

# Argus Rare Earths Monthly Outlook



## Outlook

### The month ahead

Spot prices for most medium and heavy rare earths climbed again in [REDACTED] with [REDACTED] adding 10pc on the month. The outlook for the month ahead is for further gains in average monthly values, with [REDACTED]

### The next 3-6 months

Prices for [REDACTED] in the medium term look set to [REDACTED] [REDACTED] should help to satisfy growing demand from [REDACTED]

### 12 months forward

In the longer term, prices for [REDACTED] used in [REDACTED] while other rare earths prices are [REDACTED]

### Neodymium prices

After stabilising between August and mid-October, spot neodymium prices [REDACTED]

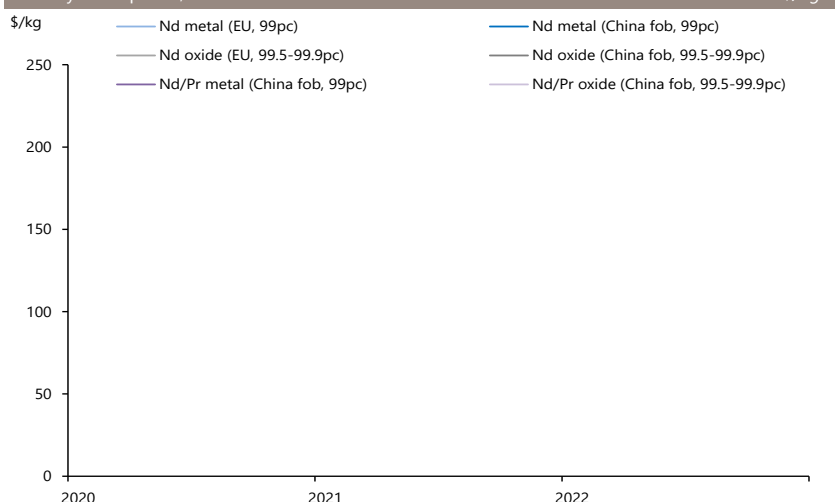
[REDACTED]

Europe, the neodymium oxide price was [REDACTED]

[REDACTED]

OUTLOOK: [REDACTED]

Neodymium prices, 2019-22



— Argus

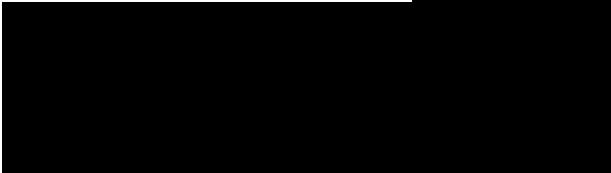
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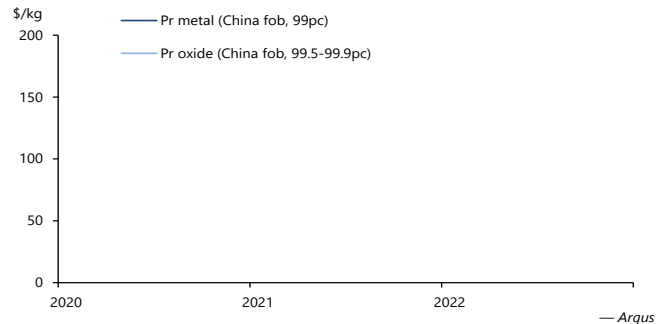
## International pricing series

### Praseodymium prices

Spot praseodymium oxide prices have

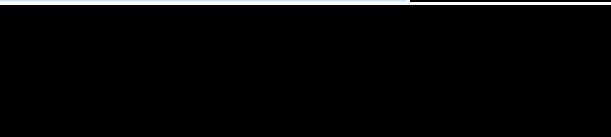


OUTLOOK:



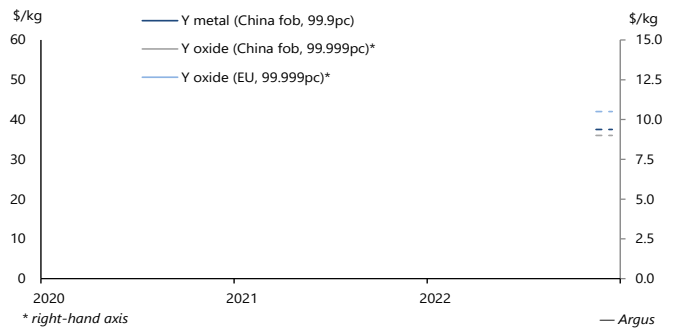
### Yttrium prices

Monthly average yttrium oxide prices



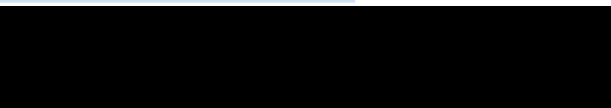
yttrium oxide in Europe was assessed 28pc higher at \$11-12/kg on 1 December.

