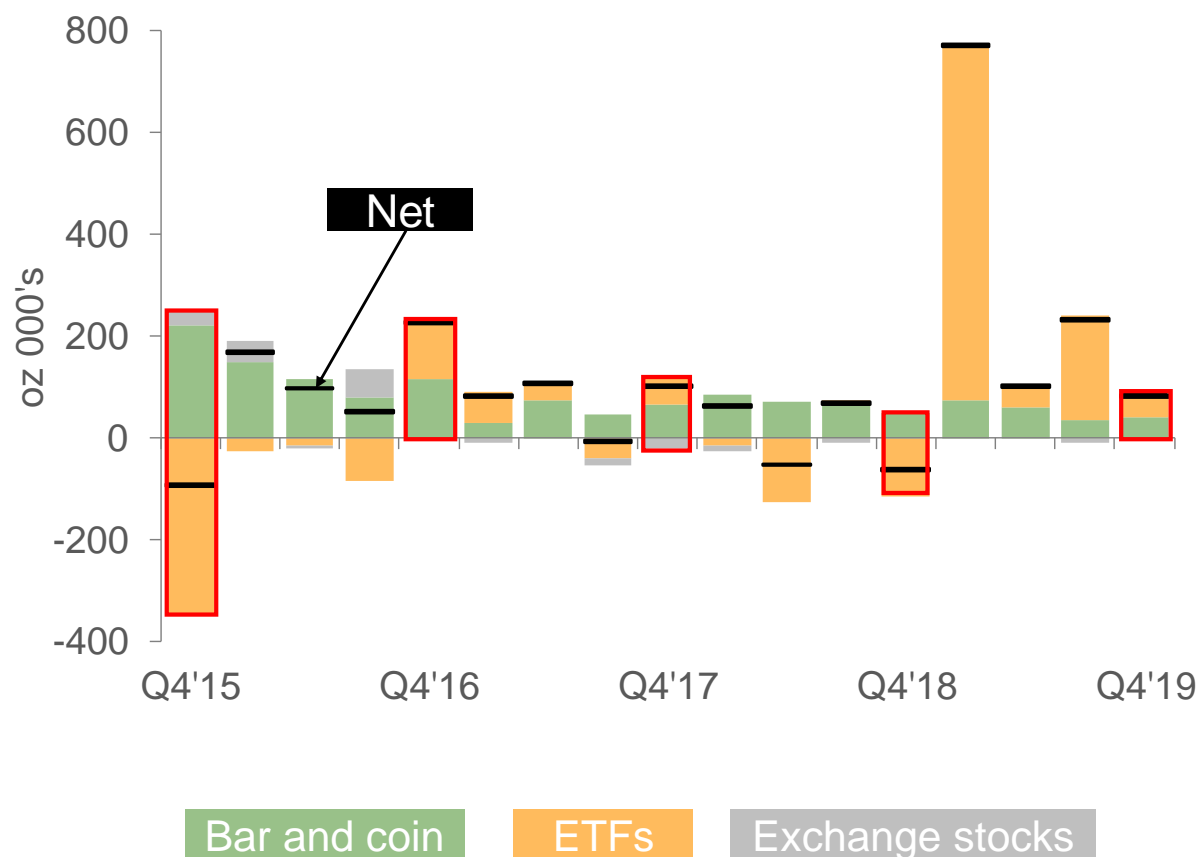
Industrial demand by category (koz)



- Platinum industrial demand down 5% (15 koz) YoY
- Weak glass demand as capacity build slowed

Q4 2019 DEMAND: STRONG INVESTMENT ON FURTHER ETF GROWTH AND FIRM BAR & COIN

Investment demand by category (koz)



- Investment demand of 80 koz in Q4'19
- ETF demand in Q4'19 of 45 koz, 2019 ETF purchases 985 koz
- Firm Q4'19 bar & coin demand of 40 koz

