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BATTERY METALS

Seaborne lithium prices hold steady for third straight week

Seaborne lithium prices held steady for the third consecutive week, with market participants softening their bearish tones for the first time this year.

S&P Global Platts assessed battery-grade lithium carbonate unchanged at $9,900/mt and lithium hydroxide steady at $11,700/mt, both on a CIF North Asia basis – which reflects offers, bids and deals for battery-grade material delivered to the main ports of China, Japan and South Korea.

Despite the market's persistent excess of supply and low demand, there was a perception this past week that prices were no longer falling.

"Since last week we've seen demand getting a little bit stronger," said a trader source who said he believed "lithium prices have reached the bottom."

He pegged the tradable value for battery-grade carbonate at $10,000-$11,000/mt, while technical-grade material would be "around $2,000/mt below that," all on a CIF Japan or South Korea basis.

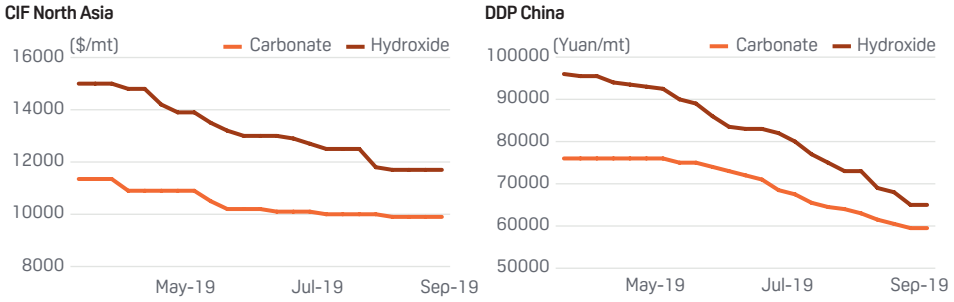
"For [battery-grade] carbonate I'd say that there is still a lot of business at double

(continued on page 2)

BATTERY METALS

		Change	Date Assessed
Weekly Prices			
Lithium Carbonate			
CIF North Asia ($/mt)	9900	+0	20-Sep-19
DDP China (Yuan/mt)	59500	+0	20-Sep-19
CIF North Asia Import Parity (Yuan/mt)	79126	-129	20-Sep-19
Lithium Hydroxide			
CIF North Asia ($/mt)	11700	+0	20-Sep-19
DDP China (Yuan/mt)	65000	+0	20-Sep-19
CIF North Asia Import Parity (Yuan/mt)	93512	-153	20-Sep-19
Cobalt Sulfate			
CIF North Asia ($/mt)	7750	+100	19-Sep-19
DDP China (Yuan/mt)	56500	+3500	19-Sep-19
Monthly Prices			
Lithium Spodumene			
FOB Australia ($/mt)	550	-30	30-Aug-19

PLATTS LITHIUM CARBONATE AND LITHIUM HYDROXIDE



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digits," said a consumer source who operates plants in Asia.

"But I wouldn't exclude that there could be something traded below $10,000/mt CIF," he said.

The trader source saw battery-grade hydroxide tradable at as high as $13,000/mt on the same CIF Japan or South Korea basis.

However, he calculated that if a hydroxide consumer from those two countries imports Chinese material, "he will probably be able to get something like $11,000/mt CIF."

The consumer source was covered by term contracts and therefore not in the spot market, but he considered Platts' $11,700/mt CIF North Asia assessment reflective of the market.

He added that "the premium [for hydroxide over] carbonate is definitely much higher in the international market than in the Chinese domestic market."

Both sources said the imminent start of the fourth quarter should bring some momentum to the demand, which could help support prices.

"Q4 is the best season. From mid-September to early December is the high season," said the trader source.

Both lithium hydroxide and carbonate prices were also steady in the Chinese domestic market after weeks of exploring the downside.

Lithium carbonate was unchanged week on week at Yuan 59,500/mt DDP China, while hydroxide also moved sideways at Yuan 65,000/mt DDP China.

The Chinese domestic market remains substantially cheaper than its seaborne counterpart on an import parity basis.

