

Future Mobility

Are we there yet?

- What makes the future of transport so important?

- How passenger and freight vehicles are being electrified

- Why AI-driven investing in future mobility could help future proof your portfolio

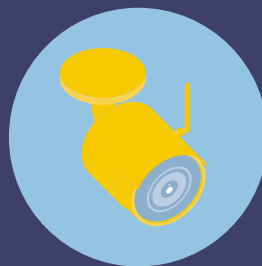


Lyxor's Thematic ETFs - March 2020

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LYXOR  etf
SOCIETE GENERALE GROUP

Preparing for change



Smart Cities



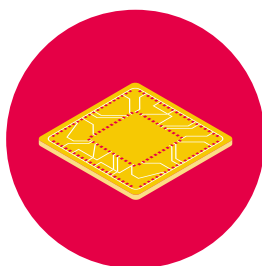
Digital Economy

Our world is changing. Technological breakthroughs, evolutionary economic forces and the climate emergency are reshaping reality for billions of people. **The question is: will your portfolio keep up?**

At Lyxor, we have identified a series of investment themes we believe will be at the forefront of this new revolution. To access these most powerful of megatrends, we've partnered with data powerhouse MSCI and a board of leading industry experts to build an innovative range of thematic ETFs:



Future Mobility



Disruptive Technology



Millennials

Each of these ETFs combines human insight, cutting edge data science and Artificial Intelligence techniques in a unique way to identify the companies that matter most, and ensure your portfolio stays one step ahead. We use low cost indexing to help maximise your return. And we screen our holdings based on their ESG impact on the world around them.

As a pioneering ETF provider with a history of innovation, we've gone the extra mile to build some truly state-of-the-art funds for a new state of mind. We're incredibly excited about this range and hope you can join us in preparing portfolios for change.



Over half a billion electric passenger vehicles are expected on the road by 2040, and lithium-ion battery costs continue to fall. We're on the cusp of another mobility revolution.

Chanchal Samadder
Head of Equities, Lyxor ETF



The electric-car revolution

Over the last 300 years, regular transport revolutions have transformed the world. The canal network, the creation of the railways, the arrival of steam-powered ships, the introduction of petrol and diesel internal-combustion engines in cars, and the invention of flight are just a few of the biggest breakthroughs.

Each of these innovations had an enormous impact on the way our economies work. Better transport links were responsible for around 20% of the productivity gains created by the industrial revolution in Britain.¹

As each innovation matured, it continued to build on the one that came before. Between the 1950s and the early 2000s, cargo shipped by air grew 2.5 times cheaper than cargo shipped by sea because air transport was both faster and increasingly affordable (air transport costs fell by more than 90% over the same time frame).²

But these new technologies didn't just create new possibilities where none existed before – they often destroyed old industries. The way that motor vehicles quickly supplanted horse-drawn transport may be the ultimate example. There's a good reason why some investors use the expression “investing in a buggy whip

manufacturer” as the classic example of buying into a doomed market – in this case the market for horse whips used to steer horse-drawn carriages. Today, we are set for a new revolution that will make the internal combustion engine as obsolete as the buggy whip.

Climate change is one major driver, making it urgent for us to move to technology that produces less greenhouse gas. Meanwhile, rapid urbanisation is increasing population density, traffic congestion, air pollution and noise pollution in cities all around the world, heightening the need for cleaner, quieter vehicles.

This points to a dim future for gas-guzzling cars and a bright one for electric vehicles (EVs). By 2040, almost 60% of all passenger vehicle sales are likely to be electric, say analysts at Bloomberg New Energy Finance.³ By then they project up to 500 million EVs on the roads³, compared with around 5 million as of 2018.⁴



¹Gregory Clark, 2014, *The Industrial Revolution*, <http://faculty.econ.ucdavis.edu/faculty/gclark/papers/HEG%20-%20final%20draft.pdf>

²Hummels, D. (2007). *Transportation costs and international trade in the second era of globalization*. *The Journal of Economic Perspectives*, 21 (3), 131- 154, cited in *World Intellectual Property Organization, 2015, Breakthrough Innovation and Economic Growth* https://www.wipo.int/edocs/pubdocs/en/wipo_pub_944_2015.pdf

³Bloomberg NEF, *Electric Vehicle Outlook 2019*.

