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The Impact of China's Rapid EV Battery Industry Development on the U.S. Domestic Supply Chain: Challenges and Strategic Responses

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Abstract: The rapid development of China's electric vehicle battery industry has significantly reshaped global battery supply chains, creating both opportunities and challenges for the U.S. domestic supply chain. This essay examines the implications of China's advancements in EV battery production and trade on the U.S. domestic supply chain, focusing on multiple aspects such as raw material sourcing, production costs, research and development, international collaborations, and policy-making expenditures. Through a comprehensive literature review, this essay identifies gaps in existing research. There are limited explorations of possible factors contributing current situation faced by the U.S., potential alternatives to the sustainable approach for battery raw material supply and applicable policies for supporting the U.S. domestic battery supply chain. To bridge the existing literature gap, the analysis delves into key challenges faced by the U.S., including rising production costs and limited technological advancements, and explores potential international partnerships to enhance supply chain resilience. The conclusion synthesizes the findings and emphasizes the importance of essential measures to address these challenges. The suggestions section proposes systematic policies for the U.S. government, emphasizing investment in domestic production, building international partnerships, and developing a diversified and sustainable supply chain to mitigate risks associated with China's growing influence. This essay aims to contribute to the discourse on strategic responses to China's dominance in the EV battery industry and provide some feasible pathways for U.S. to reinforce its core competence in the global battery market.

Keywords: Electric vehicle battery, supply chain, U.S EV.

1. Introduction

The growth in EV sales is pushing up demand for batteries, continuing the upward of recent years. Demand for EV batteries has reached more than 750 GWh in 2023, up 40% relative to 2022, though the annual growth rate slowed slightly compared to in 2021-2022. The majority of battery demand for EVs today can be met with domestic or regional production in China, Europe and the United States. Among these three main contributors in the EV battery market, China is the world's largest EV battery exporter, with around 12% of its EV batteries being exported; while the United States remains largest shares of imports, meeting more than 30% of EV battery demand [1]. The closely

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related supply side and demand side relationships between China and the U.S. play an important role in global trading and expansion. Studies suggest that China and the U.S. government has implemented a series of policies to promote their own domestic industry respectively. However, the continuously increasing exporting amounts of China in the battery industry pose an overwhelming threat to the domestic battery supply chain in the U.S. To counteract such challenge, the U.S. government has imposed some restrictive policies on the EV battery industry of China, leading to both opportunities and risks for its domestic supply chain and international partnerships. This essay aims to demonstrate the multifaceted challenges of China's rapid EV battery development on the battery supply chain of the United States, focusing on its impact on the procurement, transportation, production and sales process in the whole battery supply chain in the U.S. By conducting case study and policy analysis, this paper seeks to make a comprehensive perspective on the challenges U.S. battery supply chain faced with China's rapid development in EVs battery and explore its applicable strategic countermeasures.

2. Literature Review

The rapid development of China's electric vehicle (EV) battery industry has significant implications for the battery supply chain in the United States. A key challenge for the U.S. is its dependence on China for critical raw materials and components and various imported electric vehicles, including PHEVs, BEVs and FCEVs [2]. According to Purdy & Castillo, China controls over 60% of the global supply of lithium, cobalt, and other minerals essential for EV battery production [3]. This dependency makes the U.S. vulnerable to supply chain disruptions caused by China's leading position in battery export. Nevertheless, Smith only studied China's dominance in battery raw material supply but did not give some alternatives to the raw material sourcing approaches, leaving research gaps on relevant topics. The U.S. Department of Energy highlights the current need for diversified sourcing and the development of domestic mining and processing capabilities to mitigate these risks.

Moreover, China's advancements in battery technology, particularly in solid-state and next-generation lithium-ion batteries, pose a significant competitive threat to U.S. manufacturers. Shen and Wang argue that China's intensive research and development investments have enabled the country to lead in battery efficiency and cost reduction [4]. As U.S. automakers and battery producers face challenges in advancing their own technologies, leaving the U.S. at a competitive disadvantage.

