

# Critical Materials Crossroads Energy Materials Ecosystem Economic Impact Analysis

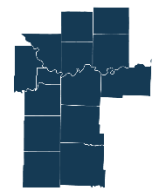
## Economic Impact Summary

The Critical Materials Crossroads Energy Materials Ecosystem would create substantial economic impacts in Kansas and Missouri during its investments and operations phases if planned activities occur. Expected gains in jobs, income and other economic measures over 10 years (2026-35) would benefit the Kansas City (KC) metropolitan region and surrounding communities in Kansas and Missouri.

The following impacts represent the combined effects of investment and operational activities in three regions: the KC metro, the rest of Kansas and the rest of Missouri. The state regions exclude the KC metro counties to avoid overstating the economic impacts.

Economic activity includes the impact of direct expenditures for construction, equipment and battery material production operations, the ripple effect of supply-chain purchases (indirect) such as feedstock and intermediate material processing and the household spending of workers (induced). Together, these activities represent the total economic impact anticipated from the developments outlined in this study. Unless otherwise noted, all monetary figures represent a cumulative amount over 10 years and are in 2024 dollar values. Employment figures represent the average annual number of jobs over the same period.

## KC Metro Region Impacts



The KC metro region would be the hub for critical mineral research, testing, refining and material production operations. More than \$3 billion in equipment and facility investments—along with battery material processing, component manufacturing and research—would support an annual average of nearly 10,000 jobs over 10 years. During this period, the region would gain \$17 billion in Gross Domestic Product (GDP) and more than \$40 billion in Gross Output. Due to the primary location of direct activities in Jackson County, Missouri, it is estimated that between 75% and 85% of impacts would be on the Missouri side of the KC metro region.

Impact	Employment	Labor Income	GDP	Gross Output
<i>Direct</i>	3,497	\$4.0 B	\$8.7 B	\$25.2 B
<i>Indirect</i>	3,192	\$2.6 B	\$4.6 B	\$9.2 B
<i>Induced</i>	3,288	\$2.0 B	\$3.6 B	\$6.2 B
<b>Total</b>	<b>9,977</b>	<b>\$8.6 B</b>	<b>\$16.9 B</b>	<b>\$40.6 B</b>

## Rest of Kansas Impacts



Critical mineral research and business developments in the KC metro region would have spillover effects on the rest of Kansas. These impacts include supply-chain and worker spending effects, as well as direct impacts from a battery feedstock supplier. Combined, these impacts would support more than 327 jobs during the analysis period, generate \$527 million in GDP and produce over \$1.4 billion in Gross Output.

Impact	Employment	Labor Income	GDP	Gross Output
<i>Direct</i>	25	\$69.6 M	\$109.7 M	\$265.7 M
<i>Indirect</i>	149	\$116.8 M	\$276.8 M	\$937.5 M
<i>Induced</i>	152	\$70.8 M	\$140.3 M	\$259.2 M
<b>Total</b>	<b>327</b>	<b>\$257 M</b>	<b>\$527 M</b>	<b>\$1,462 M</b>

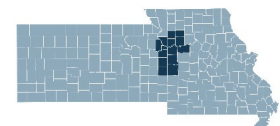
## Rest of Missouri Impacts



Critical mineral research and business developments in the KC metro region would have spillover effects on the rest of Missouri. These impacts include supply-chain and worker spending effects, as well as direct impacts from battery material mining. Combined, these impacts would support more than 568 jobs during the analysis period, generate \$887 million in GDP and produce nearly \$1.8 billion in Gross Output.

Impact	Employment	Labor Income	GDP	Gross Output
<i>Direct</i>	93	\$237.6 M	\$305.9 M	\$582.5 M
<i>Indirect</i>	208	\$179.0 M	\$313.0 M	\$736.6 M
<i>Induced</i>	267	\$145.8 M	\$268.0 M	\$473.7 M
<b>Total</b>	<b>568</b>	<b>\$562 M</b>	<b>\$887 M</b>	<b>\$1,793 M</b>

## Total Impacts



Total impacts include the KC metro region and the rest of Kansas and Missouri. The combined impacts would support more than 10,800 jobs during the analysis period, generate \$18.3 billion in GDP and produce nearly \$44 billion in Gross Output.