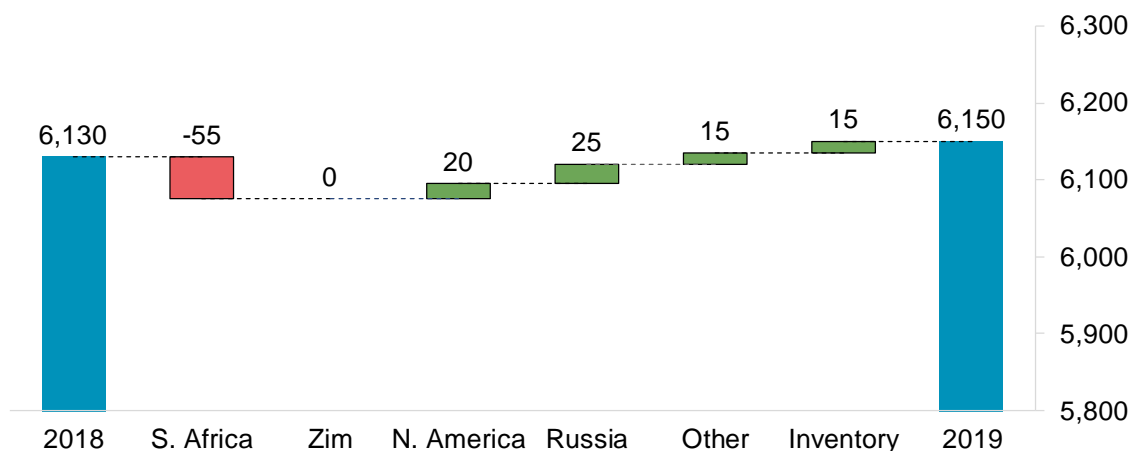
2019 FULL YEAR: FLAT SUPPLY, WEAK AUTO AND JEWELLERY, VERY STRONG INVESTMENT

SUPPLY		2018	2019	YoY, oz	YoY, %
Refined Production		6,120	6,125	5	0%
	South Africa	4,470	4,415	-55	-1%
	Zimbabwe	465	465	0	0%
	North America	350	370	20	6%
	Russia	665	690	25	4%
	Other	170	185	15	9%
Inc (-)/Dec (+) in Producer Inventory		+10	+25	15	150%
Total Mining Supply		6,130	6,150	20	0%
Recycling		1,930	1,975	45	2%
	Autocatalyst	1,420	1,490	70	5%
	Jewellery	505	475	-30	-6%
	Industrial	5	10	5	100%
Total Supply		8,060	8,125	65	1%
DEMAND					
	Automotive	3,100	2,890	-210	-7%
	Jewellery	2,245	2,095	-150	-7%
	Industrial	1,910	1,890	-20	-1%
	Investment	15	1,185	1,170	7800%
Total Demand		7,270	8,060	790	11%
Balance		790	65	-	-92%
Above Ground Stocks		3,160	3,225	65	2%

- South African supply down 1% (55 koz) on load shedding; North America supply up 6% (20 koz) on a project ramp up
- Total mining supply flat
- Recycling up 2% (45 koz) on higher autocatalyst offset by lower jewellery
- Total supply up 1% (65 koz) in 2019
- Total demand up 11% (790 koz) on investment demand surge (1,170 koz), partly offset by automotive and jewellery declines (-360 koz)
- Balanced market in 2019 (65koz)

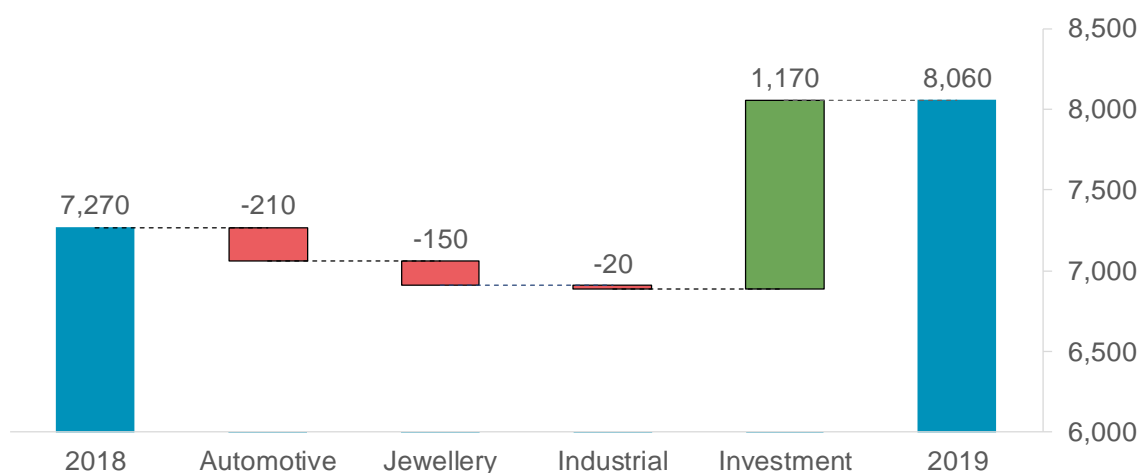
2019 FULL YEAR: SUPPLY UP 1%, TOTAL DEMAND UP 11%

Total mining supply 2018 to 2019 (koz)



- SA mine supply risks remain elevated due to Eskom power supply risk
- Labour tension has eased with wage agreements in place

Total demand 2018 to 2019 (koz)



- Record investment demand offset weak auto and jewellery

2020 FULL YEAR: CONSTRAINED SUPPLY IN 2020

SUPPLY	2020f
Refined Production	6,043
South Africa	4,332
Zimbabwe	473
North America	377
Russia	690
Other	171
Inc (-)/Dec (+) in Producer Inventory	+0
Total Mining Supply	6,043
Recycling	2,074
Autocatalyst	1,553
Jewellery	463
Industrial	58
Total Supply	8,117

- South African supply declines to 4,332 koz, on shaft closures, power outages expected to continue
- Russian production stable after planned smelter maintenance
- Autocatalyst recycling expected to remain high at 1,553 koz
- Jewellery recycling expected to fall on lower Chinese volumes

2020 FULL YEAR: PROJECTED SURPLUS OF 119 KOZ

DEMAND	2020f
Automotive	3,011
Jewellery	2,070
Industrial	2,284
Investment	633
Total Demand	7,998
Balance	119
Above Ground Stocks	3,651