Platts' $9,900/mt CIF assessment for carbonate was equivalent to Yuan 79,126/mt, including 13% value-added tax, based on Platts' import-parity formula, while hydroxide's price of $11,700/mt was equivalent to Yuan 93,512/mt on the same basis. The dollar was assessed at Yuan 7.073 at 4:30 pm Singapore time Friday.

— Henrique Ribeiro, henrique.ribeiro@spglobal.com

Chinese domestic lithium takes breather from protracted decline

Chinese domestic lithium prices broke out of a 13-week trend to the downside this week, wandering sideways, with Chinese converters reluctant to drop their prices any further as current levels near production costs.

S&P Global Platts assessed battery-grade lithium carbonate at Yuan 59,500/mt Friday and lithium hydroxide at Yuan 65,000/mt, both unchanged from last week. Both assessments are on a delivered, duty-paid China basis.

The direction going forward remained unclear, with sentiment among market participants divided.

Chinese battery-grade lithium prices have been consistently falling since the start of the year due to the increase in excess supplies of spodumene, as well as a higher penetration of technical-grade product due to the surging industry interest in cathode chemistries that do not require the prime battery-grade quality product.

The freefall in battery-grade lithium carbonate prices, however, "is slowing down now, and prices could rebound in late October," said a consumer source. He said "demand would increase and supply might decrease" by then, and that "converters had no profit margin as the prices are close to production costs."

A second consumer source, who paid Yuan 60,000/mt for battery-grade carbonate, said "there is room for lithium carbonate prices to continue to drop if spodumene prices go down further."

However, he said "it's possible to see the price rebounding slightly [at the end of] October if brine production reduces."

A third consumer source said the Chinese lithium market was "slow, there are no signs of movement, but I expect demand to pick up in the fourth quarter, usually it's a good quarter".

He did not expect battery-grade carbonate prices to be below Yuan 60,000/mt, or technical grade to fall below Yuan 50,000/mt.

"Only a few Chinese cathode makers are buying at the moment, so even product that is qualified as battery grade is being sold as technical grade," said a trader source who saw battery-grade carbonate offers at Yuan 61,000-Yuan 65,000/mt, "but if you want to buy you can get it at Yuan 58,000-Yuan 59,000/mt."

Chinese producer sources said demand from the lithium cobalt oxide (LCO), lithium ferrophosphate (LFP) and lithium manganese oxide (LMO) battery industries had recovered to some extent, however, demand from the ternary materials sector remained moderate.

One producer source said that while the market seemed to have stabilized, it might still trend slightly lower and while it was tradable at Yuan 60,000/mt, he had sold to some large customers at Yuan 59,000/mt.

"Demand from the 3C (computer, communication and consumer electronic) lithium battery industry remains steady and the volume has recovered, power battery demand remains moderate, and ternary materials producers haven't received massive orders from battery makers," he said.

The producer added that LFP and LMO demand was good, with consumption mainly comprising industrial-grade lithium carbonate, as the quality of this grade had improved greatly and the cost was lower. He put the price of industrial-grade carbonate at Yuan 48,000-Yuan 50,000/mt, a level that another producer agreed with.

However, a third producer said industrial-grade carbonate was in short supply and had been traded at Yuan 52,000/mt for higher quality.

Lithium hydroxide holds steady despite low demand

The protracted fall of Chinese domestic lithium hydroxide prices also halted this week, as converters were unwilling to lower their prices given the freefall seen over the past few months.

The first Chinese producer source said there was also no demand at all and it might not pick up until the second half of 2020 or 2021.

He had heard of a trade at Yuan 67,500/mt for 10-15 mt of coarse sand and received a bid from a client at Yuan 58,000/mt for battery-grade coarse sand, which he declined.

Another producer said coarse sand

might be tradable at Yuan 57,000/mt, with converters achieving meager or no profits for coarse sand in efforts to build long-term relationships with customers.

He put the tradable value of fine powder at Yuan 66,000-67,000/mt, while another producer source put it at Yuan 71,000/mt.

A consumer source agreed that fine powder was tradable at Yuan 66,000-67,000/mt, adding that there was limited room for a further drop as converters were receiving no profit margin at current levels.

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China, seaborne cobalt sulfate prices extend rally

Chinese domestic cobalt sulfate prices extended a rally, which started in early August, as domestic producers continued to raise their offers in response to rising raw materials costs.