⁴International Energy Agency, May 2019, <https://www.iea.org/publications/reports/globalevoutlook2019/>

Key figures

~60%

of all passenger vehicle sales are likely to be electric by 2040³

500

Million EVs on the roads³ by 2040 compared with around 5m in 2018⁴

Battery breakthroughs

One big technological leap is making that possible: better and cheaper batteries. Prices for lithium-ion batteries have dropped rapidly over the past decade and are expected to keep falling, from around \$176/kwh in 2018 to a forecast \$62/kwh by 2030⁵. That trend means that the lifetime cost of EVs should be competitive with petrol engines by the mid 2020s – purchase prices will still be higher, but this will be offset by lower fuel and maintenance costs.

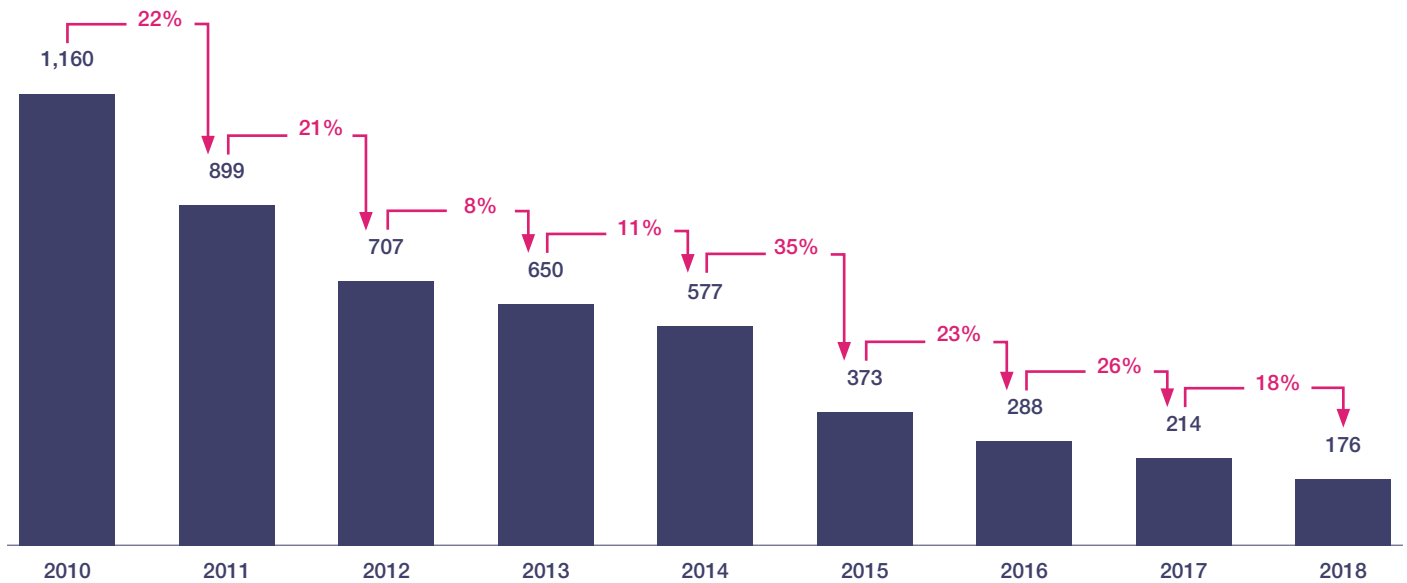
³Bloomberg NEF, *Electric Vehicle Outlook 2019*.

⁴International Energy Agency, May 2019, <https://www.iea.org/publications/reports/globalevoutlook2019/>

⁵Bloomberg New Energy Finance, March 2019

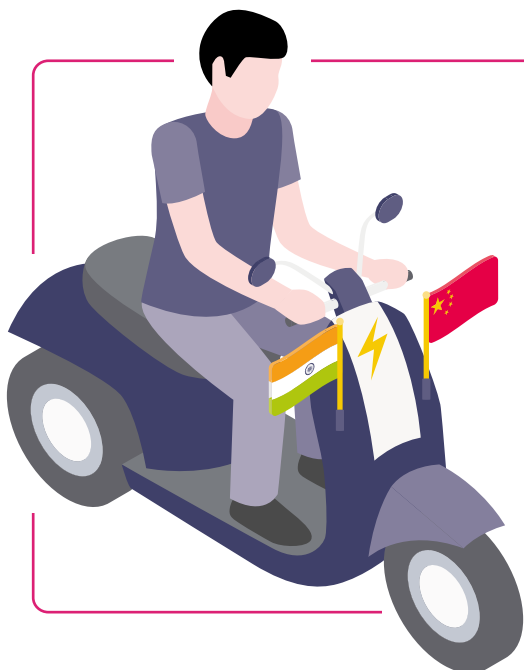
Volume weighted average lithium-ion pack price

