INDEPENDENT CAPITAL GROUP

NATURAL RESOURCES

MARKET UPDATE





August 2023

Natural Resources
Executive Summary

INDEPENDENT CAPITAL GROUP

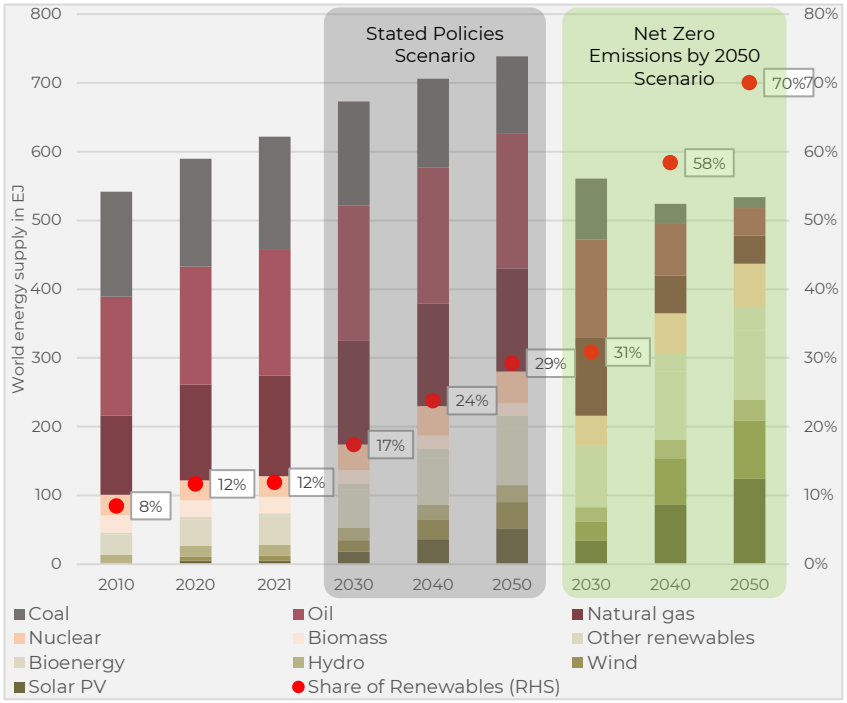
- The world is being redefined after the challenges of the last few years. In this new world order, there is a renaissance of "old" industries, because the digitalization of **the "new" world needs a lot of resources**
- The world is currently **short in all forms of energy** – the digitalization of the world is especially dependent on electricity and raw materials. **We still live in a material world**
- As the global economy grinds against physical commodity constraints, it creates physical pricing pressures that will result in the **next commodity supercycle**
- After years of underinvestment in the whole commodity supply chain, **there is a significant commodity supply risk** that has become visible right now with the current supply shock caused by Russia and the pandemic
- **Fossils** represent today 80% of our primary energy consumption and **are too important to be ignored** if we want to get a smooth energy transition
- An energy system powered by clean energy technologies needs a lot of raw materials. **Metal demand for clean energy technologies would rise at least 4x by 2040** to meet climate goals, particularly EV-related metals

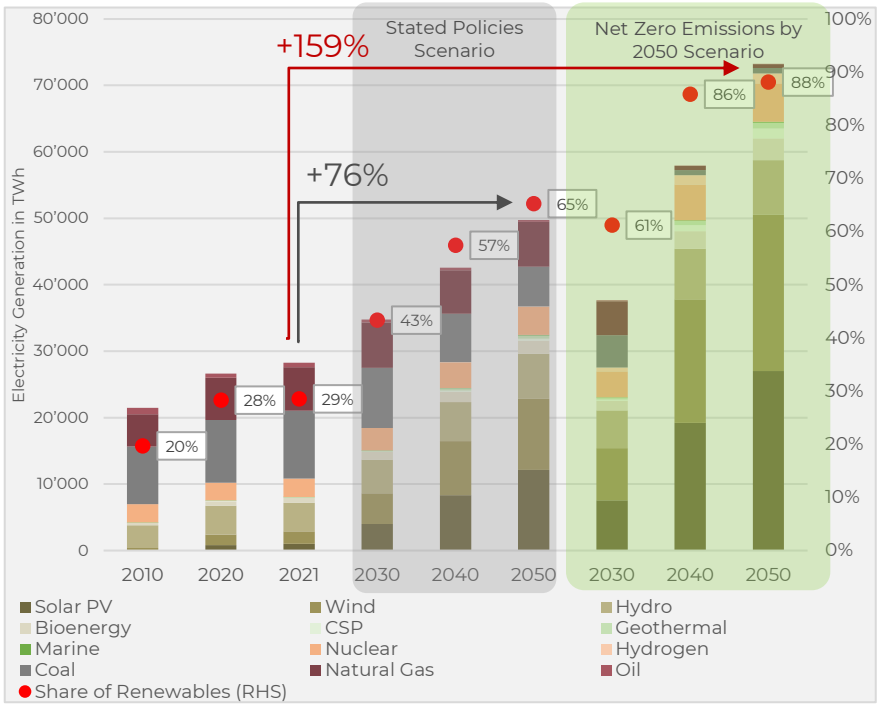
New energy order

No digital world without an «old» economy revival

- The world is being redefined after the challenges of the last few years. In this new world order, there is a renaissance of "old" industries, because the digitalization of the "new" world needs a lot of resources
- Structural under-investment in the "old" economy due to a decade of poor returns, particularly in energy where ESG issues have further reduced investment, leaving inadequate production capacity to meet the increasing need for electricity and infrastructure
  - *However, we still live in a material world. Energy is the bedrock of modern civilization!*
  - *Fossils resp. crude oil, natural gas and coal make up 80% of our primary energy consumption today*
- They are too important to be ignored if we want to get a smooth energy transition and bridge the gap between now and a renewable future. Otherwise, we fear it is likely to get worse before it gets better

We may reduce primary energy consumption worldwide but there is an important increase in electricity need, independent of the scenario





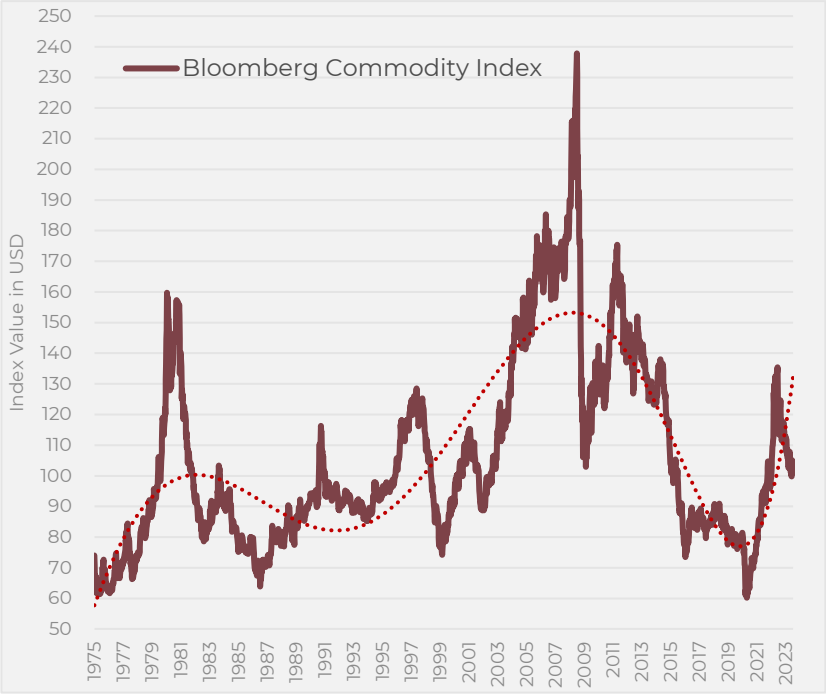
IEA **Stated Policies Scenario**: which looks not at what governments say they will achieve, but at what they are actually doing to achieve the targets and objectives they have set out and assesses where this leads the energy sector. IEA **Net Zero Emissions by 2050 Scenario:** maps out a way to achieve a 1.5 °C stabilization in global average temperature and meet key energy-related UN Sustainable Development Goals

Sources: Bloomberg, IEA, WEO 2022, ICG data

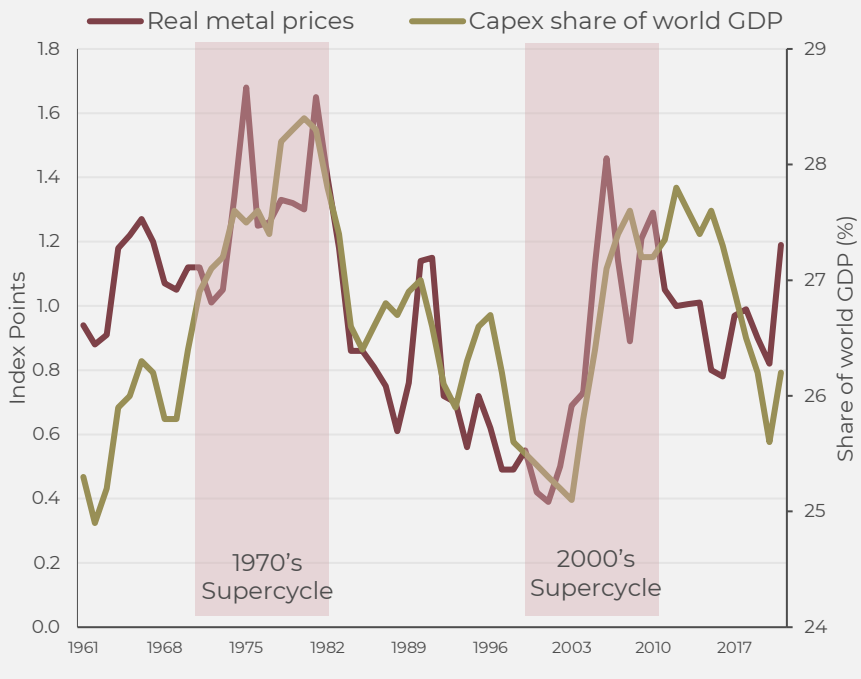
Why commodities?
A new supercycle on the horizon

- We have a global economy where the US is accelerating above capacity and China is accelerating far below capacity, but at an increasing rate. This setup, however, is occurring in the context of late cycle inventories and exhausted spare capacity, but accelerating demand growth that is below trend
  - *When China pushes demand above supply, the system will likely bump into capacity constraints on supply and inventories, recreating classic late cycle strong returns*
- As the global economy grinds against physical commodity constraints, it creates physical pricing pressures
  - *It's no coincidence that the last two supercycles corresponded almost precisely to the two largest global capex cycles in the last 70 years*

Commodity prices are back to levels seen after the GFC or before the last commodity supercycle