S&P Global Platts assessed cobalt sulfate with 20.5% cobalt content at Yuan 56,500 ($7,962) /mt delivered, duty-paid China on Thursday, up Yuan 3,500/mt from September 12.

Tradable values were indicated at around Yuan 56,000-57,000/mt this week while offers were already above Yuan 60,000/mt, market sources said. Some consumers, who did not hold inventory were obliged to pay higher prices, said a Chinese consumer.

The sales volume was not large as the operating rate of ternary materials producers was not high, he added.

The price of precursor increased significantly on rising cobalt and nickel prices, which added much pressure to producers of ternary materials, as battery makers drove the hardest possible bargain to lower their costs, said a company source from another Chinese ternary materials company. He did not think it would be possible to see a large growth rate in ternary materials output in the short term.

Both cobalt sulfate producers and consumers preferred to sit on the sidelines now because they assumed there was limited room for a further increase, said a Chinese producer.

A second Chinese producer agreed and said the price could go up further only if demand increased significantly. There was a high possibility that cobalt sulfate prices might remain flat, the producer said.

Meanwhile, seaborne prices extended their upward trend on the back of rising cobalt metal prices.

The Platts seaborne 20.5% Co cobalt sulfate assessment was at $7,750/mt CIF North Asia, up $100/mt from September 12.

A third Chinese producer, whose offers to South Korea and Japan were almost equal to domestic prices, said the tradable value should be above $7,500/mt. Another Chinese producer commented that $7,500/mt would also be a good price for exports, given the steady overseas demand.

A Western producer raised his offer to $9,100/mt this week. But he said demand from South Korean and Japanese consumers had not risen significantly.

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Battery market looks to EV recycling to source raw materials

The battery market has begun to focus on how to recycle lithium as a source of raw material going forward, with the electric vehicle revolution gaining pace and all major automakers now fully committed.

Lithium, a key ingredient in EV batteries, has been on a downward spiral throughout 2017. The price is under pressure, following a barrage of material coming into the market, mainly from Australia, with no demand as yet to meet it.

S&P Global Platts assessed battery-grade lithium carbonate and lithium hydroxide unchanged at $9,900/mt and $11,700/mt, respectively last week. Both assessments are on a CIF North Asia basis, reflective of deliveries to the main ports of China, Japan and South Korea.

Many predict that the downturn/stagnation will start to turn around in the early 2020s. But for the time being, EV early adoption isn't quite running at the pace that some had been forecasting.

However, investments of $24 billion are still required in mining to meet lithium ion battery production demand over next decade, despite lithium's recent price plunge on market oversupply and tepid demand, according to Benchmark Mineral Intelligence analysis.

When the market does turn round, and EVs become more embedded in society as costs reduce and charging becomes as simple as filling up at the petrol station, then it is likely that demand for lithium will outstrip supply.

It's then that recycling could start to become an important component of the overall market.

"Let's not forget, we need old batteries to start a recycling phase," said one market source. "It's too early in the production and adoption cycle to have units coming back, once that starts to flow then recycling will take off, and it will need to in order for the whole transition to electric mobility to have as small an environmental footprint as possible."

Lithium Australia announced earlier this week that, in partnership with Envirostream Australia, it is developing a complete recycling solution for spent batteries in Australia.

"The solution includes collecting and shredding them, then separating and chemically extracting the energy metals they contain to re-birth into new lithium-Ion batteries," the company said in a statement.

Lithium Australia Managing Director Adrian Griffin said: "Successfully recovering a precursor of such high purity for the production of new LIBs from material otherwise destined for landfill is a huge step forward for the battery industry. [We're] investigating the commercial potential of this breakthrough. Right now we're in discussions with consumers of lithium, nickel and cobalt -- both within Australia and overseas -- and we see huge

potential for a local battery recycling industry."

Earlier this month the battery recycling project ReLieVe, led by French miner Eramet, with Germany's BASF and France's SUEZ, has been selected by the EU to develop an innovative closed-loop process for the recycling of lithium-ion batteries from electric vehicles.

The EU and the three members will commit Eur4.7 million ($5.17 million) to develop the process and to structure "a well-integrated recycling industry," the French mining and metallurgy group said.