- Strong automotive on China VI compliant heavy-duty and EU diesel cars
- Strong Industrial on glass capacity growth
- Investment demand 633 koz, 303 koz bar and coin, 330 koz ETF
- Market balanced (surplus 119 koz) in 2020

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Trevor Raymond

3. Focus on fundamental drivers

- Platinum substitution for Palladium
- More diesel cars in the EU
- More Platinum demand from retrofitting

Trevor Raymond, Director of Research

4. Questions

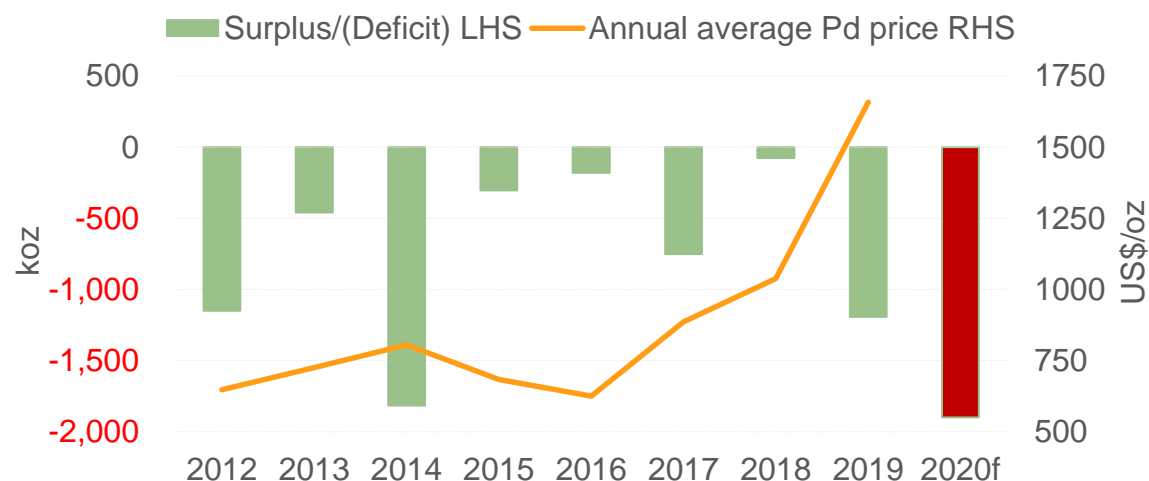
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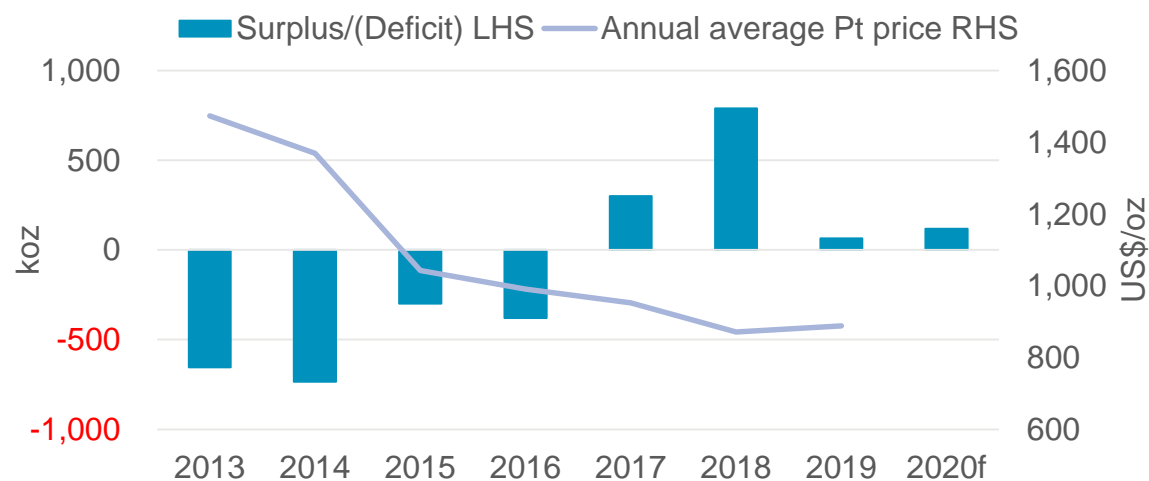