OUTLOOK:



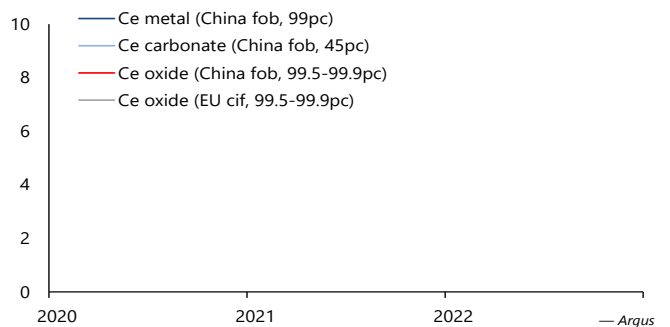
### Cerium prices

Chinese spot cerium oxide prices



on 1 December.

OUTLOOK:



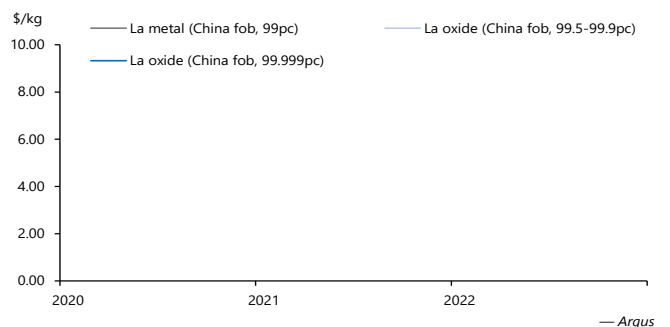
### Lanthanum prices

Lanthanum prices in China have



for the higher grade 99.999pc lanthanum oxide rose by 5.3pc to \$3.50-3.70/kg in December.

OUTLOOK:



## Price outlook

- January-November new energy vehicle sales in China were [REDACTED]
- The short-term future of Chinese ore feedstock imports is uncertain following reports of Omicron variant Covid-19 cases in Myanmar (Burma)
- China's January-November exports of rare earths totalled [REDACTED]

The rare earths market is expected to gain support this year from constrained supply of ore feedstocks and oxide products, and robust consumer demand, following rapid growth in the new energy vehicle (NEV) and wind power sectors.

Sustained capacity expansions by most magnet manufacturing plants — boosted by China's 2060 net zero carbon targets — are expected to [REDACTED]

Limited volumes of ore from Myanmar at the Yunnan-Myanmar border and low run rates because of a lack of feedstock and workforce shortages could continue to aggravate shortfalls and support the price rally for most medium and heavy rare earths this year, extending a trend seen in 2021.

But China's mining quotas for light rare earths, which rose for the fourth consecutive year from 2018, may increase by around [REDACTED]

The praseodymium-neodymium and gadolinium markets fell in the week beginning 10 January following price gains in the previous three weeks, pressured by a gradual cooling off of restocking demand and increased spot sales after Northern Rare Earth rolled over its neodymium and praseodymium-neodymium prices for January delivery. [REDACTED]

Argus assessed the range for 99pc praseodymium-neodymium oxide at Yn900,000-910,000/t (\$141,223-142,792/t) ex-works on 11 January, down from Yn900,000-920,000/t ex-works on 7 January. But prices were up from Yn890,000-900,000/t ex-works on 6 January. Export prices were assessed at \$141,000-142,500/t fob today from \$141,000-144,000/t fob on 7 January and \$139,500-141,000/t fob on 6 January, in line with the up and down movement in domestic prices.

