



capitalmarket.events – Megatrends of Tomorrow – Thu, December 2, 2021

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# Energy Transformation – Hydrogen & Strategic Metals



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# Corporate Overview – Access the Opportunities

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Founded in 1955, VanEck’s mission is to offer investors forward-looking, intelligently designed strategies

- VanEck’s thinks outside the confines of financial markets as they exist today and identifies what major historical trends — e.g., geopolitical and technological — will change the opportunity set of these markets
- Being one of the first to offer investors access to international markets in 1955 set the tone for our drive to identify and define investment trends
- **Our story evolves with the early identification of asset classes and trends that went on to shape the investment management business:** in 1968 with monetary policy and gold, in 1993 with China and emerging markets, and in 2006 with exchange traded funds

VanEck brings its best to clients and investors through:

## Independence

A history of putting clients’ interests first in all market environments

## Insight

Early identification of investment trends and asset classes that investors may be missing

## Accessibility

Client access to portfolio management teams and firm resources

## Execution

Market-tested portfolio management teams and well-designed processes

# Corporate Overview – History of Innovation



Access the opportunities.

**VanEck** FUNDS

Alpha derived from expert research and security selection or through enhanced index and model-driven solutions

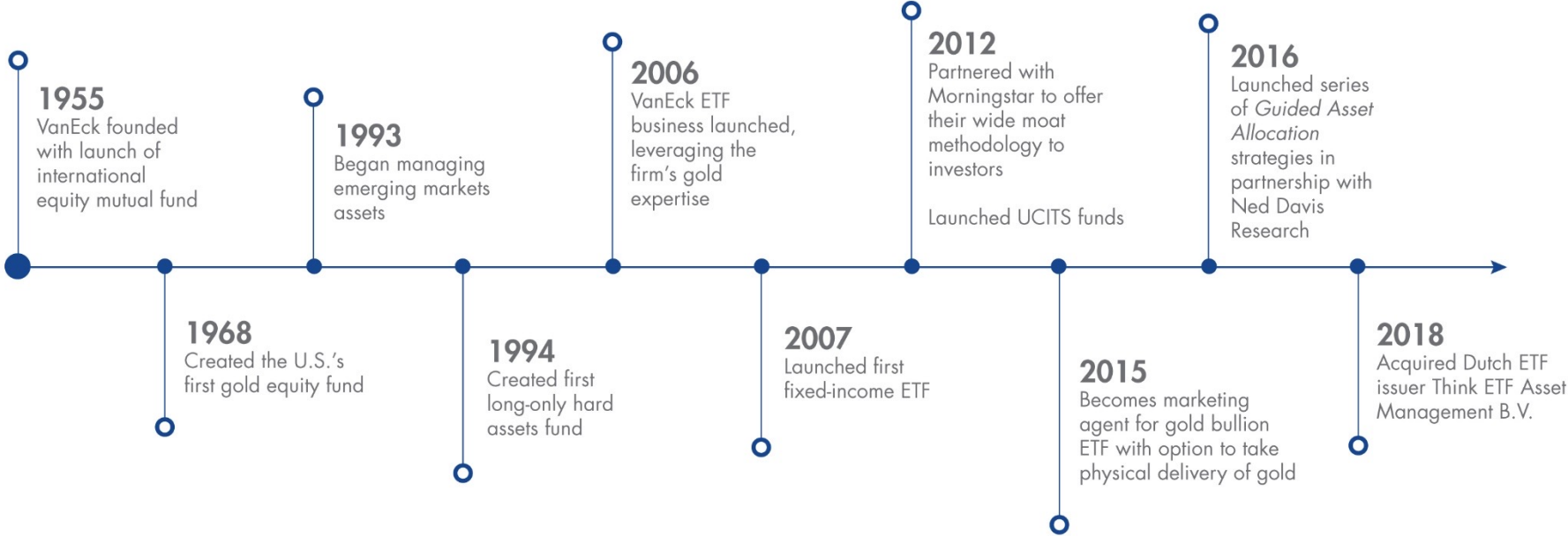
**VanEck** VECTORS

Market selection and index construction to promote investability, liquidity, diversity, and transparency

**VanEck** MVIS

Investable indices based on three key factors: liquidity, pure play exposure, and diversification

Since 1955, empowering investors to strengthen their long-term portfolios by looking beyond conventional asset classes.



# Corporate Overview – VanEck Highlights



Access the opportunities.

\$81.3 billion in assets under management globally

\$5.8 billion in assets under management in UCITS vehicles and ETPs

53 investment professionals; 311 full-time staff

24 years of average portfolio manager experience

Global headquarters in NY; offices in Australia, China, Germany, Netherlands, and Switzerland

Established in 1955

## Clients

- 400+ institutions globally – Sovereign, public, endowment foundation, corporate
- Financial advisers

## Investment Capabilities

Active & Passive

Alternatives

Asset Allocation

Commodities

Digital Assets

Emerging Markets Equity

Energy Equity

Gold Equity

Natural Resource Equity

Regional and Other Equity

Sector and Industry Equity

Strategic Equity

Sustainable Equity

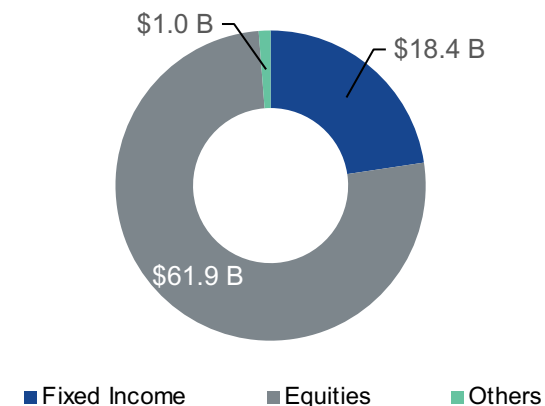
Equity Income

Emerging Markets Bonds

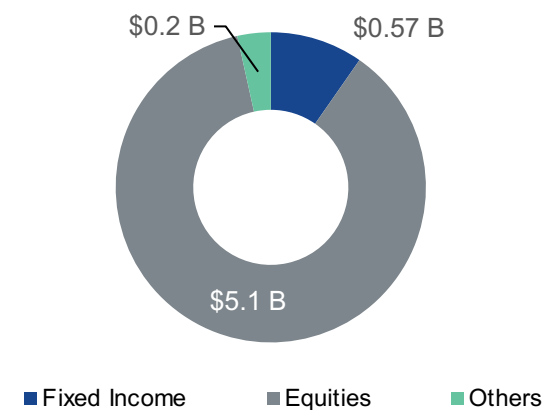
International and Corporate Bonds

Municipal Bonds

## VanEck Overall



## VanEck UCITS + ETPs





# Decarbonization Mega-Trend

# The global energy revolution is here

The transition to clean energy and focus on climate change is one of the world's most important global megatrends and presents a long-term growth opportunity.

- Clean energy is set to become the world's main source of power within the next 30 years<sup>1</sup>.
- Global consumption of renewable energy increased by more than 350% in the last decade<sup>2</sup>
- The case for fossil fuels is becoming economically unjustifiable.



Source: 1. Statista, Projected electricity generation worldwide from 2018 to 2050, by energy source. 2. Forbes, Renewable Energy Growth Continues At A Blistering Pace, 2 August 2020.

# Structural trends driving mass adoption of clean energy



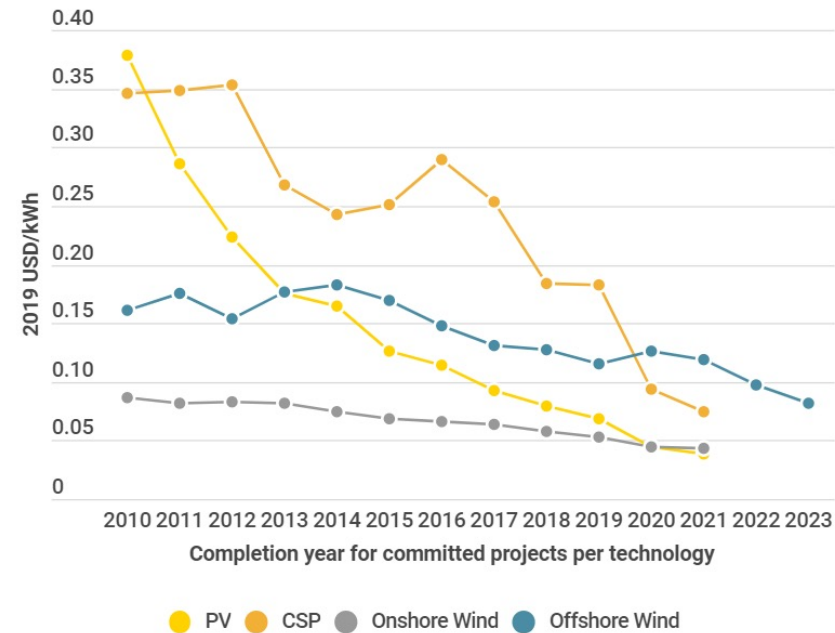
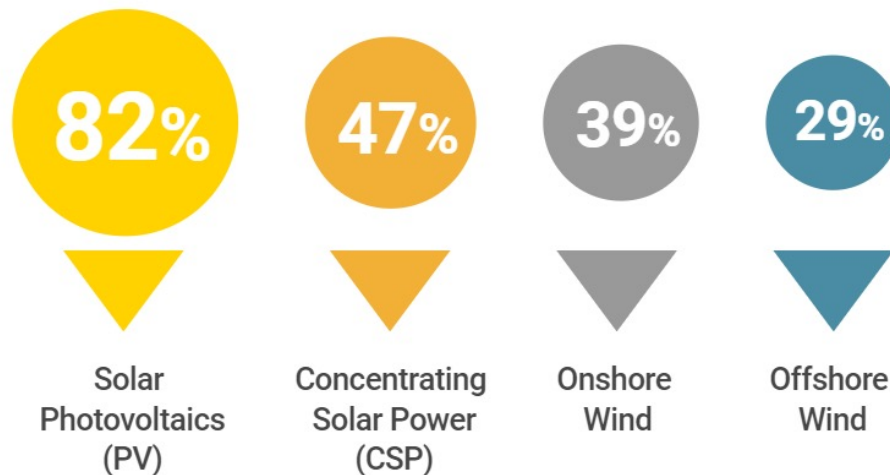


# Dramatic reductions in cost fueling opportunity

- Renewable electricity costs have fallen sharply over the past decade, driven by improving technologies, economies of scale, increasingly competitive supply chains and growing developer experience.
- More than half of the renewable capacity added in 2019 achieved lower power costs than the cheapest new coal plants.

