Why Buy Electric Vehicle Metals?

为什么要买EV金属？

The Electrification Supercycle

电气化超级周期

The demand for metals—such as lithium, cobalt and nickel—means that there is only one way to feed an electrifying world: higher prices.

在现如今的电气化时代，对锂、钴和镍等金属的需求增长必然会造成一个结果：更高的价格。

Lithium prices have soared since 2015 and in early 2017, the industry recognized that there will soon be shortages of cobalt. We believe that class I nickel, which has yet to move substantially and is priced at 27% of its 2007 high, will become one of the biggest benefactors of the Electrification Supercycle.

自2015年以来，锂价格飙升。2017年初，业内认识到钴很快就会出现短缺。我们认为，I级镍将成为电气化超级周期的最大受益者之一，I级镍的价格尚未大幅上涨，目前只达到2007年高点的27%。

Lithium	***Cobalt***	***Nickel***
锂	***钴***	***镍***
Up 4x	*Up 3x*	*The next breakout*
上涨了4倍	上涨了3倍	*下一个爆款*
Since its 2015 breakout	*Since its 2017 breakout*	*Read Why*
自2015年突破以来	自2017年突破以来	*阅读为什么*

Own the kind of metal being hoarded by battery, electronics and car manufacturers, and get direct, long term exposure to the coming supply squeeze pushed by the electrification supercycle. We create a market on these physical metals and ensure buy/sell volume liquidity by working with LME brokers and refineries, while also allowing customers to borrow against their holdings via the Peer to Peer Lending platform.

我们拥有电池、电子产品和汽车制造商争相囤积的金属，并直接、长期地暴露在即将到来的由电气化超级周期推动的供应短缺危机。我们为这些实物金属创建了一个市场，并通过与LME经销商和精炼厂合作，确保提供充分的金属买入/卖出量，同时允许客户通过点对点借贷平台将持有的金属作为抵押进行借贷。

Participate in the EV revolution

参与电动汽车革命

Our electric vehicle (EV) metal parcels are packaged in 250kg (551lb) industrial drums or 2 ton (4,409lb) bulk bags. These parcels contain battery-grade metals used in battery manufacturing.

我们的电动汽车（EV）金属包装在250kg（551lb）的工业桶或2吨（4409lb）的集装袋中。这些包裹装有电池制造过程中所必需的电池级金属。

The drums and bulk bags fulfill the industry standard requirements for security, size, rates, logistics, accessibility, material handling, delivery points, and permitting to ensure liquidity.

这些工业桶装和集装袋装金属满足各项行业标准，例如，安全性、尺寸、费率、物流、可达性、材料处理、交收地点以及流通许可等标准。

EV parcels are uniquely identified physical property, audited by Ernst & Young LLP and Bureau Veritas, fully insured against loss, guaranteed to be genuine, and stored in an LME-approved warehouse in Singapore to allow for seamless liquidity solutions.

EV包裹是具有唯一标识的实物资产，由安永会计师事务所和必维国际检验集团定期进行审计，具备全额保险，保证真品，并储存于LME认证的新加坡仓库内，以提供无缝的流动性解决方案。

EV parcels can be bought and sold online 24/7 based on LME cash pricing, with additional competitive mark-up. They can serve as collateral to easily obtain low interest peer to peer loans. EV parcels can be delivered on demand.

以LME的现货价格加上额外的竞争性加价，EV包裹可以全天候在线买卖。它们可用作抵押品，从而获得低息点对点贷款。EV包裹也可以按需配送。

Electric vehicle metals offered

提供EV金属

Cobalt（钴）

Typically packed in 250 kg drums with a minimum 99.8% purity in briquette or cut cathode forms. Current average delivery time is four weeks.

通常包装于250 kg的工业桶中，纯度不低于99.8%，呈煤砖或阴极切割状。目前平均交货周期约为四周。

Class I Nickel（1级镍）

Sold and packed in 250 kg drums or 2,000 kg bulk bags as minimum 99.8% pure Class I briquettes. Current average delivery time is four weeks.