PALLADIUM DEFICITS ESCALATE - INCREASING THE LIKELIHOOD OF SUBSTITUTION BY PLATINUM

2020: 9th consecutive Pd deficit



Platinum remained balanced in 2019

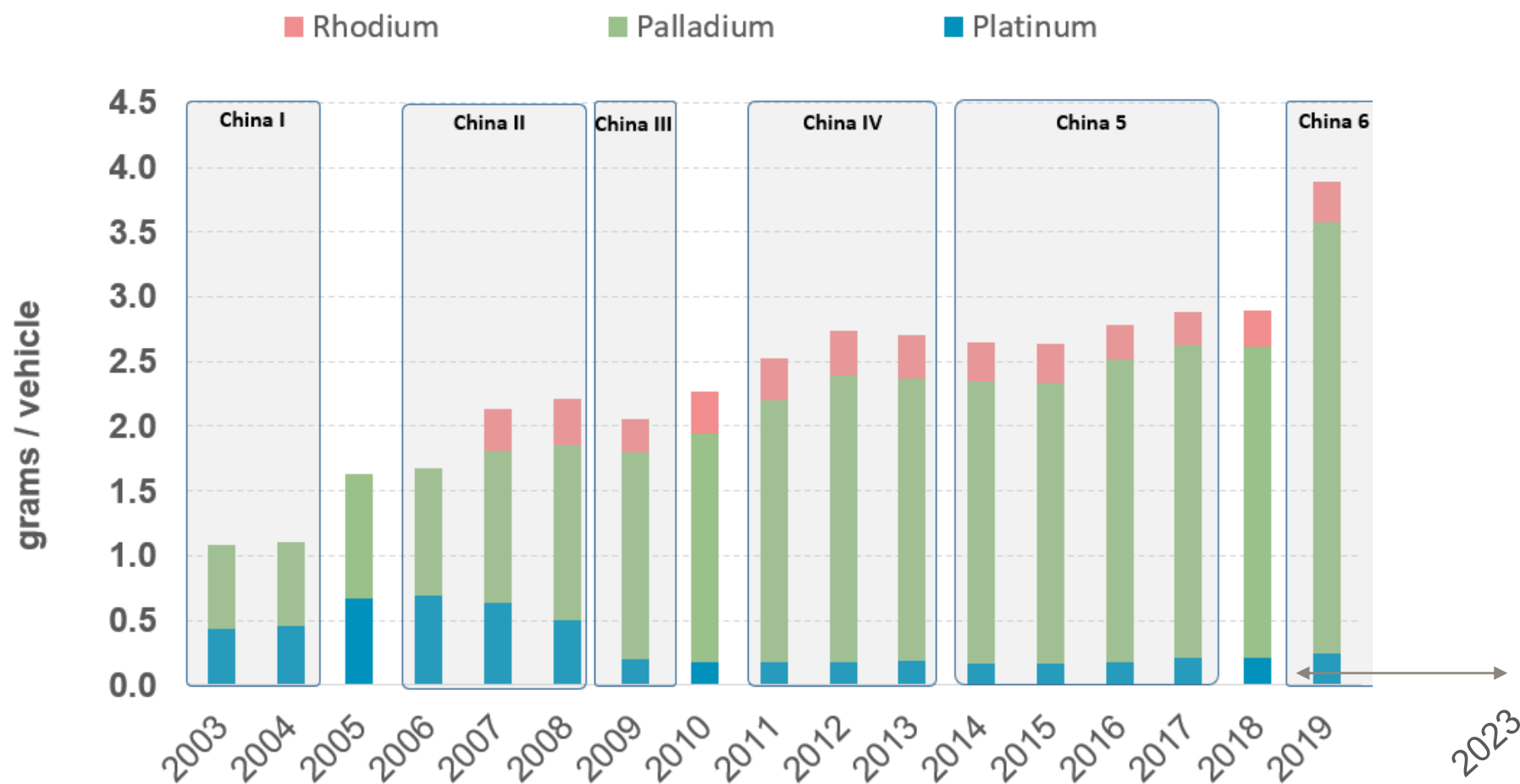


- Re-balancing between platinum and palladium markets highly likely
- 2019 palladium automotive demand up by 895 koz per annum to 9.7 moz
- Palladium supply up by 183 koz
- Forecast of 2020 palladium deficit:
 - Johnson Matthey: > 1.2 moz
 - Anglo American Platinum: 1.9 moz
- Platinum market balanced at historic low prices