Commodity supercycles correspond to large capex cycles

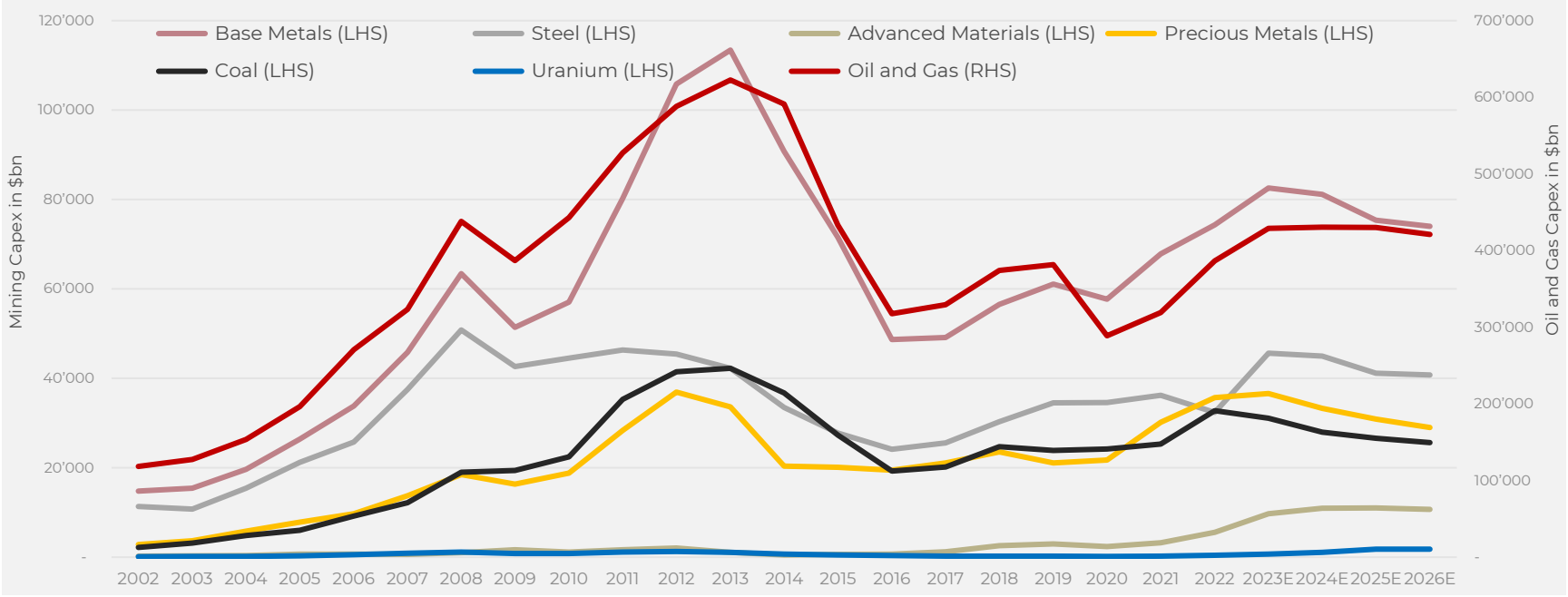


Sources: Bloomberg, OEC, Credit Suisse, Goldman Sachs

Commodity supply risk
Underinvestment remains

- Demand weakness can relieve the symptoms of underinvestment but cannot cure the underlying illness of inadequate production capacity
- Only large-scale capital investments into commodity production capacity can debottleneck the system and provide excess capacity that will cure the illness
  - *Unfortunately, the exact opposite has occurred over the past two years. Despite the sharp rise in commodity prices, capex in both energy and metals has fallen, not risen, exacerbating the problem*
- The current high costs of capital reflect the better returns in the physical economy and the need to attract capex to expand production capacity, which is where we are today
  - *The old carbon economy still needs investment until the green transition is complete, otherwise the global economy risks hitting capacity constraints on growth*

Capex across commodities still relatively low despite higher commodity prices



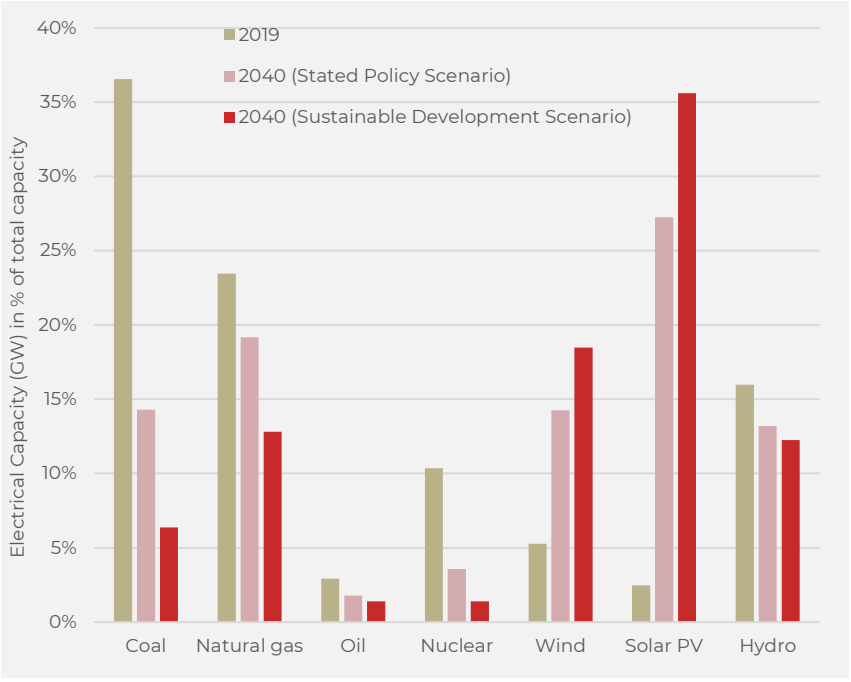
Sources: Bloomberg, Goldman Sachs, ICG data

Decarbonization

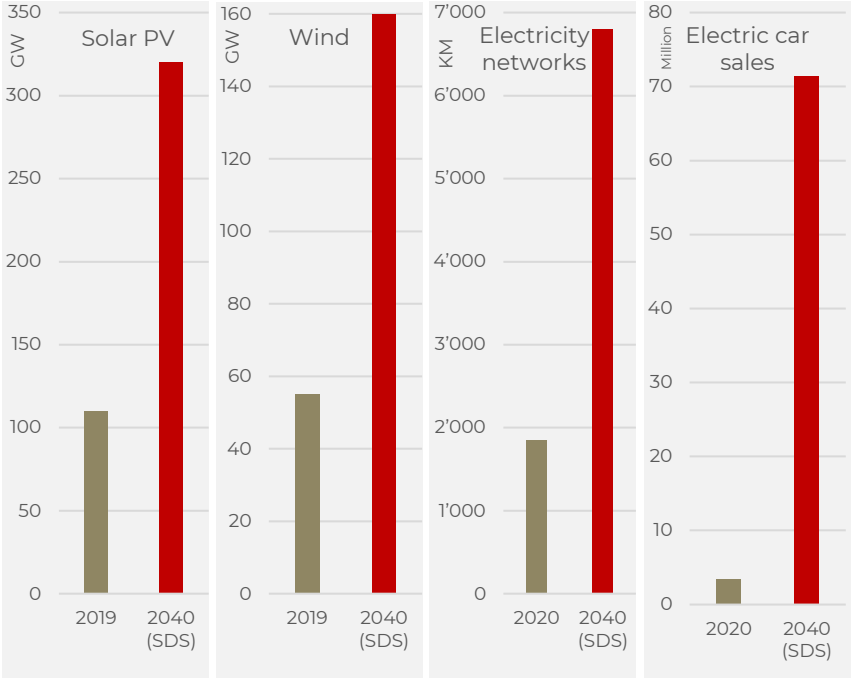
Fast-evolving energy world, renewables have taken off

- Large infrastructure spending programs are implemented worldwide as voters are pressing for rapid decarbonization
  - ➢ *Now we have visibility for a decade e.g. REPowerEU $200Bn, Climate bill Inflation Reduction Act $370bn*
- Independently of which scenario* you take, renewables are expected to increase significantly
- In any case, we need at least a 3 times faster yearly growth rate of new clean energy technologies to reach a greener world by 2040

Solar becomes the new king of electricity and is set to triple before 2030 under current and proposed policies



Achieving climate goals requires further rapid acceleration in clean energy deployment per year (SDS scenario)



- IEA **Stated Policies Scenario** (STEPS): This scenario reflects all of today's announced policy intentions and targets, insofar as they are backed up by detailed measures for their realisation.
- IEA **Sustainable Development Scenario** (SDS) estimates that a surge in clean energy policies and investment puts the energy system on track to achieve sustainable energy objectives, including the Paris Agreement, energy access and air quality goals.

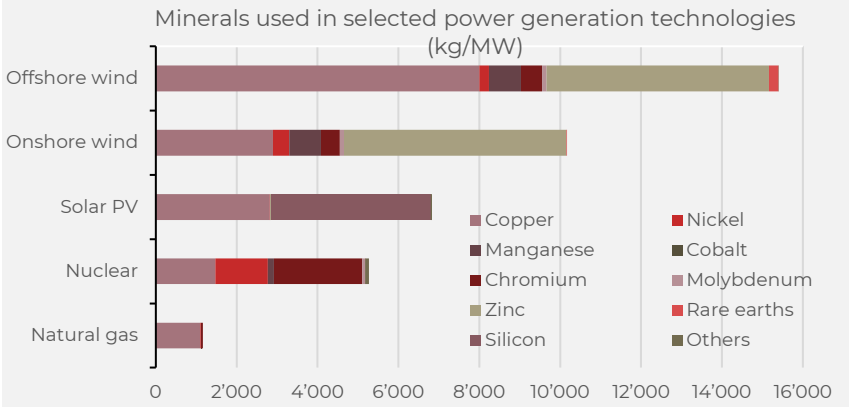
Sources: Bloomberg, IEA, WEO 2020, ICG data

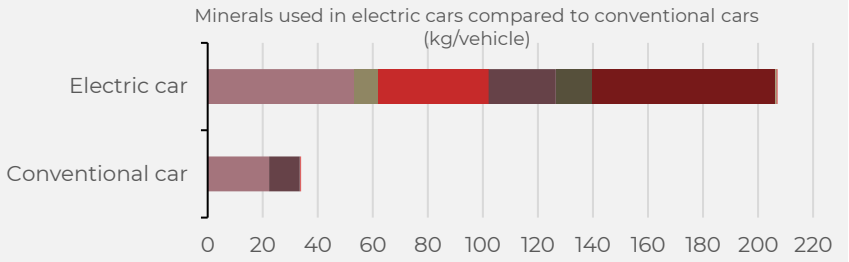
Metals are in the heart of the supercycle

Metal demand to quadruplicate

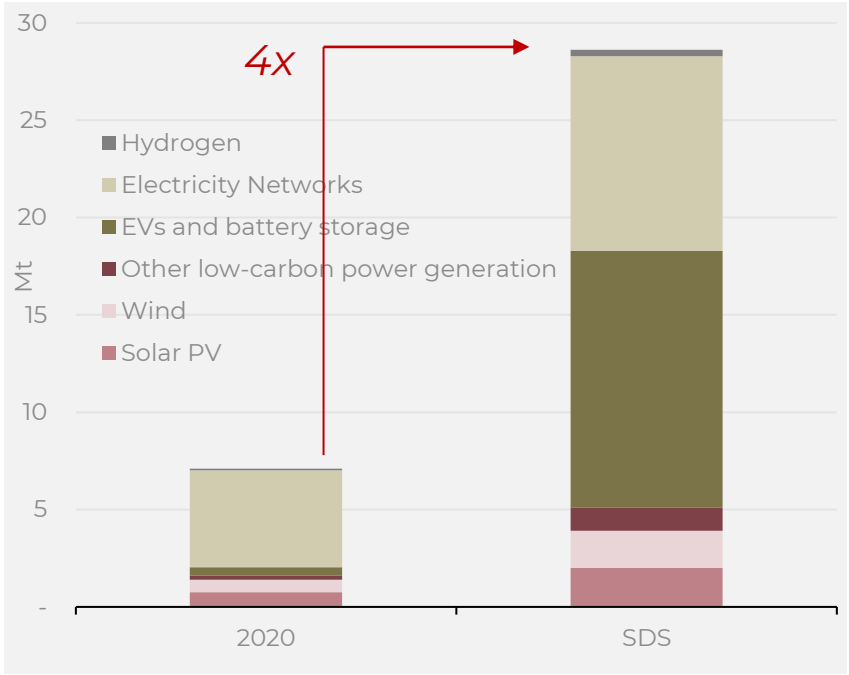
- An energy system powered by clean energy technologies differs profoundly from one fueled by traditional hydrocarbon resources as they generally require more minerals than their fossil fuel-based counterparts
  - ➢ *EV-related metals to increase significantly: lithium 42x, graphite 25x, cobalt 21x, nickel 19x, rare earths 7x*
- **An avg 13MW offshore wind turbine* needs 39t copper, 71t zinc, 6.5t aluminium, 3.1t nickel, 10.3t manganese, 1.4t molybdenum, 1'553t steel**

Raw materials are a significant element in the cost structure of many technologies required in the energy transition





Metal demand* for clean energy technologies would rise at least 4x by 2040 to meet climate goals, particularly EV-related metals