以250公斤工业桶或2吨集装袋的形式包装和售卖。纯度不低于99.8%，呈煤砖状。平均交货周期为四周。

Other electric vehicle metals.

其他EV金属。

Lithium（锂）

Reacts with humidity and can be explosive when exposed to air or water. It is also corrosive and produces poisonous fumes. We do not offer lithium purchasing options nor storage solutions.

对湿度较为敏感，接触空气或水时可能会发生爆炸。具有腐蚀性，会产生有毒烟雾。我们不销售锂，也不提供相关存储方案。

Copper（铜）

Copper's low price and bulkiness make it expensive, as a percentage of its value, to store. We currently do not see enough demand to offer a copper storage option.

铜的价格低但积庞大，因此按其价格的百分比计算，铜的存储成本非常之高。我们目前不认为铜存储服务具备足够的适销性。

Graphite（石墨）

Forms the anode of almost every battery, but can be easily produced synthetically. It is unlikely to appreciate substantially as demand increases. We do not offer graphite storage.

几乎是所有电池的必备阳极材料，但是很容易合成，所以不会因需求增加，导致大幅的价格上升。我们不提供石墨存储服务。

Bulk Metals（大体积金属）

Manganese, aluminum and silicon are also used in these batteries but supply is plentiful and no shortages are expected.

锰、铝和硅也是电池的必备材料，但供应充足，预计不会出现短缺。

The shift to electric vehicles is accelerating.

向电动汽车的转变正在加速。

The electric vehicle revolution is undeniable. The International Energy Agency expects the number of electric vehicles on the road to increase from 2 million in 2016 to 70 million by 2025.

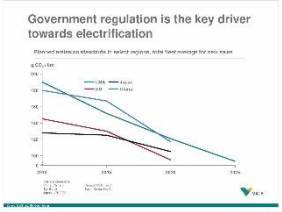
电动汽车革命是不可否认的。国际能源署预计，到2025年电动汽车的数量将从2016年的200万辆增加到7000万辆。

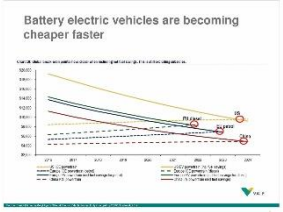
This number will increase substantially, as stringent combustion engine restrictions are being implemented by governments. China will require that 12 percent of all vehicles sold in the country must be electric by 2020. The French and British governments plan to end the sale of new petrol and diesel vehicles by 2040. The Indian government has set a target for every vehicle sold in the country to be powered by electricity by 2030.

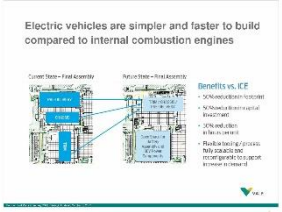
由于各国政府正在实施严格的内燃机限制，这个数字将大大增加。中国将要求，到2020年，国内销售的汽车必须有12%是电动汽车。法国和英国政府计划到2040年停止销售新的汽油和柴油汽车。印度政府已经制定了一个目标，即到2030年，国内销售的每辆汽车都要由电力驱动。

This shift is propelled by battery costs which have fallen tremendously from around USD 1,000 per kilowatt hour (kWh) in 2010 to around USD 150 per kWh in 2018, making EV cars much more powerful and inexpensive. Falling battery prices mean that the production of electric vehicles is becoming cheaper than that of traditional vehicles, as EVs require only half the production floor and capital expenditures compared to equivalent internal combustion engine (ICE) cars.

电池成本从2010年的1000美元/千瓦时(kWh)大幅下降到2018年的150美元/千瓦时，这不仅使得电动汽车的动力变得更强，价格也变得更加低廉。电池价格的下降也意味着，电动汽车的生产成本正变得比传统汽车更加低廉，因为电动汽车的生产空间和生产费用仅为等量内燃机汽车的一半。







The demand for EV batteries is hitting an inflection point, causing more capital to be invested into gigantic factories, which lowers costs through economies of scale, and applied research that increases power efficiencies. These investments in turn will further reduce unit prices of each car, thereby creating even greater demand in an upward spiral that will see a massive shift towards electric vehicles.