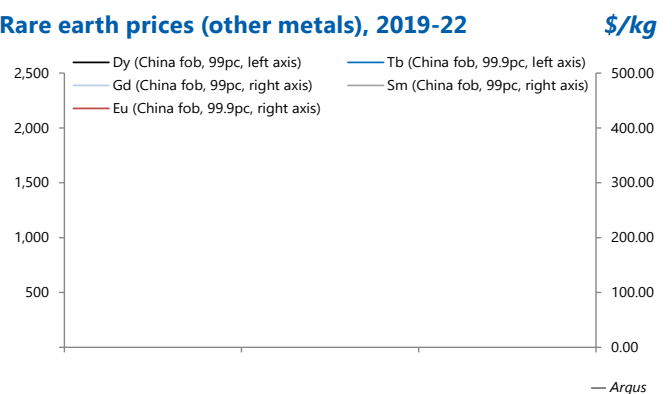
Prices for 99pc praseodymium-neodymium metal edged up to Yn1,130-1,150/kg ex-works on 11 January from Yn1,110-1,130/kg ex-works on 7 January and Yn1,090-1,100/kg ex-works on 6 January. [REDACTED]

The range for 99.5-99.9pc neodymium oxide climbed to Yn1,000-1,020/kg ex-works on 11 January from Yn1,000-1,010/kg ex-works on 6 January in response to tight spot availability. Export prices were assessed higher at \$156,500-159,500/t fob today compared with \$156,500-158,000/t fob on 6 January.

Prices for 99pc neodymium metal rose further to Yn1,240-1,260/kg ex-works on 11 January from Yn1,230-1,250/kg ex-works on 7 January and Yn1,210-1,220/kg ex-works on 6 January. [REDACTED]

Prices for 99.5-99.9pc praseodymium oxide stayed unchanged from 6 January at Yn900,000-910,000/t ex-works

Rare earth prices (other metals), 2019-22



on 11 January, while export prices remained flat at \$141,000-142,500/t fob.

Argus assessed prices unchanged from 6 January at Yn8,500-9,000/t ex-works for 99.5-99.9pc cerium oxide and Yn7,900-8,400/t ex-works for 99.5-99.9pc lanthanum, as major producers maintained their selling prices.

Prices for 99.5pc dysprosium oxide were assessed

The higher domestic prices boosted the export market, with the range for 99.5pc dysprosium oxide rising by \$12/kg from 6 January to \$470-476/kg fob on 11 January, while export prices for 80pc ferro-dysprosium also increased by \$12/kg to \$470-476/kg fob.

The range for 99.99pc terbium oxide

The higher domestic prices pushed up the export market, with prices for 99.99pc terbium oxide rising to \$2,010-2,050/kg fob on 11 January from the 6 January range of \$1,810-1,830/kg fob. Export prices for 99.9pc terbium metal moved up to \$2,545-2,585/kg fob from \$2,290-2,310/kg fob on 6 January.

The holmium market

The lower praseodymium-neodymium market and increased spot supplies pressured the gadolinium market, with prices for 99.5-99.9pc gadolinium oxide falling by Yn5/kg from 10 January to Yn505-515/kg ex-works on 11 January following sustained gains from the 6 January range of Yn480-490/kg.

Prices for 75pc ferro-gadolinium

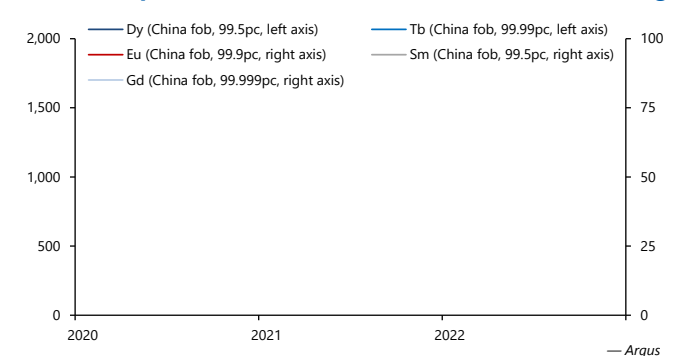
Northern Rare Earth has kept its list prices for January delivery of neodymium and praseodymium-neodymium unchanged from

Northern Rare Earth's subsidiary companies have been required to guarantee all of their oxide feedstock sales to its parent firm, which usually orders its long-term contracts at discounted prices instead of spot prices.

has reached an agreement with major steel mill

The higher feedstock costs are expected to narrow profit margins in the short term as spot prices for rare earth oxide and metal products started to stabilise gradually, with weaker buying activity after consecutive gains over the past few weeks.