Metal demand* according to the IEA "the role of critical minerals" excludes steel and aluminium that are also very important in the green energy transition
- IEA **Stated Policies Scenario** (STEPS): This scenario reflects all of today's announced policy intentions and targets, insofar as they are backed up by detailed measures for their realisation.
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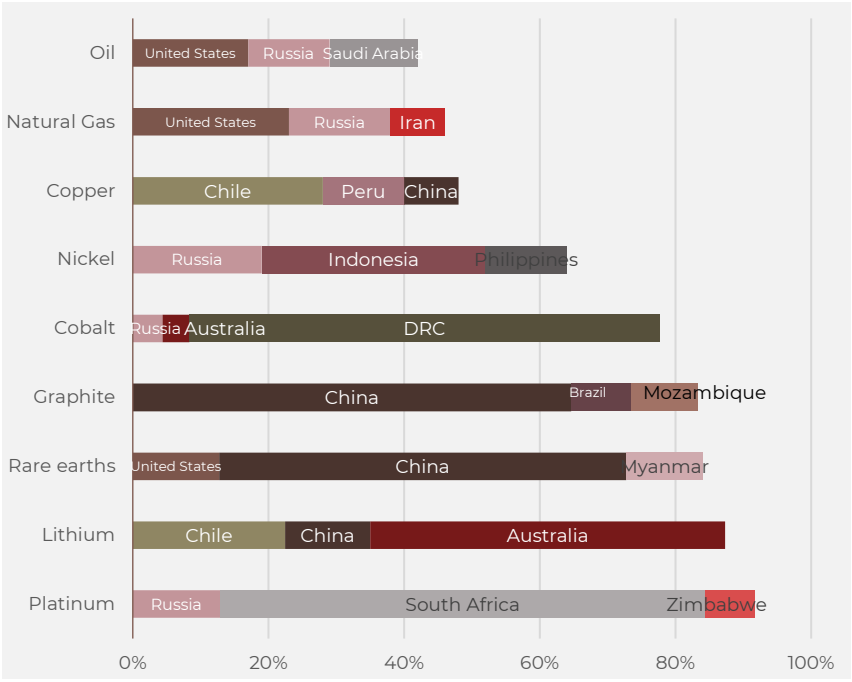
*Sources: Bloomberg, IEA, WEO 2020, ICG data, *Material usage estimates for different wind turbines (DD-EESG, DD-PMSG, GB-PMSG, GB-DFIG) by European Commission JRC*

The age of critical metals

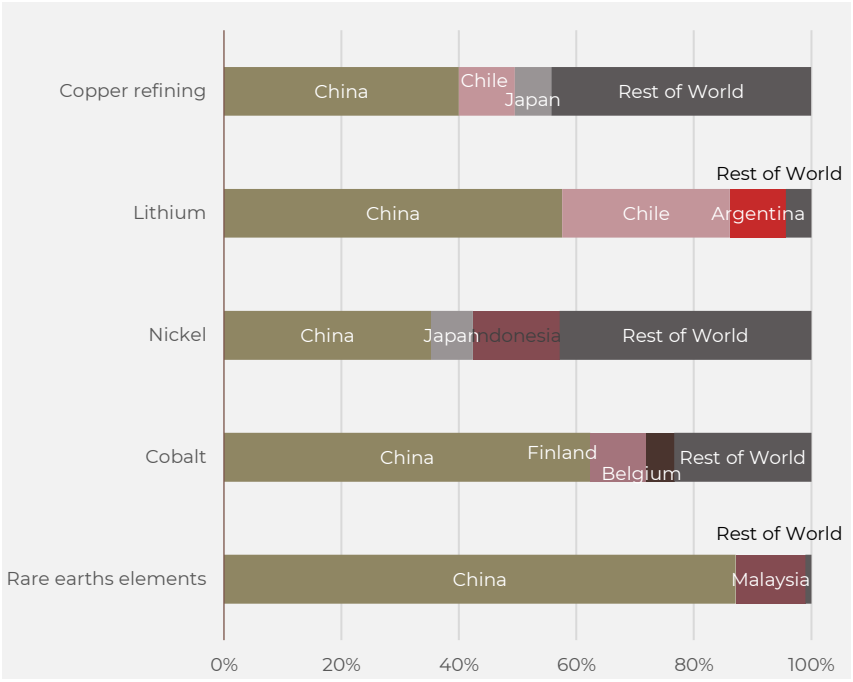
High metal supply concentration

- Even if some metals are considered “rare” the quantity (proven reserves) are often abundant
- The more important problem is the timely access to these metals that is often “critical” because of the high concentration of production and processing
  - *Current production of many energy transition relevant materials are geographically concentrated*
  - *Emerging markets and especially China has a significant presence across the board*

Share of the top 3 producing countries in total production for selected metals and fossil fuels in 2019



Share of processing volume by country for selected metals in 2019



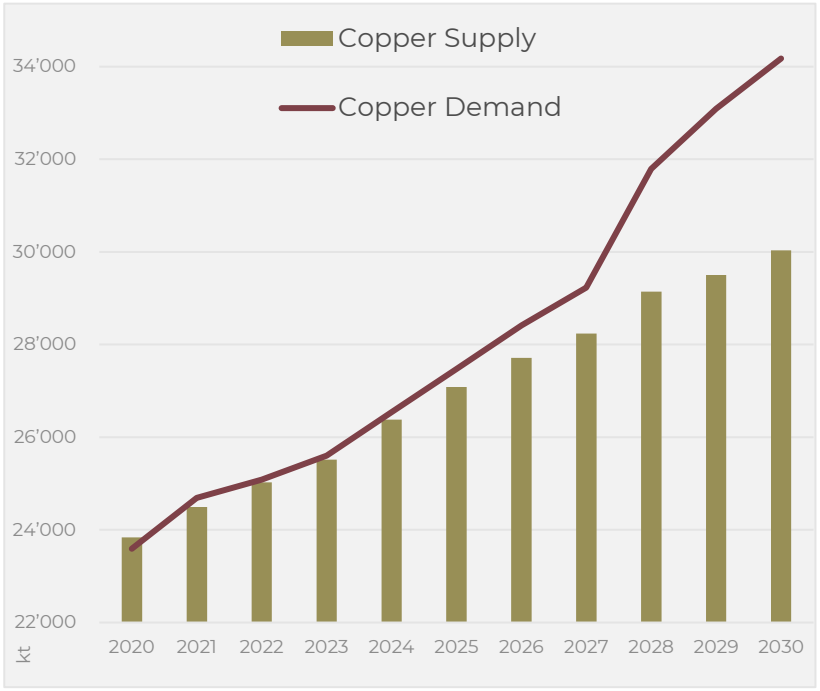
Sources: Bloomberg, IEA, USGS, World Bureau of Metal Statistics, Adamas Intelligence, ICG data

Supply risk underestimated

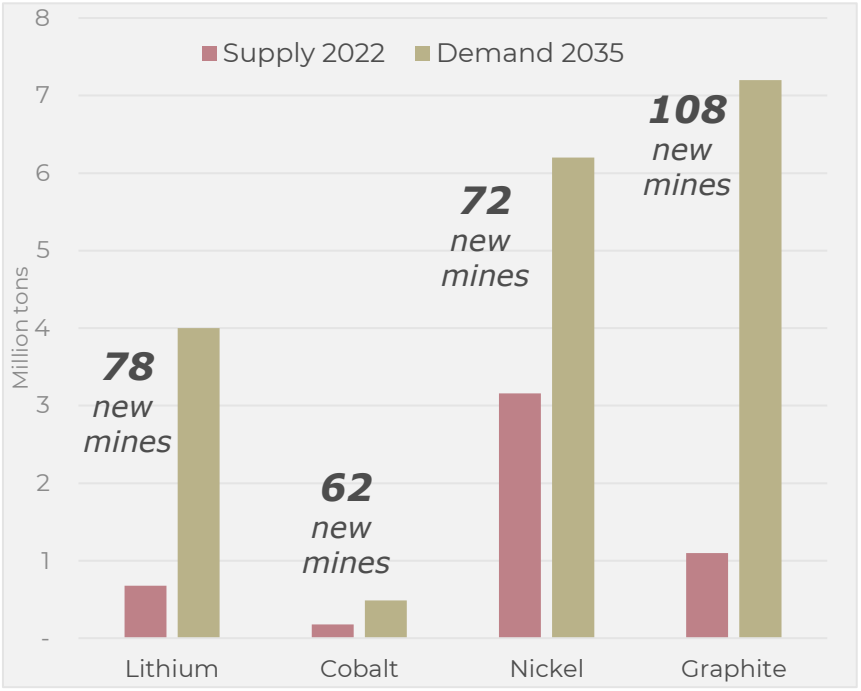
There is a structural under-investment in supply

- Meeting primary demand in any scenario requires a strong growth in investment to bring forward new supply sources over the next decade
  - *Analysts estimate an additional 7-10mt of new mine production will be needed to satisfy the projected supply gap in copper by 2030. Most projects have yet to be sanctioned.*
  - *$23bn of investment a year in new copper projects, 64% higher than the avg spend over the last 30 years p.a.*
- To meet zero-carbon targets, the mining industry would have to deliver new projects at a frequency and consistent level of financing never previously accomplished

Copper to fall into significant deficit by 2030



Mines needed to meet global battery demand by 2035



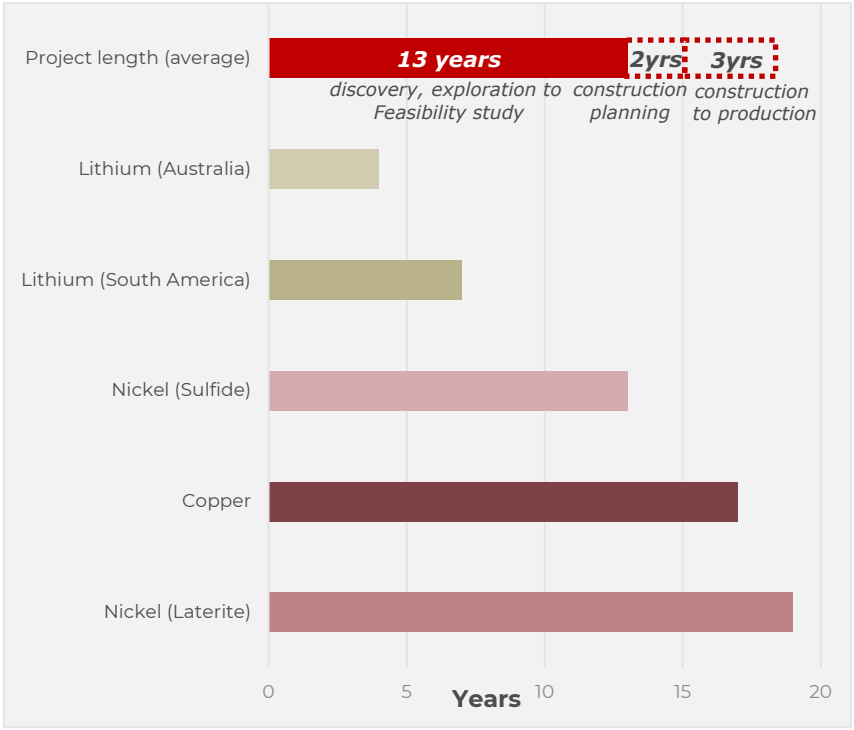
Primary demand is total demand net of recycled volume (also called primary supply requirements). Projected production profiles are sourced from the S&P Global Market Intelligence database with adjustments to unspecified volumes. Operating permits include the expansion of existing mines. Under-construction projects include those for which the development stage is indicated as commissioning, construction planned, construction started or preproduction.
Average mine plant size at 45kt p.a. for lithium, 5kt p.a. for cobalt, 42kt p.a. for nickel, 57kt p.a. for graphite
Sources: Bloomberg, IEA, S&P Global, JPM, UBS, CS, Jefferies, Goldman Sachs, BMO, Scotiabank, ICG data

Supply risk underestimated

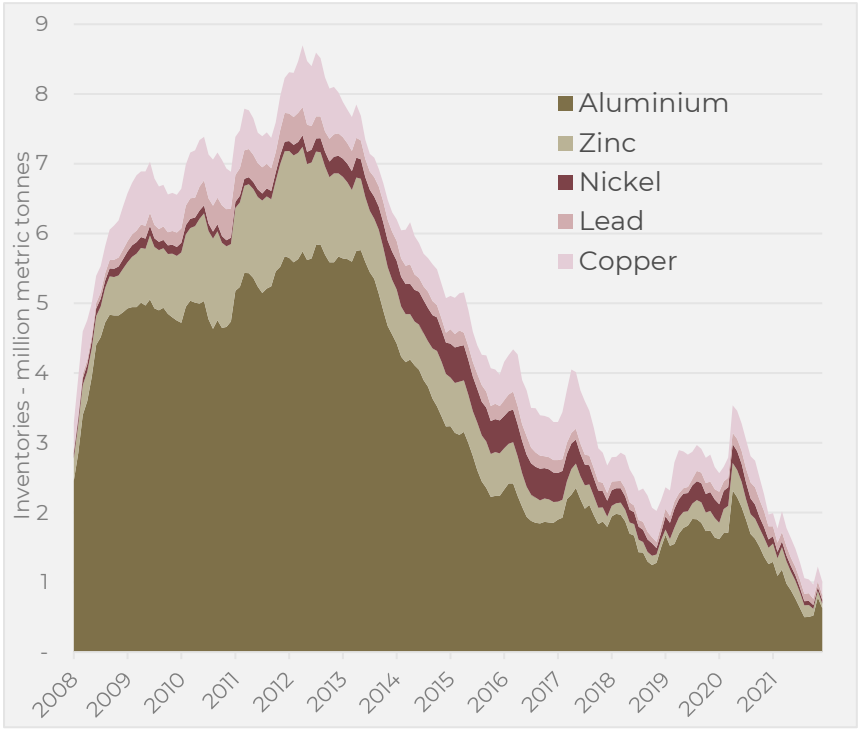
Mining project approval rates dwindle to cyclical lows

