

# BATTERY METALS INSIGHT

July 2020

**COVID-19 SUPPORTS REGIONAL SUPPLY CHAINS, BUT WEIGHS ON LITHIUM PRICES AND EV SALES: POTENTIAL SCENARIOS**

## Quarterly pricing wrap: Lithium prices remain under pressure

Lithium chemicals prices remained on a downward track in the second quarter of 2020, driven by the COVID-19 pandemic's impact on demand, while production cuts were insufficient to reduce the stubborn oversupply.

Some market participants said they believed Q2 was the worst period of 2020 regarding demand, due to the pandemic effects, meaning that the pressure on prices might be softer in the remainder of the year. Others, however, said they expected prolonged consequences, which could maintain the bear run until the end of

the year and even further into the first half of 2021.

According to one market participant, there are still around three months of inventory to be consumed. A second source said the original expectations for 2020 would likely be postponed to 2021 — if there were no second wave of the coronavirus.

Battery-grade lithium carbonate prices fell 10% in Q2 both within China and in the seaborne market. S&P Global Platts assessments ended Q2 at Yuan 41,300/mt DDP China and \$6,500/mt CIF North Asia.

A noteworthy development during the quarter was the Chinese government's early-April announcement that it would be extending electric vehicle subsidies for two more years to 2022.

Some sources expected the subsidy policy to favor lithium-iron-phosphate (LFP) cathode chemistries over nickel-rich materials, such as nickel cobalt manganese (NCM) and nickel cobalt aluminum oxide (NCA).

This was expected to support lithium carbonate prices, but the opposite took place, with carbonate prices dropping almost every week throughout Q2 as China's domestic demand was still considered very low. Some Chinese sources attributed this to the higher supply coming from Qinghai brines and lepidolite producers.

Moreover, some consumers were still operating at lower-than-usual rates, due to restrictions related to the pandemic.

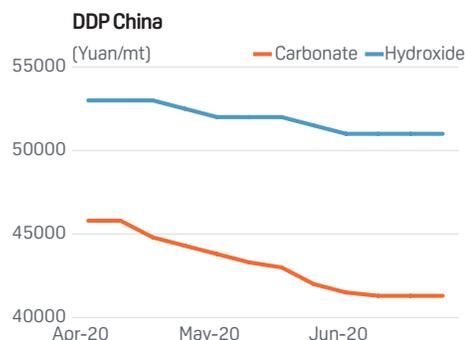
The dynamic was similar in the seaborne market. Despite the supply disruptions in Argentina, where Livent and Orocobre halted operations for two or three weeks, weak demand from the automotive sector prevailed. However, unlike falling Chinese domestic prices, seaborne levels plateaued from May 29 to the end of June.

As in previous quarters, significant price ranges were observed, with carbonate prices reported as low as \$4,000/mt and as high as \$8,000/mt on the same CIF basis. According to some sources, there were also previously negotiated long-term contracts being performed at levels even higher than that.

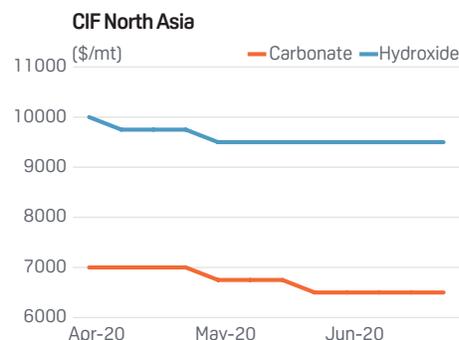
Battery-grade lithium hydroxide was less affected than carbonate, dropping 3.7% in China and 5% in the seaborne market in Q2,

[\(continued on page 2\)](#)

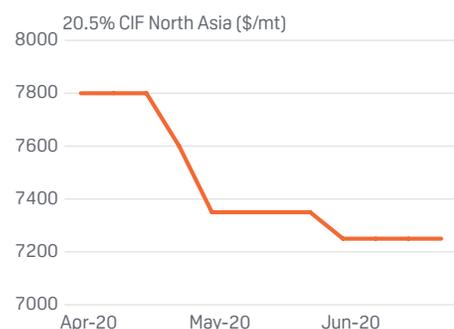
### LITHIUM CARBONATE AND HYDROXIDE PRICING



Source: S&P Global Platts



### COBALT SULFATE PRICING



Source: S&P Global Platts



to Yuan 51,000/mt DDP China and \$9,500/mt CIF North Asia, respectively.