Real 2018 USD



Source: BloombergNEF, March 2019

One of the biggest bottlenecks for EVs is charging. Far-thinking governments and local authorities are rolling out a wider network of charging points, and the introduction of ultra-fast chargers should speed up the process, allowing batteries to be replenished in minutes rather than hours. Further in the future, wireless charging may allow batteries to be topped up on the go, through charging pads embedded in streets and motorways.



Emerging markets will play a key role in most of the megatrends that will shape the global economy, and EVs are no exception.

China is already the largest market for electric vehicles⁶ and a leader in charging infrastructure. China is using both subsidies and penalties to incentivise EV production and adoption. China and other emerging markets including India are the biggest buyers of two- and three-wheeled EVs including motorcycles; of which there are already over 300 million.⁷

⁶Bloomberg New Economy Finance, *Electric Vehicle Outlook 2019*

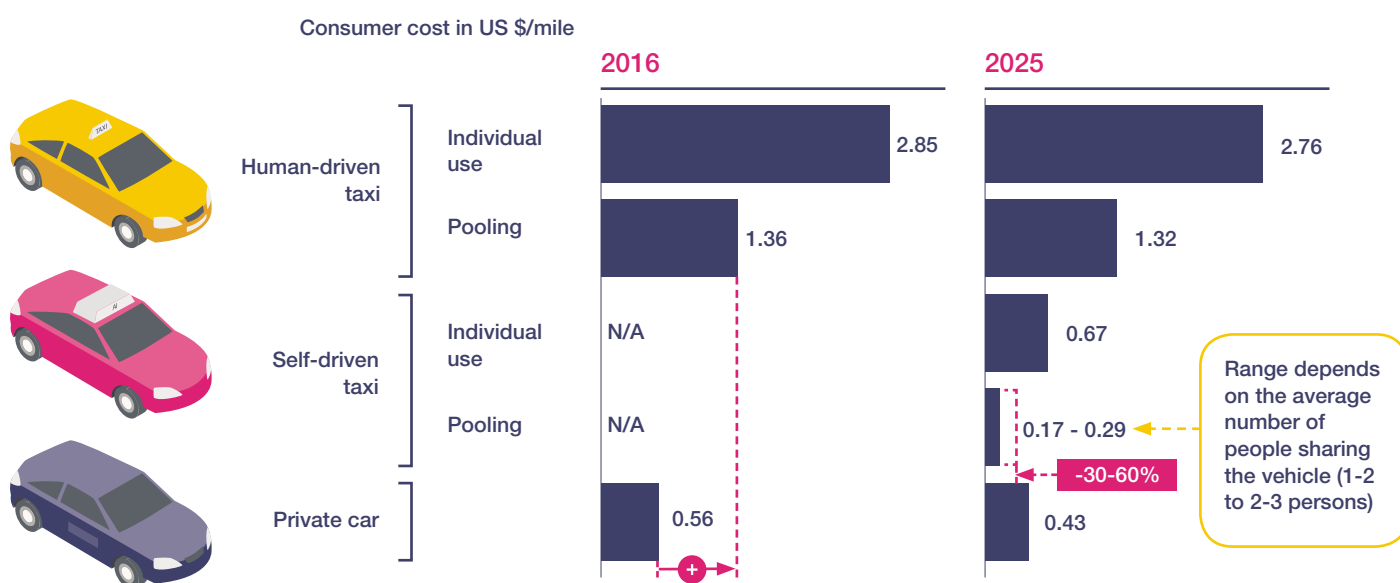
⁷International Energy Agency, May 2019, <https://www.iea.org/publications/reports/globalevoutlook2019/>

From ride sharing to real autonomy

However, electrification will be only one of the key changes to how we get around. Sharing-economy trends such as car sharing, carpooling and ride sharing are already making our transport system more efficient. The shared mobility sector is forecast to grow at almost 20% per year in the period to 2025.⁸