"Around 50,000 tons of batteries are expected to be recycled by 2027 in Europe and it could be multiplied almost tenfold by 2035," SUEZ Chief Operating Officer Jean-Marc Boursier said.

Still, one senior Japanese trader was slightly more skeptical of when recycling will have any real meaning to the EV battery business.

"In my view it's at least 10 years away," the trader said.

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Nickel correction could continue following stellar run despite possible supply-side disruptions: sources

The recent hype in the nickel market could start to look overdone, even with possible supply-side issues going forward, according to market participants at the beginning of the trading week.

Nickel has been a runaway steam train in 2019, hitting fresh highs one after another, propelled by news that Indonesia will bring forward an ore export ban starting next year.

The London Metal Exchange three-month price started the year at $10,670/mt and hit an intraday high of $18,850/mt September 2.

Indonesia's energy and mineral resources ministry confirmed earlier this month that all nickel ore exports, including material over 1.7% nickel content, will be banned from January 1, 2020, two years earlier than originally expected, to increase revenue from domestic processing of the ore.

According to United Nations Comtrade data, Indonesia exported 19.8 million mt of nickel ore and concentrate in 2018, of which 19.3 million mt went to China.

The discussions leading up to this confirmation is what set the price on fire, although participants some have become increasingly dubious that the spike will last.

China, the main buyer, was likely to be able to source material from elsewhere, Jason Sappor a commodities analyst at Market Intelligence, also a part of S&P Global, said in an interview.

"We estimate that Chinese laterite port stocks could feed around four months of domestic Nickel Pig Iron [NPI] output, as of the end of August. However, we do not believe Chinese buyers will rely solely on these stocks and will look to the Philippines in particular as a substitute," Sappor said.

He added that ahead of the Indonesian ban, "we expect Indonesian exports of nickel ore to rise, with Chinese buyers attempting to stock up. This could reduce Chinese refined imports in the near term, which may be the reason why stock levels in London metal Exchange-registered warehouses have risen in recent weeks. This — in addition to profit-taking — is likely to be a factor behind the price correction in the past week."

The LME price closed the Monday session at $17,075/mt, after hitting an intraday low of $16,790/mt. On Tuesday, the LME cash settlement was $17,000/mt.

LME stock levels fell to a low a low of 141,906 mt in August, and have slowly been rising since. Shed inventory stood at 163,308 mt as of Monday close.

"There is talk in the market that another 60,000-90,000 mt of metal could hit LME warehouse over the next week," one London-based trader said Tuesday. He said that could bring the price down to around $15,000/mt, but doubted it could go much lower.

The trader said that in reality, he did not believe there was a nickel shortage and, if anything, Chinese demand is falling in the key market of stainless steel manufacturing.

"Indonesia's ban on nickel ore exports is likely to push the market into a sizable deficit," ANZ said in a paper. "However, this market is remarkably resilient. High inventories and alternative sources should see this supply-squeeze subside, limiting the upside in prices from here," ANZ said.

Philippines suspends operations

There was some more supply-side news this week when the Philippines — the second-largest nickel ore exporter after Indonesia — suspended extraction operations at four of its mining companies in preparation for the implementation of a new responsible mining law.

"This potentially removes a further source of nickel ore supply from the market as the scramble to secure raw material units ahead of the end-of-year Indonesian ore ban continues, and is likely to further bolster nickel ore prices," BMO analyst Colin Hamilton said in a note Monday.

However, the price fall in the face of the news perhaps indicated that near-term, market participants see the metal as overbought and in need of a correction.

"Longer term, nickel demand and, therefore, LME prices will continue to be dominated by stainless steel demand. While demand for nickel in electric-vehicle battery applications is rising alongside the impressive percentage growth in EV vehicle sales, absolute volumes are still comparatively small," MI's Sappor argued.

The EV revolution was long touted as another possible boost for the nickel price, but for many that reality is still a long way off the horizon.

Dutch bank ING said Tuesday that Chinese nickel pig iron output increased to a record high of 53,600 mt in August, up 36% year on year, as domestic producers raised operating rates ahead of the planned ban on Indonesian nickel ore exports.

"China's NPI output could remain strong for the rest of the year as Indonesian ore shipments are brought forward before the export ban," ING said.