This might look at odds with the resurgence of LFP. But the progressive ramp up in NCM 811 output in China could be one of the reasons why hydroxide was more resilient than carbonate in Q2.

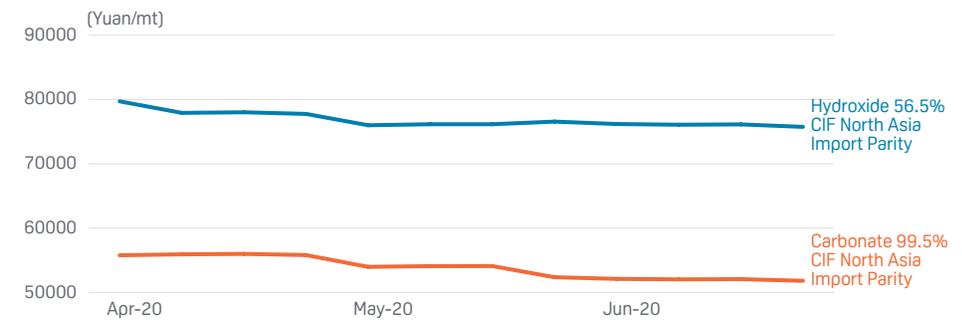
There is also the quality issue, which is hard to achieve and also depends on long qualification periods, as well as the shorter shelf-life and the fact that most hydroxide consumers are tied to long-term contracts. This reduces room for spot volatility.

Some market participants agreed that lithium hydroxide prices are less vulnerable than carbonate. Moreover, many still said they expected nickel-rich cathodes to be the mainstream in the coming years, which would favor hydroxide over carbonate.

Others, on the other hand, consider the current hydroxide-carbonate spread too wide since it's possible to convert spodumene into either of them at very similar costs. This should force hydroxide prices down over time to converge with carbonate numbers.

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## LITHIUM CARBONATE AND HYDROXIDE SPREADS



Source: S&P Global Platts

## SPODUMENE CONCENTRATE 6% PRICING



Source: S&P Global Platts

## COVID-19 deepens 'deglobalization' trend in the lithium supply chain

The COVID-19 pandemic has exacerbated concerns across the lithium-ion battery industry about China's dominance of the supply chain. The pandemic has also highlighted the requirement for local supply chains, as the world turns to a sustainable future and plans for net zero.

Despite some momentum, however, the progression of regional supply chains still faces challenges that go beyond simply raising equity.

Although there has been controversy about Chinese dominance, other regions such as South America and Australia are significantly more important than China in the lithium raw materials mining and extraction process. However, it's evident that the vast majority of the downstream value-add activities are performed in China, largely due to an abundance of cheap energy and forward planning.

This is a consequence of the Chinese government's early push towards

electrification, especially through subsidizing electric vehicles (EV). The country currently accounts for more than half of global EV sales. This emergence of demand incentivized the development of the industry around it, combined with an important financial push from the Chinese government.

As it becomes increasingly clear that the electrification trend will not reverse, the Western Hemisphere has been trying to catch up. In the case of the US, one of the main challenges to reducing the gap is the lack of a government-run, one-direction plan, according to DCDB managing partner Emily Hersh. This is exactly what allowed China to take the lead.

"You won't find a Republican senator saying he is in favor of green energy, and you won't find a Democrat saying he is in favor of mining," she said, adding that there needs to be a champion to articulate a plan.

"The successful approach in the US would be for governors who have

slightly different capital situation going on to take the lead and work with each other regionally."

The US concerns about the importance of lithium and other minerals date from 2017, when the Trump administration signed an executive order to "ensure secure and reliable supplies of critical minerals." A list of 35 minerals – including not only niche products such as lithium and rare earths, but also more common ones like bauxite and tin – was released one year later.