## Costs continue to decrease for solar and wind power technologies

### Renewable energy costs declined rapidly over the last 10 years (2010-2019)



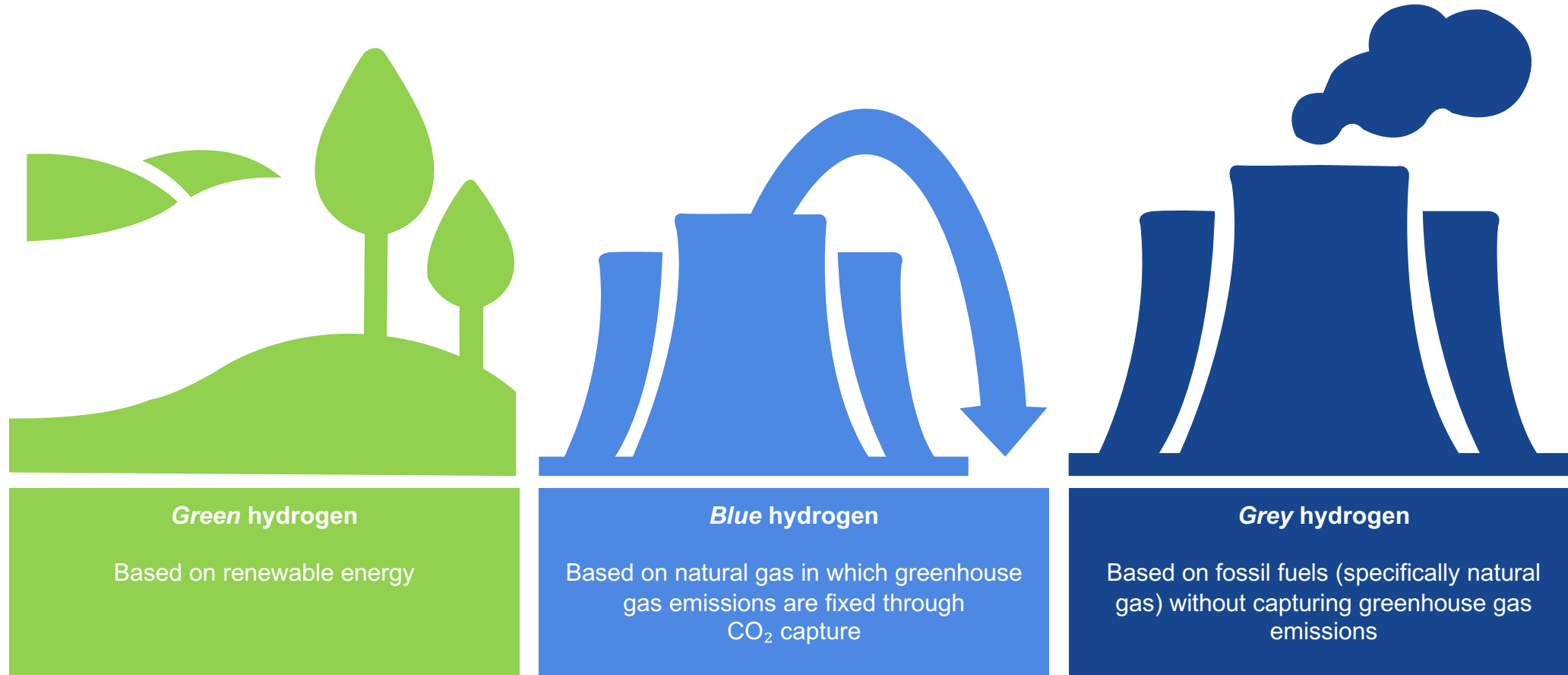


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**Hydrogen**

# The hydrogen colour spectrum

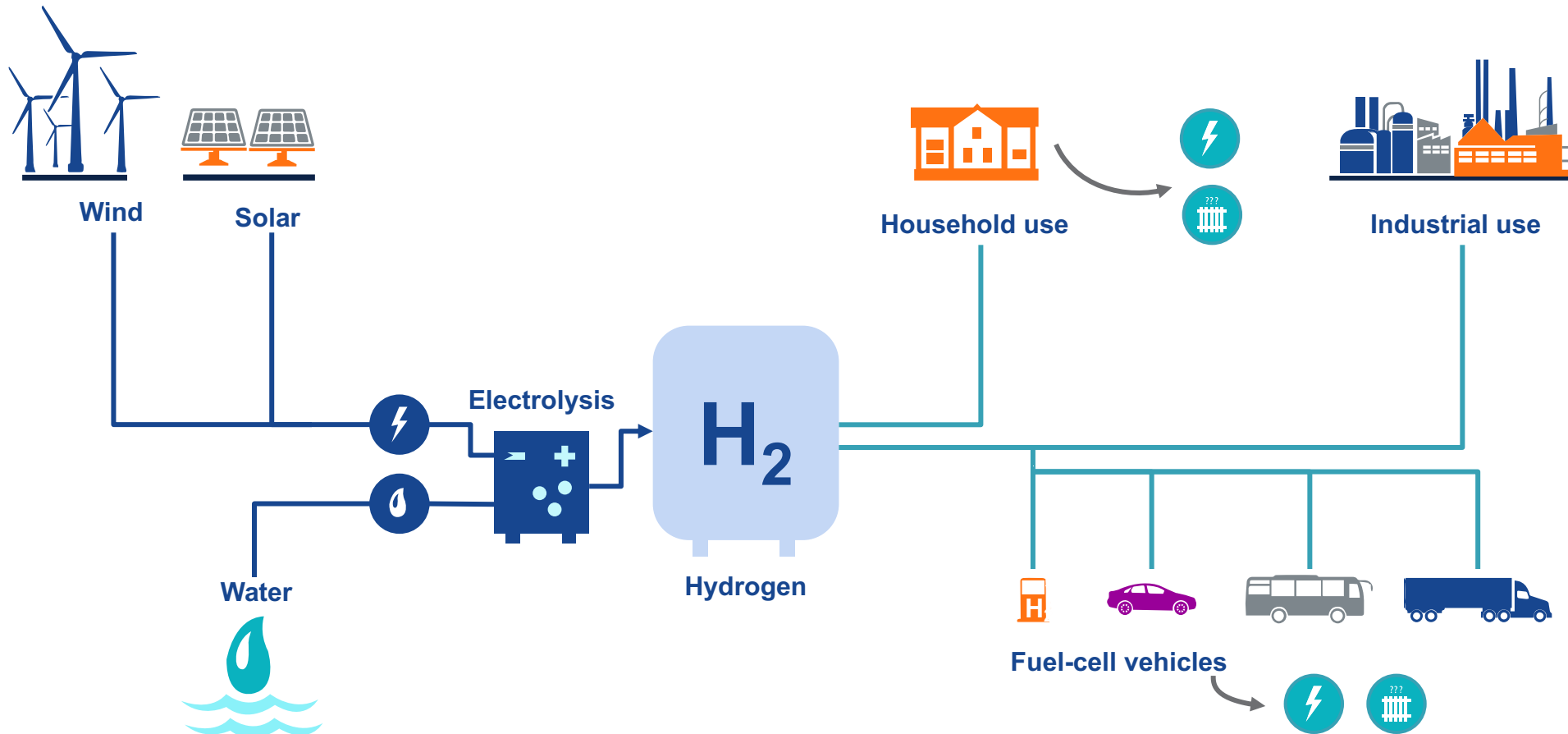
Different ways how Hydrogen is produced:



There are no official definitions for these colors, but the heading represents common industry nomenclature  
Source: Green Car Congress

# Green hydrogen is the objective

Hydrogen can be produced from water and, providing it's made using renewable energy, does not add to atmospheric CO2. Further, its high energy density makes it more suited than electric batteries for powering anything that is especially heavy, such as aircraft and ships.



# Hydrogen: Oil of the future - key to the energy transition?

For many industries there are currently no climate-neutral fuel alternatives but Hydrogen is on the best way to solve this problem.