电动汽车电池的需求正面临着一个拐点，导致更多的资金流入大型工厂，通过规模经济和提高能效的应用研究来降低成本。这些投资反过来将进一步降低每辆车的单价，从而创造更大的需求，形成一个向电动汽车大规模转移的螺旋式上升趋势。

For example, Tesla was initially set to double world lithium ion battery production with its pioneering Gigafactory, but is now planning to build four additional such factories.

例如，特斯拉最初打算通过其开拓性的“Gigafactory”将全球锂电池产量提高一倍，但现在正计划再建4家这样的工厂。

Mainstream car manufacturers are now focusing heavily on EVs, with hundreds of new EV models under development, ensuring a tremendous battery demand growth. Volvo, for example, has announced that it will cease the production of pure combustion engine cars by 2019, and Volkswagen has signed a 25 billion USD deal to procure battery supplies and will convert 16 factories to produce electric vehicles.

主流汽车制造商现在都把重点放在电动汽车上，正在开发数以百种的新型电动汽车，这将确保电池需求的巨大增长。例如，沃尔沃宣布到2019年将停止生产纯内燃机汽车，大众汽车已经获得了一项250亿美元的电池供应协议，并将原有的16家工厂改造成电动汽车生产工厂。

An increase in electric vehicle production, plus initiatives by governments, is expected to increase the demand for nickel & cobalt

电动汽车产量的增加，加上各国政府的举措， 对镍和钴的需求预计将增加

Collin Kettel, CEO of Palisade Global Investments Ltd, discusses the increasing importance of nickel & Cobalt

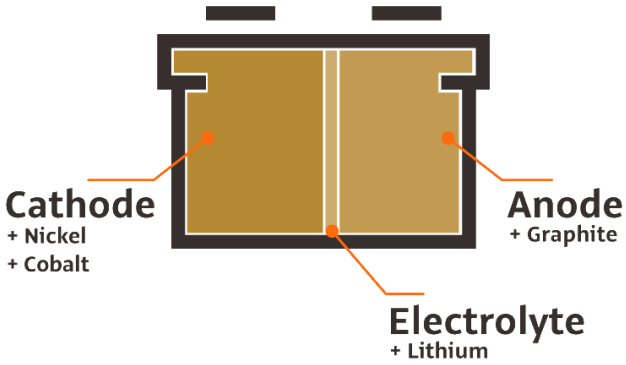
帕利赛德全球投资有限公司首席执行官科林·凯特尔讨论了镍和钴日益增长的重要性

Evolving battery chemistries determine future metal demand.

不断发展的电池化学技术决定了未来的金属需求。

Lithium ion batteries have three key components:

锂电池有三个关键组件：



The cathode determines performance and cost.

阴极决定了性能和成本。

Batteries have to compromise between energy, capacity, costs, life cycle, safety, operating allowances and other factors. The cathode chemistry determines how good a battery is and what metals are needed. The following are the various formulations:

电池必须在能量、容量、成本、生命周期、安全性、运行余量和其他因素之间进行权衡。阴极化学决定了电池的质量和所需的金属材料。以下是各种阴极化合物：

Nickel manganese cobalt (NMC). Nickel provides the performance, cobalt keeps the battery safe and manganese allows for high current discharge without heating up excessively. The more nickel is used, the more powerful and inexpensive the battery becomes but it must be more carefully fine-tuned to maintain safety. This chemistry has high energy density and a long life span.