However, in practice little has changed so far. "Take rare earths for example, what is mined in the US has to go to China for processing," Hersh said.

In November last year, the US signed a cooperation agreement with Australia on critical minerals. The countries' export finance agencies agreed to work together to fund new projects and diminish China's dominance, but no concrete investments have been announced so far.

Europe, on the other hand, seems to be ahead of the US in the race. Despite also being much behind China in the development of regional lithium supply chains, Europe has been attracting more investments than the Asian country since last year (*see infographic*).

### European Battery Alliance key

The European Battery Alliance was established in 2017 to help create a competitive manufacturing chain in Europe.

EBA senior industry strategy executive Bo Normark told S&P Global Platts that mining had been given very low priority in Europe for decades, resulting in low activity and attractiveness.

“This has, however, changed dramatically even before the coronavirus [pandemic] and in the annual survey of the most attractive regions for mining globally by the Fraser Institute, they conclude that there has been a spectacular change in the top,” he said.

According to the Fraser Institute’s Investment Attractiveness Index 2019, Europe was the most attractive region in the world for mining investment in 2019, with Finland coming in as the second best jurisdiction in the world for investment, after ranking 17th in 2018. Portugal came in fifth, up from number 46 in 2018, while the Republic of Ireland and Sweden also made the top 10.

Normark said the main challenge now was for countries and companies to deliver on the expectations created for the mining industry.

“Another challenge is finding competent people since the mining industry has been less attractive in Europe for many decades,” he said.

He added that it was well known that there are sufficient lithium deposits in Europe to meet the continent’s entire long-term requirements.

“This will not be done overnight, but a realistic plan is that Europe in the timeframe of 2025-2030 could become self-supplied in lithium. This is important since all projections today are pointing towards lithium being used not only in today’s batteries, but also in the next generation of batteries,” Normark said.

He noted that from a pure commercial standpoint, the formation of a more global

battery supply chain would allow the European battery industry to find the lowest cost options for extracting the materials it needs, while also contributing to the competitiveness of the industry.

“Industrial development, investment and jobs are naturally important elements for distribution of global wealth. With this also comes, if done right, [the opportunity] to spread high environmental and ethical standards to developing countries,” he said.

But there are some disadvantages, Normark said, noting that there could be supply risks from instability arising for various reasons, while it also makes it more difficult to implement and guarantee the highest ethical and environmental standards.

“Another disadvantage is that the fast development of the battery industry has proven to be closely linked to building strategic cooperation along the battery value chain and this can become less efficient. Currently the battery material supply chains create a lot of transportation that can be avoided with local sourcing from Europe,” he said.

“Creating jobs in Europe in combination with the electrification of transportation is an important element to create public acceptance. If jobs are lost and not new created it could slow down the transformation,” Normark added.

### Britishvolt eyes UK dominance

Britishvolt recently expressed interest in building the UK’s first EV battery gigafactory. The preferred location is in Wales, where it could eventually lead to creation of in excess of 4,000 jobs.

Speaking to S&P Global Platts, Chief Strategy Officer Isabel Sheldon said collaboration will be essential for success in the EV and broader battery sectors.

Sheldon has nearly 20 years of experience in the space, ranging from roles at Johnson Matthey, Cummings and the UK Battery Industrialisation Centre, as well as previously running her own successful battery-focused business.

She said that Brexit and the pandemic offer favorable opportunities to the development and rollout of Britishvolt.

“Local supply chains are as important to business as they are to the environment,” she added.

Sheldon detailed how materials such as the cathode (high nickel-based cathode materials), a significant part of next generation EV batteries, needs to be protected from moisture and as such long transit time from hot climates could be detrimental to the product before it is even placed into a battery cell.

This means local refining is essential. One big concern for consumers is the range of an EV, and the better the material is processed and constructed, the better the longevity of the battery pack will be.

The battery industry is forecast to be worth GBP5 billion (\$6.3 billion) domestically by 2025, and the demand for lithium ion cells across a number of industries, including vehicle electrification, is already increasing dramatically.