## Planes

Hydrogen-powered planes are already in development. Airbus has developed several concepts for zero-carbon flight, aiming to fly a commercial aircraft by 2035.<sup>1</sup>



## Trucks

In Europe, the scale-up of hydrogen truck manufacturing and fuel station construction is underway, involving companies like Nikola, Iveco and Volvo.



## Trains

Alstom has developed a hydrogen-powered train, which is already carrying passengers in several countries.<sup>2</sup>



## Steel Plants

The race is on to decarbonise steel, one of the biggest industrial emitters of CO<sub>2</sub>. Companies like ArcelorMittal, SSAB and ThyssenKrupp are beginning to use hydrogen gas to reduce iron ore.<sup>3</sup>

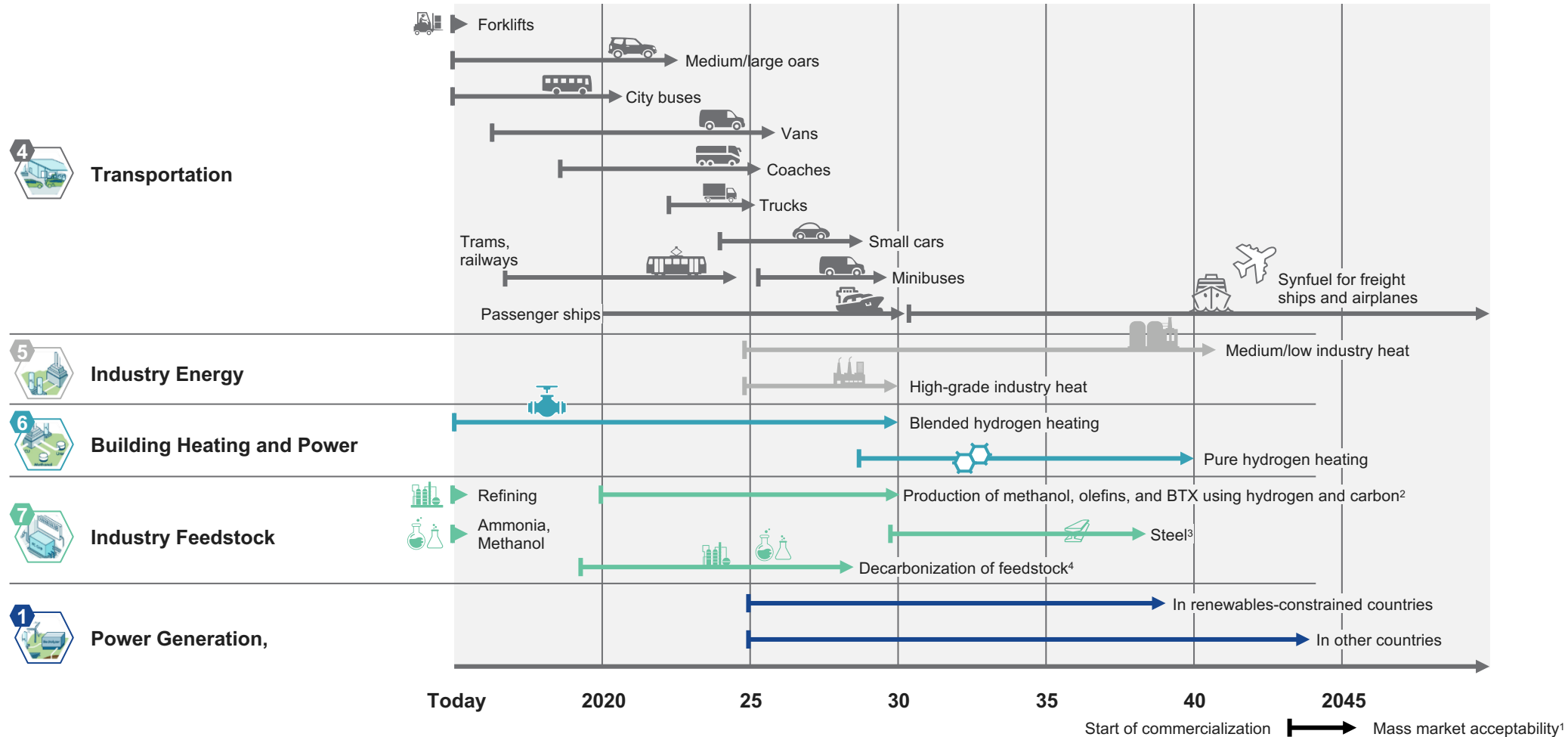
Source: <sup>1</sup>[Airbus](#).

<sup>2</sup> [Alstom](#).

<sup>3</sup> Green steel": The race to clean up one of the world's dirtiest industries. Financial Times. As of 15 February 2021.

Pictures copyright: Airbus and Alstom/Christoph Busse.

# Hydrogen technology is ready to be deployed



1 Defined as sales >1% within segment in priority markets

2 Market share refers to the amount of production that uses hydrogen and captured carbon to replace feedstock

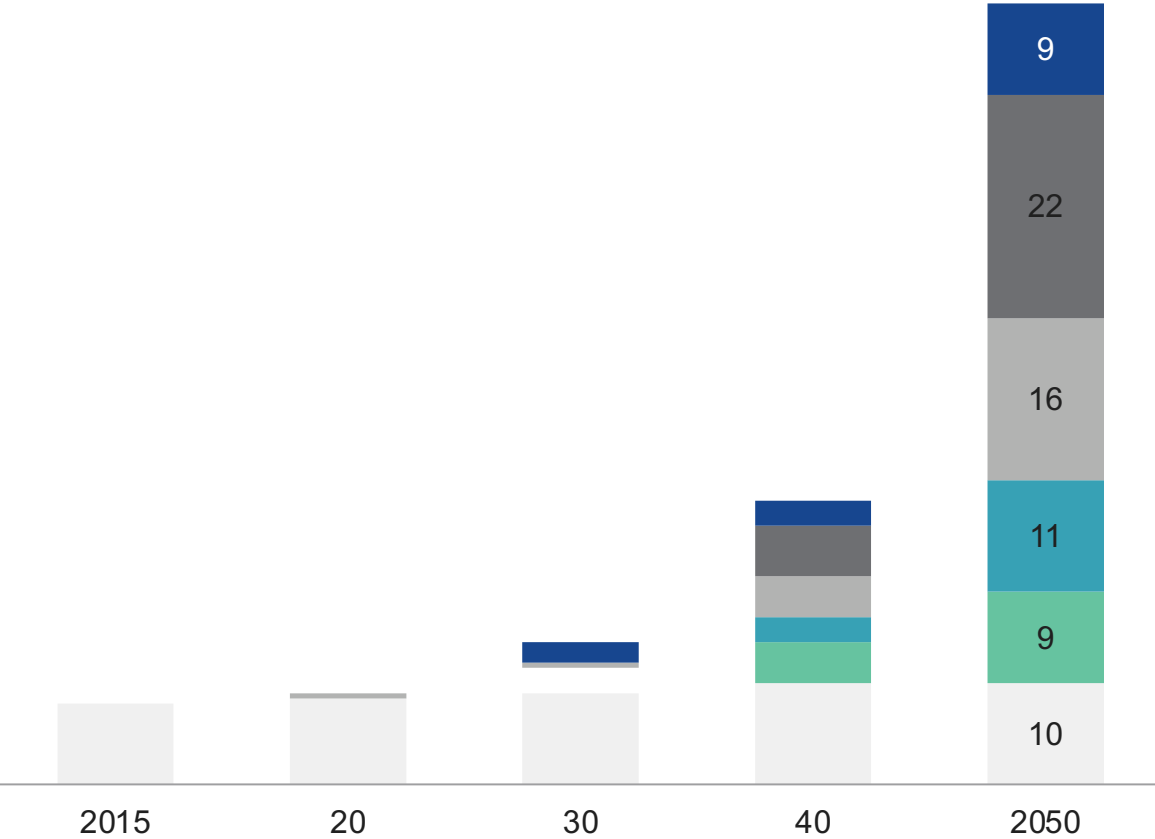
3 DRI with green hydrogen, iron reduction in blast furnaces, and other low-carbon steel making processes using hydrogen

4 Market share refers to the amount of feedstock that is produced from low-carbon sources

Source: Hydrogen Council

# Hydrogen demand could increase 10-fold by 2050

Global demand for power from hydrogen (EJs)



Existing raw material uses

- 1 Power generation and buffering
- 4 Transport
- 5 Industrial energy
- 6 Heating and power for buildings
- 7 New raw material

Source: Source: Hydrogen Council, "Hydrogen, Scaling up" report, 2017  
 \*Feedstock means raw material to supply or fuel a machine or industrial process. CCU means Carbon capture and storage. DRI means direct reduced iron (with green hydrogen, iron reduction in blast furnaces, and other low-carbon steel making processes using hydrogen)