China's dominance in the EV battery market is driven by government policies, large-scale investments in infrastructure, and a robust manufacturing base. This has led to China becoming the world's largest producer of lithium-ion batteries, which powers not only domestic EVs but also electric vehicles in Europe and North America. As a result, the U.S. faces great challenges in maintaining its competitiveness in the global EV battery manufacturing industry. Even though Wang and Shen refer to increasing trends in EVs battery industry development in today's China, he did not take the current U.S. battery industry status and their trading relationships into account, making the research a limited and inconclusive result.

However, Cheng suggest that the U.S. has opportunities to strategically respond by fostering innovation and strengthening domestic production. Policies like the U.S. Inflation Reduction Act and the CHIPS Act aim to incentivize the development of critical supply chains and reduce dependency on foreign suppliers. Additionally, increasing public-private partnerships and investing in advanced manufacturing technologies could position the U.S. as a leader in the next phase of the EV battery revolution.

In conclusion, the existing literatures discussing about China-U.S. EVs battery industry mainly focused on one single aspect of challenges faced by the U.S. battery supply chain, including technological barrier, raw material shortage and government policy intervene. And the responsive strategies they raised were limited to the short-term and insufficient effects. However, this study

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combines and expands all the existing research, seeking to provide a systematic analysis frame on challenges of U.S. domestic battery supply chain. Thereafter, some corresponding and effective solutions to such challenges can be figured out to tackle the realistic problems. While China's rapid development of the EV battery industry presents significant challenges for the U.S. domestic supply chain, there are emerging strategic responses that could help reduce the risks and build up a more resilient and competitive U.S. EV industry.

3. Analysis

How the surging development of EVs battery industry in China affects the domestic battery supply chain of U.S. is a complicated and multifaceted issue, which can be discussed from several aspects in the supply chain management, including the raw material procurement, production and transportation expenditure, research and development prospect, and international supply stability. Furthermore, this essay will probe into the role of U.S. government policies in stabilizing the domestic battery supply chain and reducing the dependence of battery components and technology on other countries, especially China. By studying the various contributors to the challenges faced by U.S. domestic battery supply chain, we will gain insights into the current situation and struggle encountered by battery supplier in the United States, and how can they cope with such issue by adopting comprehensive approaches. Therefore, a balanced and stable supply chain of battery can be built around the globe.

3.1. Raw Material Sourcing

China has an incredibly comparative advantage in the upstream of EV battery industry. While minerals necessary for the clean energy transition such as lithium, cobalt, copper, and graphite are sourced from various countries, China dominates their processing and other steps along the battery supply chain, thus indirectly affecting the U.S. global supply chain of critical materials and components in the battery production. Some 80% of U.S. battery imports in 2022 by value were sourced from China. In 2022, the United States imported 100% of natural graphite, another important mineral for batteries, a third of it from China [5]. Such large amounts of imports of raw material of other countries inject extreme instability in supply chain of battery and uncertainty in battery industry development. Even with enhanced production, North American cathode and anode production would only amount to 4% and 3% of domestic demand by 2030. Despite the U.S. having substantial lithium reserves, most of the refining capacity is in China, creating a bottleneck in the supply of essential battery components [6, 7]. Similarly, China's ability to process cobalt from the Democratic Republic of the Congo (DRC) means that the U.S. is indirectly dependent on Chinese processing facilities for cobalt.

Whether China's dominance affects the U.S. battery supply chain directly or indirectly, the local battery and EV manufacturers suffered a lot from the dependent raw material sourcing. Take one of the biggest EV manufacturers – Tesla as an example. Tesla's dependence on China for the import of raw materials essential to its battery production is a critical factor in the company's global operations. In 2022, Tesla, like many other electric vehicle manufacturers in the U.S., sourced a significant portion of its battery raw materials from China. Specifically, around 70% of the lithium-ion battery materials that Tesla imports are processed in China, despite the U.S. having some domestic lithium mining operations. Tesla also imports approximately 60% of its cobalt, another essential material for battery anodes. In addition, Tesla's nickel supply is influenced by China's dominance in the global nickel refining sector, with roughly 50% of the U.S.'s nickel imports coming from Chinese companies [8]. This heavy reliance on Chinese suppliers for critical raw materials means that Tesla is highly

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vulnerable to supply chain disruptions caused by geopolitical tensions, trade restrictions, or fluctuations in material prices.