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Nissan teams up with EDF to power EV smart charging

Japanese automaker Nissan has teamed up with European energy firm EDF to make charging of electric vehicles as simple as possible for consumers, bringing smart charging to the UK, France, Belgium and Italy, they said in a joint statement.

Smart charging -- or vehicle to grid -- has been getting a lot of attention recently, with more and more companies investing in the technology, which allows cars to both charge efficiently and also have the facility to send power back to the grid when not required. This, it is hoped, will help smooth out any spikes caused as more EVs come to market and consumers adopt the technology.

"Energy accumulated in the batteries of EVs can also be used for businesses own energy needs or the grid when required -- a benefit that will become increasingly important as greater numbers of EVs arrive on our roads and to help balance intermittent renewable generation," the statement read.

Still in its infancy, the EV business has many question marks surrounding its success, from range anxiety to the ability to top up energy as easily as a conventional vehicle. All of the major automakers are now fully committed to making that transition as seamless as possible in order to not only sell EVs but also avoid hefty government fines linked to strict carbon dioxide emissions standards.

Beatrice Bigois, MD for customers at EDF Energy, said: "Our customers are looking to us to help them transition to electric vehicles, and smart charging technologies are crucial to this journey. Our ability to offer our customers solutions that will help them to invest in electric vehicles and start to realise the financial and environmental benefits they bring is achievable through partnerships such as this."

Last week, automaker Ford said it plans on EV sales outstripping conventional engines by 2022, in a move to lower carbon dioxide emissions.

Ford will partner with six energy suppliers across Europe to provide home charging wall box installation services and green energy tariffs for plug-in hybrid customers, "enabling simpler, faster and more affordable charging of electrified vehicles."

In talks with EU member states concluded in December, parliamentary negotiators informally agreed that new cars must emit 37.5% less carbon dioxide on average by 2030 from 2021.

The rules include a target for average carbon dioxide emissions from new cars and vans to be 15% lower by 2025 from 2021.

Meanwhile, Japanese automaker Honda has said it plans to sell only electrified cars in Europe by 2025.

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California waiver fight may become a top energy issue in election

US President Donald Trump said Wednesday he is revoking California 's waiver to set tougher-than-federal fuel economy standards that 13 states and the District of Columbia follow, a move that will throw the fight into the court system, extend uncertainty for automakers, and likely make it one of the top energy issues of the 2020 presidential election.

Trump said on Twitter his administration's policy to freeze national fuel economy standards over 2022-25 would make cars less expensive, leading drivers to replace older vehicles sooner and making roads safer.

"There will be very little difference in emissions between the California Standard and the new US Standard, but the cars will be far safer and much less expensive," Trump said on Twitter.

"Many more cars will be produced under the new and uniform standard, meaning significantly more JOBS, JOBS, JOBS! Automakers should seize this opportunity because without this alternative to California , you will be out of business."

California Attorney General Xavier Becerra is expected to sue to block the move, but the state was in a legal holding pattern Wednesday as the Trump administration has not yet formally revoked the Clean Air Act waiver despite the president's tweet.

"We don't actually know what the administration is proposing to do or how they're couching it legally because we haven't seen any more than the president's tweet," California Air Resources Board Chair Mary Nichols told reporters Wednesday.

Nichols said there's no process for revoking a waiver "because it's never been done." The state has received some 100 waivers over the past 50 years.

The Trump administration's rollback of the Obama administration's auto efficiency standards would increase US oil demand by an estimated 500,000 b/d.

ClearView Energy Partners Managing Director Kevin Book said in a note to clients Wednesday that revoking California 's waiver could make fuel economy the No. 2 energy issue in the 2020 presidential race, behind climate change, "further polarizing vehicle technologies and raising the political stakes of potential lawsuits."

"We would suggest that the profile of the issue seems poised to grow in the wake of Saturday's drone and missile attacks on Saudi Arabian producing infrastructure," Book said.

Threat to auto innovation

Consumer Reports found in a survey earlier this year that 88% of Americans think automakers should continue to improve fuel economy for all vehicle types, and 80% supported moving to a fleetwide average of 40 mpg by 2025, from the current 25 mpg.