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**Mining Market**

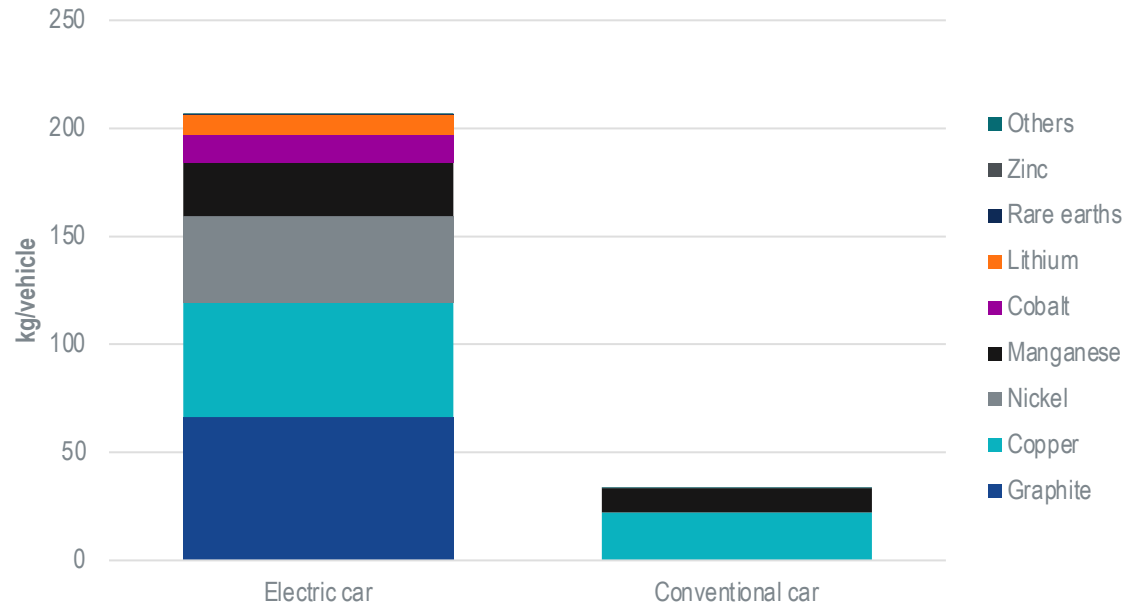


# “Green” Metals Seemingly One Of The Primary Beneficiaries

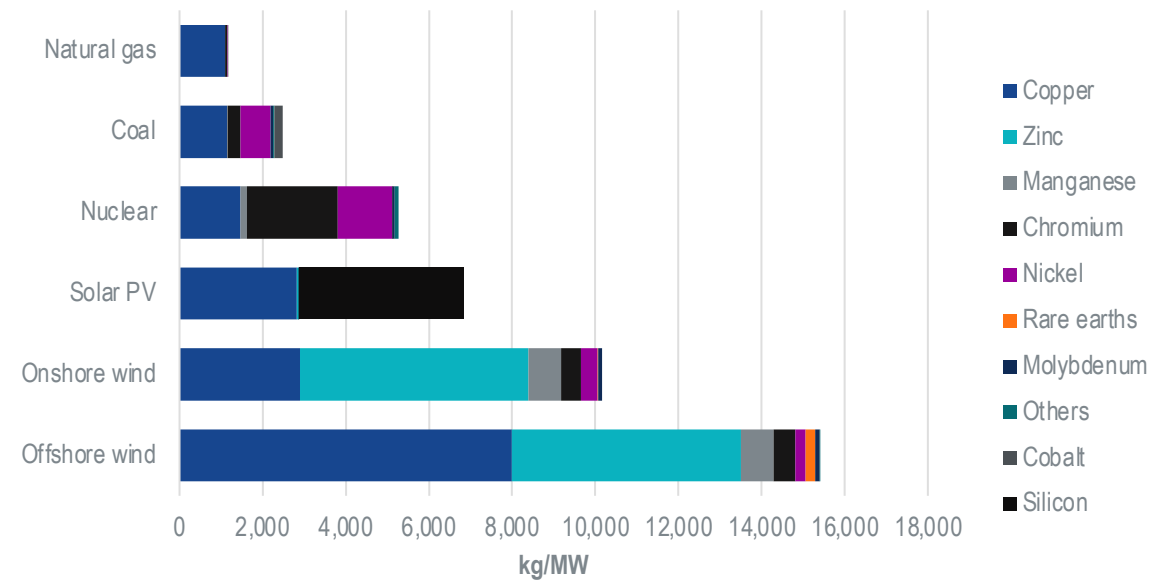
## Transitions Are Metals Intensive

- Metals remain a key player in the transition resource space
- Supply risk and end use varies—however, opportunity for growth on the whole still exists, we believe

## Minerals Used in Electric Vehicles



## Minerals Used in Clean Energy Technologies



Source: IEA. Data as of May 2021.

# Metals' Role In Decarbonization Is Expanding

- Applications helping to decarbonize the economy are metals intensive and expanding rapidly

## Renewables Applications & Metals Required In Manufacturing Processes

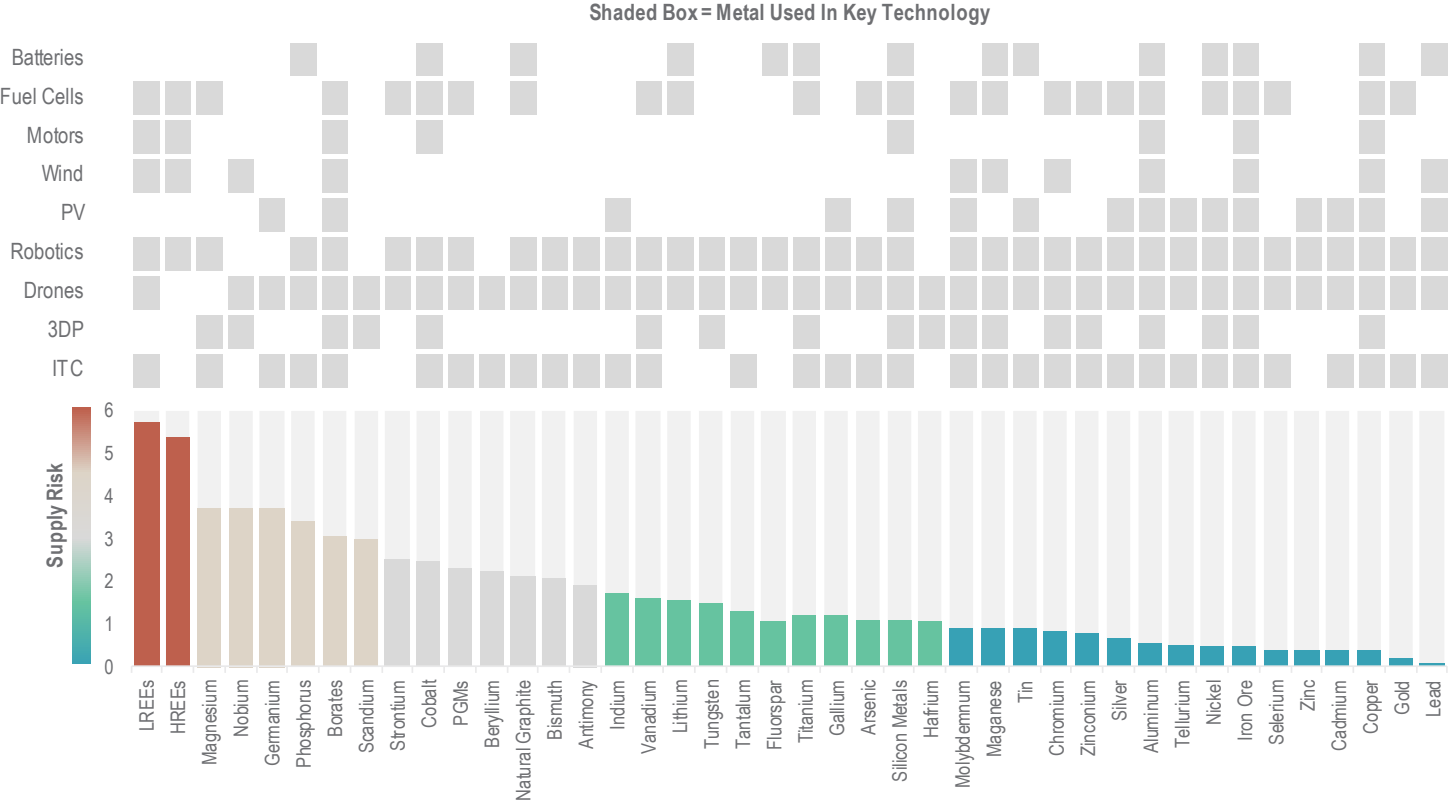
	Power Applications			Automotive	Other		
	Wind	Solar Photovoltaic	Energy Storage	Electric Vehicles	Electric Motors	Carbon Capture & Storage	Light Emitting Diodes
Aluminum	■	■	■		■	■	■
Chromium	■					■	■
Cobalt			■	■		■	
Copper	■	■		■	■	■	■
Indiu		■				■	■
Lead	■	■					■
Lithium				■			
Molybdenum	■	■				■	■
Neodymium*	■			■			
Nickel	■	■	■	■		■	■
Silver		■		■			■
Steel	■						
Zinc		■					■

Source: BofA Merrill Lynch. Data as of December 2020. \*Proxy for rare earth metals.