PALLADIUM DEFICITS ESCALATE - INCREASING THE LIKELIHOOD OF SUBSTITUTION BY PLATINUM

China 6 implementation: step change in loadings

China per Vehicle PGM Loading

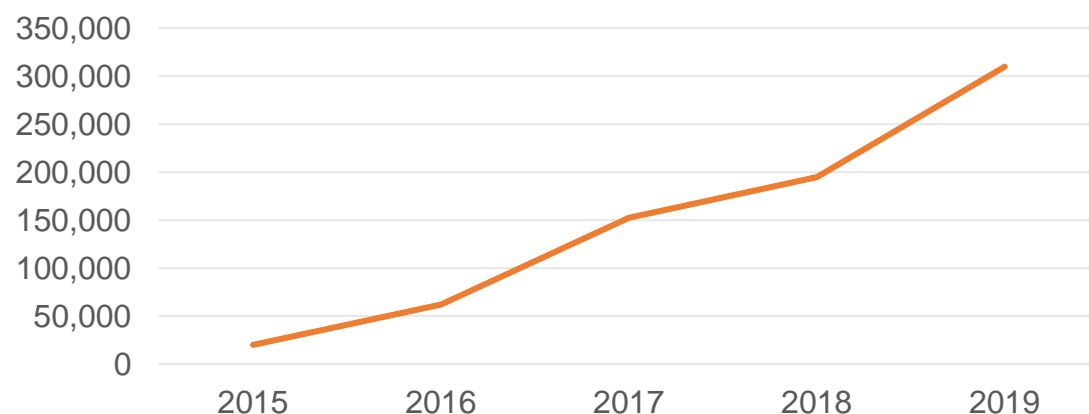


PALLADIUM DEFICITS ESCALATE - INCREASING THE LIKELIHOOD OF SUBSTITUTION BY PLATINUM

Palladium use in LNG Heavy Duty trucks



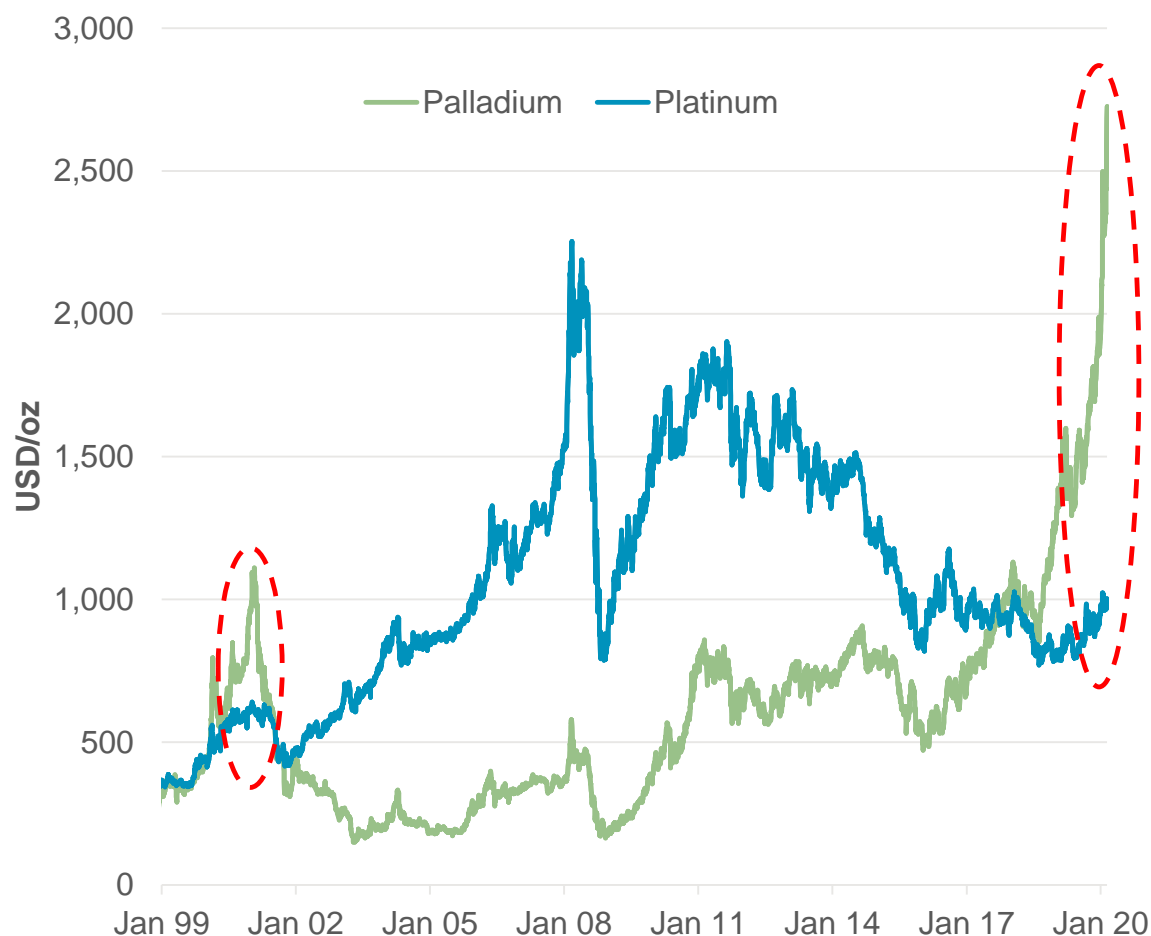
China LNG HD Truck fleet expansion



- c.150 koz more palladium demand from a surprise demand segment
- c.115,000 LNG fuelled heavy-duty trucks sold in 2019, compared to c.40,000 in 2018
- China 6 compliant LNG HD trucks loading of 2 oz per vehicle
 - Typical Pd Loading: 200g/ ft³ (car 30g/ ft³)
 - Class 7/8 Diesel Engine – 7.8 L (0.3 ft³ catalyst)
 - 60g (2 oz) per truck
 - 75,000 more trucks in 2019 = 150 koz

SUBSTITUTION BY PLATINUM TO BALANCE MARKETS – LESSONS FROM 2000

Platinum and palladium price (US\$/oz)



- In the early 2000s, price driven platinum substitution for palladium occurred at \$495/oz premium
- Palladium's premium to platinum averaged \$675/oz in 2019, and has averaged \$1,354/oz YTD 2020
- OEM forward book longer in 2017 than in 2000
- China OEM buying in SPOT market exaggerating price response