- While for most of minerals there is not a problem of resources, the timing to bring new mines into operation is often problematic as require on average 16-17 years from the beginning to commencing output
  - *In practice, some of these projects have not been developed because of poor economics. However, even those that can offer an attractive return on investment have other hurdles to overcome prior to development*
  - *Mainly the conditions for delivering projects are challenging, with political, social and environmental hurdles higher than ever. Further to that, there is often no sufficient infrastructure, incl. power, water and transport*
- Cumulative metals deficits into mid-decade present elevated risk of stock depletion

Average mining project development lead times (from discovery to production)



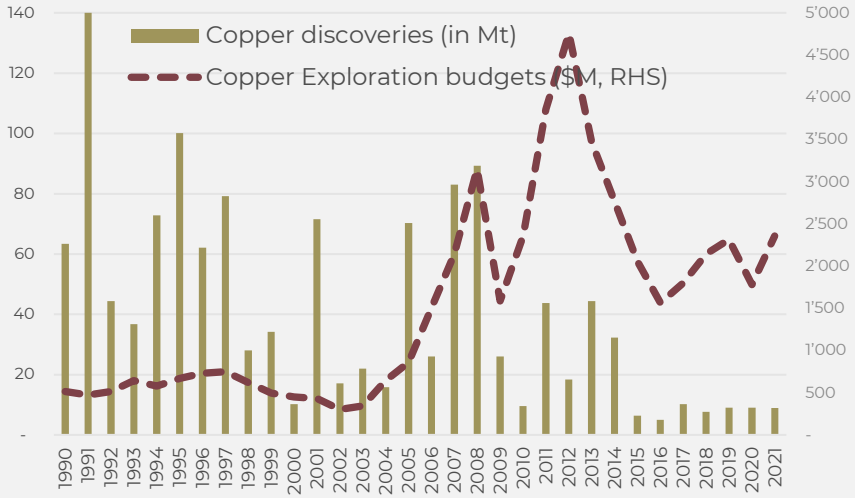
Inventory increased due to Covid-19 but fell again



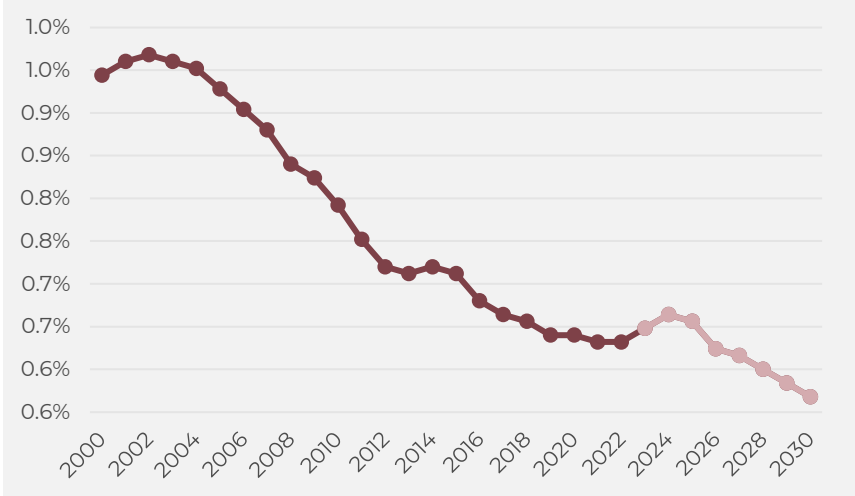
Sources: Bloomberg, IEA, S&P Global, ICG data

Copper - what else?
Supply charts

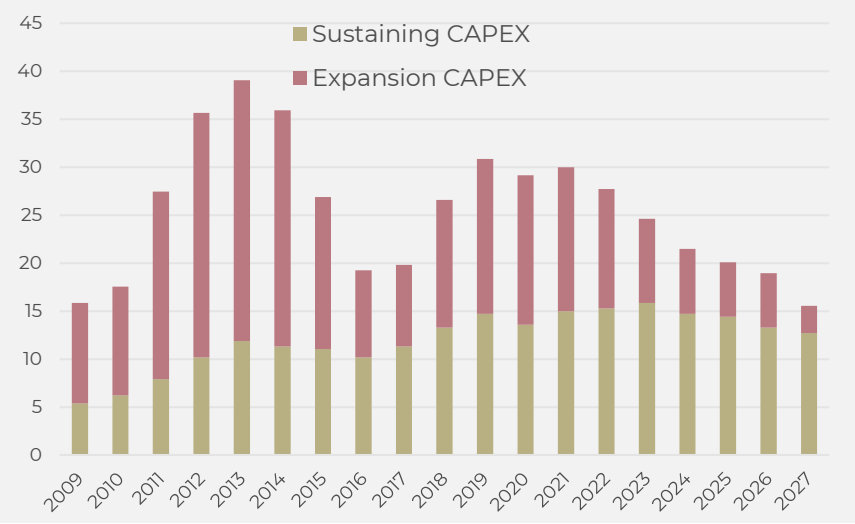
Copper supply discovery drought continues



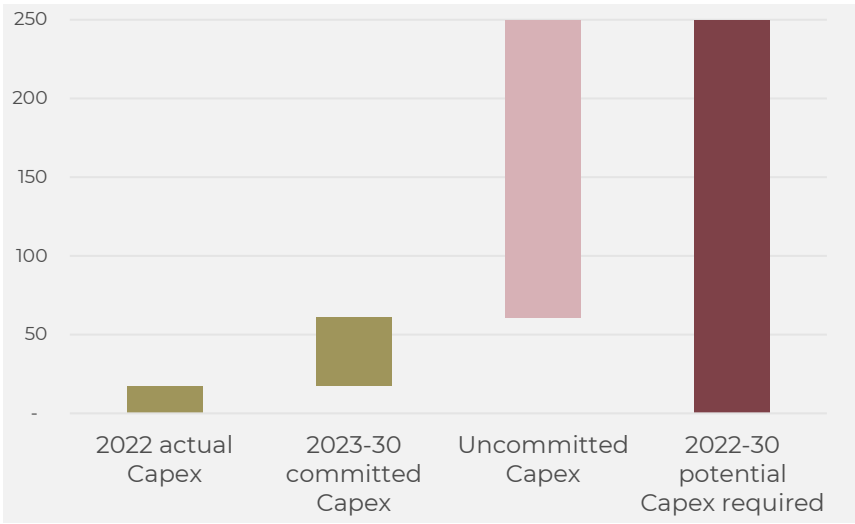
Copper grades falling significantly



Expansion capex falling significantly



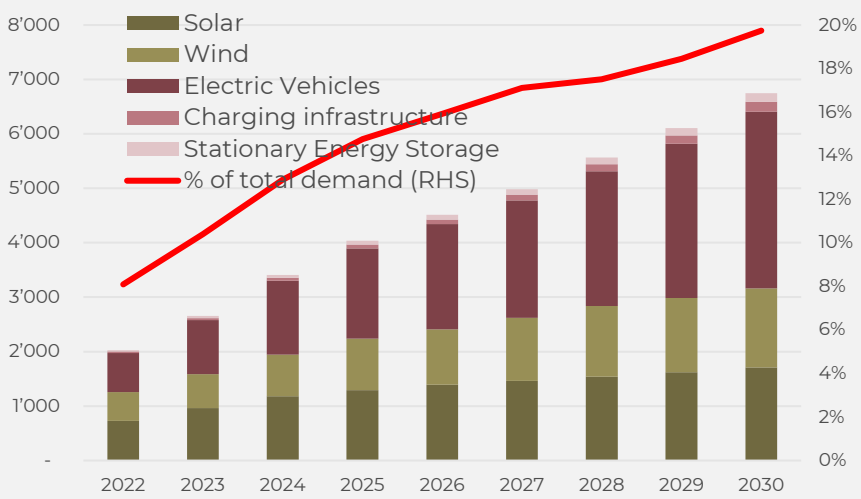
Copper investments needed by 2030



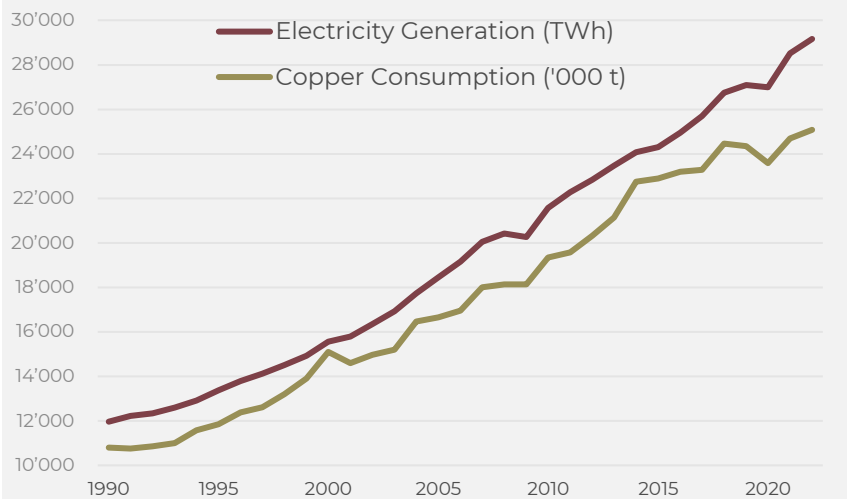
Sources: Bloomberg, CS, UBS, JPM, GS, Jefferies, Scotiabank, ETC, IEA, S&P Global, ICSG, ICA, ICG data

Copper - what else?
Demand charts

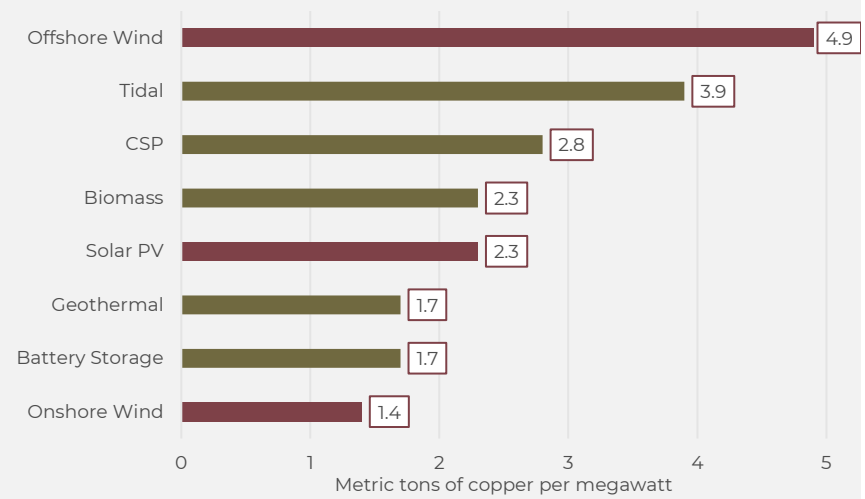
Global green copper demand to reach 20% of total demand by 2030



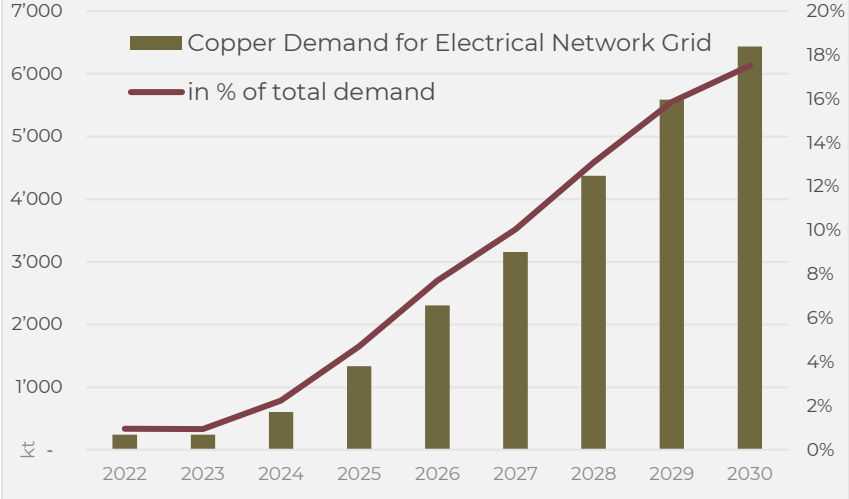
Electricity generation vs. refined copper consumption