# Key “Green Technologies” Pose Supply Risk

- Push for expansion of these “green technologies” has the potential to greatly impact supply for a number of raw materials

## Supply Risk of Raw Materials For Key “Green Technologies”

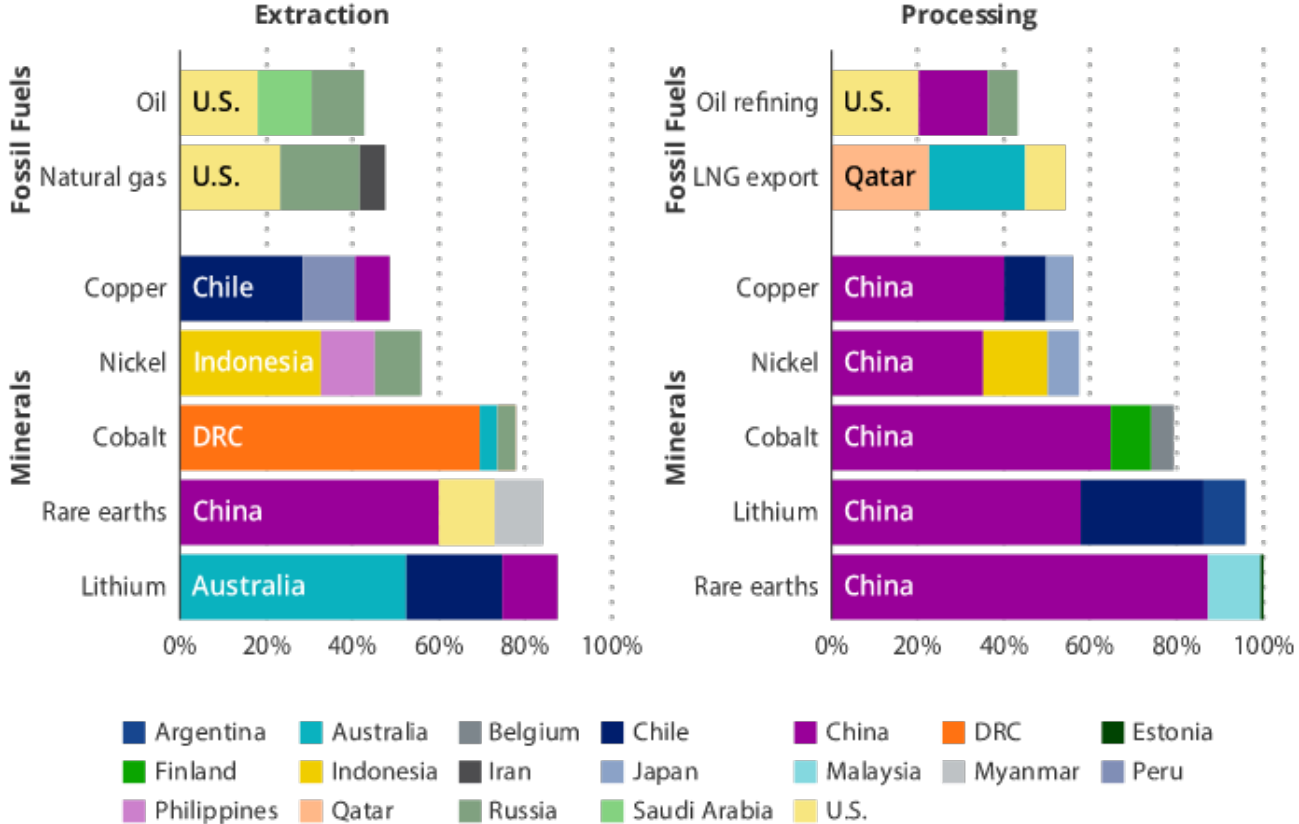


Source: TIC, JRC. Data as of December 2020.

# Supplying Decarbonization Needs

- Geographical concentration could lead to further supply risk due to geopolitical risks

Top 3 Producing Countries of Select Minerals and Fossil Fuels (2019)

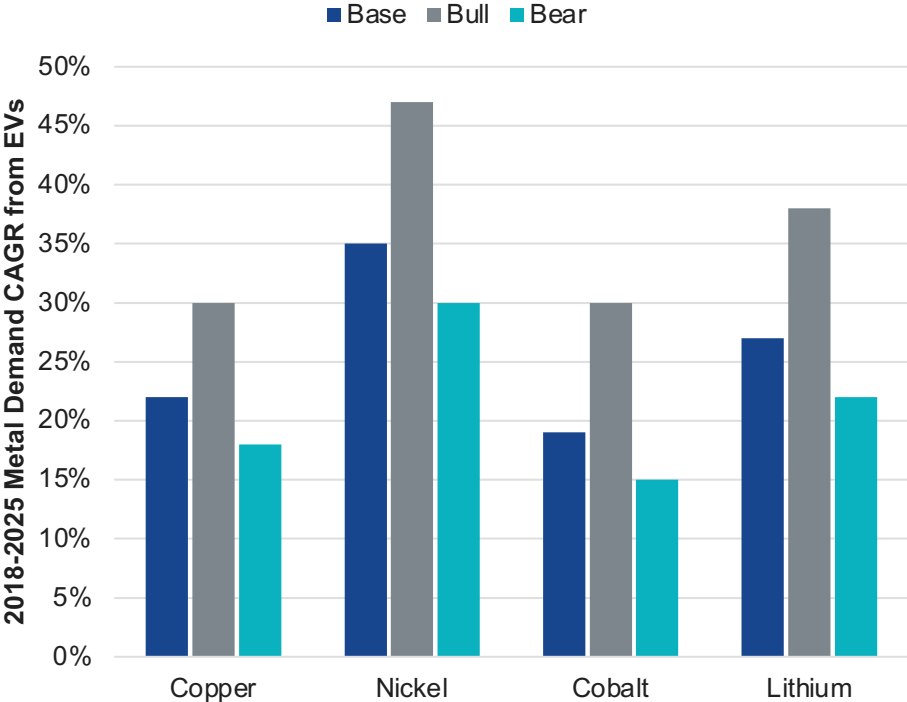
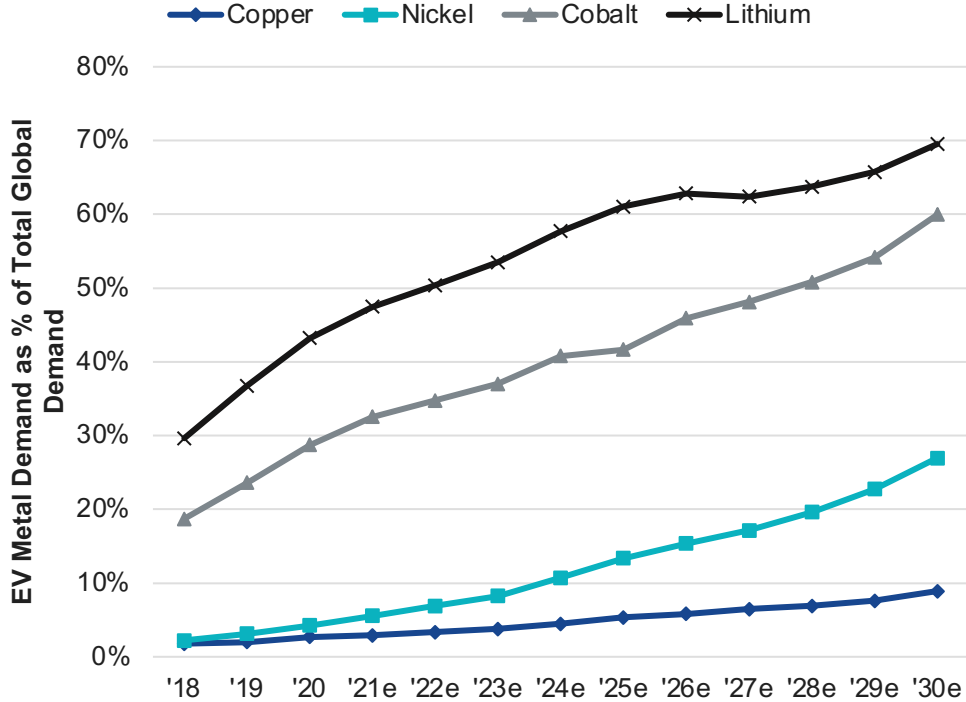


Source: IEA.

# Electric Vehicles Could Be A Game Changer

- In terms of overall metals intensity, electric vehicles (EV) remain a significant component of anticipated growth
- Risks: Please consider risks such as Emerging Markets Risk and Risks of Investing in Smaller Companies before investing. For further information on risks please see slide 23

**EV Metals Demand % Of Total Demand (Left) and Metals Demand CAGR from EVs (Right)**



Source: Morgan Stanley. Data as of December 2020. Past growth is not indicative of future results; current data may differ from data quoted.  
 \* Projected data. Actual data may differ.



# Easy Access to Energy Transformation with ETF's

**VanEck<sup>®</sup>**

**VanEck Vectors Hydrogen  
Economy UCITS ETF**

# VanEck Vectors Hydrogen Economy UCITS ETF

## Key ETF Features

- Provides exposure to companies involved in Hydrogen Economy.
- Tracks the MVIS Global Hydrogen Economy Index(MVHTWOTR)
  - Global Scope
  - Pure-play focus
- Registered for public distribution in AT, DE, DK, ES, FI, IE, IT, NL, NO, SE, CH & UK.