Shannon Baker-Branstetter, Consumer Reports' manager of cars and energy policy, said automakers plan models three to five years out. While some will design more efficient vehicles to meet global demand regardless of US policy, others will continue to rely on the high profitability of less-efficient cars, she said.

"This effort is an expensive waste of time," she said of the rollback. "It is going

to fail in court because there's no legal basis for revoking an existing emissions waiver, but the uncertainty it brings stalls innovation and progress on increasing consumer choices of efficient and electric vehicles."

'Unlawful' deal

Earlier this month, the Trump administration stepped up its attack on California 's efforts to preserve its tough vehicle fuel economy targets by calling the state's deal with automakers Ford , Honda , BMW and Volkswagen "unlawful" and "invalid." The top lawyers for the US Department of Transportation and Environmental Protection Agency urged CARB's Nichols in a letter to dissolve the agreement and threatened "legal consequences."

"Congress has squarely vested the authority to set fuel economy standards for new motor vehicles, and nationwide standards for GHG [greenhouse gas] vehicle emissions , with the federal government, not with California or any other state," they said in a letter.

California and the four automakers announced in July they had reached a "voluntary framework" to cut tailpipe emissions annually through 2026 model-year vehicles, delivering the same GHG reductions as the existing Obama-era standards in five years instead of four.

EPA Administrator Andrew Wheeler has said he plans to adopt the final rule later this fall, a target that has been delayed many times.

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Continued scant attention to critical minerals jeopardizes US clean energy goals

The US transition to a clean energy economy could be scuttled if more attention is not given to the critical minerals vital to solar, wind, electricity storage and other green technologies, lawmakers were warned at a hearing Tuesday.

Access to critical minerals, such as lithium, cobalt, nickel and graphite, will be key to the US clean energy industry's ability to innovate and stay ahead in globally competitive markets, yet not enough is being done to secure a reliable supply of these raw materials, DOE Assistant Secretary Daniel Simmons told the Senate Energy and Natural Resources Committee.

Simmons, who heads DOE's Office of Energy Efficiency and Renewable Energy, said "the dependency of the US on foreign sources of critical minerals creates a strategic vulnerability for both our economy and our military, with respect to adverse foreign government actions, natural disasters and other events that can disrupt supply."

Behind the curve

The US is already behind the curve as China has made great strides with a strategic effort to control the supply chains for clean technologies, and countries like Canada and Australia have also made aggressive plays to more efficiently procure raw materials needed to transition their energy systems to more renewables.

China is the top producer and processor of at least 10 critical minerals that are essential to the clean energy industry. Is has been systematically acquiring critical minerals around the world, targeting debt-stressed mining companies and trading much-needed capital for control or influence over large shares of global production of these resources, Allison Carlson, managing director at Foreign Policy Analytics, said during the hearing.

"While China's resource accumulation is vast, that country's control over clean energy technology and their supply chains is not a foregone conclusion," Carlson contended. The US, however, will need to "fundamentally rethink how we understand strategic industries and the long-term investments that are needed to support US clean energy manufacturing."

Sustainable resource development; intensified focus on industrial and post-consumer minerals recycling; and robust investments in material science and research and development "could help reduce dependence on extraction, mitigate supply chain vulnerabilities and provide alternative resources of supply that will be critical to US competitiveness in the next Industrial Revolution," Carlson said.

Future mines

Robert Kang, CEO of Blue Whale Materials, a leading lithium ion recycling company, asserted that the lithium ion battery recycling industry offered "one answer to meet the demand for US sources of critical minerals."

Anywhere from 20% to 30% of the world's critical minerals needs could be met by recycling, according to estimates Kang cited.

"It's reclaiming value from our waste stream," Kang said. "One of the next new mines of the future are our urban cities, our homes. We have this material locked away in drawers and in boxes that we don't look at too often," he said, referring to old cell phones and other gadgets that are often tossed aside for newer models. "So if we can promote collection, if we can take these spent batteries and bring them back into this industry, I think we can claim a significant amount of minerals."

US collection of spent batteries for recycling, however, must increase, as collection levels stand at under 5% in the US compared with more than 40% in European countries, Kang said, adding that US processing and refining capabilities must also be enhanced as most batteries that are collected in the US must then be shipped to China, South Korea and Europe for recycling.