Copper content per megawatt of installed capacity – excl. transmission



Copper demand for electrical network-grid is underestimated



Sources: Bloomberg, CS, UBS, JPM, GS, Jefferies, Scotiabank, ETC, IEA, S&P Global, ICSG, ICA, ICG data

Resource «wars»

Global resource competition to come

- The contest of models in “Cold War II” is not about ownership of the means of production
- It is about material production versus immaterial service provision
  - *Countries that focus on manufacturing (China) and resources (Russia) in the physical world against an alliance led by the US, which for the last generation has sacrificed much of its own manufacturing and mining to specialize in global leadership in finance, services, and entertainment*
- 1990, the US was the world’s number-one producer of minerals
  - *Today, it is in 7th place*
- In 1954, the US was 100% dependent on imports for 8 minerals
  - *Today, the US is 100% reliant on imports for 17 minerals and depends on imports for over 50% of 29 widely used minerals. China is a significant source for half of those 29 minerals*

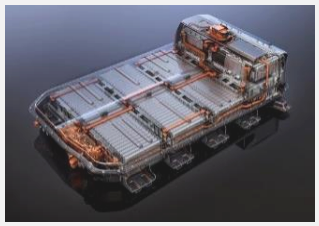
To replace all UK-based vehicles today with electric vehicles*

207’900t cobalt = 1.1 years of global output
264’600t lithium LCE = 1/2 year of global output
7’200t neodymium (RE) = 1 year of global output
2’362’500t copper = 1/10 year of global output
10’720’000t alu = 1/6 year of global output

If wind farms are chosen to generate power for those UK cars*

72’000t neodymium & dysprosium (RE) = 10 years of global output
20’600’000t copper = 0.9 year of global output
13’150’000t alu = 1/5 year of global output
1’468’000t steel = 3/4 year of global output





UK has 67m people -> 32m cars and 2m cars are sold p.a.
The US has 330m people -> 285m cars and 17m cars are sold p.a.
The world has 8bn people -> 1bn cars and 70m cars are sold p.a. (to grow to 120m p.a.)

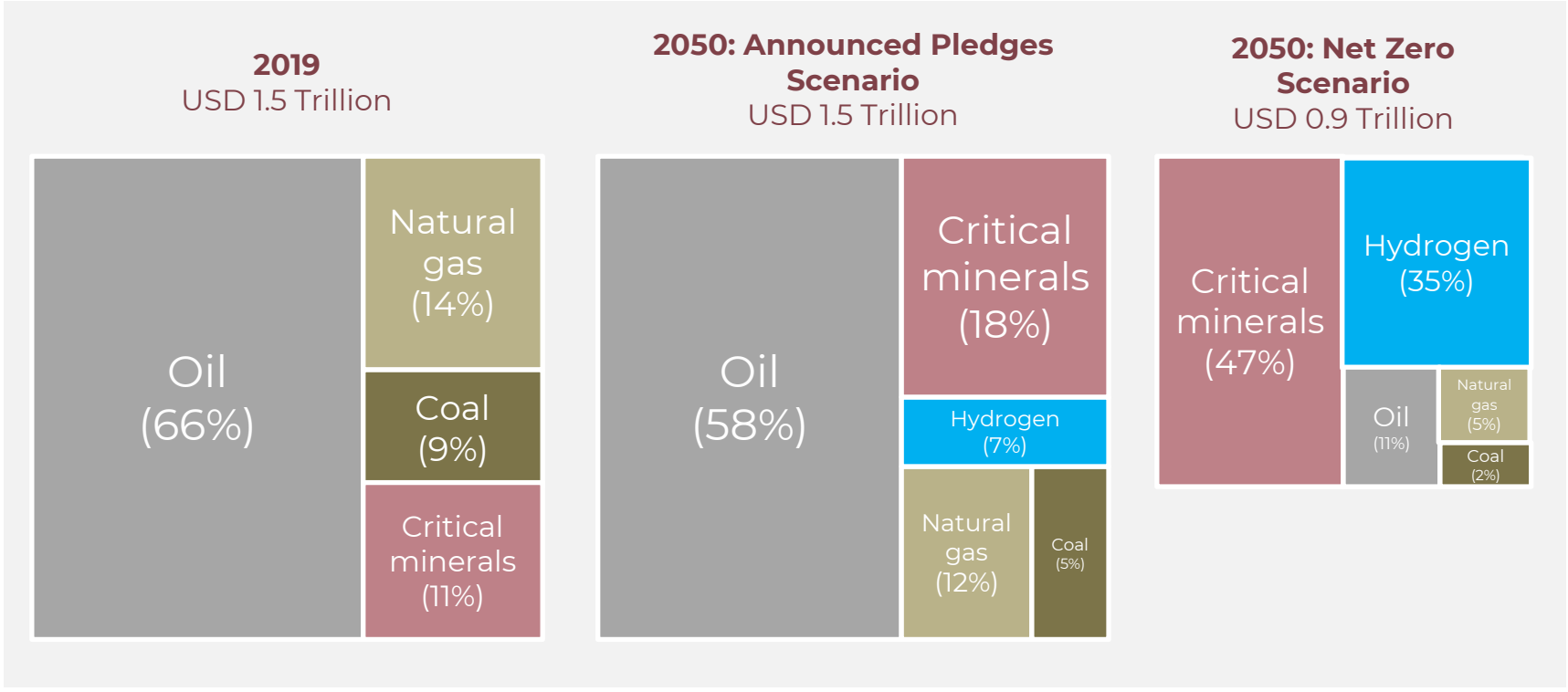
**The metal resource needed to make all cars and vans (no trucks) electric by 2050 and all sales to be purely battery electric in the UK by 2035 (NMC 811 batteries), based on 2021 output resp. supply data. Sources: Tablet Magazine – The coming resource war by Prof. Michael Lind at Lyndon B. Johnson School of Public Affairs. SoS Minerals, USGS, ICG database*

The rise of critical minerals

Critical minerals to become key

- The next commodity super-cycle is driven by the energy transition and metals are in the heart of the super-cycle
- Under announced pledges, a growing share of oil and gas trade flows towards developing economies in Asia
- In all scenarios, but especially in the net zero pathway, critical minerals and hydrogen-based fuels are on the rise

Value of international energy-related resource trade and the rise of new energy-related commodities



Notes:
- IEA **Announced Pledges Scenario** (APS): This scenario assumes that all climate commitments made by governments around the world, including Nationally Determined Contributions (NDCs) and longer-term net zero targets, will be met in full and on time.
- IEA **Net Zero Scenario** (NZE) which sets out a narrow but achievable pathway for the global energy sector to achieve net zero CO2 emissions by 2050

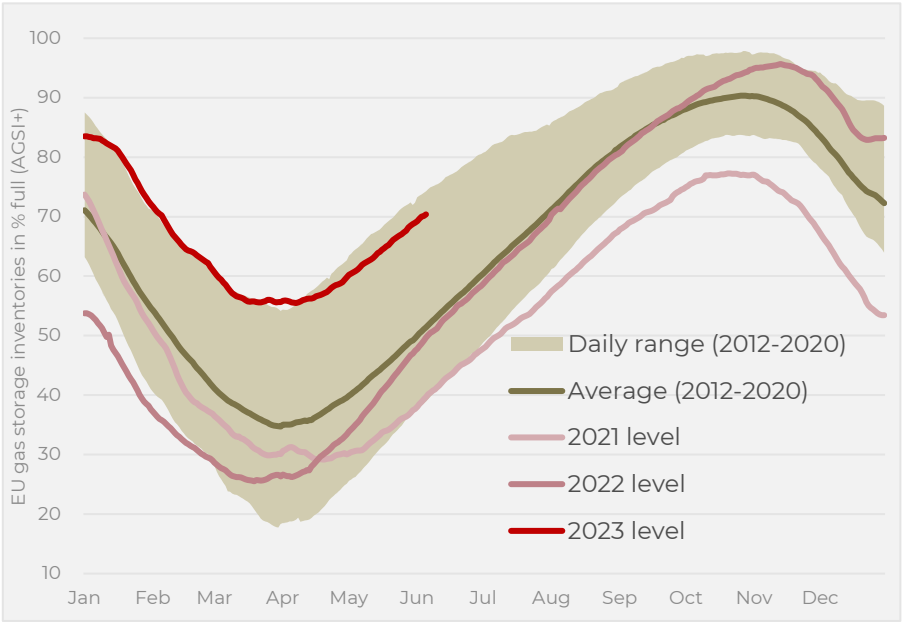
Sources: Bloomberg, IEA, WEO 2020, ICG data

Energy crisis

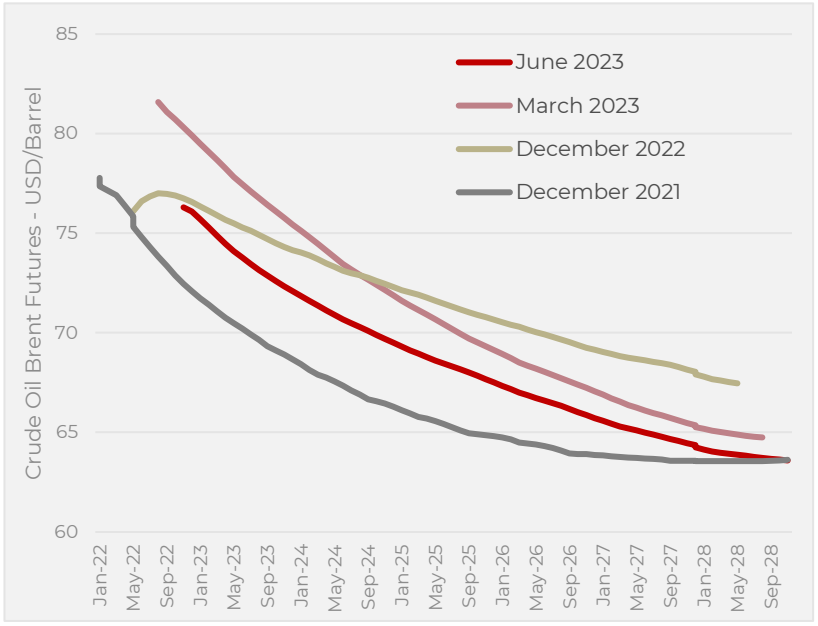
Energy markets are facing a severe supply crisis

- Energy markets were facing their most severe supply crisis since the 1990 Gulf War
- Right now, we have a crude oil Brent price of around $80/b after a lot of downside scenarios happened
  - *A market crash, recession fears, an oil demand decline in China because of a Zero-Covid policy, record high release of US Strategic Petroleum Reserves*
- Europe had filled its gas reserves for the winter through alternative supplies
  - *LNG imports in 2022 up 70% from 2021 levels but also demand destruction or substitution. However, half of those LNG imports came resp. were resold from China on weak demand and may be prove difficult to repeat in 2023*
  - *We had an all-time high record coal consumption of 8bn tonnes in 2022 +1.2% YoY*
- Saudi Arabia's energy minister Prince A. bin Salman has also indicated that there is a disconnect between futures prices and fundamentals, and that OPEC+ cut production, bringing the OPEC+ floor back in play

Despite the natural gas cuts from Russia, the pace of inventory refilling in Europe was above average levels thanks to alternative supplies



Oil curve in a high backwardation over 2022 and longer-term futures prices holding above >$65/bl