“In light of recent events [the coronavirus pandemic], it is clear that moving from a global to [more] regional market [is] key for industrial players and policy makers,” Vincent Ledoux Pedailles, executive director at Infinity Lithium, told S&P Global Platts. “The [pandemic] will accentuate even more the need to develop an integrated and local EV supply chain in Europe, with direct access to lithium.”

### Is it really possible to leave China aside?

Despite all the efforts from other regions, especially Europe and the US, China is expected to remain key in the lithium-ion supply chain — and is even more crucial for those in the more upstream side of the industry.

“It is generally more economically attractive to place [lithium] converting assets either near the resource or in regions that can easily serve energy storage device manufacturing centers like China, Japan and [South] Korea,” said Eric Norris, president for lithium at US-based chemicals company Albemarle, stressing that China continues to be an important country for the company.

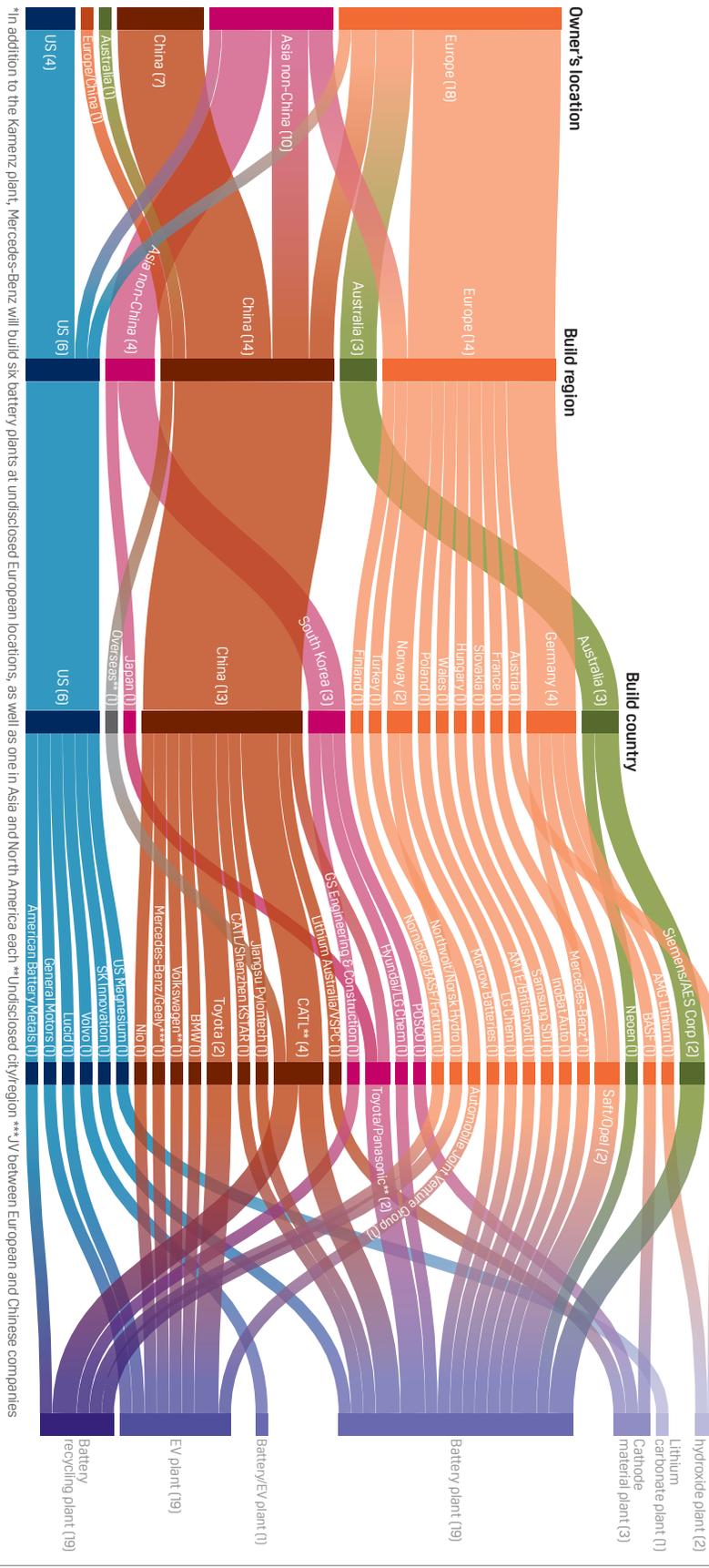
“As such, we will have, and will plan to have going forward, ample conversion capacity in China to serve that market, as well as capacity outside of China to address the globalization of the industry,” he added.