镍锰钴（NMC）。镍决定性能，钴确保电池的安全性，锰允许高电流放电而不过热。镍的含量越高，电池的性能就越强，价格也就越便宜，但必须对其进行更仔细的调整，以确保其安全性。这种化合物能量密度高，且寿命长。

There are three reference NMC generations:

NMC化合物可分为三代：

- NMC111 containing 33% Nickel and 33% Cobalt is the simplest
- NMC111含有33%镍和33%钴，是最简单的
- NMC622 contains 60% Nickel and 20% Cobalt, greatly improving the power/cost ratio
- NMC622含有60%的镍和20%钴，，大大提高了功率成本比
- NMC811 contains 80% Nickel and 10% Cobalt, the highest theoretical performance vs. Cost
- NMC811含80%镍和10%钴，理论上性能成本比最高

Lithium nickel cobalt aluminum (NCA). A power/costs improvement over NMC 111 because it increased the percentage of nickel while reducing expensive cobalt. Tesla uses this extensively but will likely switch to the 3rd generation NMC811 chemistry once mature. NCA has relatively lower energy density but a long-life span.

镍钴铝（NCA）。与NMC 111相比，功率成本比有所提高，因为它增加了镍的含量，同时降低了昂贵的钴的含量。特斯拉广泛使用这一技术，但一旦技术成熟，很可能会转向第三代NMC811化学。NCA的能量密度相对较低，但寿命较长。

Lithium cobalt oxide (LCO). Used extensively in the portable electronics industry, e.g. in iPhones, this chemistry has good performance but, due to its very high cobalt usage (around 55%), is expensive. LCO has a high energy density but a short life span.

锂钴氧化物（LCO）。这种化学物质广泛应用于便携式电子行业，如iPhone，性能良好，但由于钴的使用量非常高（约55%），因此价格昂贵。LCO能量密度高，但寿命短。

Lithium iron phosphate (LFP). Intrinsically safer than other chemistries but not nearly as powerful as NMC811. This was the early preferred choice in China, but the trend is now to switch to NMC which meet the minimum energy density levels required to qualify for Chinese government subsidies.

磷酸铁锂（LFP）。本质上比其他化学物质更安全，但不如NMC811强大。这是中国早期的首选，但现在的趋势是转向满足中国政府补贴要求的最低能量密度水平的NMC。

Lithium manganese oxide (LMO). It was used in early EVs, such as the Nissan Leaf, because of its high reliability. LMO's downside is low cell durability and mediocre power compared to competing technologies.

锂锰氧化物（LMO）。由于它的可靠性较高，被用于早期的电动汽车，如日产聆风。与竞争技术相比，LMO的缺点是电池耐用性低，功率一般。

"Lithium ion batteries should be called nickel graphite" Elon Musk, Tesla Founder / CEO

"锂离子电池应该叫镍石墨"特斯拉创始人/首席执行官埃隆·马斯克

The industry is moving toward NMC811

行业正朝着NMC811迈进

NMC811 is widely expected to become the preferred cathode chemistry for EV as it will have the best power to cost ratio. NMC811 is expected to drive battery prices well below USD 100 per kWh and enormous NMC production capacity is currently being setup.

NMC811有望成为电动汽车的首选阴极化学材料，因为它具有最佳的功率成本比。NMC811的应用将使电池的价格远低于100美元每千瓦时，并且巨大的NMC产能正在形成。

Battery production realities are such that class I nickel and cobalt will remain the primary EV cathode metals for the next few decades. Promising improvements are the advent of solid state batteries and potentially graphene coatings. Solid state batteries could replace the liquid lithium electrolyte with a solid electrolyte which could make them safer, more compact and faster charging.

电池生产的现实情况是，在未来几十年，I级镍和钴仍将是主要的电动汽车阴极金属。有所改进的话，将会是固态电池和石墨烯涂层的出现。固态电池可以利用固态电解质代替液态锂电解质，使其更安全、更小型、充电更快。

Solid state batteries will change the electrolyte, thereby possibly changing the “lithium-ion” designation and with batteries potentially not requiring lithium at all. However, the NMC811 cathode chemistry and the role of nickel and cobalt will essentially remain the same.

固态电池将改变电解质，从而改变“锂离子”的称号，使得电池根本不再需要锂。然而，NMC811阴极化学及镍和钴的作用基本上将保持不变。