To cope with the great shares of battery raw material dependence on China. The U.S. government has adopted various responses that focused on securing alternative sources of these materials to deal with this challenge, with initiatives like the Inflation Reduction Act (IRA) aiming to increase domestic mining and processing capabilities. The U.S. is also seeking partnerships with countries such as Canada, Australia, and Chile—who control significant lithium and cobalt deposits—to reduce reliance on China [9]. However, these efforts are still in the emerging stages, and establishing a robust, self-sufficient raw material supply chain will take time and significant investment.

3.2. Increased Cost in Battery Production

China's scale of production and low labor costs, combined with efficient supply chain management, enable its companies to produce batteries at a fraction of the cost of their U.S. counterparts [10]. There are multiple factors contributing to the increased production cost of EV battery industry in the United States, including the infrastructure lacking, technology gap, higher labor cost and raw material dependence. The U.S. has to import most of the raw materials used in EV batteries, often at higher prices than those available to Chinese companies. China's ability to control a significant portion of the global supply of critical raw materials gives it leverage to maintain competitive pricing.

China has heavily invested in large-scale battery production facilities, including gigafactories for lithium-ion batteries and associated components. However, the U.S. has lagged behind in terms of building such high-capacity facilities. While companies like Tesla and LG Chem have established some manufacturing plants in the U.S., the overall production capacity remains significantly lower than China's. For instance, as of 2023, China has established more than 50% of the world's battery gigafactory capacity, whereas the U.S. has only around 20-25% [11]. The absence of sufficient domestic manufacturing infrastructure drives up the costs of importing components and materials from overseas, which are typically more expensive due to transportation, tariffs, and time delays.

In terms of technology gap, over the past decade, China has invested heavily in developing cutting-edge battery technologies, including innovations in battery chemistry, manufacturing processes, and automated production techniques. In comparison, U.S. companies have been slower to develop the same level of technological expertise and advanced manufacturing processes. For example, Tesla has made strides in battery innovation, particularly with its 4680 battery cells aimed at reducing costs and improving energy density. The domestic manufacturers continue to rely on older and less efficient production methods, leading to higher manufacturing costs. Additionally, U.S. manufacturers have less experience in large-scale battery production, meaning they lack the optimization and efficiencies that come with experience and technological maturity.

In contrast to China, which benefits from economies of scale and a lower labor cost base, the U.S. faces higher labor and operational costs in battery production. This disparity places additional pressure on U.S. manufacturers who are attempting to scale production to meet growing demand.

The development of domestic infrastructure in the U.S. to process materials and produce batteries is costly and time-consuming. Despite initiatives like the Inflation Reduction Act, which aims to stimulate semiconductor and battery manufacturing industry in the U.S., these costs are still significant. As a result, U.S. manufacturers struggle to match the price competitiveness of Chinese producers, creating an uneven playing field that could impair the U.S. in becoming a global leader in the EV industry.

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3.3. Battery Technology Research and Development

China's rapid development of next-generation battery technologies, such as solid-state batteries and advanced lithium-ion chemistries, poses a significant challenge for the U.S. In particular, China's government policies and investments in research and development have encouraged China to develop more efficient, higher-capacity, and cheaper batteries.

China has invested heavily in the research and development of next-generation batteries, resulting in technological breakthroughs that provide Chinese manufacturers with a competitive edge. In contrast, the U.S. has not matched China's pace in battery innovation. While American companies such as Tesla, QuantumScape, and Solid Power are making strides in the field, they face financial and technological barriers, including the high cost of R&D and limited government support compared to Chinese counterparts [12].

The U.S. government has attempted to address this gap by funding research and development through agencies such as the Department of Energy (DOE), with initiatives like the Battery500 Consortium, which aims to advance solid-state battery technology. However, these efforts are relatively small compared to the scale of China's investments [13]. In the near term, U.S. companies will need to significantly increase their R&D spending to bridge the technology gap with China. Also, the governments of both China and the U.S. are supposed to make an agreement and vigorously enroll in the international negotiation to reinforce the collaboration on technology advancement.

