



## Federal incentives drive global battery manufacturing deployments

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The electrification of the transportation sector continues as nations seek to achieve ambitious decarbonization goals and consumers grow more comfortable with trading in their gas guzzlers for battery packs. But is the global battery supply chain – from critical minerals mining to cell assembly – prepared to satisfy short and long-term demand projections?

Demand for critical minerals in electric vehicle (EV) and battery storage applications is expected to grow by at least 30 times by 2040. The International Energy Agency estimates that 40 times more lithium and up to 25 times more graphite, cobalt, and nickel are required to meet the demand projections over the next two decades.<sup>1</sup> Without these critical minerals, the entire green energy transition may be at risk.

### Supply chain outlook

China currently dominates the global EV battery supply chain with 75 percent of lithium-ion battery cell capacity, 80 percent of graphite mining, and more than 50 percent of lithium, cobalt, and graphite materials processing. Additionally, the global landscape for critical mineral deposits is limited to a select number of countries: 50 percent of lithium is mined in Australia, and 70 percent of cobalt is mined in China.<sup>2</sup>

To lessen dependencies on China and to mitigate potential supply chain vulnerabilities that could result from the industry's geographic concentration, other nations – especially in the west – are competing more aggressively for market share. The proposed strategy? Significant incentive packages designed to attract upstream and downstream processors and to also expand domestic battery production capacity.

<sup>1</sup> Institute for Energy Research (IER), "The Role of Critical Minerals in Clean Energy Transitions," 2021: <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary>.

<sup>2</sup> Institute for Energy Research (IER), "Global Supply Chains of EV Batteries," 2023: <https://www.instituteforenergyresearch.org/renewable/electric-vehicle-battery-costs-soar/#:~:text=Batteries%20account%20for%20about%2030,prices%20by%20241%2C200%20per%20vehicle.>

### Green subsidy race

Last century, the world witnessed the nuclear arms and space races. This century, countries are competing for supremacy in the green energy transition and battery production with substantial subsidies.

The Inflation Reduction Act (IRA) continues to bolster the United States' favorability for battery-related manufacturing operations. According to the Environmental Defense Fund, more than \$92B in battery-related investments have been announced in the United States since the IRA's passing in August 2022, at which time it became the single largest legislative measure for climate funding globally<sup>3</sup>. The act provides a combination of supply and demand-side subsidies, including credits for EV purchases and production tax credits for manufacturers.<sup>4</sup>

Following the passing of the IRA, other nations reacted with incentive packages to enhance their attractiveness to manufacturers across the battery and clean energy industries.

Canada proposed the Clean Technology Investment Tax Credit (ITC) in March 2023. This provision includes a refundable tax credit valued at 30 percent of total machinery and equipment investments critical to the production of clean technologies, including batteries and the extraction, processing, and recycling of critical minerals. The ITC will be in effect from January 1, 2024, thru 2034.<sup>5</sup> Ford Motor Company, SK Battery Manufacturing, and EcoPro BM already announced a new \$1.2B cathode factory in Quebec;<sup>6</sup> while Volkswagen plans to open its first battery gigafactory under its PowerCo SE subsidiary in Ontario by 2027.<sup>7</sup>

The Green Deal Industrial Plan is the European Union's (EU) attempt at growing its share in the sector. The plan seeks to reinforce the EU's commitment to climate neutrality and outlines four key pillars: a simplified regulatory environment, fast-track subsidy and financing approvals, skill development programs, and open trade agreements.<sup>8</sup> The EU is known for its intensive bureaucratic approvals and scrutiny of state aid to private enterprises; however, as part of its overall proposal, member countries are permitted to offer state aid if they can demonstrate that a company may otherwise locate elsewhere.<sup>9</sup> Member states such as France are already moving full speed ahead by offering large subsidies to wind, solar, and battery companies. The French government's current proposal would enable companies to qualify for tax credits equivalent to 25 to 40 percent of their total capital expenditures.<sup>10</sup>

Other nations, including Japan and India, also unveiled green subsidies over the past few years, but it is difficult to compete with the sheer size of programs available in the US, Canada, and EU.

### Market movement:

#### The Future Footprint of the Battery Industry

For the foreseeable future, China will remain the market leader in battery-related production activities. North America, followed by Europe, will continue to gain market share as battery-related production operations take advantage of federal incentive programs and the region's lower energy costs.<sup>11</sup>

Interested in exploring where your company should target its next investment? A comprehensive location strategy is necessary to balance cost and non-cost factors. Utility costs and service solutions, skilled labor availability, supply chain efficiencies, and incentives are just a few factors a company must consider when making a site selection decision.

<sup>3</sup> Environmental Defense Fund (EDF), "U.S. Electric Vehicle Manufacturing Investments and Jobs," August 2023: <https://www.edf.org/sites/default/files/2023-08/EDF%20WSP%20EV%20report%208-16-23%20FINAL%20FINAL.pdf>.

<sup>4</sup> Institute for Energy Research (IER), "Global EV Outlook 2023," 2023: <https://www.instituteforenergyresearch.org/renewable/electric-vehicle-battery-costs-soar/#:~:text=Batteries%20account%20for%20about%2030,prices%20by%20%241%2C200%20per%20vehicle.>

<sup>5</sup> Government of Canada, "A Made-In-Canada Plan: Affordable Energy, Good Jobs, and a Growing Clean Economy," March 2023: <https://www.budget.canada.ca/2023/report-rapport/chap3-en.html>.

<sup>6</sup> Electrek, "Ford and SK announce new massive battery cathode factory in Quebec's battery valley," August 2023: <https://electrek.co/2023/08/17/ford-sk-announce-massive-battery-cathode-factory-quebec-battery-valley/>.

<sup>7</sup> Volkswagen News Rooms, "Volkswagen Group steps up activities in North America – Canada chosen as location for first overseas gigafactory of its battery company

PowerCo SE," March 2023: <https://www.volkswagen-newsroom.com/en/press-releases/volkswagen-group-steps-up-activities-in-north-america-canada-chosen-as-location-for-first-overseas-gigafactory-of-its-battery-company-powerco-se-15615>.

<sup>8</sup> European Commission, "The Green Deal Industrial Plan," 2023: [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan_en).

<sup>9</sup> The Economist Intelligence Unit (EIU), "The Global Green Subsidy Race," 2023.

<sup>10</sup> Reuters, "France to offer new tax credit for investments in green technologies," May 2023: <https://www.reuters.com/sustainability/france-offer-new-tax-credit-business-investments-green-technologies-2023-05-11/>.

<sup>11</sup> Clean Energy Associates (CEA), "Energy Storage System Supplier Market Intelligence Report (H2 - 2022)," May 2023: <https://www.cea3.com/cea-blog/energy-storage-system-supplier-market-intelligence-report-h2-2022>.

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