Rare earth prices (other oxides), 2019-22



## Price table

Argus rare earths indexes (cumulative averages)					
Element	Units	Month index Dec 21	Moving quarterly average	Moving yearly average	Forecast Dec 22
<b>Cerium</b>					
carbonate min 45% REO fob China	\$/kg	0.65			
metal min 99% fob China	\$/kg	6.78			
oxide min 99.5-99.9% fob China	\$/kg	1.56			
oxide 99.5-99.9% cif Europe	\$/kg	2.70			
<b>Dysprosium</b>					
metal min 99% fob China	\$/kg	601.55			
oxide min 99.5% fob China	\$/kg	459.24			
<b>Europium</b>					
oxide min 99.99% fob China	\$/kg	30.50			
<b>Ferro-dysprosium</b>					
min 80% Dy fob China	\$/kg	458.96			
<b>Gadolinium</b>					
metal min 99% fob China	\$/kg	103.00			
oxide min 99.999% fob China	\$/kg	82.00			
<b>Lanthanum</b>					
metal min 99% fob China	\$/kg	6.60			
oxide min 99.5-99.9% fob China	\$/kg	1.49			
oxide min 99.999% fob China	\$/kg	3.60			
<b>Mischmetal</b>					
35% La 65% Ce fob China	\$/kg	6.70			
low Zn and Mg fob China	\$/kg	39.00			
<b>Neodymium</b>					
metal min 99% fob China	\$/kg	176.73			
oxide min 99.5-99.9% fob China	\$/kg	147.25			
metal 99% cif Europe	\$/kg	173.50			
oxide 99.5-99.9% cif Europe	\$/kg	141.50			
<b>Praseodymium</b>					
metal min 99% fob China	\$/kg	182.60			
oxide min 99.5-99.9% fob China	\$/kg	141.25			
<b>Praseodymium-neodymium</b>					
metal min 99% fob China	\$/kg	164.96			
oxide min 99% fob China	\$/kg	133.77			
<b>Samarium</b>					
metal min 99% fob China	\$/kg	21.00			
oxide min 99.5% fob China	\$/kg	4.75			
<b>Terbium</b>					
metal min 99.9% fob China	\$/kg	2,258.34			
oxide min 99.99% fob China	\$/kg	1,755.00			
<b>Yttrium</b>					
metal min 99.9% fob China	\$/kg	43.50			
oxide min 99.999% fob China	\$/kg	11.42			
oxide 99.999% cif Europe	\$/kg	11.50			

## Markets

Momentum is building to diversify and expand supply chains for [REDACTED]

Mining firm [REDACTED] which owns and operates the [REDACTED] in California, has announced plans to build a metal, alloy and magnet plant in [REDACTED]

[REDACTED] has also concluded a non-binding preliminary agreement with German magnetic material and sintered rare earth magnet producer [REDACTED] which announced plans to build a magnet plant in [REDACTED]

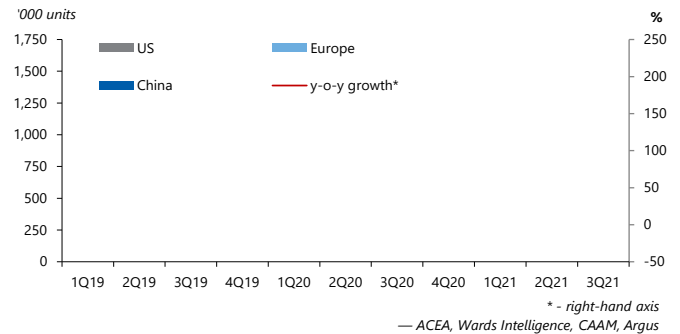
In Europe, Canadian specialty materials and bonded rare earth magnet producer [REDACTED] plans to expand operations at its [REDACTED] and build an alloy, metal and magnet manufacturing plant to supply the European automotive industry.