3.4. International Supply Chain with Partnered Countries

In response to China's dominance in the EV battery market, the U.S. has begun forging strategic partnerships with countries that have access to critical raw materials and advanced manufacturing capabilities. These partnerships aim to create more resilient and diversified supply chains.

One of the most significant partnerships is with Canada, which is home to abundant resources such as lithium, cobalt, and nickel. Through initiatives like the U.S.-Canada Clean Energy Partnership, the two countries are collaborating on the development of sustainable supply chains for EV batteries [14]. Canada has committed to supporting U.S. battery manufacturers by providing a steady supply of lithium, with plans to improve extraction and processing capacity. This collaboration helps reduce the supply risks that come from global trade disruptions or geopolitical tensions, while also fostering job creation and economic development in both countries. The U.S.-Australia Critical Minerals Agreement, signed in 2020, is another important step in diversifying the global battery supply chain. As Australia is one of the world's largest producers of critical minerals such as lithium, nickel, and cobalt—key components for EV batteries, the U.S. and Australia will be able to enhance cooperation on the extraction, processing, and recycling of these minerals through this agreement [15]. Under this agreement, the U.S. and Australia have committed to joint ventures for mining operations and the development of processing facilities that will ensure a more stable and transparent supply of these raw materials. In particular, Australia's lithium deposits are of great interest, as the U.S. is striving to reduce its reliance on China for lithium processing. This partnership contributes to stabilizing the supply of raw materials for EV batteries and enhances the security of the U.S. electric vehicle battery market.

Moreover, the U.S. has sought to build relationships with Chile and Argentina, which are part of the Lithium Triangle and possess some of the largest untapped lithium reserves in the world. The goal of these partnerships is to ensure that the U.S. has access to raw materials while mitigating geopolitical risks associated with China's control over the supply of these critical resources.

Additionally, Japan and South Korea are important partners in the global EV battery supply chain. These countries are leaders in battery technology and production, and their collaborations with U.S.

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manufacturers could help advance U.S. battery technology while creating more resilient global supply chains [16].

3.5. Policymaking and Implementation Cost

Government policies play a crucial role in shaping the future of the U.S. EV battery industry. The U.S. government has introduced several policies aimed at reducing its dependence on China and bolstering its own domestic battery production. However, the cost of policy-making and implementation is significant.

For instance, the Inflation Reduction Act (IRA), passed in 2022, includes provisions aimed at enhancing the U.S. battery supply chain, particularly through incentives for domestic production of critical minerals, EVs, and batteries. The IRA allocates approximately $7 billion for investments in the clean energy sector, including support for battery manufacturing facilities and the development of domestic mineral supply chains. Additionally, the CHIPS and Science Act is another major policy initiative with an allocation of $52 billion in federal subsidies to boost semiconductor production, which also includes provisions for the development of battery production technologies [17]. While these investments are crucial for advancing the domestic battery industry, the initial policy costs are high, and the return on investment may take several years.

Additionally, it is necessary to ensure effective coordination between various policy initiatives, especially those focused on domestic production and international cooperation. The IRA, CHIPS Act, and other industry-focused policies, such as the Bipartisan Infrastructure Law, promote domestic production of critical minerals and battery components, but this must be balanced with the need for international cooperation [17, 18]. For example, the U.S. seeks to reduce reliance on foreign suppliers, particularly China, for key materials like lithium and cobalt, while also negotiating international agreements with countries such as Canada, Chile, and Australia to secure stable, ethical sources of these materials. The challenge lies in balancing protectionist domestic policies with the need for global supply chain collaboration, which is vital for meeting global demand for EVs and batteries. Furthermore, these policies must also address environmental concerns, as domestic mining operations can have significant ecological impacts. The effective and efficient cooperation of different policies requires continuous contributions made by authorities and informed and reliable decisions from policymakers.

A significant concern in the U.S. battery industry is the environmental impact of mining and processing the raw materials necessary for battery production, particularly lithium, nickel, and cobalt. The U.S. has implemented various policies to address these concerns, including support for green mining technologies and sustainable processing methods. However, there remains a gap in the full integration of environmental considerations into the policy framework. For instance, while the U.S. encourages domestic mining through the Defense Production Act and other incentives, these policies do not always factor in the long-term environmental costs of increased mining activities [19]. To mitigate these issues, green policies such as the promotion of battery recycling and the development of second-life battery technologies are gaining importance. Additionally, the U.S. government is looking at ways to incorporate environmental justice into its battery supply chain initiatives, ensuring that communities affected by mining operations are not unduly burdened.