PLATINUM SUBSTITUTION FOR PALLADIUM – LOW TEMP GASOLINE AND DIESEL (WPIC PQ1'19)

Highest potential: Large gasoline engines, underfloor catalyst bricks and diesel



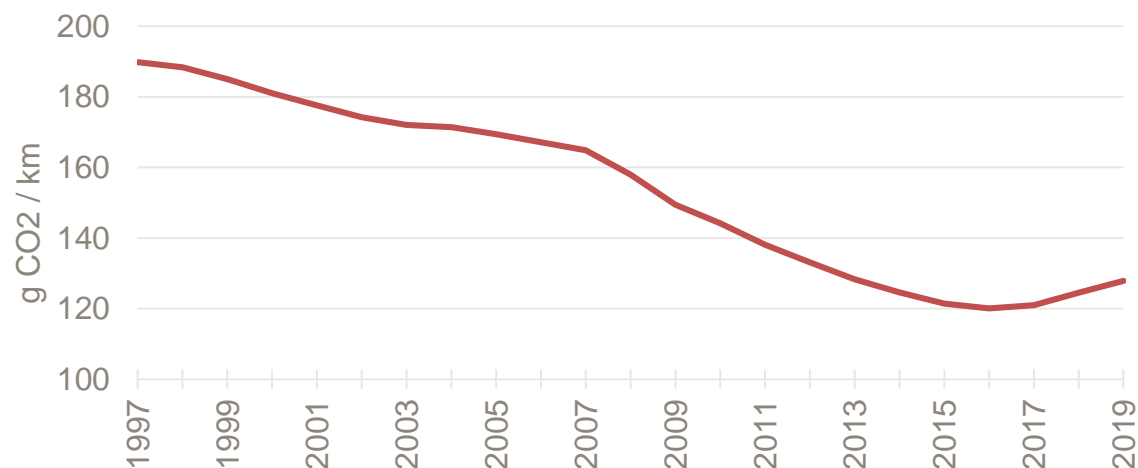
- Very low sintering risk in large US gasoline engines and underfloor catalyst bricks
- Ford “F150” type vehicle: 3m per year, 20% substitution = 180 koz
- Low wash coat thermal stability risk if less than 60% of palladium replaced
- Over 700 koz of palladium is used annually in diesel catalysis
- Diesel is the natural (and recent) home of platinum; reducing substitution risk and lead time for implementation

PLATINUM SUBSTITUTION FOR PALLADIUM – DATA NOT YET PUBLIC – DYNAMICS UNCLEAR

Common beliefs on substitution	Arguments against substitution happening	More positive views / additional insights
Automakers too busy with RDE and BEV to bother / too risky after Dieselgate	OEM engineers too busy to do substitution R&D. Challenges to ensure compliance. Improving / launching battery vehicles more important.	Euro 6 d already met from Sept 2017/2019. All OEMs have multiple BEV models already on sale. Solid state battery research – different engineers
Platinum does not work at high temperatures of new gasoline cars / not as simple as in the past	Platinum is not as stable as palladium and sinters (molecules join without melting) at high temperatures. It wont last 160,000 km and is too risky to try	When Pd was first used to substitute for platinum it improved thermal stability of the molecules in the washcoat but at only 20% Pd. This stability will not be lost if under 80% Pd substituted by Pt
Takes a long time with significant costs (R&D, retooling, re-certification) with high technical risk	To take a car already on sale and substitute all its palladium would take 1-2 years, R&D required - high risk of non-compliance, re-certification costs over €1m,	If Pt used for Pd while car is pre-launch: no retooling, no recertification, no R&D and weeks to months to implement. Highly confidential and proprietary. Fabricators may not disclose
The cost savings are insignificant and not worth the effort or risk	4g of palladium switched to platinum only saves \$150 per car and not worth the effort. Palladium shortages resolved soon anyway	8.4g (6g + 40% China 6) at \$900/oz Pt and \$2,400 Pd = \$405/car. Massive Pd substitution in 2000 for \$90/car and Rh substitution in 2007 for \$70/car
No need to as Russian supply growth / stock sales will meet shortage	High grade Nickel orebody at full capacity. Expansion is high capex and long lead time due to weather. Palladium fund can supply metal	Earliest meaningful expansion is 5 years+ Platinum can get to market far sooner to reduce OEM PGM costs. Pd fund competes for same metal
If they had done it they would tell us / announce it	All fabricators and OEMs agree that substitution is costly and slow. It will happen in the future	Johnson Matthey state some substitution in 2020 Pt demand. This was happening 2 years ago. Announcing will increase Pt price and harm OEM