The initial magnet capacities being proposed are small. The production of 1,000 t/yr of sintered NdFeB magnets would only require around 300 t/yr of metal and 400 t/yr of oxide. By comparison, [REDACTED]

The biggest barrier to all rare earth magnet projects outside China is economic. [REDACTED]

Global quarterly EV sales, 2019-22

'000 units



standards may be the only way to break the deadlock that has stymied previous attempts.

The US was the largest buyer [REDACTED]

### EV outlook

The Chinese government will reduce its subsidies for NEVs by 30pc in 2022 and stop offering subsidies completely for NEVs from 2023. In 2022, [REDACTED]

China began to offer [REDACTED]

issued by the country's state council in October.

The country started to reduce its government subsidies for NEVs in the past few years in order to curb overcapacity, but in April 2020 it extended them for two years, until the end of 2022, and exempted the purchase tax on NEVs in 2021-22 to relieve the negative impact of the Covid-19 pandemic.

The reduction and cancellation of government subsidies in 2022-23 are expected to prompt NEV and power battery manufacturers to find other ways to reduce production and procurement costs for feedstocks, according to market participants.

China's NEV production and sales [REDACTED]

NEV output totalled [REDACTED]

China's NEV sales in November accounted for [REDACTED]

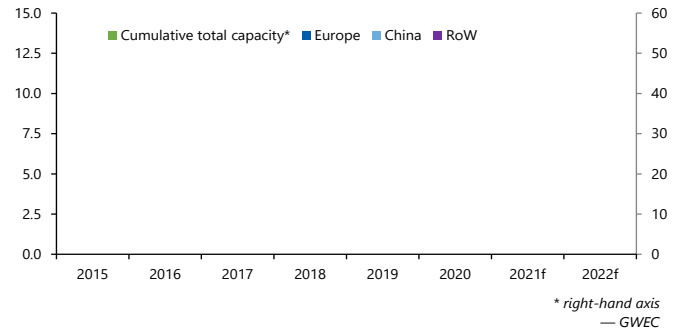
NEV output and sales [REDACTED]

US EV manufacturer Tesla's production [REDACTED]

In October-December, Tesla produced [REDACTED]

The US has been rapidly developing its EV industry after President Joe Biden took office. The Build Back Better infrastructure plan includes a federal tax credit of up to \$7,500 for each BEV and PHEV car purchased. The US has accelerated [REDACTED]

**Global offshore wind capacity additions, 2015-22** **GW**



**Offshore wind power**

Longer development timelines are shielding the nascent US offshore wind sector from the supply chain issues sparked by the Covid-19 pandemic that helped slow work on onshore renewable energy projects. As a consequence, the opening wave of US offshore wind farms appear to be on schedule, even as supply chain disruptions and higher prices for resources needed by wind and solar farms complicate development timelines inland.

"Offshore wind, by its nature, the way the project development timeline goes, is a longer-term horizon," [REDACTED]

That longer timeline is exemplified by utility [REDACTED], at present the largest [REDACTED]. Construction is scheduled for 2024-26. While the company has already placed orders with steel mills and equipment manufacturers [REDACTED]

While many onshore projects are pushing back construction schedules, a number of east coast states are still moving ahead with their offshore wind plans, with [REDACTED] each selecting another round of projects on 17 December. Other projects will likely follow in 2022, with the [REDACTED]

## Supply

The Chinese government has issued a raw material industry development strategy for its [REDACTED]

This is the first time Beijing has come up with a development plan for [REDACTED]

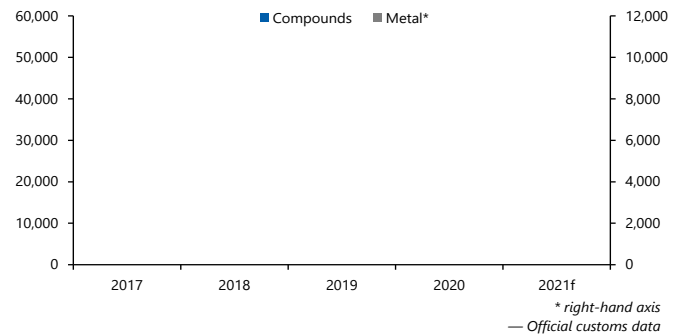
China aims to cultivate 5-10 leading enterprises with ecological leadership and core competitiveness [REDACTED]

China's state council on 23 December gave its approval for the country's major rare earth producers, Chalco and Minmetals, and the local government of Ganzhou city in south China's Jiangxi province, the main production hub for heavy and medium rare earths, to set up a new company called the [REDACTED]

The medium and heavy rare earths market is expected by market participants to benefit from the formation of the new company, as the three large-scale enterprises [REDACTED]

Major steel mill Baogang has [REDACTED]

Annual Chinese rare earth exports, 2017-21



Baogang owns the Bayan Obo mine in northern China's Inner Mongolia province, which is the world's largest rare earth mine. It sells its rare earth concentrates only to Northern Rare Earth, in which it holds a 30pc share.