China's dominance in processing critical battery materials like lithium, cobalt, and graphite poses challenges to the U.S. battery supply chain, increasing dependency and risks for manufacturers like Tesla. While China benefits from cost-efficient large-scale production, advanced technology, and significant R&D investments, the U.S. faces higher costs, infrastructure gaps, and slower innovation. To counter these situations, the U.S. government has introduced policies like the Inflation Reduction Act and forged partnerships with resource-rich countries such as Canada, Australia, and Chile to diversify supply chains and boost domestic production. However, these efforts require significant

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time, investment, and coordination, along with balancing environmental concerns and international cooperation to build a sustainable and competitive battery industry.

4. Discussion

The rapid development of China's EV battery industry has presented multifaceted challenges for the U.S. battery supply chain, particularly in terms of raw material procurement, production costs, technological innovation, and global competitiveness. A significant portion of the raw materials required for EV battery production, including lithium, cobalt, and nickel, is processed in China. As highlighted in earlier sections, the U.S. is heavily dependent on China for these critical materials, with companies like Tesla sourcing approximately 70% of their lithium and 60% of their cobalt from Chinese processors. This dependency exposes U.S. manufacturers to potential disruptions, particularly in light of geopolitical tensions, trade restrictions, and fluctuations in global market prices. As the global supply of these materials becomes more contested, the U.S. must find ways to diversify its supply sources and reduce its reliance on Chinese imports.

A strategic response to this issue could involve deepening partnerships with resource-rich countries such as Canada, Australia, Chile, and Argentina, all of which possess abundant lithium, cobalt, and nickel reserves. Through initiatives like the U.S.-Canada Clean Energy Partnership and the U.S.-Australia Critical Minerals Agreement, the U.S. has begun to diversify its raw material supply chain and reduce its dependence on China. However, these efforts are still in their early stages, and it will take considerable time and investment to develop alternative supply chains that can match the scale and efficiency of China's existing infrastructure. The development of a secure, sustainable, and resilient raw material supply chain will require long-term investments in mining, processing, and transportation infrastructure, which remain cost intensive.

Another critical challenge stems from China's large-scale battery production capabilities, which enable its manufacturers to achieve economies of scale and produce batteries at a fraction of the cost of their U.S. counterparts. The relatively high labor costs, coupled with the underdeveloped infrastructure for large-scale battery production in the U.S., make it difficult for U.S. manufacturers to compete on price. While the Inflation Reduction Act (IRA) and the CHIPS Act aim to incentivize the development of domestic battery manufacturing facilities and critical mineral processing, these policies are only beginning to take effect, and the capital outlay required for such large-scale infrastructure is substantial. The U.S. battery production capacity remains far below that of China, with China controlling over 50% of global battery gigafactory capacity as of 2023, compared to 20-25% for the U.S. While companies like Tesla have made progress in establishing local manufacturing plants, the gap in production scale remains a critical challenge.

The technology gap between China and the U.S. in battery production is another significant issue. China's heavy investments in R&D, as well as government policies that encourage the development of next-generation battery technologies such as solid-state and advanced lithium-ion batteries, have positioned Chinese manufacturers ahead of their U.S. counterparts in terms of both efficiency and innovation. While the U.S. has made strides in battery technology, as exemplified by Tesla's development of the 4680 battery cells, these advancements are still in their early stages and have not yet reached the scale required to rival China's capabilities. The U.S. government's efforts to support domestic R&D, including initiatives like the Department of Energy's Battery500 Consortium, are commendable, but they remain significantly smaller in scope compared to China's state-sponsored investments. Therefore, the U.S. needs to accelerate its R&D spending and increase collaboration between private industry and government to bridge this technology gap and avoid falling further behind in the global EV battery market.