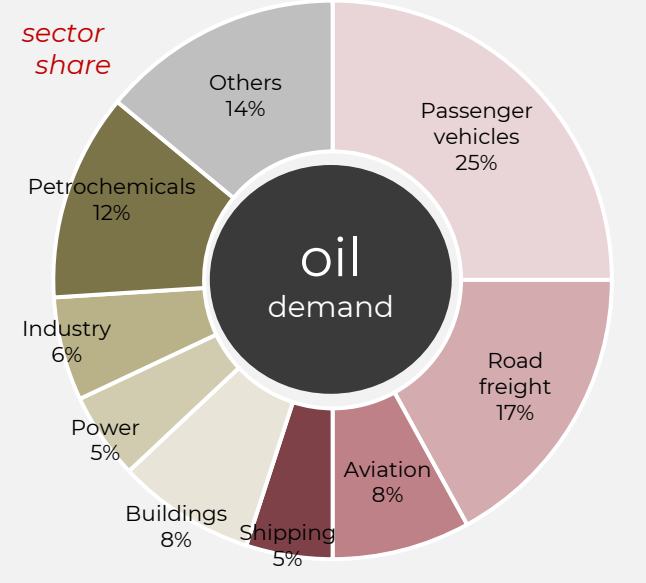
Sources: Bloomberg

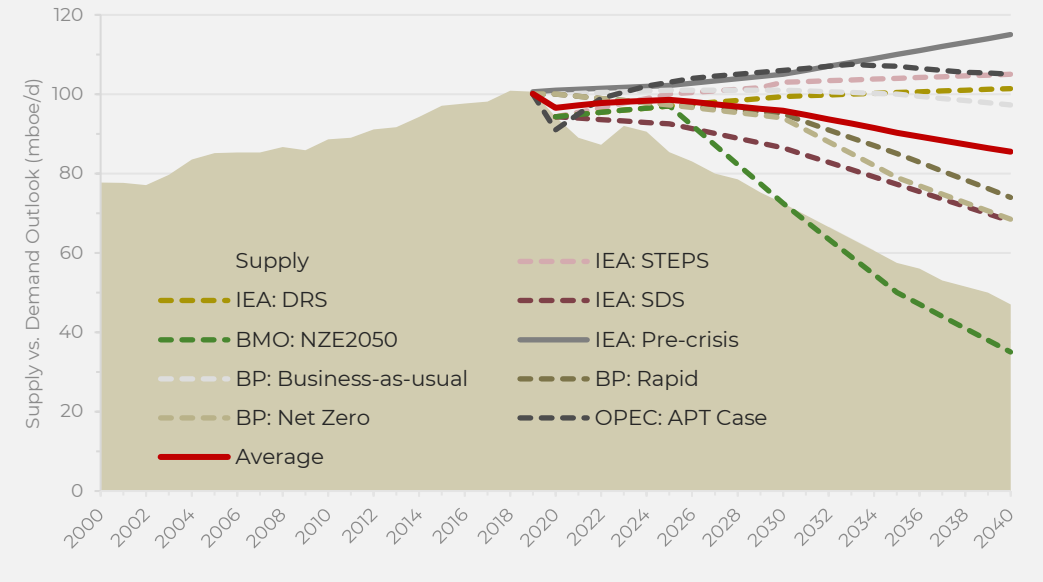
Oil demand

Significant debate on the future of oil

- There is an increasingly aggressive push by many developed countries to dramatically reduce or eliminate the consumption of fossil fuels and move into renewables. However, transitions do not happen overnight
- In fact, oil demand increased and recovered to pre-pandemic levels in 2022 and will grow through 2030 according to most analysts before it begins a slow, inexorable decline
  - *History shows that demand growth was negative in only 10 years since 1965 (even during recessions)*
  - *IEA World Energy Outlook conceded that the world remains far from of a "net zero" trajectory, and the "Announced Pledges" of world governments to date do not translate to a meaningful decline in oil demand until after 2030*
- Oil markets were mainly in deficit during the last 2 years and without the release of US Strategic Petroleum Reserves (1.5mboe/d) markets would still be in deficit
- Some scenarios show that total demand in 2040 could still be roughly in line with where it was in 2019
- The lack of investment in new supply over the last five years comes to view

The world is currently short on all forms of energy. While the energy transition is dominating the discussion, the world still depends heavily on fossil fuels and is expected to do so in the short to medium term. Oil is not only transportation and some sectors' demand is still growing





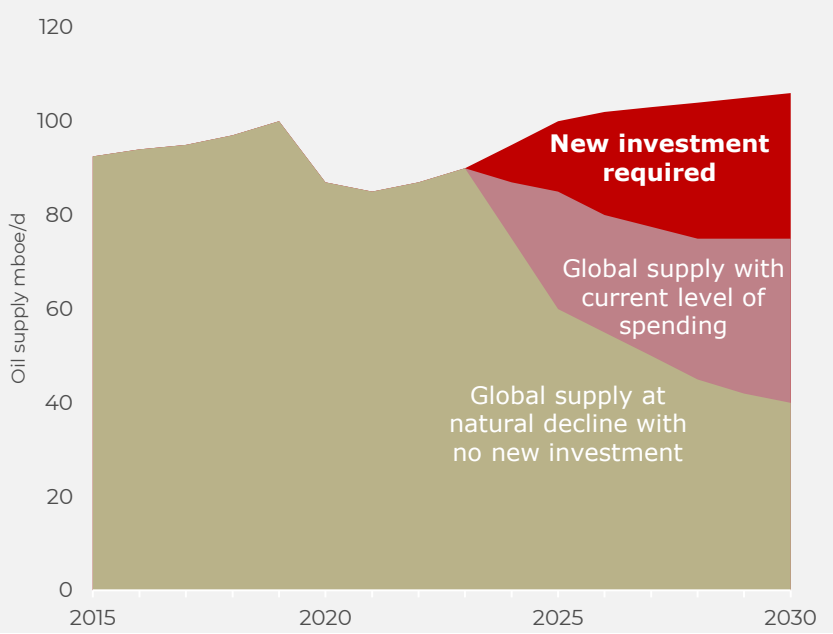
Sources: Bloomberg, UBS, CS, GS, IEA, EIA, BCA, BakerHughes, WoodMac, ICG database, Scotiabank, BMO

Oil supply

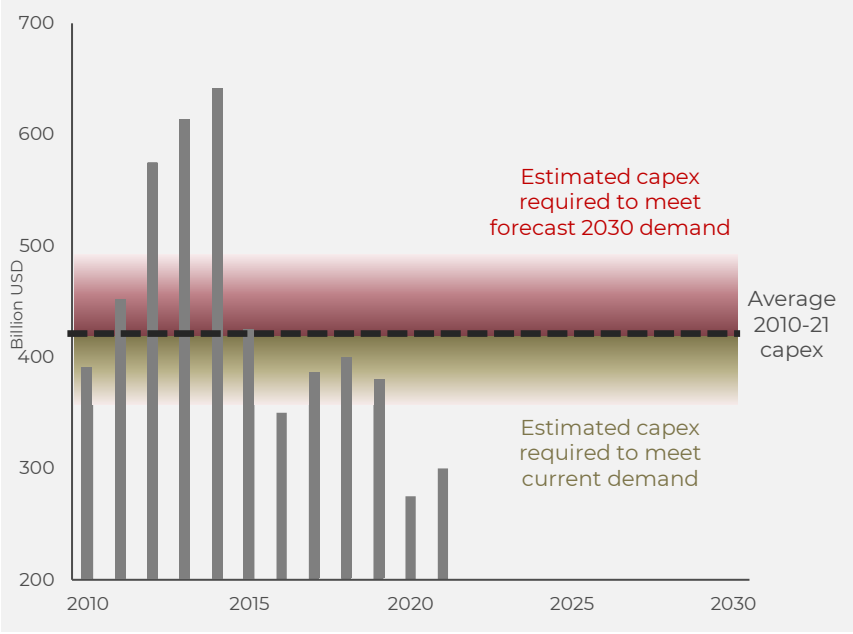
Greater industry investment needed

- The world faces a global energy crisis on a scale not seen since the 1970's, driven in no small part by hostile government policy and social antipathy towards the energy industry
- Reinvestment rate is the lowest in over 20 years. Lack of major projects to pressure medium-term supply
  - *Capex must increase dramatically and sustainably to maintain and grow global production of oil & natural gas*
- The resulting under-investment has left the world also with little spare productive capacity
  - *Saudi just said its long-term max production capacity is probably only 13mboe/d, this is dangerous*
- According to JP Morgan energy demand is expected to exceed supply by 20% and would require $1.3tn of incremental capital to close the gap by 2030
  - *However, despite rising commodity prices and cash flows, capital is actually exiting the industry in the form of dividends and buybacks*
- The consequences of ignoring the economic and physical realities of energy are starkly on display in Europe and in much of the developing world

To meet oil demand, substantial new investments are required to compensate for decline of existing fields



Capex is roughly half of the average level of the past decade



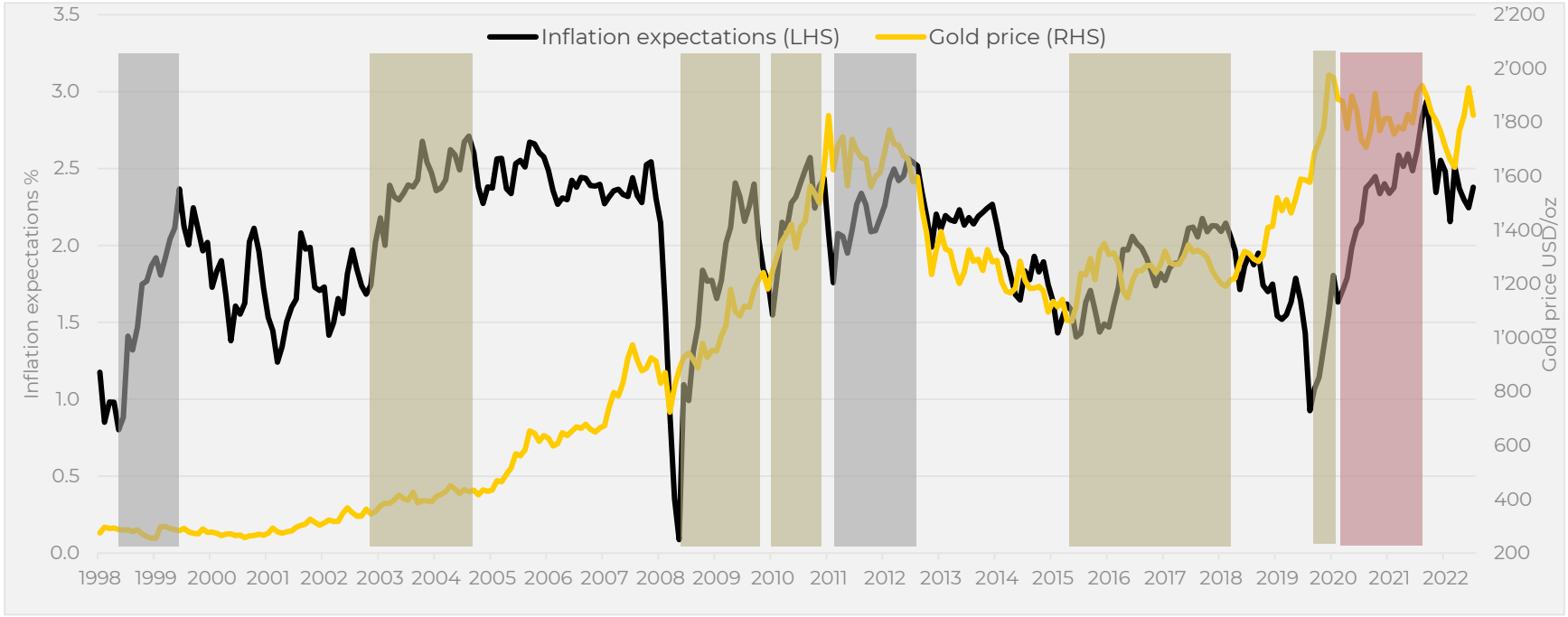
Sources: Bloomberg, UBS, CS, GS, IEA, EIA, BCA, BakerHughes, WoodMac, ICG database, Scotiabank, BMO

Gold

First time gold doesn't rise with increasing inflation expectations

- Since we have been able to measure inflation expectations (via the TIPS or 10-year breakevens), historically gold has risen both nominally and in real terms every single time inflation expectations were on the rise
- Interestingly, when inflation expectations have been rising, gold has never traded down, historically
  - *This also held true immediately after the COVID-induced sharp market crash in 1Q 2020*
  - *However, the anomaly here, is that from August 2020 inflation expectations continued to rise, and gold did trade down*
  - *Currently it seems that the USD direction is having a bigger influence on the gold price than inflation trends*

Historically gold has risen both nominally and in real terms every single time inflation expectations were on the rise but this time not



Period of steadily rising inflation expectations and **gold price was flat**	Period of steadily rising inflation expectations and **gold price was up**	Period of steadily rising inflation expectations and **gold price was down**