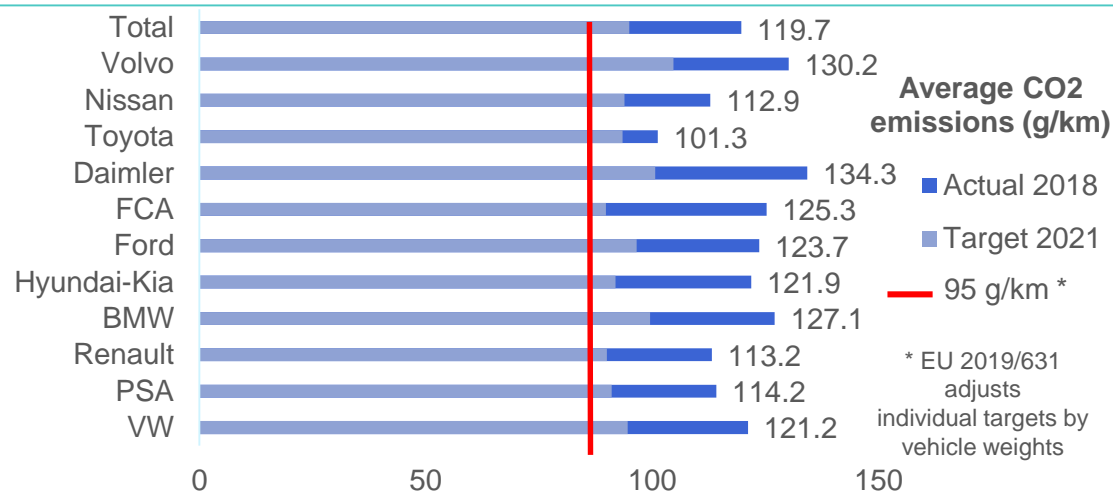
AUTOMOTIVE: EU AUTOMAKERS FLEET CO₂ EMISSIONS ARE INCREASING – FINES OF €14 BN - 34 BN PER ANNUM

UK average new car CO₂ emissions - registration weighted



- Average CO₂ per new car sold in the EU is increasing, as shown by UK data
- Limit of 95 g/km legislated in 2009 (EC443/2009)

Auto makers fleet emissions missing EU 2021 targets

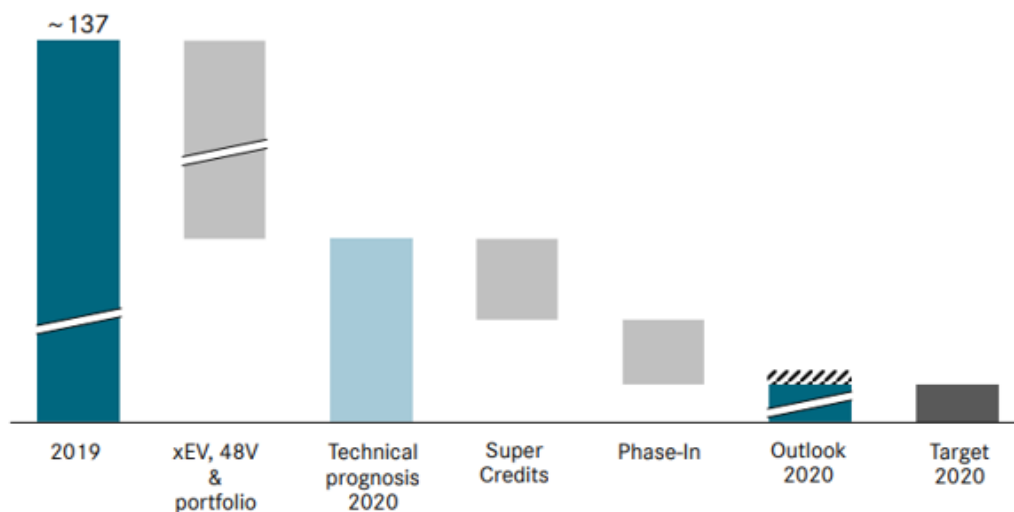


- Estimates of EU automaker fines from missed 2021 CO₂ targets:
 - €14.7 bn fines if an average 111.9 g/km CO₂ target is achieved (PA Consulting*)
 - €34 billion based on an EU fleet average of 119.7 g/km (JATO)

AUTOMOTIVE: DIESEL HYBRIDS A KEY PART OF DAIMLER PLAN TO REDUCE FLEET CO₂

Mercedes road map to achieving 2020 CO₂ target

ROADMAP EU CO₂ COMPLIANCE



- Daimler 2019 fleet CO₂ emissions:
 - 137 g/km ~ c.€3 bn fine under EU 2021 CO₂ emission regulations
- Plug-in diesel hybrids = key element of emissions reduction plan (e.g. Mercedes-Benz GLE 350de)
 - 4% (86 k sales) plug-in diesel hybrid sales would save c. €680 Mn in CO₂ fines

Key Regulation: (EC) 443/2009

- Applies a fleet emission target of 95 g/km
- Super-credits incentivize manufacturers to offer zero / low-emission cars emitting less than 50 g/km