Finally, the international supply chain dynamics play an essential role in shaping the future of the U.S. battery industry. The U.S. must continue to build strategic partnerships with resource-rich

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countries while ensuring that these collaborations are mutually beneficial and sustainable. The need to balance domestic production incentives with global supply chain cooperation remains a key challenge. For example, U.S. policies like the IRA promote domestic sourcing of critical materials, but they must also ensure that international trade agreements and partnerships with countries like Chile, Australia, and Canada are not hindered. Moreover, the environmental impact of battery raw material extraction is another key issue. The U.S. must ensure that its policies and initiatives incorporate sustainable practices to minimize the environmental impact of mining and processing operations.

China's rapid advancements in EV battery production have created significant challenges for the U.S. supply chain, including reliance on Chinese-sourced raw materials, consisting of lithium, cobalt, and nickel. Also, the surging development of China in battery industry indirectly leads to higher production costs, and a widening technology gap between China and the U.S. While the U.S. has started diversifying its supply chain through partnerships with partnered countries like Canada and Australia and implementing policies like the Inflation Reduction Act (IRA), these efforts are limited to the financial support and incentives, without encouraging technological innovation per se. China's dominance in large-scale production and R&D has allowed it to achieve cost efficiencies and technological leadership that the U.S. struggles to match. Therefore, the U.S. must accelerate infrastructure renovation, boost innovation through private and public collaboration, strengthen international partnerships, and prioritize sustainable practices in its supply chain strategy.

5. Suggestions

Given the current challenges encountered by the United States, several strategic responses could be adopted by the U.S. to strengthen its domestic EV battery supply chain and reduce its dependence on China.

5.1. Infrastructure Reformation

The U.S. needs to prioritize the development of domestic battery production infrastructure. Investments in large-scale gigafactories, as seen in China, will help the U.S. scale its battery production to meet growing demand. Incentivizing companies to build gigafactories in the U.S., supported by tax credits and public-private partnerships, would reduce transportation and labor cost disadvantages. Moreover, improving the efficiency and speed of building these plants will allow the U.S. to catch up to China's scale.

5.2. Raw Material Sourcing Diversification

The U.S. should continue to diversify its raw material sources by forging partnerships with countries like Canada, Australia, Chile, and Argentina. Trade agreements should focus on ensuring a steady, ethical supply of materials such as lithium, cobalt, and nickel while reducing geopolitical risks. These partnerships should include not only access to raw materials but also investments in joint mining and processing facilities to ensure the U.S. can secure its supply chains.

5.3. Investment in Research and Development

To address the technology gap, the U.S. must increase its investment in research and development. Collaboration between private companies and government-funded initiatives, such as the Battery500 Consortium and the Department of Energy's efforts to advance solid-state batteries, should be expanded. The U.S. should aim to develop next-generation battery technologies that can compete with China's advancements in cost, energy density, and sustainability. Additionally, fostering

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innovation in battery recycling and second-life battery technologies could provide an alternative to new raw material sourcing and reduce environmental impacts.

5.4. Policies Coordination and International Cooperation

The U.S. government must ensure better coordination between domestic policies and international trade agreements. While policies like the IRA and CHIPS Act incentivize domestic production, they must also facilitate international cooperation on supply chain management, ensuring that strategic partnerships with key resource-rich countries are not jeopardized by protectionist measures. The U.S. should also address the environmental impact of raw material extraction by incentivizing green mining technologies and supporting sustainable practices in its supply chain.

5.5. Sustainable Mode of Development

Sustainability must serve as the priority of U.S. battery industry policies. The U.S. government should prioritize green mining practices and invest in recycling infrastructure to offset the environmental impact of both raw material extraction and battery disposal. These efforts can help the U.S. balance the need for expanded battery production with its environmental commitments.

6. Conclusion

In conclusion, China's rapid development of the EV battery industry has posed significant challenges to the U.S. domestic supply chain, particularly in the areas of raw material procurement, production costs, technological innovation, and global competitiveness. While the U.S. remains highly dependent on China for critical raw materials and battery components, strategic efforts to diversify raw material sources, increase domestic production capacity, and close the technological gap can help reduce this dependence. Government policies, such as the IRA and CHIPS Act, are a step in the right direction, but their success will depend on effective coordination with international partnerships, significant investments in R&D, and sustainable practices. By addressing these challenges comprehensively, the U.S. can build a more resilient and competitive EV battery supply chain that supports the growing demand for electric vehicles and ensures its position as a global leader in the clean energy transition.