Political will

Senate energy committee Chairman Lisa Murkowski, Republican-Alaska, conceded that allowing the US to continue to fall "further behind in the global race to control supply chains for new technologies … [would be] a massive strategic mistake impacting everything from our ability to create high paying jobs to our national security and influence on the global stage."

"But we have to find the political will to advance policies that will allow us to rebuild a robust domestic supply chain," Murkowski said. "I'm hopeful that by highlighting the direct link between minerals and clean energy technologies, we can gain additional support for our legislative efforts, which are designed to help us avoid future shortages and strengthen our manufacturers."

— *Jasmin Melvin, jasmin.melvin@spglobal.com*

Battery Metals weekly wrap

A couple of things happened to me this week that made me really realize the electric mobility revolution is starting to etch itself into our everyday lives.

I was on my way to meet a broker to discuss market activity, and as I am crossing the road I nearly get run over by a silent (but almost deadly) delivery van powered by electricity. No wonder there are calls for EVs to be fitted with some kind of 'fake' engine sound, or whatever annoying ringtone the owner wants to download.

I continued my journey, and how did my contact meet and greet me? He arrived on his electric scooter. He was literally brimming with joy to extol the benefits of owing an ES, or however they are to be known.

To be fair, it's not the first time I have been nearly run over by an EV, and many people I speak to have also had close calls. But it did open my eyes to how many people in London at least are starting to ping around on electric scooters.

One contact told me that's the way it should be, no need for range anxiety in cities, just make small journeys on easily chargeable small vehicles, be it a bike, a scooter or a small car. "At the end of the day, in a city, why do you need massive range? These devices are the future, they make complete sense and the entry price is low enough to get more and more people on board."

Earlier this month the UK government announced new funding of GBP400 million ($493 million) to boost the country's EV-charging infrastructure.

An initial GBP70 million will be used to create 3,000 new rapid-charge points, more than doubling the number across the UK to 5,000 by 2024.

"Britain already boasts one of the biggest networks of charging infrastructure in Europe and soon we will have the fastest thanks to this investment," Exchequer Secretary Simon Clarke said in a statement.

And this week Japanese automaker Nissan teamed up with European energy firm EDF to make EV charging as simple as possible for consumers, bringing smart charging to the UK, France, Belgium and Italy.

Charging has been the hot topic of 2019 so far. There have been more partnership announcements than you could shake a stick at, so fingers crossed we're on the right path.

Smart charging -- or vehicle to grid -- has been getting a lot of attention recently, with more and more companies investing in the technology, which allows cars to both charge efficiently and also have the facility to send power back to the grid when not required. This, it is hoped, will help smooth out any spikes caused as more EVs come to market and consumers adopt the technology.

Still in its infancy, the EV business has many question marks surrounding its success, from range anxiety to the ability to top up energy as easily as a conventional vehicle. All the major automakers are now fully committed to making that transition as seamless as possible, in order to not only sell EVs but also avoid hefty government fines linked to strict carbon dioxide emissions standards.

Beatrice Bigois, MD for customers at EDF Energy, said: "Our customers are looking to us to help them transition to electric vehicles, and smart charging technologies are crucial to this journey. Our ability to offer our customers solutions that will help them to invest in electric vehicles and start to realise the financial and environmental benefits they bring is achievable through partnerships such as this."

The EV revolution certainly seems to be uniting not only opinion, but also big business like never before. We all know change is needed, and it appears the best way to make that happen is by combining forces.

There was some bad news however this week, so let's hold the group hugs for now.

According to campaign group Transport & Environment, the number of dirty diesel cars and vans on European roads has reached 51 million. The analysis shows an increase by 18% over the past 12 months and a 74% rise since 2016.

"The calculations, which are based on vehicle sales since 2008 as well as on new real-world emissions data, show that carmakers continue to sell dirty diesels," the group said in a damning report. "Almost one-fifth of these polluting cars and vans are in Germany (9.9 million), followed by France (9.8 million) and the UK (8.5 million). Together with Italy, Spain and Belgium, these six countries represent 81% of the EU dirty diesel fleet."

Maybe the future's not so bright, after all?

Until next week, stay charged.

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