AUTOMOTIVE: NEW MILD AND PLUG-IN HYBRID DIESEL MODELS ON SALE IN EUROPE TO REDUCE FLEET CO₂

New diesel models already on sale in the EU

Make	Model	Engine	PHEV	mHEV	CO ₂ g/km
Audi	Q7 Sport 45 TDI	3.0 L		✓	184
	SQ7	4.0 L		✓	200
BMW	X3 - xDrive20d,	2.0 L		✓	134
	3 series - 320d xDrive	2.0 L		✓	117
Daimler	C-Class - C300de EQ Power	2.0 L	✓		38
	E-Class - E300de EQ Power	2.0 L	✓		41
	GLE 350de 4 Matic	2.0 L	✓		29
Ford	Kuga Ecoblue Hybrid	2.0 L		✓	113
Hyundai	Tuscon 1.6 CRDi 2WD DCT	1.6 L		✓	114
	Tuscon 2.0 CRDi 4WD Auto	2.0 L		✓	147
JLR	Range Rover Evoque	2.0 L		✓	149
Kia	Sportage 1.6 CRDi	1.6 L		✓	129
Volvo	XC60 B4/B5	2.0 L		✓	151
	X90 B5	2.0 L		✓	156

- Many more diesels than expected have been launched recently
- More launches of new mild and plug-in diesel hybrids announced for 2020

Land Rover Evoque diesel mild hybrid SUV

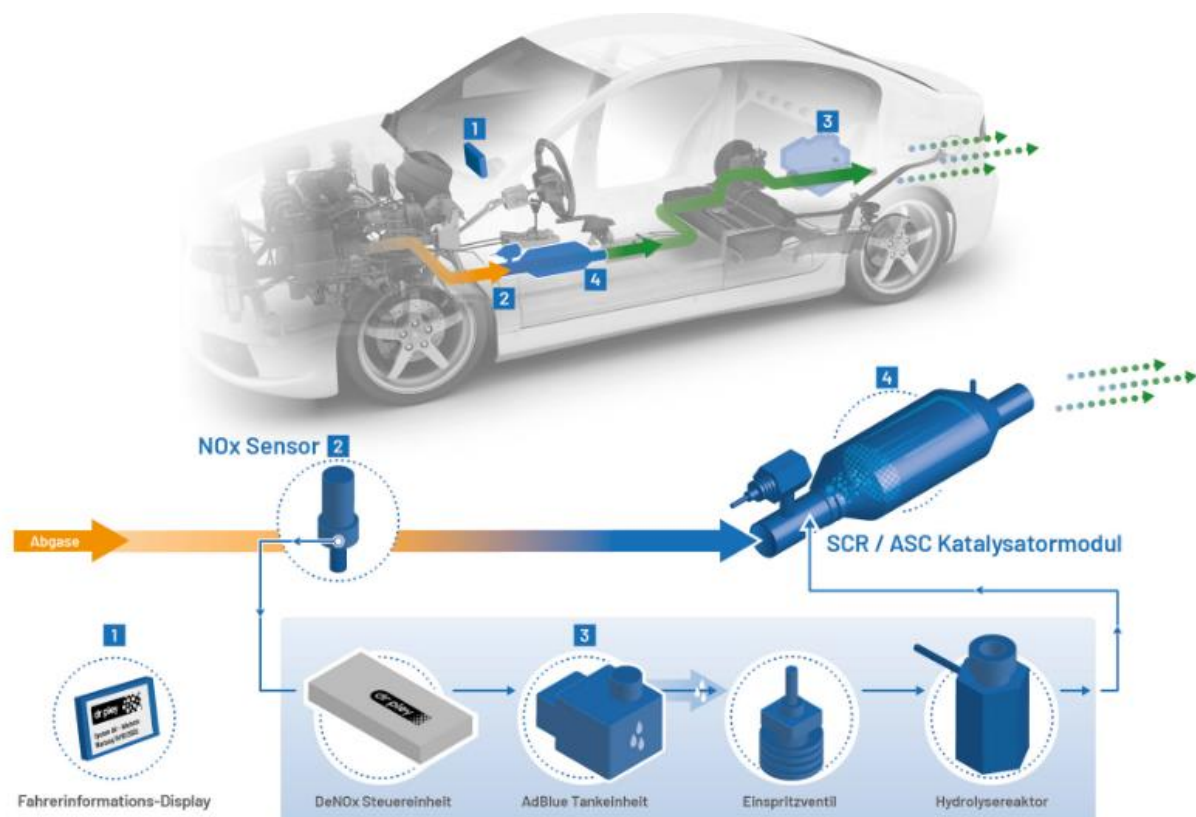


Mercedes-Benz GLE 350 de plug-in diesel hybrid



RETROFIT TECHNOLOGY SUITABLE FOR EURO 5 DIESEL LIKELY TO ADD TO PLATINUM DEMAND

'Add-on' SCR system by Bosal Retrofit GmbH



ASC = Ammonia Slip Catalyst

– Removes unprocessed NH₃, contains ~ 1g/retrofit

- Bans in German cities in place (Euro 4: Jan 19, Euro 5, Sept 19)
- EU public funds developed retrofit
- New German Federal Law – Access with ban in place if NO_x <270 mg/km
- New SCR system (plus ASC) added to existing LNT system for €3,200 per car – OEM funded in Germany

AIRTM
INDEX

BEST

0–80 A

80–168 B

168–270 C

270–600 D

600–ABOVE E

WORST

URBAN NO_x
mg/km



EURO 5 now - Also a solution for 40m EURO 6 high emitters on the road

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