Norris said Albemarle chooses the location of its conversion plants based

# CHARGED UP: EUROPE THE NEW HOT SPOT FOR LITHIUM-ION BATTERY INVESTMENTS

Electrification in transport has been predominantly a Chinese endeavor so far, but Europe is increasing its relevance as another key region for this transition. Driven by more strict regulations on emissions, European companies are on the forefront of investments related to the battery supply chain. Europe also already attracts as many projects as China does. The pandemic accelerated the drive to have a less China-dependent industry, leaving an unanswered question: where will the lithium required to power all these batteries come from? Before the pandemic, a lithium shortage was certain to take place in a few years. The new scenario indicates it might be sooner than expected.

## Investment announcements - 2020

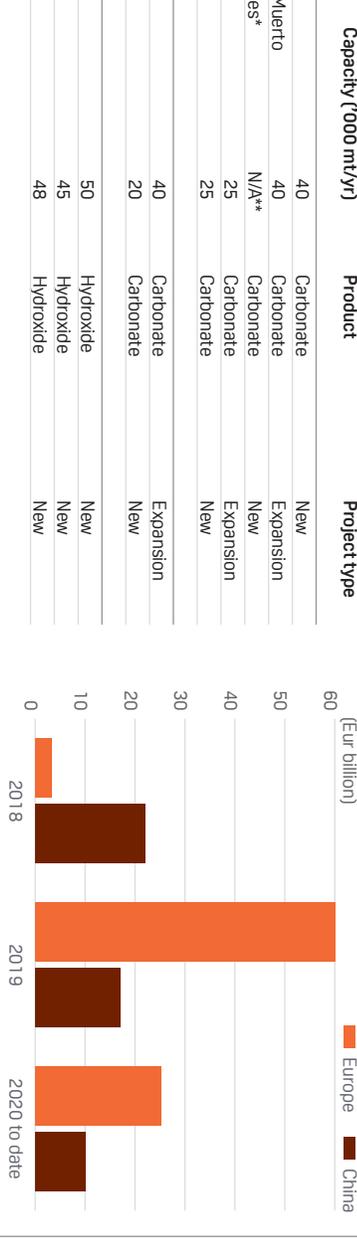


## COVID-19 to delay several lithium projects

Owner	Name of project	Capacity ('000 mt/yr)	Product	Project type
Argentina	Cauchari-Olaroz	40	Carbonate	New
Lithium Americas/Ganfeng	Sal de Hornbre Muerto	40	Carbonate	Expansion
Livent	Centenario-Ratones*	N/A**	Carbonate	New
Eramet	Sal de Olaroz	25	Carbonate	Expansion
Orocobre	Sal de Vida	25	Carbonate	New
Galaxy				
Chile				
Albemarle	La Negra 3-4	40	Carbonate	Expansion
Codeco/Lithium Power International	Marcunga	20	Carbonate	New
Australia				
Albemarle	Kemerton	50	Hydroxide	New
SQM/Weststammers	Mount Holland	45	Hydroxide	New
Tianqi	Kwinana	48	Hydroxide	New

\*Cancelled, not only delayed \*\*Targeted production was not disclosed

## Europe dwarfs China in new investments



\*In addition to the Kamenz plant, Mercedes-Benz will build six battery plants at undisclosed European locations, as well as one in Asia and North America each \*\*Undisclosed city/region \*\*\*JV between European and Chinese companies

All data on investments is as of June 26  
Source: S&P Global Platts

on the proximity to the lithium resource, overall capex requirements, operating costs, logistics of shipping raw material or finished goods, permitting, and proximity to customers.