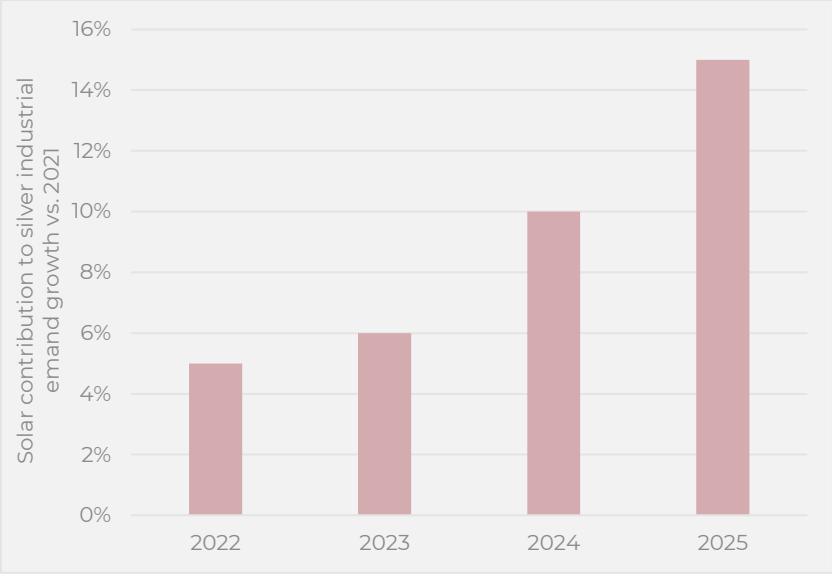
Sources: Bloomberg, ICG, Cantor Fitzgerald

Precious metals

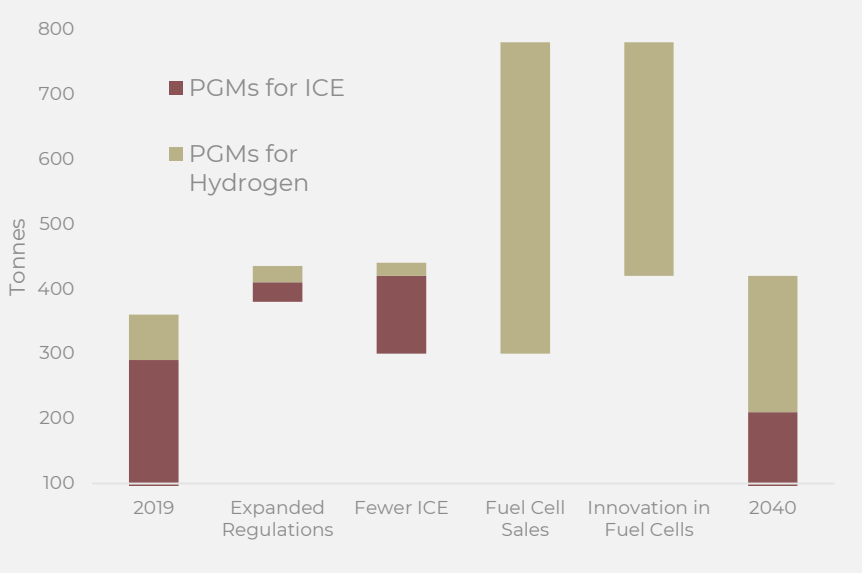
Silver and PGM to benefit from the energy transition

- Silver plays a vital role in the production of solar cells that produce electricity
  - *Silver is the most electricity-conducting metal on the planet, is relatively fire-safe and it's also a light metal*
- The silver demand from photovoltaic (PV) doubled over the last 5 years and is increasing strongly
- Silver is already in deficit and only 27% of silver supply is primary
  - *73% of silver supply comes as a byproduct from zinc, copper, lead or gold mines*
- PGMs are mainly used in catalysts for ICE vehicles today but are also central to hydrogen catalysis and in fuel cell technology
  - *PGM markets are in a chronic deficit but are driven by the ICE vs. EV story*
  - *Expectations are that demand for fuel cells will more than replace the demand from ICE catalysts by 2040 although innovation is a wildcard in both directions*

Solar demand to boost silver industrial demand by 15% by 2025



PGM demand for fuel cells to replace missing future ICE demand

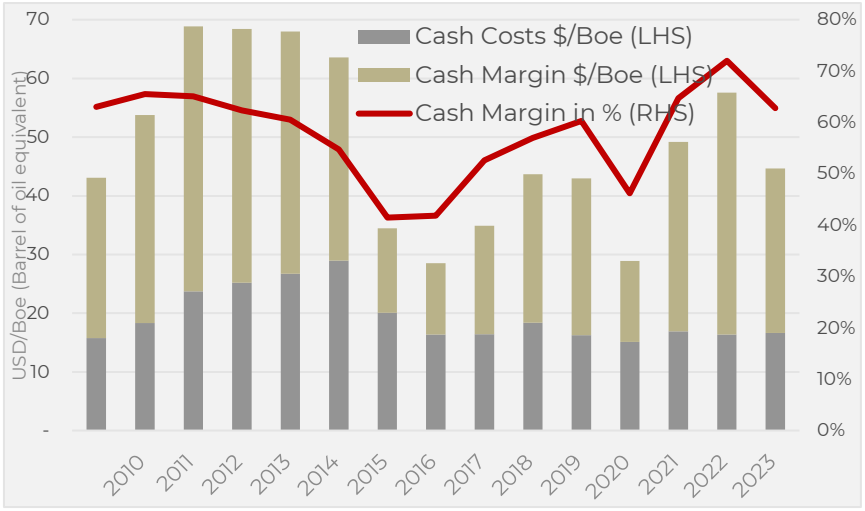


Sources: Bloomberg, World Gold Council, SilverInstitute, ICG Database, Goldman Sachs, BMO

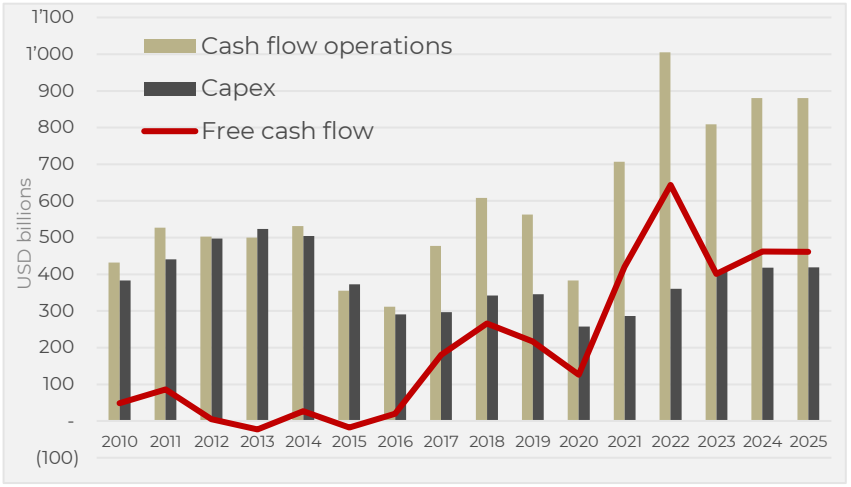
Equity sweetspot

Energy producers are in their best shape in history

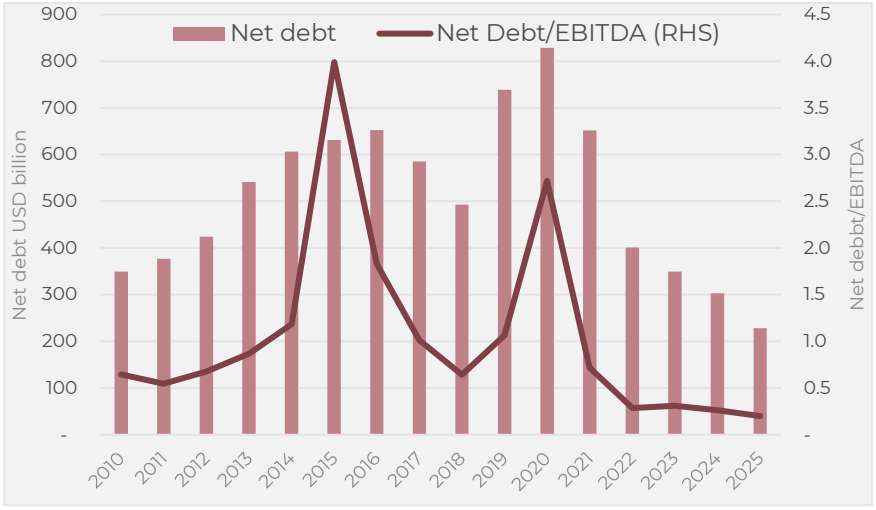
Oil & Gas producers have currently low costs and high cash margins



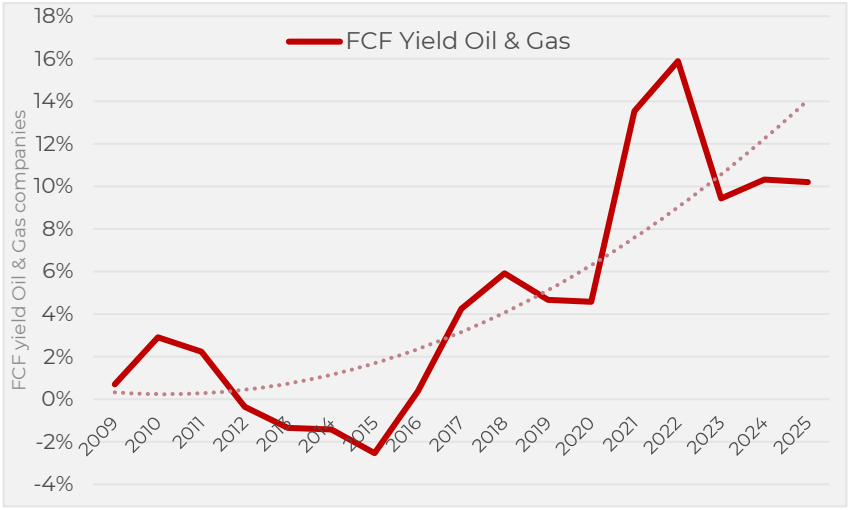
Cost deflation and the flexibility of the industry's business model was heavily underestimated – capital efficiency increasing strongly