Impact	Employment	Labor Income	GDP	Gross Output
<i>Direct</i>	3,615	\$4.4 B	\$9.2 B	\$26.0 B
<i>Indirect</i>	3,548	\$2.9 B	\$5.1 B	\$10.9 B
<i>Induced</i>	3,708	\$2.2 B	\$4.0 B	\$6.9 B
<b>Total</b>	<b>10,872</b>	<b>\$9.5 B</b>	<b>\$18.3 B</b>	<b>\$43.8 B</b>

The energy materials ecosystem would employ a significant labor force in the KC metro region. Its economic contributions would be felt across Kansas and Missouri, acting as a catalyst for related industries, such as battery manufacturers, to establish or expand operations in both states.

## ADDITIONAL IMPACTS

The jobs supported during these 10 years include a mix of wage and salary workers and the self-employed. Nearly 9,000 average annual jobs are considered wage and salary positions, distributed almost evenly across direct, indirect and induced economic activities. The predominant occupation is on the manufacturing production line (19%), followed by administrative support roles, including contract workers (11%) and transportation and material movers (10%) – see Exhibit A.

The mix of occupations represents skills needed for direct battery material processing and handling, such as production line and transportation workers, as well as business operations, engineering and research. Some occupations, such as personal care and food service jobs, are spurred by worker spending at retailers, restaurants, hair salons and other establishments.

### Exhibit A. Wage & Salary Occupation Details

Occupation Groups	Average Annual Jobs	Percent of Jobs	Avg. Wage	Typical Skill/Educ. Minimum*
Manufacturing Production Occupations	1,734	19%	\$68,724	Middle-Skill
Admin. Support Occupations	951	11%	\$58,224	Entry-Skill
Transp. & Material Moving Occupations	896	10%	\$53,539	Entry-Skill
Construction Occupations	688	8%	\$66,626	Middle-Skill
Maintenance & Repair Occupations	678	8%	\$75,338	Middle-Skill
Sales & Related Occupations	592	7%	\$67,329	Entry-Skill
Management Occupations	583	7%	\$181,137	High-Skill
Business & Financial Oper. Occupations	535	6%	\$110,325	High-Skill
Food Service Occupations	495	6%	\$24,421	Entry-Skill
Engineering & Related Occupations	350	4%	\$130,229	High-Skill
Healthcare Pract. & Tech. Occupations	282	3%	\$98,817	High-Skill
Building & Grounds Maint. Occupations	270	3%	\$33,747	Entry-Skill
Computer & Math Occupations	237	3%	\$127,052	High-Skill
Healthcare Support Occupations	211	2%	\$30,480	Entry-Skill
Personal Care & Service Occupations	91	1%	\$28,120	Entry-Skill
Education Instruction Occupations	77	1%	\$38,808	High-Skill
Arts & Entertainment Occupations	73	1%	\$85,426	High-Skill
Protective Service Occupations	63	1%	\$44,144	Middle-Skill
Community & Social Serv. Occupations	59	1%	\$53,345	High-Skill
Science Occupations	51	1%	\$103,457	High-Skill
Legal Occupations	41	0.5%	\$150,847	High-Skill
Agricultural & Related Occupations	7	0.1%	\$42,221	Entry-Skill
<b>Average Annual Wage &amp; Salary Jobs</b>	<b>8,965</b>	<b>100%</b>	<b>\$76,365</b>	

\*Typical minimum skill/education requirements of most jobs in an occupational group. 2022 avg. wages.

Entry-skill occupations, defined as jobs requiring minimal training or experience, represent the largest wage and salary group (39%) and offer employment opportunities for those seeking a first job or with little post-secondary education (see Exhibit B). Middle-skilled jobs, such as manufacturing production, construction and maintenance occupations, represent 35% of employment. These positions, which require experience or technical training, offer career advancement opportunities for workers without a four-year college degree and pay an average of \$20,000 more than entry-skilled jobs.

One in four occupations typically require a four-year college degree or higher level of education and experience. These high-skilled positions are found in business, finance, management and engineering professions. Overall, the average pay for workers in this analysis is \$76,365, roughly \$10,000 more than the KC metro region average pay for all occupations (\$66,772).