Going downstream, China's relevance as the biggest EV consumer market is still to be challenged,

which should keep feeding the local industry with further investments. Since the beginning of the year, at least two major Western automakers announced significant milestones in China: US-based Tesla started up its Shanghai Gigafactory, while Germany's Volkswagen invested Eur2.1 billion

to acquire stakes in battery maker Guoxuan High-tech Company and auto manufacturer JAC Motors.

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## The Chinese view: what does China think of the “West’s anxiety” on lithium?

China will remain the largest global lithium chemicals supplier in the coming years, in spite of increasing interest in the West in developing local supply chains in order to reduce its reliance on China.

Some sources say Europe will become a new energy vehicle (NEV) production hub in the coming years. But it will be difficult to reduce its dependence on raw materials from China, at least in the short term, they said.

“Europe will become another major NEV producer, seeing fast growth after 2021 thanks to the stimulus policies released by European governments,” said an eastern China-based analyst.

Another analyst in the region agreed it was an inevitable that Europe would become the next major NEV force, as it was theoretically workable for carmakers in Europe to establish their local supply chains. However, the cost will definitely be higher than imports from China, he added.

“Establishing the local supply chains is inevitable, as Europe becomes another major NEV production hub,” said a large Chinese lithium converter.

However, there are major hurdles - technology, cost and comprehensive utilization of resources or environmental protection - that Europe must overcome to develop its local supply chain.

China has first-in-class technology for producing lithium carbonate from brine or spodumene, lower production costs and relatively mature process flow.

On top of that, the tail-product sodium sulfate can be sold as a raw material to detergent plants and mineral waste residue can be sold to cement plants, a costly and difficult approach for European countries, the source said.

There is a long way to go and a great deal of uncertainty over Europe developing local supply chains, as a wide range of variables such as resources, technology and cost are involved, said another Chinese lithium converter.

The Chinese domestic battery metals market, meanwhile, is continuing to come under pressure due to a supply glut, despite expectations that increased demand for lithium iron phosphate (LFP) batteries will lend some support to lithium carbonate prices.

### Chinese market activity ramps up

China's NEV vehicle and battery output both saw a month-on-month increase in May, but there was little impact on the unsteady battery metals market, at least in the short-term, according to sources.

A rebound in NEV output and sales in the second half of this year will only help backfill the demand destruction of the past few months as a result of the coronavirus pandemic, according to sources.

It is obvious NEV sales are set to see a year-on-year decline overall in 2020, with the anticipation of reaching around 1 million units, according to some market observers. After that, China's NEV sales will see significant growth in 2021.

China's NEV output increased 3.5% month on month to 84,000 units in May, although that was still a year-on-year decline of 25.8%, according to the latest data from the China Association of Automobile Manufacturers (CAAM).

NEV sales reached 82,000 units in May, up 12.2% from a month earlier, but down 23.5% year on year.

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## DEMAND SIDE: THE VIEW FROM PLATTS ANALYTICS

### Cool-off in long-term oil price pressures electric vehicle sales forecast

Self-quarantining, mandatory travel restrictions, the prevalence of working-from-home in some sectors, and the shuttering of businesses as part of efforts to mitigate the COVID-19 pandemic have sent shockwaves through the global economy. This might hurt the adoption of electric vehicles in the short term, according to Platts Analytics.

Demand destruction has put significant downward pressure on the near-term oil price outlook, even in light of significant voluntary OPEC+ production cuts.

Platts Analytics latest projections of that Dated Brent crude prices will average nearly \$39/Bbl in 2020 are nearly 40% below expectations at the start of 2020.

The impacts of COVID-19 are expected to persist well into the medium-term, and will likely result in more permanent structural changes.

The mid-May, **Scenario Planning Quarterly Update** from Platts Analytics outlined a downward revision in long term oil demand due to two years of lost demand growth and likely behavioral changes. As a

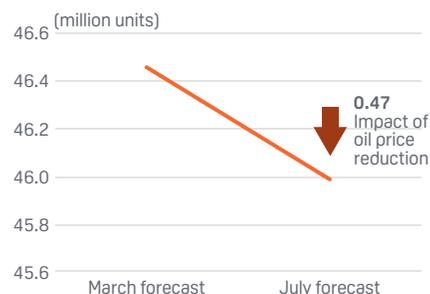
result, Platts Analytics has lowered our long-term average Brent crude oil price forecast by 13% in 2040.