Both sides have agreed to [REDACTED]

The selling price will be adjusted by Yn527.20/dmt for each 1pc of REO.

Baogang's total supply volume for [REDACTED]

Chinese metal processing producer [REDACTED]

increased its praseodymium-neodymium metal output to a record high this year in response to [REDACTED]

The firm lifted its praseodymium-neodymium metal output to over 10,000t in 2021, up by more than 10pc from nearly 9,000t last year, according to an official from [REDACTED]



[REDACTED]  
[REDACTED]  
[REDACTED] It has not disclosed more recent output figures.

[REDACTED] has confirmed the potential for its [REDACTED] [REDACTED] to produce key oxides of zirconium, niobium, hafnium and rare earths such as neodymium, praseodymium, dysprosium and terbium.

As part of its mine metals strategy for extracting, refining and manufacturing metals and alloys, the firm has completed an optimisation programme to produce critical metals, alloys and powders for advanced and clean technology applications and industries.

The project, which has received all regulatory approvals and is ready for detailed design and construction planning, can support [REDACTED]  
[REDACTED]  
[REDACTED]

While capital expenditure is estimated at A\$1.67bn (\$1.17bn) and operating costs are seen averaging A\$287mn/yr, gross revenues over the life of the project are expected to be around A\$15.8bn. Some of the funding is expected to come from [REDACTED]  
[REDACTED]  
[REDACTED]

Annual output is anticipated to be around [REDACTED]  
[REDACTED]  
[REDACTED]

A major goal of the project is to provide [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Rare earth project tracker					
Company	Mine	Country	Stage of Development	Resource (mn t)	REO (mn t)
Lynas Rare Earths	Mt Weld	Australia	Operating; NdPr output down 10pc to 1,255 in 3Q21 (Oct 21)	55.40	3.00
MP Materials	Mountain Pass	US	Operating; 18pc increase in output to 12,160t in 3Q 21 (Oct 21)	28.00	2.50
Rainbow Rare Earths	Gakara	Burundi	Operating; viability of 10,000 t/yr plant confirmed (Mar 21)	10.00	0.14
Northern Minerals	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Vital Metals	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Hastings Technology Metals	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Arafura Resources	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Iluka Resources	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Australian Strategic Materials	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Ionic Rare Earths	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Greenland Minerals and Energy	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Mkango Resources	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Peak Resources	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Pensana Rare Earths	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Rainbow/Bosveld Phosphates	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Rarex	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Steenkampskraal Holdings	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Torngat Metals	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Commerce Resources	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Namibian Critical Metals	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Search Minerals	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Texas Mineral Resources	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

## Trade

Chinese imports of rare earths from [redacted] in November after remaining at [redacted]. China also imported more US rare earth metal ore in [redacted].

China's imports from Myanmar rose to [redacted]. The average import price of \$39,500/t for November rose by 270pc from a year earlier and by 136pc from \$16,702/t in October.

[redacted] China's imports from Myanmar were expected to rise further in December, [redacted].

China's imports of US rare earth metal ores [redacted] for three consecutive months, [redacted]. China's January-November imports from the US [redacted] with the average import price of \$4,049/t [redacted].

China's exports of rare earths [redacted].

China's November rare earth [redacted] propelled by buoyant stockpiling demand from international consumers ahead of the Christmas and new year holidays.