Many experts expect on-demand autonomous vehicles (or “robo-taxis”) to ultimately replace traditional taxis. The cost of these is likely to become increasingly competitive with running a private car, according to analysts at McKinsey⁹, and as that happens private car ownership will become less important. Level 4 autonomous vehicles (AVs) – which can work in specific areas without ever needing intervention by a driver – are expected to be available by the mid 2020s and be widely used by the 2030s when demand could reach 55-60 million units a year.¹⁰

By 2025, a pooled self-driving taxi could compete with a private EV



NOTE: all cars are modelled as battery electric vehicles. Source: Bloomberg New Energy Finance; McKinsey. *An Integrated Perspective on the Future of Mobility, Part 3: Setting the Direction Toward Seamless Mobility*, McKinsey Centre for Seamless Mobility, 2019.

These breakthroughs won't just apply to private cars – self-driving electric vehicles are likely to form part of public transport networks as well. Greater connectivity, automation, sharing and electrification will allow us to create truly integrated transport systems where users of navigation apps and ride-hailing platforms can mix and match trains, buses, car share, bike share, e-scooters, autonomous shuttles and AVs for almost any conceivable journey, creating easy seamless mobility.¹¹

The opportunities for optimisation don't just apply to passenger transport. E-commerce has greatly increased the number of parcels being sent, meaning more freight traffic – but solutions such as urban consolidation centres, load pooling and route optimisation can help to offset that. Trials in the cities of Nijmegen and Utrecht in the Netherlands showed that these lead to more efficient truck utilisation and can reduce mileage by as much as 45%.¹²

⁸ResearchAndMarkets.com, December 2018, *Ride Sharing Market by Type (E-hailing, Station-Based, Car Sharing & Rental), Car Sharing (P2P, Corporate), Service (Navigation, Payment, Information), Micro-Mobility (Bicycle, Scooter), Vehicle Type, and Region - Global Forecast to 2025*

⁹*An Integrated Perspective on the Future of Mobility, Part 3: Setting the Direction Toward Seamless Mobility*, McKinsey Centre for Seamless Mobility, 2019. ¹⁰*The Future of Mobility*, McKinsey 2016. ¹¹*An Integrated Perspective on the Future of Mobility, Part 3: Setting the Direction Toward Seamless Mobility*, McKinsey Centre for Seamless Mobility, 2019. ¹²*An integrated perspective on the future of mobility, part 2: Transforming urban delivery*, McKinsey Center for Business and Environment

A vast range of investment opportunities

What's particularly exciting for investors is that this barely touches on all the investment opportunities that this revolution will create, since it will upend many existing technologies.

Electric propulsion has different requirements for components such as axles, braking, driveline, drive chain, powertrain, steering, suspension, sensor, control and antenna systems, compared to traditional cars – so improved systems are being developed for EVs and AVs. For example, electric drivetrains can accelerate a vehicle faster as instant torque kicks in, while regenerative braking recaptures energy lost during deceleration and suspension systems can also generate electricity by recovering vibration or kinetic energy from a moving car.