### Implications for light duty plug-in electric vehicle adoption and battery demand

A reduction in the oil price forecast has a multi-pronged impact on passenger electric vehicle (PEV) adoption. First, lower oil product prices erode the operational cost benefits associated with electrification. Put another way, consumers are less likely to search for alternatives to incumbent fossil fuels if there is less pain at the pump motivating them to do so.

This factor not only reduces PEV sales in absolute terms, but also reduces the rate at which PEV manufactures and supply chains scale. The rate of cost declines associated with increased scale and learning-by-doing are slowed when less vehicles are sold,

### PLUG-IN ELECTRIC VEHICLE SALES



Source: S&P Global Platts - Platts Analytics Scenario Planning Service

**S&P Global Platts**

**GO DEEPER**

Platts Analytics Scenario Planning service provides in-depth and comprehensive coverage of Alternative Transportation developments. Coverage includes the **EV Essentials monthly** publication, which tracks historical progression of EV sales growth and other key metrics, the quarterly **Electric Vehicle Sales and Policy Scorecard** assessing the potential impact of major policy initiatives and investments on EV adoption momentum at the national and company level. Recent special coverage includes an in-depth analysis of diesel demand vulnerability to alternative fuels in the heavy duty trucking sector titled *Semi Trucks and US Diesel Demand; Are Alternative Fuels in Mirror Closer Than They Appear?*

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extending the tail of the long-term impacts of oil price declines.

More on the impact of total cost of ownership on PEV adoption can be found in Scenario Planning Services' 2018 report *U.S. Total Cost of Vehicle Ownership: Low Resale Values Keep BEVs Expensive*.

We have revised our PEV adoption forecast to reflect our latest reduction in long-term oil price in alignment with the dynamics mentioned above.

As a result of the lower oil price outlook, we have reduced global annual light duty PEV sales versus our March forecast. Cumulatively this results in less PEVs on the road in 2040, with PEVs accounting for nearly half of annual car sales in 2040 (against 3% in 2020).

Platts Analytics estimates that a reduction in light duty PEV sales of this magnitude could reduce 2040 annual battery demand by 25-37 GWh. Strong policy support offers a possible upside to PEV sales despite low oil prices. Platts Analytics' **EV Essentials** has outlined how PEV sales in regions with strong policy support have remained strong despite record low oil prices.

The EU has seen both record high PEV market share and absolute PEV sales volumes in 2020-YTD despite seeing the lowest average retail gasoline prices for a decade due in large part to preferential tax code and strict transportation emissions standards. Policies like California's Low Carbon Fuel Standard

## BATTERY METALS INSIGHT

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can also secure the operating benefits of electrified transportation.

These changes come on the heels of our March update that accounted for a reduction in short-term auto sales associated directly with COVID-19 lockdowns and the associated

economic volatility. Platts Analytics Scenario Planning Service continues to monitor long-term energy price tendency and its impact on PEV adoption trajectories – and include data updates for light duty PEV sales, fleet, and energy impacts.

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## SUPPLY SIDE: THE VIEW FROM S&P GLOBAL MARKET INTELLIGENCE

### Low prices disrupt lithium upstream financing, supply diversification

Total financing inflows into lithium assets are expected to remain low in 2020 and beyond, and lithium is expected to remain in a low price environment to discourage excess supply, according to S&P Global Market Intelligence.

This was reflected by the level of junior and intermediate company lithium financings in the first five months of 2020, which was only 5% of the financing raised in the same period in 2019.

Given the lack of investment in projects, S&P Global Market Intelligence expects the leading incumbent producers to drive the supply increase through expanding production at their existing operations.

Governments of top lithium raw material-producing countries, including Chile and Australia, have tried to add value by going downstream, while top plug-in electric vehicle markets, such as Europe, are promoting some degree of raw material self-sufficiency.