Balance sheets to become healthier that at any point in history



The focus is clearly to increase shareholder returns

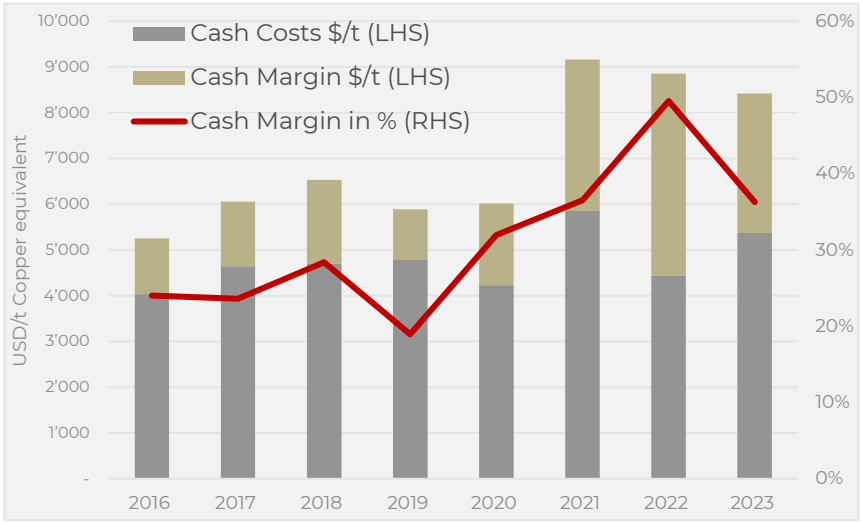


Sources: Bloomberg, ICG database from >150 listed oil & gas companies

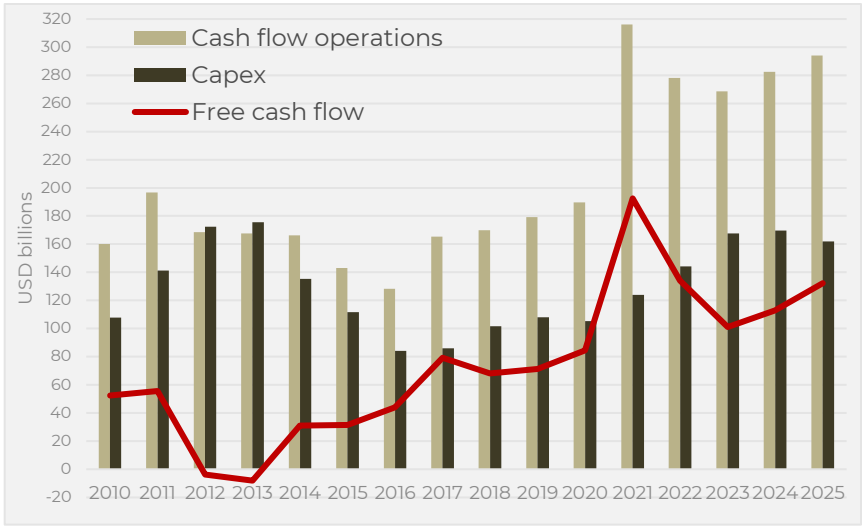
Equity sweetspot

Miners have record margins

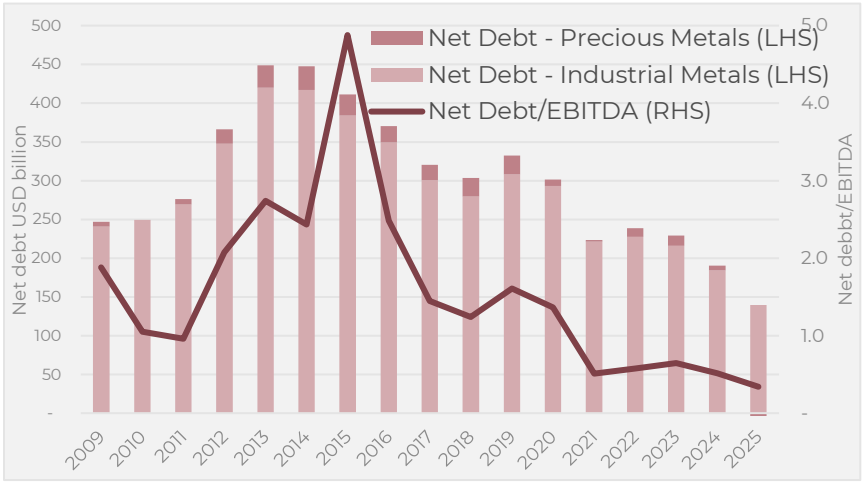
Miners cash margins are still above the average of the last few years



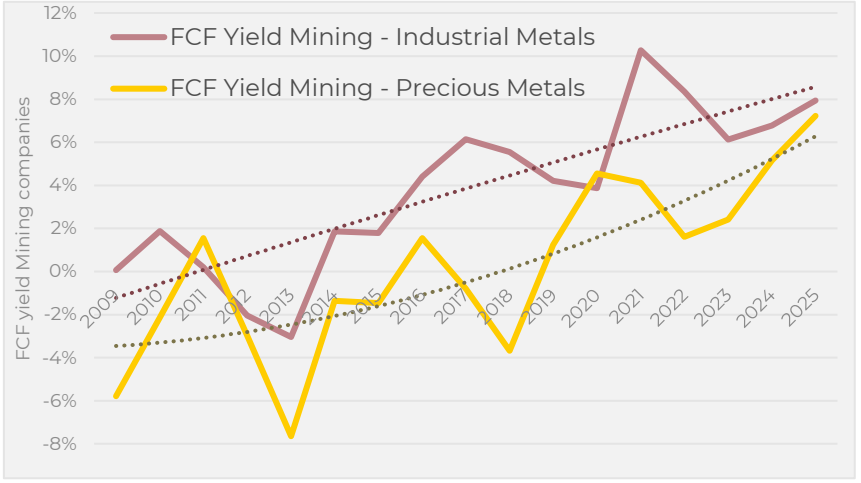
Capital efficiency increased strongly and with-it free cash flows



Balance sheets are healthier that at any point in history and most precious metals companies are already debt-free



With increasing free cash flow profile, the miners are also starting to improve shareholder returns through dividends and buybacks



Sources: Bloomberg, ICG database from >200 mining companies

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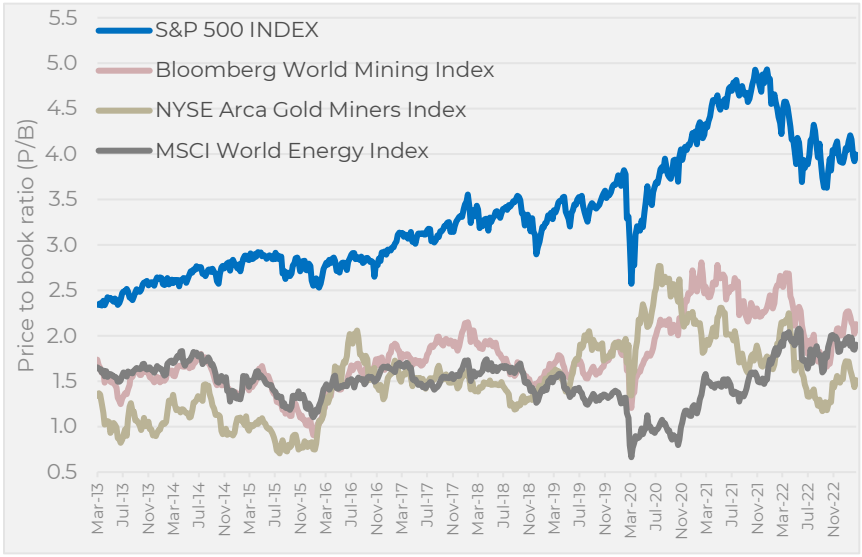
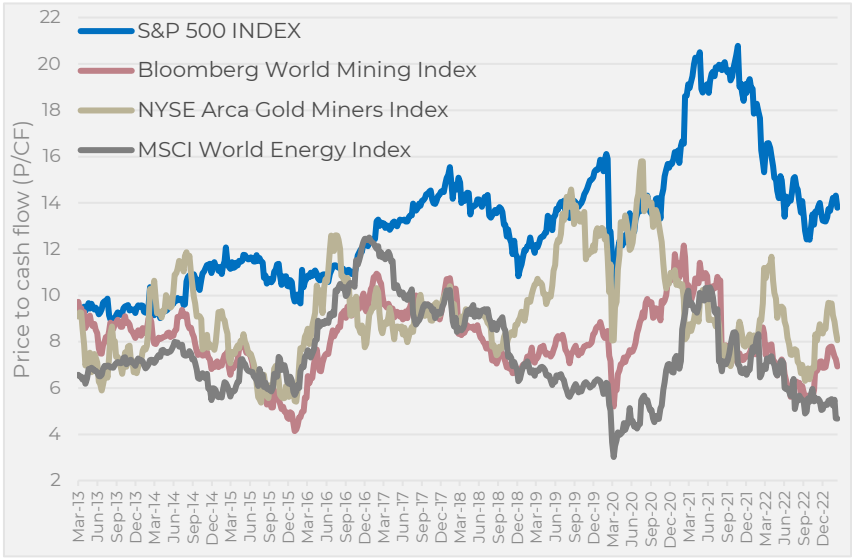
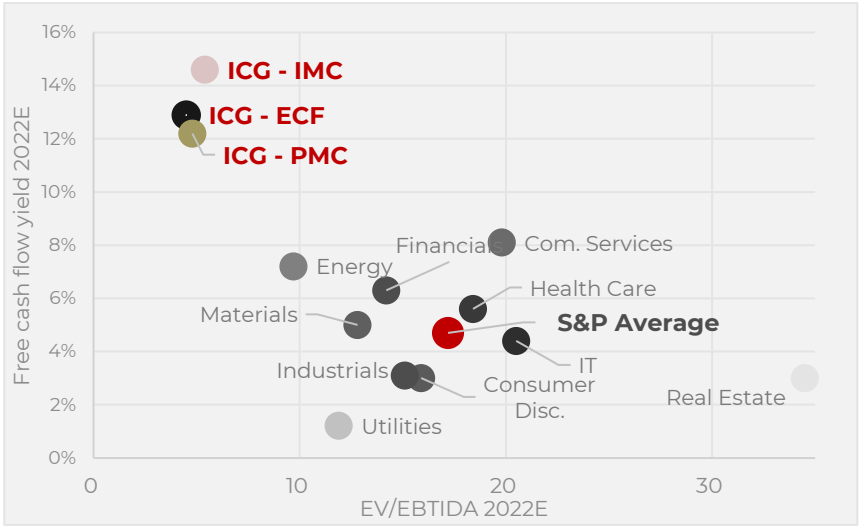
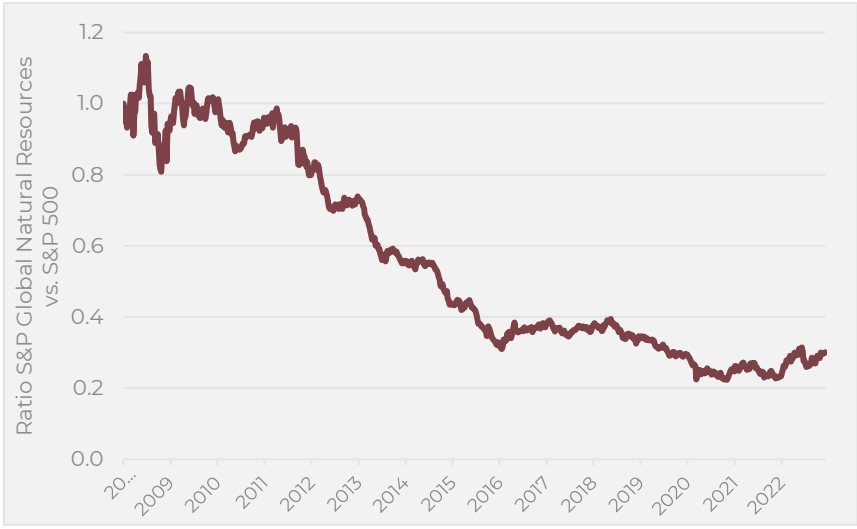
Comeback?

Valuation relative as well as absolute record low









Sources: Bloomberg, ICG database

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Gateway Strategies

Road to Green

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ECF	CRUMI	IMC	PMC	CPC
Oil & Gas Producers	**Crucial Minerals** Producers	**Industrial Metals** Producers	**Precious Metals** Producers	**Clean Power** Producers
Oil 52% Natural Gas 39% NGL 9% *Upstream 90%* *Midstream 5%* *Downstream 3%* *Chemicals 2%* *Renewables 1%*	Copper 22% Lithium 16% Uranium 11% Nickel 6% Rare Earths 4%	Copper 25% Steel 14% Iron Ore 12% Lithium 5% Zinc 5%	Gold 75% Silver 12% Copper 6% PGMs 5%	Wind 33% Hydro 30% Solar 23% Geothermal 3% Bioenergy 1%

We offer also tailor made solutions along the road to green

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Gateway Strategies
Road to Green

	ECF	CRUMI	IMC	PMC	CPC
Performance YTD *14.08.2023*	*7.0%*	*-2.6%*	*-5.4%*	*-0.2%*	*-1.2%*
Performance 1 year	*6.5%*	*2.9%*	*1.1%*	*8.6%*	*-9.6%*
Performance 2 years	*71.3%*	*-7.1%* *Inception 15.09.2021*	*-11.1%*	*-12.5%*	*25.5%*
Performance 3 years	*153.5%*	*n/a*	*52.6%*	*-31.6%*	*49.8%*
Scoring to peers 3 years	*100%*		*79%*	*68%*	
Number of holdings	*25*	*25*	*25*	*25*	*25*
Market cap	*$ 33 bn*	*$ 3 bn*	*$26 bn*	*$5 bn*	*$9 bn*
P/CF	*2.5 x*	*15.6 x*	*6.4 x*	*6.6 x*	*6.2 x*
EV/EBITDA 2023E	*3.0 x*	*9.8 x*	*5.2 x*	*4.3 x*	*9.9 x*
EBITDA margin 2023E	*58%*	*44%*	*37%*	*42%*	*56%*
P/E 2024E	*6.2 x*	*8.0 x*	*8.9 x*	*9.4 x*	*17.2 x*
FCF yield 2024E	*16.2%*	*12.9%*	*9.2%*	*12.4%*	*4.3%*
Net debt/equity	*21%*	*-9%*	*12%*	*0.4%*	*87%*
Dividend yield	*8.0%*	*2.2%*	*4.4%*	*2.9%*	*3.5%*
Fund size	USD 27 million	USD 4 million	USD 32 million	USD 5 million	Target USD 10 million
Legal status	Luxembourg SICAV with UCITS-IV status	Actively Managed Certificates "AMCs"	Liechtensteiner UCITS contractual fund	Liechtensteiner UCITS contractual fund	Liechtensteiner UCITS contractual fund