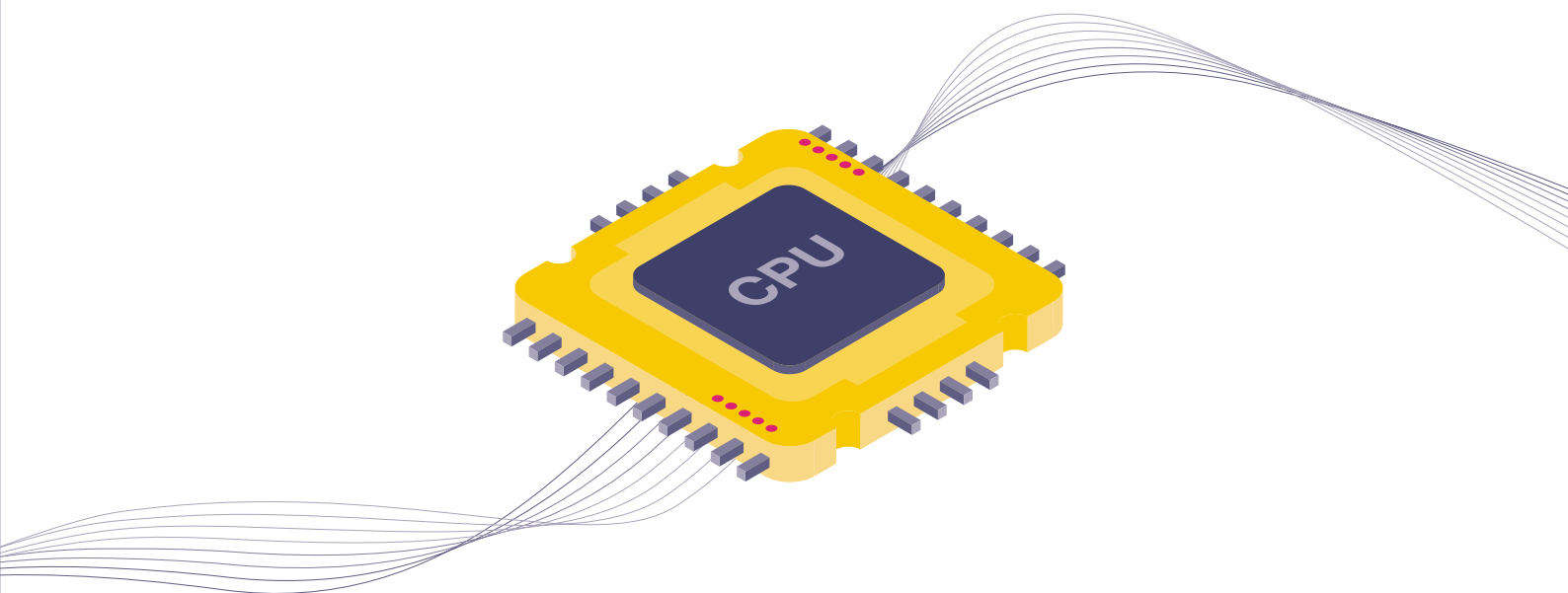
Meanwhile, shared mobility and AVs require highly sophisticated real-time navigation and communication systems. That means more demand for portable telematics, geospatial software, GPS tracking and 3D mapping among other important technologies – which also in turn means a growing market for sensors, data analytics and increasingly sophisticated semiconductor chips.



Finding the full range of opportunities

This makes transport an ideal candidate for the cutting-edge approach that we use to build our ETF. Instead of focusing on a small number of large companies, we use artificial intelligence techniques to search through vast amounts of big data and identify the full range of companies that that exposed to these trends.

So, while our fund holds firms such as EV maker Tesla and carmaker Honda – which has already developed an autonomous work vehicle for activities such as firefighting and farming – it includes less obvious choices as well. For example, technology group Nvidia is developing a hardware and software platform called NVIDIA DRIVE that provides autonomous-driving functions, which could open up new markets for its high-performance computer chips.



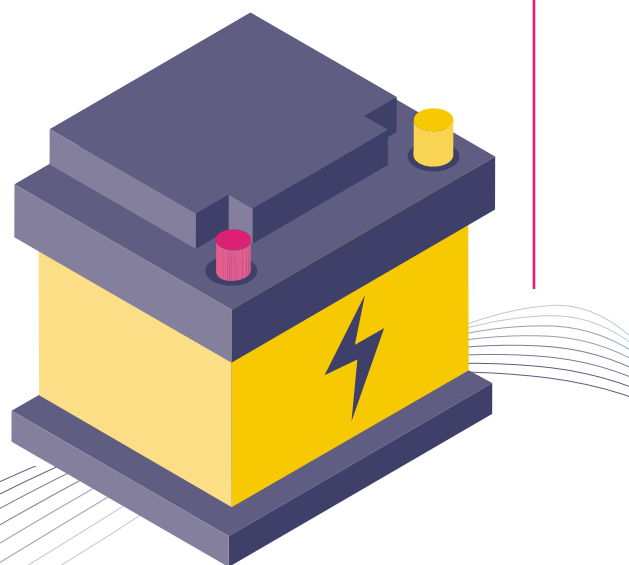
Our ETF is also exposed to more contrarian ideas such as car-rental firms Avis and Hertz. Their core business of car rentals has been affected by the rise of ride-sharing services – but instead of sticking their heads in the sand, these companies have responded by embracing the new opportunities these present and now offer rental services to ride sharers. In the longer term, when self-driving cars enter the mainstream, traditional rental firms are obvious candidates for operating fleets of them and connecting them with users.