There has been limited real progress, however, as Chile's attempt to build downstream battery capacity did not materialize, partly due to challenges in providing the right feedstock, while falling

lithium prices and capital expenditure overruns have led to construction delays and stoppages at lithium refineries in Australia and Canada.

In 2019, 60% of the world's lithium raw material — lithium produced from mine or brine resources — was produced in Australia.

Average annual lithium carbonate prices started falling in 2018, but the amount raised for lithium by junior and intermediate mining companies only started to show a decline in 2019. We expect lithium financing to remain low this year as prices continue declining.

A decline in lithium financings also raises doubts as to whether there will be sufficient funding available to develop lithium projects in newer jurisdictions.

China accounted for over 60% of lithium compound production globally in 2019. Asia is also home to the majority of the global lithium-ion vehicle battery capacity and the headquarters for leading manufacturers including CATL, LG Chem, Panasonic, Samsung SDI and BYD.

While there has been limited progress in the diversification of the lithium upstream, there have been increasing investments in lithium-ion vehicle battery capacity in the US and Europe. CATL, Samsung SDI, SK Innovation and LG Chem are all building or planning to expand battery capacity in Europe.

The European Investment Bank is providing loans to LG Chem for expanding battery production, and to Umicore for a new cathode materials plant to supply LG Chem. In the US, LG Chem is also working with General Motors to build a second battery plant to serve that key EV market.

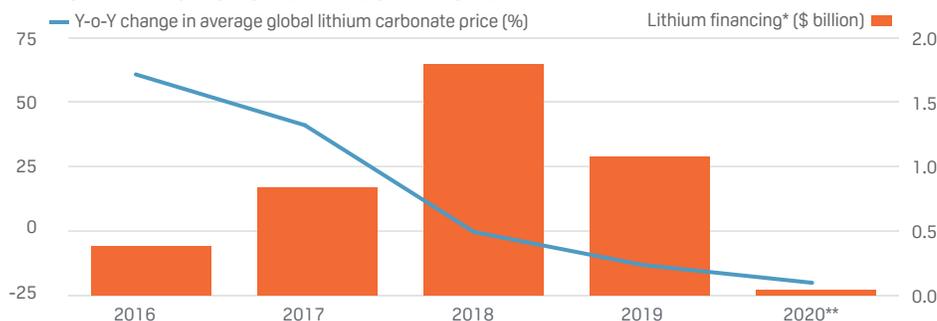
The issue will be what kind of battery materials the plants need — cell, component (cathode, anode, electrolyte), or more upstream (metal compounds, graphite flake, needle coke) — and if these could be substituted with cost competitive, good quality local supply.

Developing a secondary supply of battery raw materials is also a strong option for early adopters of plug-in vehicles as they seek to establish localized supply, greater raw material sufficiency and a circular economy -- a direction the European Union is actively promoting.

At the same time, companies in the EV supply chain continue to invest in building production bases in China.

US-headquartered lithium producer Albemarle acquired lithium refining capacity in China in 2017, and has since expanded capacity. International car makers such as Tesla, Volkswagen and BMW are also leading the charge in capturing the growth in China's plug-in vehicles market by offering tailored models, localized production, deepening collaboration with Chinese partners and even acquiring local value chain players.

#### LITHIUM FINANCING TO REMAIN LOW THIS YEAR



Data as of June 8, 2020.

\*Lithium financing raised by junior and intermediate mining companies.

\*\*2020 figures represent year-to-date data through May.

Sources: S&P Global Market Intelligence, Global Trade Tracker

For governments handing out plug-in subsidies, the fiscal multiplier on their national economies could be greater if more of the supply chain were located domestically. It generally takes a long time, however, for shifts in supply chains to occur within the metals and mining

space. The lithium-ion battery value chain is also complex.

The good news is the lithium market is expected to nearly double between 2019 and 2024, from 280,000 mt of lithium carbonate equivalent to 536,000 mt; and the focus on electrification

of the passenger fleet is here to stay, which will give more time for the supply chain to potentially accommodate localized production where feasible and economical, driven primarily by global operators and owners.

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