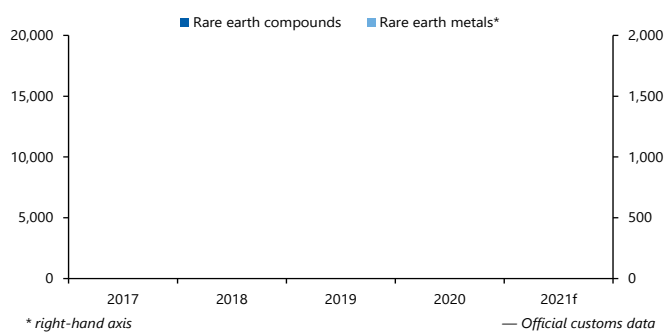
November shipments of [redacted] customs data show, signalling rapid growth in export demand from [redacted].

Stockpiling demand from international buyers has picked up since October, boosted by robust demand from [redacted]. This came after four consecutive months of declines since June, as international consumers had [redacted].

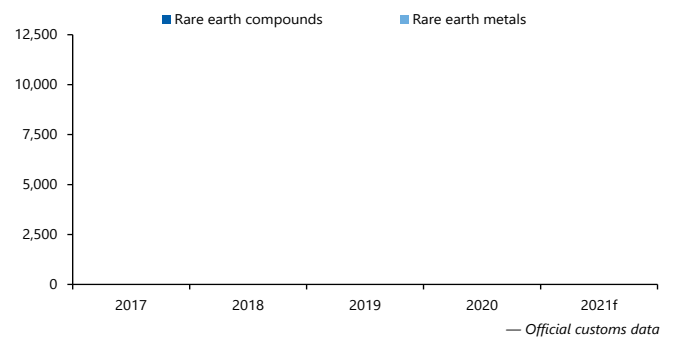
China's January-November exports [redacted]. Average export prices for January-November increased by [redacted].

Japanese imports of rare earth compounds in January-October increased by 33pc to 11.23mn kg compared to 8.45mn kg a year previously. [redacted].

Annual US rare earth imports, 2019-22



Annual Japanese rare earth imports, 2017-21



In October, [REDACTED] Total import costs for rare earth compounds [REDACTED]. Japanese imports of rare earth metals [REDACTED]. Total import costs for rare earth metals were [REDACTED].

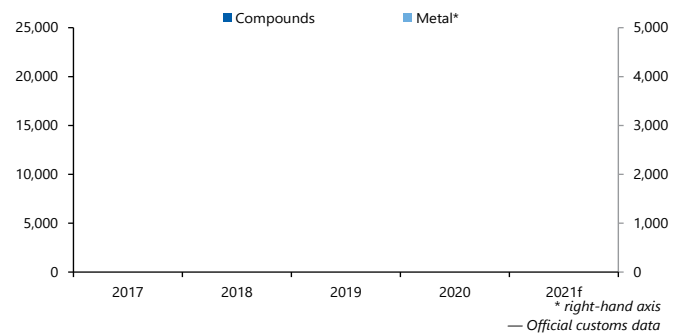
The US is the other major importing country [REDACTED].

Imports of rare earth compounds into the US [REDACTED]. Total import costs were \$109.7mn at an average value of \$10.95/kg. [REDACTED].

In October, the US imported [REDACTED].

**Annual EU27 + UK rare earth imports, 2017-21**

£



Imports of rare earth compounds into Europe (EU27 plus the UK) [REDACTED].

Rare earths compound imports increased to [REDACTED]. The total cost of imports was \$158.4mn, with an average cost of \$9.05/kg. [REDACTED].

The region imported 1.79mn kg of rare earth compounds in October (96pc up on the same period in 2020), with import costs [REDACTED].

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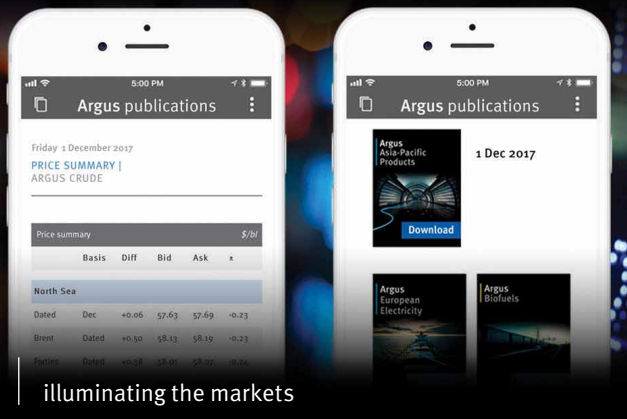
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