And of course, the opportunities don't end with technologies that are reaching a commercial stage. The future of transport is likely to involve even more exciting developments such as hypersonic air travel, Elon Musk's hyperloop concept, and sub-orbital and space flight. Firms operating in these sectors may one day be eligible for the ETF, thanks to the constantly evolving nature of the underlying index.

Building a better battery

The battery supply chain offers many attractive opportunities, since improved capacity and charging times will be crucial for electric vehicles to replace internal combustion engines. Our ETF's holdings include major lithium producers such as Albemarle, Livent and Tianqi Lithium – but with a view to being ahead of trends in battery technology, it also includes producers of titanium dioxide such as Tronox.

Titanium plays an important role in the latest generation of batteries – known as lithium titanate (LTO)-based lithium-ion batteries – because it speeds up the battery charging process (to as little as two minutes), allows for recharging, and can extend the life of batteries to as long as 20 years.¹³ Other holdings include Samsung SDI, one of the world's leading battery manufacturers, while Umicore recycles metals and returns them to the supply chain to be reused, thereby making the whole process more sustainable.



¹³Titanium Dioxide Manufacturers Association, <https://tdma.info/could-titanium-dioxide-be-the-solution-to-the-battery-problem/>

Powering your portfolio



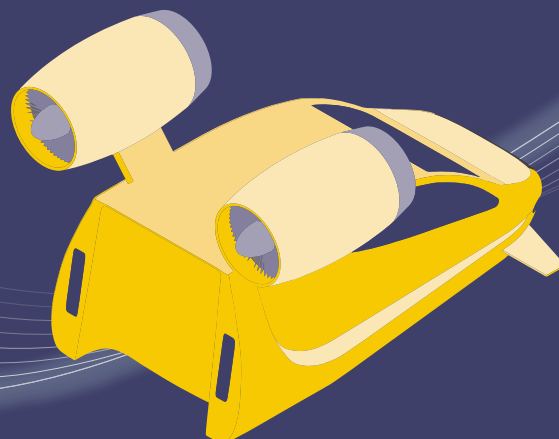
While an age of flying cars may still be a distant prospect, the future of mobility has effectively already begun. Future mobility is a game changer that can make smart cities more liveable, help to address climate change, and move the world towards a sustainable future based on renewable energy. Electrification of both passenger and freight transport will be a key driver. Companies laying the foundations for this and driving forward the boundaries of knowledge are set to be multi-decade growth stories.

To identify these candidates, we've partnered with data powerhouse MSCI. We use cutting-edge artificial intelligence techniques combined with advice from experts in the field to seek out companies in a prime position to exploit these trends.

We also include an ESG filter to build a more responsible exposure.

Our ETF not only holds large and established companies leading the revolution, but smaller ones too. In fact, around two thirds of the portfolio is in small and mid-caps,¹⁴ giving you more access to companies with high growth potential compared to a traditional capitalisation-weighted tracker.

Our unique investment process helps us identify the companies that can change the world, and make obsolescence a thing of the past. When it comes to making sure your investments keep up with the future of mobility, our ETF could be an ideal solution.



¹⁴Lyxor International Asset Management, as at 28/02/2020.