References

[1] *IEA (2024), Global EV Outlook 2024, IEA, Paris https://www.iea.org/reports/global-ev-outlook-2024, Licence: CC BY 4.0*
[2] *Busby, J. (2023). Is US Dependence on China for the Battery Supply Chain a National Security Risk. World, 2023(4).*
[3] *Purdy, C., & Castillo, R. (2022). China's Role in Supplying Critical Minerals for the Global Energy Transition.*
[4] *Shen, C., & Wang, H. (2019). Research on the technological development of lithium-ion battery industry in China. In Journal of physics: Conference series (Vol. 1347, No. 1, p. 012087). IOP Publishing.*
[5] *Bian, L. (2023). China's role in scaling up energy storage investments. Energy Storage and Saving, 2(2), 415-420.*
[6] *Olivetti, E. A., Ceder, G., Gaustad, G. G., & Fu, X. (2017). Lithium-ion battery supply chain considerations: analysis of potential bottlenecks in critical metals. Joule, 1(2), 229-243.*
[7] *Ahmed, S., Nelson, P. A., Gallagher, K. G., Susarla, N., & Dees, D. W. (2017). Cost and energy demand of producing nickel manganese cobalt cathode material for lithium-ion batteries. Journal of Power Sources, 342, 733-740.*
[8] *Mayoral, A. M. A. N. D. A. (2022). US Challenges in EV Battery Production. Coalition for a Prosperous America.*
[9] *AN, H., & Cho, K. (2024). Global Research Cooperation Patterns in the Secondary Battery Industry.*
[10] *Brodd, R. J., & Helou, C. (2013). Cost comparison of producing high-performance Li-ion batteries in the US and in China. Journal of Power Sources, 231, 293-300.*
[11] *IEA (2022), Global Supply Chains of EV Batteries, IEA, Paris https://www.iea.org/reports/global-supply-chains-of-ev-batteries, Licence: CC BY 4.0*
[12] *Islam, E. S., Ahmed, S., & Rousseau, A. (2021). Future battery material demand analysis based on us department of energy r&d targets. World Electric Vehicle Journal, 12(3), 90.*

DOI: 10.54254/2754-1169/163/2025.20689

[13] *Bresser, D., Hosoi, K., Howell, D., Li, H., Zeisel, H., Amine, K., & Passerini, S. (2018). Perspectives of automotive battery R&D in China, Germany, Japan, and the USA. Journal of Power Sources, 382, 176-178.*

[14] *Vegh, G., Madikere Raghunatha Reddy, A. K., Li, X., Deng, S., Liu, T., Amine, K., & Zaghib, K. (2024). North America's Potential for an Environmentally Sustainable Nickel, Manganese, and Cobalt Battery Value Chain. Batteries, 10(11), 377.*

[15] *BYERS, J., COLLARD, R., GOWDIE, B., & PASTOR-ELSEGOOD, J. A. Y. A. (2022). The US-Australia Alliance and the Future of Tech. NEXT-GENERATION PERSPECTIVES ON THE US–AUSTRALIA ALLIANCE, 11.*

[16] *Barlock, T. A., Mansour, C., Riddle, M., Crisostomo, N., Keyles, G., Gohlke, D., ... & Weigl, D. (2024). Securing Critical Materials for the US Electric Vehicle Industry: A Landscape Assessment of Domestic and International Supply Chains for Five Key Battery Materials (No. ANL-24/06). Argonne National Laboratory (ANL), Argonne, IL (United States).*

[17] *Slowik, P., Searle, S., Basma, H., Miller, J., Zhou, Y., Rodríguez, F., ... & Baldwin, S. (2023). Analyzing the impact of the Inflation Reduction Act on electric vehicle uptake in the United States. International Council on Clean Transportation.*

[18] *Cheng, A. L., Fuchs, E. R., & Michalek, J. J. (2024). US industrial policy may reduce electric vehicle battery supply chain vulnerabilities and influence technology choice. Nature Energy, 1-10.*

[19] *Humphries, M. (2015). China's Mineral Industry and US Access to Strategic and Critical Minerals: Issues for Congress.*