## Fund Details

Inception Date	26 March 2021
Base Currency	USD
Investment Strategy	Industry
Product Structure	Physical (Full Replication)
Income Treatment	Reinvestment
Rebalance Frequency	Quarterly
TER	0.55%
Domicile	Ireland
AUM( 30 June 2021 )	\$45.0M
Number of holdings	25

## Trading Information

Exchange	ISIN	Currency	Ticker	Bloomberg	Sedol	RIC
SIX Swiss Exchange	IE00BMDH1538	CHF	HDRO	HDRO SE	BN7CP15	HDRO.S
London Stock Exchange	IE00BMDH1538	USD	HDRO	HDRO LN	BN6JHY4	HDRO.L
London Stock Exchange	IE00BMDH1538	GBP	HDGB	HDGB LN	BN6JHZ5	HDGB.L
Deutsche Börse	IE00BMDH1538	EUR	HDR0	HDR0 GY	BMTR7Z9	HDR0.DE
Borsa Italiana	IE00BMDH1538	EUR	HDRO	HDRO IM		HDRO.MI



# MVIS Global Hydrogen Economy Index

## Key ETF Features

Holding Name	Ticker	Currency	Country	Sector	% of Net Assets
PLUG POWER INC	PLUG US	USD	United States	Industrials	10.45
BALLARD POWER SYSTEMS INC	BLDP US	USD	Canada	Industrials	8.89
NIKOLA CORP	NKLA US	USD	United States	Industrials	8.32
MITSUBISHI CHEMICAL HOLDINGS CORP	4188 JP	JPY	Japan		8.14
AIR LIQUIDE SA	AI FP	EUR	France		8.03
LINDE PLC	LIN US	USD	United Kingdom		7.89
AIR PRODUCTS AND CHEMICALS INC	APD US	USD	United States	Materials	7.67
NEL ASA	NEL NO	NOK	Norway	Industrials	7.1
BLOOM ENERGY CORP	BE US	USD	United States	Industrials	6.17
FUELCELL ENERGY INC	FCEL US	USD	United States	Industrials	5.57

Country Weighting	% of Net Assets
United States	38.71
United Kingdom	18.14
Canada	10.15
France	9.02
Japan	8.14
Norway	7.99
South Korea	3.46
Sweden	2.92
Germany	1.01
Israel	0.38
Other/Cash	0.08

Performance in % (30 June 2021)	YTD	1 Month	3 Months	6 Months	1 Year	3 Years	5 Years	Since Inception
ETF (NAV)		3.52	-5.90					-1.54
MVHTWOTR (Index)	-4.84	3.55	-5.85	-4.84				-1.61

Currency Exposure	% of Net Assets
U.S. Dollar	55.50
British Pound	10.25
Euro	10.02
Japanese Yen	8.14
Norwegian Krone	7.99
South Korean Won	3.46
Swedish Krona	2.92
Canadian Dollar	1.26
Israeli Shekel	0.38
Other/Cash	0.08

Source: VanEck. Data as of 30 June 2021. The Index is unmanaged and not securities in which investments can be made. You cannot invest in an Index. Past performance is not a guarantee of future results. Index performance is not illustrative of fund performance.

**VanEck<sup>®</sup>**

**VanEck Vectors Global  
Mining UCITS ETF**

# VanEck Vectors Global Mining UCITS ETF



Access the opportunities.

**VanEck Vectors Global Mining UCITS ETF (GDIG)** is a UCITS-compliant exchange-traded fund that invests in a portfolio of global companies primarily involved in the metal and mineral extraction industries, with the aim of providing investment returns that closely track the performance of the **EMIX Global Mining Constrained Weights Index (former Euromoney Global Mining Constrained Weights Index\*)**.

## Fund Details

Inception Date	18 April 2018
Base Currency	USD
Investment Strategy	Hard Assets Equity
Product Structure	Physical (Full Replication)
Income Treatment	Reinvestment
Rebalance Frequency	Quarterly
TER	0.50%
Domicile	Ireland
AUM( 30 June 2021 )	\$187.7M

## Comprehensive global mining exposure

Exposure to emerging and developed markets, includes gold and silver miners

## Capture global growth story

Industry restructuring has resulted in limited supply at a time when commodities have begun to recover

## Cost efficient ETF structure

Only UCITS ETF to provide dedicated exposure to global mining companies at a fraction of the cost of open-end funds

## Trading Information

Exchange	ISIN	Currency	Ticker	Bloomberg	Sedol	RIC
Borsa Italiana	IE00BDFBTQ78	EUR	GDIG	GDIG IM		GDIG.MI
London Stock Exchange	IE00BDFBTQ78	USD	GDIG	GDIG LN	BDGHQ85	GDIG.L
SIX Swiss Exchange	IE00BDFBTQ78	CHF	GDIG	GDIG SE		GDIG.S
London Stock Exchange	IE00BDFBTQ78	GBP	GIGB	GIGB LN	BDGHQ96	GIGB.L
Deutsche Börse	IE00BDFBTQ78	EUR	WMIN	WMIN GY		WMIN.DE

Source: VanEck. Data as of 30 June 2021.

\*IHS Markit acquired all equity indices from Euromoney Trading Ltd in March 2017 and rebranded as EMIX Indices, consistent with the branding for the global equity index universe. This new branding took effect on 15 November 2017.

The index is unmanaged and is not a security in which investment can be made. You cannot invest in an index. See important disclosures at the end of this presentation.

# VanEck Vectors Global Mining UCITS ETF



Access the opportunities.

- Measures the returns of companies in the metal and mineral extraction industries
- Market capitalization, free float adjusted and covers Emerging and Developed Markets

Holding Name	Ticker	Currency	Country	Sector	% of Net Assets
RIO TINTO PLC	RIO LN	GBP	Australia	Materials	6.33
VALE SA	VALE US	USD	Brazil	Materials	5.43
BHP GROUP LTD	BHP AU	AUD	Australia	Materials	5.27
GLENCORE PLC	GLEN LN	GBP	Australia	Materials	5.09
FREEMONT-MCMORAN INC	FCX US	USD	United States	Materials	4.64
NEWMONT CORP	NEM US	USD	United States	Materials	4.51
ANGLO AMERICAN PLC	AAL LN	GBP	South Africa	Materials	4.14
BARRICK GOLD CORP	ABX CN	CAD	Canada	Materials	3.38
BHP GROUP PLC	BHP LN	GBP	Australia	Materials	3.3
FRANCO-NEVADA CORP	FNV CN	CAD	Canada	Materials	2.61

Country Weighting	% of Net Assets
Australia	32.33
Canada	15.55
United States	12.95
South Africa	8.13
Brazil	7.67
China	3.69
Russia	3.58
Mexico	2.21
India	1.92
Zambia	1.09
Other/Cash	10.88

Currency Exposure	% of Net Assets
British Pound	20.82
Canadian Dollar	20.12
U.S. Dollar	19.99
Australian Dollar	17.22
South African Rand	4.87
Hong Kong Dollar	3.66
Russian Ruble	2.83
Indian Rupee	1.92
Mexican Peso	1.50
Japanese Yen	0.99
Other/Cash	6.07

Performance in % (30 September 2021 YTD)	1 Month	3 Months	6 Months	1 Year	3 Years	5 Years	Since Inception
ETF (NAV)	0.09	-8.75	-10.43	-4.14	19.74	16.15	9.86
JCGMMUN (Index)	0.38	-8.90	-10.59	-4.01	20.77	16.92	10.60
Performance Differential (NAV - Index)	-0.29	0.15	0.16	-0.13	-1.03	-0.77	-0.74

Sector Weighting	% of Net Assets
Materials	93.34
Energy	4.39
n/a	0.00

Source: VanEck. Data as of 30 September 2021.

\*IHS Markit acquired all equity indices from Euromoney Trading Ltd in March 2017 and rebranded as EMIX Indices, consistent with the branding for the global equity index universe. This new branding took effect on 15 November 2017. The index is unmanaged and is not a security in which investment can be made. You cannot invest in an index. Past performance is no indication for future performance. See important disclosures at the end of this presentation.

**VanEck<sup>®</sup>**

**VanEck Vectors Rare Earth  
and Strategic Metals UCITS  
ETF**

# VanEck Vectors™ Rare Earth and Strategic Metals UCITS ETF



Access the opportunities.

## Key ETF Features

- **One-Trade Access to the Rare Earth/Strategic Metals Industry:** A highly volatile industry that supplies key inputs to many of the world's most advanced technologies
- **Pure Play, Comprehensive Global Exposure:** Companies must derive at least 50% of total revenues from the rare earth/strategic metals industry to be added to the Index and may include A-shares issued by Shanghai-listed companies trading via Shanghai-Hong Kong Stock Connect
- Registered for public distribution in AT, DE, DK, ES, FI, IE, IT, NL, NO, SE & UK.

## Fund Details

Inception Date	24 September 2021
Base Currency	USD
Investment Strategy	Natural Resources
Product Structure	Physical (Full Replication)
Income Treatment	Reinvestment
Rebalance Frequency	Quarterly
TER	0.59%
Domicile	Ireland
AUM( 30 September 2021 )	\$4.7M
Number of holdings	21

## Trading Information

Exchange	ISIN	Currency	Ticker	Bloomberg	Sedol	RIC
Deutsche Börse	IE0002PG6CA6	EUR	VVMX	VVMX GY	BP48264	VVMX.DE
Borsa Italiana	IE0002PG6CA6	EUR	REMX	REMX IM		REMX.MI
London Stock Exchange	IE0002PG6CA6	USD	REMX	REMX LN	BMGTRP8	REMX.L
London Stock Exchange	IE0002PG6CA6	GBP	REGB	REGB LN	BP480K4	REGB.L
SIX Swiss Exchange	IE0002PG6CA6	CHF	REMX	REMX SE		

Source: VanEck. Data as of 30 September 2021. The Index is unmanaged and not securities in which investments can be made. You cannot invest in an Index. Past performance is not a guarantee of future results. Index performance is not illustrative of fund performance.