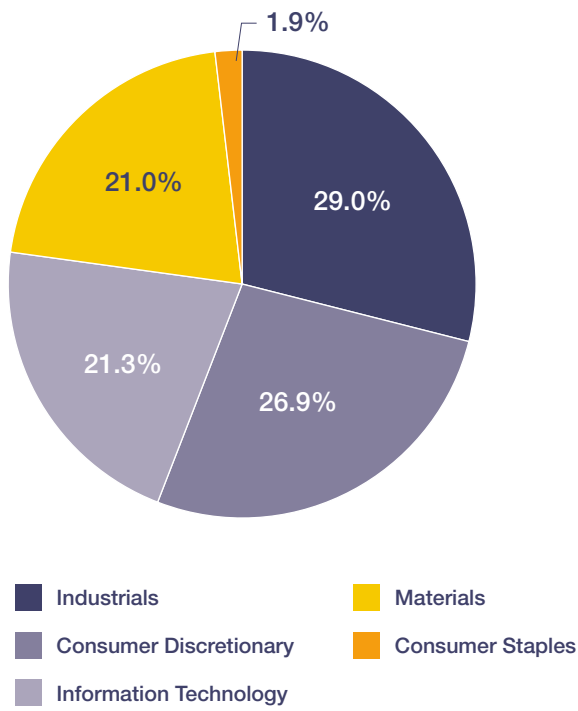
A quick look under the hood



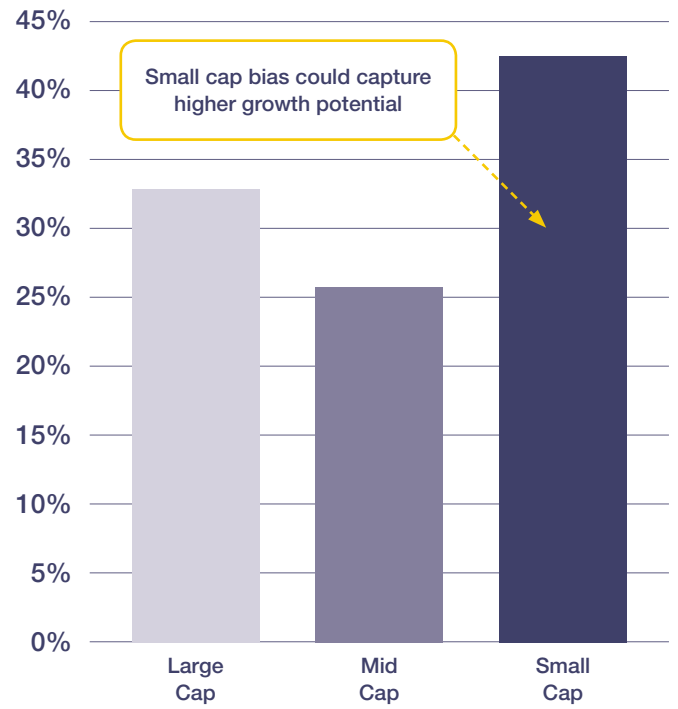
Related concepts, products and services

- Shared Mobility
- Autonomous Vehicles & related tech
- Electro-chemical energy storage tech
- New Passenger & Freight Transportation Methods
- Electric Vehicles (“EVs”) & EV components and materials
- Mining and Metals companies used to manufacture batteries

