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From Black Gold to White Gold: Saudi Arabia's Move into Lithium

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As the global energy landscape shifts towards renewable sources, lithium has become crucial, especially for the electric vehicle (EV) industry. Discovered in 1817 on the Swedish island of Utö and later found in Australia and Chile, this lightweight metal is essential for lithium-ion batteries, which power EVs and are vital for a fossil fuel-free future. Nobel laureates John B. Goodenough, M. Stanley Whittingham, and Akira Yoshino made groundbreaking contributions to lithium-ion battery technology, laying the foundation for modern electronics and EVs.

With the global demand for lithium expected to reach 1.5 million tons by 2025 and over three million tons by 2030, nations are racing to secure this resource. Among these nations, Saudi Arabia and other Gulf countries have made notable steps. However, while these nations should leverage their expertise in energy and oil to pursue lithium mining and refining, they must adopt a pragmatic approach to the EV industry. Overcommitting to EV production at this stage could be premature, given the current market dynamics and challenges faced by ventures like Lucid Motors. Instead, focusing on downstream processing and cathode production, which are currently undersupplied, presents a more viable opportunity for Saudi Arabia.

Since the booming EV market in the last few years, lithium demand has surged. As countries strive to reduce carbon footprint and transition to cleaner energy sources, the need for efficient energy storage solutions has become paramount. However, this growing demand has also highlighted the volatility and challenges within the lithium market. In fact, the lithium market has experienced significant fluctuations. In 2022, lithium prices soared to $80,000 per metric ton due to fears of supply shortages. However, by January 2023, prices had plummeted to just over $13,000 per metric ton as supply chains stabilized and demand projections were adjusted. China's dominance in the lithium market plays a crucial role in these price fluctuations. As the largest consumer and processor of lithium, any changes in China's demand or supply chain impact global prices. Moreover, the anticipated surge in global EV sales did not materialize as strongly as expected, leading to lower-than-expected lithium consumption and contributing to the sharp decline in prices. Looking ahead, S&P Global forecasts that lithium carbonate prices will stabilize between $20,000/mt and $25,000/mt from 2024 to 2027. This stabilization is crucial for planning and investment in the lithium industry, providing a more predictable environment for stakeholders.

Saudi Arabia is exploring partnerships to secure lithium resources by strengthening ties with South America, a region rich in lithium deposits. At the recent Future Investment Initiative conference held in Brazil, Yasir Al-Rumayyan, Governor of the Public Investment Fund (PIF), highlighted this growing relationship, stating, "we started investing in Brazil in 2016 in food security, and we are interested in investing in renewable energy, mining, [and] technology…". In fact, Saudi Arabia's mining minister, H.E. Bandar Alkhorayef, is set to visit Chile this week to negotiate a potential partnership aimed at ensuring a steady supply of raw lithium to support the Kingdom's electric vehicle ambitions. Analysts have identified a "strong possibility" of Saudi Arabia signing a lithium supply agreement with Chile. Almar Water Solutions, a subsidiary of Abdul Latif Jameel Energy, acquired a 50% stake in the Chilean company Aguas y Riles S.A in June 2021 and has gone on to partner with Chile's Codelco for the Maricunga lithium mining project, located in the 'Lithium Triangle' in northern Chile, home to the largest and highest quality lithium brine deposits. These partnerships highlight Saudi Arabia's recognition of the importance of securing raw materials to support the Kingdom's aspirations in the lithium sector.

The Kingdom has also sought domestic lithium extraction and refining as a commendable move to enhance its position in the renewable energy market and reduce their reliance on oil. Given their extensive experience in the energy sector, well-developed infrastructure in industrial zones such as Jubail and Yanbu, and their geographical landscape with untapped land that could contain lithium reserves, Saudi Arabia is well-positioned for this venture. The Kingdom's infrastructure and expertise in chemical and refining industries make it well-suited for lithium processing. The National Geological Database (NGD) reported in 2022 that there are significant lithium deposits in the Diriyah Hills and Al-Hamra Mountains areas of Riyadh. These deposits, found in pegmatite rocks associated with rare earth element deposits, fall within the concession of Rawaq Mining Company. This suggests a promising potential for Saudi Arabia to develop its lithium extraction capabilities further. Current initiatives in the region are already underway. These partnerships could be valuable, potentially reducing time and costs by building on existing advancements. Additionally, even importing lithium carbonates from brine projects in South America will require further stages of final refining, which further underscores the critical role of refining chemicals in the process.

Saudi Arabia has made strategic investments in the EV industry as well, leveraging their financial resources as part of a broader initiative to diversify their economies. Saudi Arabia's Public Investment Fund (PIF) has taken a significant stake in Lucid Motors, a Californian EV manufacturer, holding a 60% stake and investing a total of $6 billion since 2018. Despite this substantial financial input, Lucid has faced challenges, highlighting the need for a more measured approach to EV production. In May 2023, Lucid announced a $3 billion capital raise, with $1.8 billion contributed by a PIF affiliate. This investment aims to enhance Lucid's production capabilities with the establishment of a manufacturing facility in King Abdullah Economic City, initially set to assemble 5,000 vehicles annually. Additionally, Saudi Arabia has launched Ceer, its first electric vehicle brand, awarding a $1.3 billion contract to construct a manufacturing complex in King Abdullah Economic City. Saudi Arabia plans to manufacture approximately 400,000 electric vehicles (EVs) by 2034, highlighting the country's dedication to the long-term growth of the EV sector. Simultaneously, Ceer, Saudi Arabia's first electric vehicle brand, awarded a $1.3 billion contract to construct a manufacturing complex in the same city. While these initiatives represent significant steps towards developing an EV industry, the challenges faced by Lucid Motors suggest that a cautious and strategic approach is necessary.