# VanEck Vectors™ Rare Earth and Strategic Metals UCITS ETF



Access the opportunities.

## Key Features

### Top 10 Holdings

Holding Name	Ticker	Currency	Country	Sector	% of Net Assets
ZHEJIANG HUAYOU COBALT CO LTD	603799 C1	CNY	China		7.46
CHINA NORTHERN RARE EARTH GROUP	600111 C1	CNY	China	Materials	6.7
GANFENG LITHIUM CO LTD	1772 HK	HKD	China	Materials	6.46
LIONTOWN RESOURCES LTD	LTR AU	AUD	Australia	Materials	5.87
SHENGHE RESOURCES HOLDING CO LT	600392 C1	CNY	China	Materials	5.86
TRONOX HOLDINGS PLC	TROX US	USD	United States		5.85
STANDARD LITHIUM LTD	SLI CN	CAD	Canada	Materials	5.78
OROCOBRE LTD	ORE AU	AUD	Australia	Materials	5.72
LYNAS RARE EARTHS LTD	LYC AU	AUD	Australia	Materials	5.48
LITHIUM AMERICAS CORP	LAC US	USD	Canada	Materials	5.13

### Currency Exposure

Currency Exposure	% of Net Assets
Australian Dollar	29.29
Chinese Renminbi	28.38
U.S. Dollar	20.07
Euro	8.14
Hong Kong Dollar	6.46
Canadian Dollar	5.78
Japanese Yen	1.89
Other/Cash	-0.01

### Country Exposure

Country Weighting	% of Net Assets
China	34.84
Australia	29.29
United States	14.94
Canada	10.91
Netherlands	4.43
France	3.71
Japan	1.89
Other/Cash	-0.01

### Sector Exposure

Sector Weighting	% of Net Assets
Materials	100.01
Other/Cash	-0.01

Source: VanEck. Data as of 30 September 2021. The Index is unmanaged and not securities in which investments can be made. You cannot invest in an Index. Past performance is not a guarantee of future results. Index performance is not illustrative of fund performance.

# Opportunities and Risks

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## Opportunities

- Investing in promising global miners companies with just one ETF.
- Low correlation to other asset classes.
- ETFs have lower regular management costs than active investment funds.
- ETFs are highly transparent. The composition of the underlying indices can easily be understood.
- Transparent secondary trading at current prices takes place during stock exchange trading hours.
- No front-end load is charged when ETFs are bought in the secondary market.
- When buying and selling ETFs in the secondary market, the investor only pays the costs arising from the market maker's spread between bid and ask prices (bid-ask spread) and the individual transaction costs (commission) charged by the investor's bank.

## Risks

- VanEck Vectors UCITS ETFs provide no capital guarantee. They are linked to an index which may develop positively or negatively, i.e. the value of the ETF can rise or fall. The net asset value in particular can fall below the buying price at any time; in the event of a sale, this would therefore result in a loss of capital and in unfavorable circumstances (such as a market driven loss of all the index components) to total loss of the capital invested.
- In the interests of efficient portfolio management, financial instruments and techniques may be used to link the value of the fund to the performance of the index. Although prudent use of these financial instruments and techniques is generally advantageous, they also entail certain risks owing to the special characteristics of derivatives and the mechanisms of derivative markets.
- The equities which the index replicates may be traded in a different currency than that used by the investor. As a result, currency losses may have a negative impact on the return to the investor from the investment.
- Risk of Investing in Natural Resources Companies: Investments in natural resources and natural resources companies, which include companies engaged in agriculture, alternatives (e.g., water and alternative energy), base and industrial metals, energy, forest products and precious metals, are very dependent on the demand for, and supply and price of, natural resources and can be significantly affected by events relating to these industries, including international political and economic developments, embargoes, tariffs, inflation, weather and natural disasters, livestock diseases, limits on exploration, often changes in the supply and demand for natural resources and other factors.
- Emerging Markets Risk: Investments in emerging market countries are subject to specific risks and securities are generally less liquid and less efficient and securities markets may be less well regulated. Specific risks may be heightened by currency fluctuations and exchange control; imposition of restrictions on the repatriation of funds or other assets; governmental interference; higher inflation; social, economic and political uncertainties.
- Risk of investing in smaller companies: The securities of smaller companies may be more volatile and less liquid than the securities of large companies. Smaller companies, when compared with larger companies, may have a shorter history of operations, fewer financial resources, less competitive strength, may have a less diversified product line, may be more susceptible to market pressure and may have a smaller market for their securities.





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**Q&A**





**VanEck<sup>®</sup>**

**Appendix**

# Projected impacts of global warming

- **Climate change** is a long-term change in the average weather patterns that have come to define Earth's local, regional and global climates. These changes have a broad range of observed effects.
- **Global warming** is the long-term heating of Earth's climate system observed since the pre-industrial period (between 1850 and 1900) due to human activities.
- **Fossil fuels are considered the primary contributor to climate change and global warming.** Burning oil, gas and coal to produce energy releases large amounts of carbon dioxide, a greenhouse gas, into the air. Carbon emissions trap heat in our atmosphere, causing global warming.
- **The Paris climate agreement** aimed to hold the rise in global average temperature "well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius."

## Projected impacts of global warming

C	1.5°C	2°C	IMPACT of 2°C compared to 1.5°C
 LOSS OF PLANT SPECIES	<b>8%</b> of plants will lose 1/2 their habitable area	<b>16%</b> of plants will lose 1/2 their habitable area	<b>&gt; 2x worse</b>
 LOSS OF INSECT SPECIES	<b>6%</b> of insects will lose 1/2 their habitable area	<b>18%</b> of insects will lose 1/2 their habitable area	<b>&gt; 3x worse</b>
 EXTREME HEAT	<b>14%</b> of the global population exposed to severe heat every 1 in 5 years	<b>37%</b> of the global population exposed to severe heat every 1 in 5 years	<b>&gt; 2.6x worse</b>
 SEA-ICE-FREE SUMMERS IN THE ARCTIC	At least once every 100 years	At least once every 10 years	<b>10x worse</b>

# Invest in the Hydrogen Economy

## Hydrogen industry companies

### Pure-Play Hydrogen Stocks

### Hydrogen Gas Produces

### Fuel Cell Producers

### Hydrogen Storage

HEXAGON

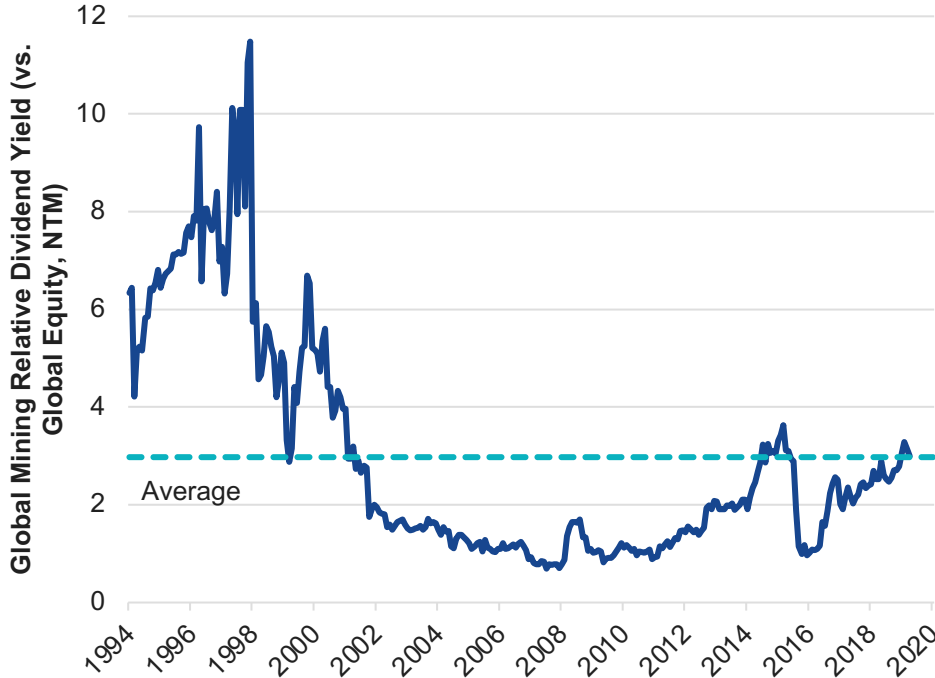
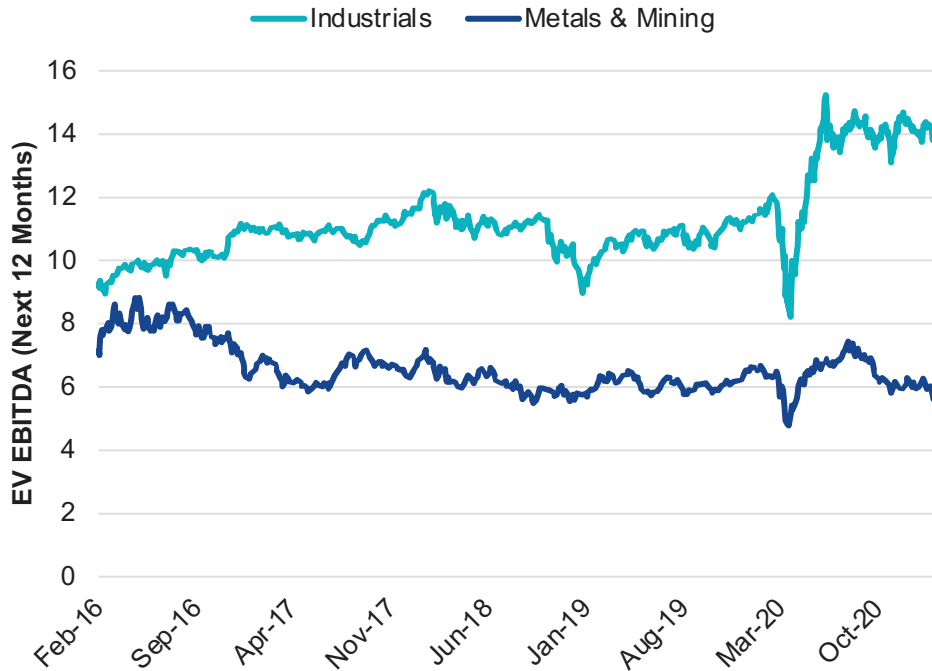
### Electrolyser Producers