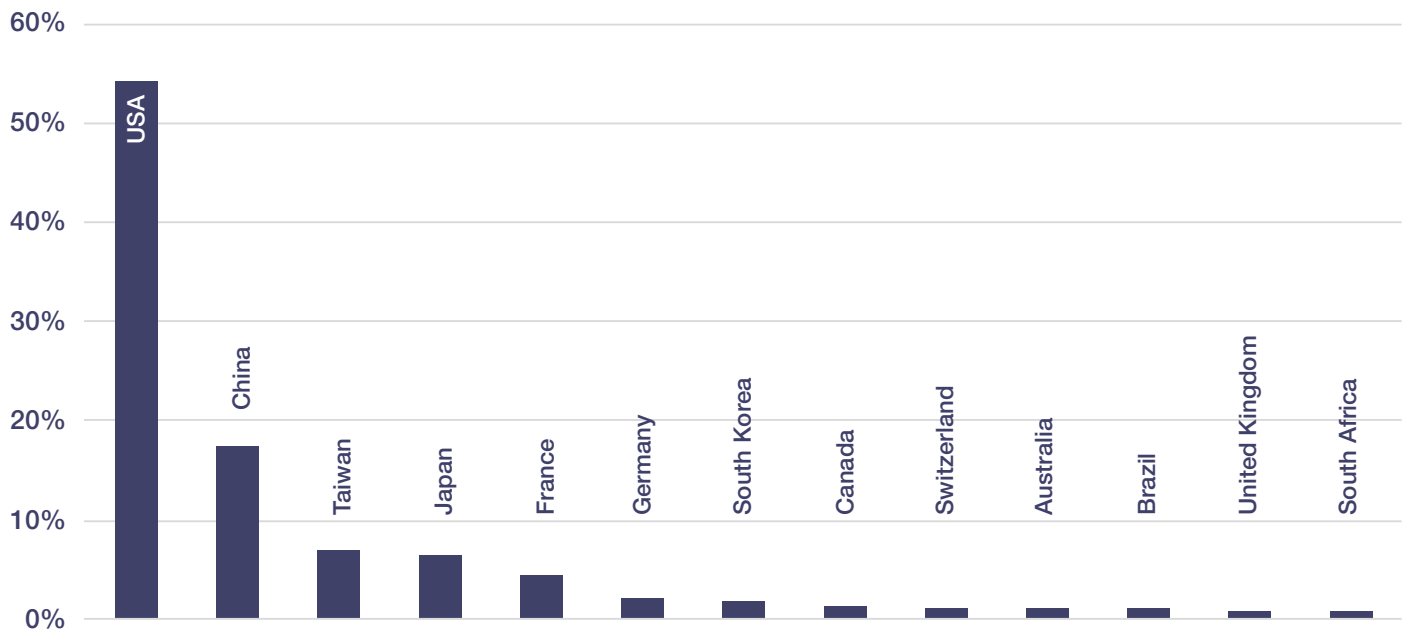
Sector breakdown



Market cap breakdown



Country breakdown



Source for all data: Lyxor International Asset Management, MSCI, as at 28/02/2020.

Top 10 holdings

Security name	GICS Sector	Country	Weight
TESLA	Consumer Discretionary	USA	4.56%
NIO A ADR	Consumer Discretionary	China	4.13%
HERTZ GLOBAL HLDGS	Industrials	USA	3.86%
LIVENT CORP	Materials	USA	3.84%
WALSIN TECHNOLOGY CORP	Information Technology	Taiwan	3.43%
AVIS BUDGET GROUP	Industrials	USA	3.32%
YAGEO CORP	Information Technology	Taiwan	2.88%
NVIDIA	Information Technology	USA	2.86%
GRAFTECH INTL	Industrials	USA	2.79%
O'REILLY AUTOMOTIVE	Consumer Discretionary	USA	2.69%
Total			34.35%

ETF name	Replication type	Bloomberg tickers	ISIN	Current temporary TER*	Target TER*
Lyxor MSCI Future Mobility ESG Filtered (DR) UCITS ETF	Physical	ELCR, MOBI	LU2023679090	0.15%*	0.45%*

Source for top 10 holdings data: Lyxor International Asset Management, MSCI, as at 28/02/2020.

*Source: Lyxor International Asset Management, as at 10/03/2020. Target TER is 0.45% but has temporarily been decreased to 0.15% until September 2021.

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A note on investing in megatrends

Time horizons are long, and portfolios may be concentrated



- ▶ Megatrends take time to shape the world; your investment horizon should be **long term**



- ▶ Thematic indices are more narrow than traditional cap weighted indices
- ▶ As a result of this increased concentration, **volatility may be higher**



- ▶ Unconstrained by traditional allocations based on countries and sectors, thematic ETFs could be used as 'satellites' to strengthen the core of your equity portfolio

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Knowing your risk

It is important for potential investors to evaluate the risks described below and in the fund prospectus on our website www.lyxoretf.com

Capital at risk

ETFs are tracking instruments: Their risk profile is similar to a direct investment in the Underlying index. Investors' capital is fully at risk and investors may not get back the amount originally invested.

Replication risk

The fund objectives might not be reached due to unexpected events on the underlying markets which will impact the index calculation and the efficient fund replication.

Counterparty risk

With synthetic ETFs, investors are exposed to risks resulting from the use of an OTC swap with Société Générale. In-line with UCITS guidelines, the exposure to Société Générale cannot exceed 10% of the total fund assets. Physically replicated ETFs may have counterparty risk if they use a securities lending programme.

Underlying risk

The Underlying index of a Lyxor ETF may be complex and volatile. For example, when investing in commodities, the Underlying index is calculated with reference to commodity futures contracts exposing the investor to a liquidity risk linked to costs such as cost of carry and transportation. ETFs exposed to Emerging Markets carry a greater risk of potential loss than investment in Developed Markets as they are exposed to a wide range of unpredictable Emerging Market risks.

Concentration risk

Thematic ETFs select stocks or bonds for their portfolio from the original benchmark index. Where selection rules are extensive it can lead to a more concentrated portfolio where risk is spread over fewer stocks than the original benchmark.

Currency risk

ETFs may be exposed to currency risk if the ETF is denominated in a currency different to that of the Underlying index they are tracking. This means that exchange rate fluctuations could have a negative or positive effect on returns.

Liquidity risk

Liquidity is provided by registered market-makers on the respective stock exchange where the ETF is listed, including Société Générale. On exchange, liquidity may be limited as a result of a suspension in the underlying market represented by the Underlying index tracked by the ETF; a failure in the systems of one of the relevant stock exchanges, or other market-maker systems; or an abnormal trading situation or event.

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