Producing EV batteries or vehicles domestically may not be economically viable. As Mehdi Ali, co-founder of Woodcross Capital, points out, "There are a number of stages before you can take the raw ore in the ground and then turn and convert that into a product that is then capable of being used in an EV." This complexity emphasizes the financial challenges Saudi Arabia faces in not only extracting lithium but also processing it to the point where it can be used in EV batteries. Additionally, Saudi Arabia's EV industry faces several other challenges. Competing with established players like China and the United States, who have already developed the necessary infrastructure and expertise, poses a formidable barrier. Saudi Arabia currently lacks the advanced technological know-how required for battery chemistry, electric drivetrain development, and vehicle software integration. Building this expertise and infrastructure will require substantial investment in education, training, and grid upgrades. Moreover, the domestic market for EVs is still emerging, necessitating extensive efforts to promote consumer awareness and adoption. Balancing investment between developing new industries and supporting traditional sectors further complicates the path forward.

One example of navigating these challenges is EV Metals Arabia, the operating subsidiary of EV Metals Group plc (EVM), which has identified supply chain gaps for EV manufacturers and battery cell producers. EVM aims to address these gaps by developing integrated supply chains for lithium and other metals from Western Australia while also developing the Saudi supply chain. The refining process is straightforward and utilizes open technology, allowing for potential expansion. Additionally, Saudi Arabia can play a role in the downstream production of cathode materials, which is vital after refining raw materials from mining or brine. While there might be an oversupply of raw materials over time, the downstream sector remains undersupplied. EVM is developing the world's first integrated Battery Chemicals Complex at Yanbu Industrial City in Saudi Arabia to produce high-purity chemicals like lithium, nickel, cobalt, manganese, and cathode active materials used in EV batteries and renewable energy storage. The Lithium Chemicals Plant, part of this complex, represents a strategic step with an initial investment of $800 million, aiming to produce 50,000 tons per annum of lithium hydroxide monohydrate (LHM). This plant will process spodumene concentrate from Western Australia, with construction beginning in Q1 2023 and commissioning in the second half of 2024.

While refining lithium domestically supports Saudi Arabia's economic diversification objectives, a more prudent approach to entering the EV industry is crucial for achieving sustainable long-term success. While refining lithium leverages existing strengths, developing a domestic EV industry at the current pace may not yield significant economic returns. Robin Mills, chief executive of Qamar Energy, emphasizes the importance of a vertically integrated supply chain to manage market volatility and ensure predictability. This strategic approach would allow Saudi Arabia to navigate the lithium market's fluctuations and secure its position in the global energy landscape without overextending into less profitable ventures. Jennifer Gnana, the Saudi Arabia correspondent for S&P Global Commodity Insights, highlights the strategic use of oil revenues to invest in technologies beyond internal combustion engines. "There is the thought that if we have to be the last players in oil, we should use some of that funding to go beyond the internal combustion engine," says Gnana. Such statements indicate that Saudi Arabia's new energy strategy heavily relies on acquiring foreign expertise, engaging in multilateral diplomacy, and diversifying markets. Positioned at a strategic crossroads between China and the West, Saudi Arabia and the UAE are engaging in a delicate balancing act. Driven by national interests, Saudi Arabia aims to collaborate with both Chinese and American entities to acquire the necessary technology for advancing its renewable energy objectives.

Europe, meanwhile, is highly committed to electric vehicles (EVs), with EVs - whether fully electric, plug-in hybrids, or full hybrids - accounting for 50% of all new passenger car registrations in June, up from 47.5% a year earlier. However, Europe faces its own green paradox with its push for EVs and the necessary lithium mining. The EU aims to decarbonize its transport sector, responsible for a quarter of its CO2 emissions, to achieve climate neutrality by 2050. This involves having thirty million EVs on the road by 2030, requiring significantly more lithium. However, European countries are increasingly conscious of the environmental impact of lithium extraction, with stringent regulations aimed at minimizing ecological damage. This, in turn, challenges Europe to balance urgent lithium demand with environmental protection and sustainability goals. Critics argue that the EU's strategy conflicts with its leadership in climate change and environmental legislation, describing it as hypocritical. The approach perpetuates over-consumption and dependency on external sources, raising geopolitical concerns, particularly with China. According to European environmentalists, this dependency would amount to modern colonialism, with

peripheral regions exploited for the sake of major cities. These challenges present an opportunity for Saudi Arabia and the Gulf states. By focusing on refining and downstream lithium processing, the Kingdom - in the long term - can support Europe's EV goals while leveraging its expertise in the energy sector. Saudi Arabia may be able to bridge the gap between raw material extraction and sustainable energy solutions to establish itself in the global energy transition.

By focusing on securing lithium supplies and investing in refining and downstream processing, Saudi Arabia and the Gulf can utilize their existing strengths in the energy sector to build more sustainable and resilient economies. This approach will allow them to navigate the inherent volatility of the lithium market and the complexities of the global EV industry while laying the groundwork for future growth. By maintaining a pragmatic and measured approach to the EV industry and focusing on areas where they can add the most value, Saudi Arabia is poised to become a key player in the shift towards cleaner energy.

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