For illustrative purposes only. Reference to a particular security is made on a historical basis and does not imply that the security is currently held or intended to be held in any VanEck portfolio. The above information does not constitute a recommendation to buy or sell any security. Companies may be engaged in more than one of the clean energy services associated with them above.

# Global Miners Still Trading At Attractive Valuations

- On both a relative and absolute basis (versus recent history) global mining stocks are still exhibiting attractive valuations
- Risks: Please consider risks such as Emerging Markets Risk and Risks of Investing in Smaller Companies before investing. For further information on risks please see slide 23

EV/EBITDA (Next 12-Month, Left) and Relative Dividend Yield (Metals & Mining vs. All Other Sectors, Right)

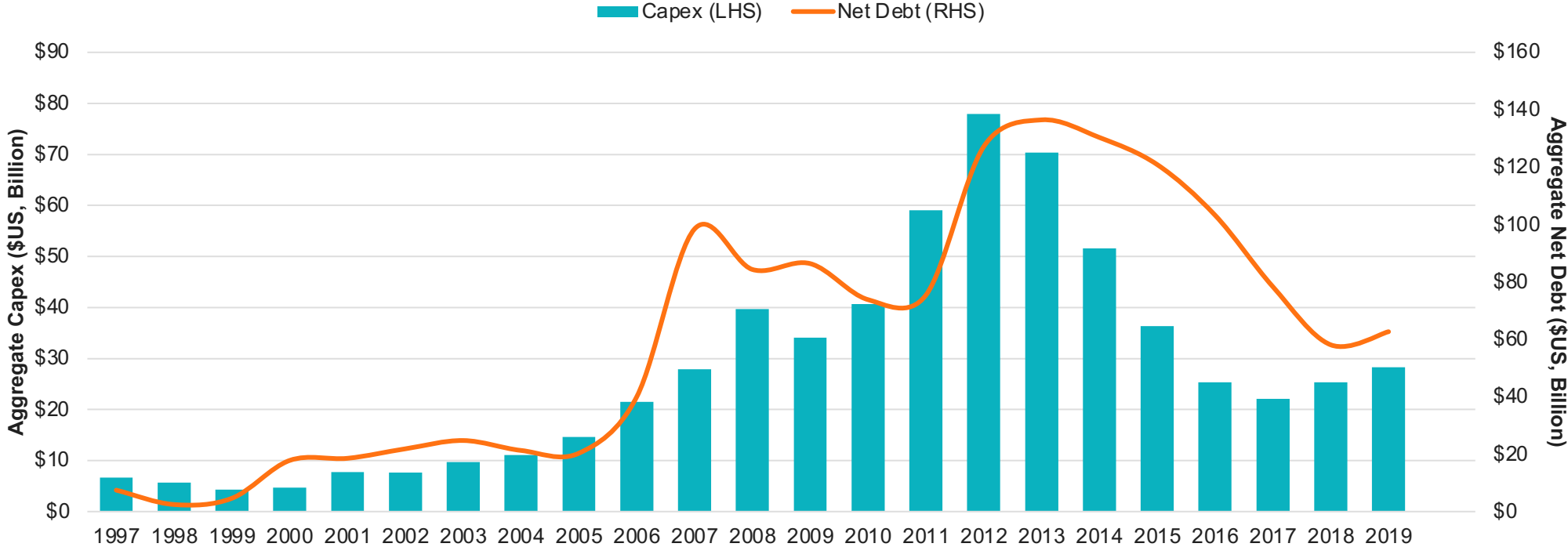


Source: Morgan Stanley, Refinitiv, MSCI. Data as of December 2020. Past growth is not indicative of future results; current data may differ from data quoted.

# Capex And Net Debt Reductions Have Been Dramatic

- Diversified miners have gone to great lengths to clean up their balance sheets, including reducing capital expenditures (capex) and net debt
- Risks: Please consider risks such as Emerging Markets Risk and Risks of Investing in Smaller Companies before investing. For further information on risks please see slide 23

## Capital Expenditures and Net Debt of “Big 6” Miners\*

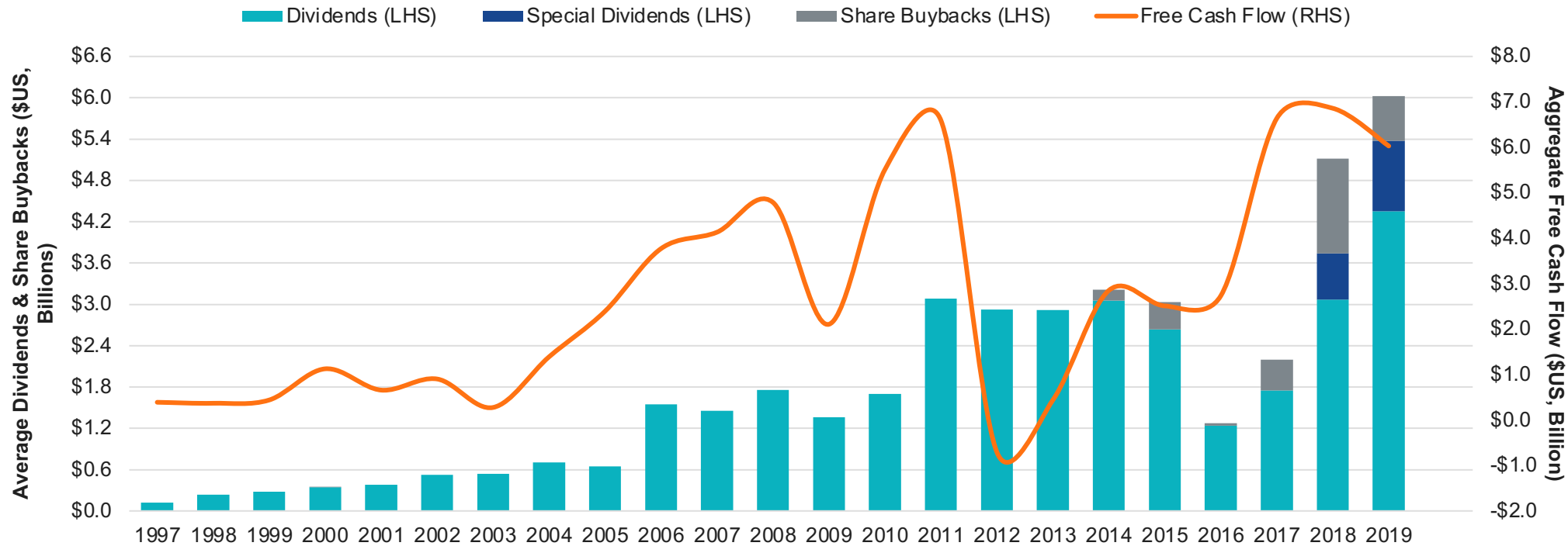


Source: VanEck, Company Reports, Bloomberg. Data as of August 2020. \*\*Big 6” miners includes Anglo American, BHP Billiton, Glencore, Rio Tinto, Teck Resources and Vale. Past growth is not indicative of future results; current data may differ from data quoted.

# Improved Free Cash Flow Generation, Shareholder Return

- Investors continue to be rewarded by miners' renewed focus on free cash flow generation
- Risks: Please consider risks such as Emerging Markets Risk and Risks of Investing in Smaller Companies before investing. For further information on risks please see slide 23

## Dividends, Share Buybacks and Free Cash Flow of "Big 6" Miners\*



Source: VanEck, Company Reports, Bloomberg. Data as of August 2020. \*\*Big 6" miners includes Anglo American, BHP Billiton, Glencore, Rio Tinto, Teck Resources and Vale. Past growth is not indicative of future results; current data may differ from data quoted.

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