**Exhibit B. Occupations by Minimum Skill or Education Levels**

Typical Skill/Educ. Minimum	Average Annual Jobs	Percent of Jobs	Avg. Wage
High-Skill	2,288	26%	\$127,620
Middle-Skill	3,163	35%	\$69,195
Entry-Skill	3,514	39%	\$49,439
<b>Average Annual Wage &amp; Salary Jobs</b>	<b>8,965</b>	<b>100%</b>	<b>\$76,365</b>

Additional state and local taxes, shown in Exhibit C, would be generated during this 10 year period as job and income gains occur across Kansas and Missouri. Counties and cities in the KC metro region are expected to gain \$553 million in tax revenues. Local governments in Kansas and Missouri would see tax revenues of \$22 and \$54 million, respectively.

The states of Kansas and Missouri are also expected to gain tax revenues over this period. While there is no specific breakout of fiscal gains from the KC metro region that flow to each state, given that most direct employment would be in Missouri, it is likely that a large share (75-85%) of tax revenues would accrue to Missouri.

It is important to note that these tax benefits do not include fiscal expenditure estimates, such as the cost of public road improvements or maintenance, that would impact these figures.

**Exhibit C. Local and State Tax Estimates**

Region	Local City/County	State	Total
KC Metro	\$553 M	\$672 M	<b>\$1,224 M</b>
Kansas	\$22 M	\$35 M	<b>\$57 M</b>
Missouri	\$54 M	\$44 M	<b>\$97 M</b>
<b>Total</b>	<b>\$629 M</b>	<b>\$750 M</b>	<b>\$1,379 M</b>

# KANSAS CITY METRO BACKGROUND

The KC metro region, home to more than 1.1 million workers, is a highly diversified economy. Known for its logistics strength as a centrally located metro, Kansas City also has concentrations in manufacturing sectors complementary to the critical minerals ecosystem – see Exhibit D.

## Exhibit D. Kansas City Metro Job Trends for Selected Manufacturing

<b>Kansas City Metro</b>				<b>U.S.</b>
<b>Industry</b>	<b>2023 Jobs</b>	<b>2023 Job Concentration</b>	<b>2018-23 % Job Change</b>	<b>2018-23 % Job Change</b>
<b>Manufacturing</b>	<b>90,041</b>	<b>1.0</b>	<b>14%</b>	<b>2%</b>
Transportation Equip. Manufacturing	17,682	1.4	8%	5%
Semiconductor & Other Elect. Comp. Mfg.	6,281	2.2	59%	7%
Other Electrical Equip. Mfg. (incl. Battery)	1,758	1.5	123%	13%

Source: Lightcast estimates based on BLS and Census employment figures. Job concentration is how specialized an industry is compared to the U.S. avg. (2.0 is twice as concentrated as the U.S. avg.).

Employing more than 90,000 production workers in 2023, Kansas City has experienced significant growth in manufacturing jobs over the past five years (14%) compared to the U.S. average (2%). The large transportation equipment industry, including two vehicle assembly plants, employs more than 17,600 workers and is 40% more concentrated in the KC metro region compared to the U.S., with a 1.4 job concentration index. Transportation equipment manufacturing job growth (8%) has also outpaced the national average (5%) from 2018 to 2023.

Semiconductor and other electronic component manufacturing is also a specialty of the KC metro region, with a job concentration index of 2.2. This sector employs more than 6,000 workers and has seen high job growth (59%) over the past five years. Other electrical equipment manufacturing—primarily battery production—is concentrated in Kansas City, with more than 1,700 employees in 2023. This industry has experienced tremendous gains, with job growth of 123% from 2018 to 2023. Growth is expected to accelerate further as the metro area Panasonic battery plant, projected to employ 4,000 workers, opens in 2025. The increasing concentration and employment in these manufacturing sectors would further strengthen the Kansas City metro as a Midwest hub for electrical component and battery production workers.

In addition to a competitively growing manufacturing sector, KC metro region workers enjoy a more affordable lifestyle. The metro had a first-quarter 2024 [cost-of-living index](#) of 91.3, meaning general costs are 9% below the national average. An affordable location also benefits employers, who can offer regionally competitive wages at a lower cost than metros with higher living expenses.

## INVESTMENT PHASE ECONOMIC IMPACTS

The KC metro region would be the location for a large, multi-year capital investment in facilities and equipment to enable critical mineral research, testing, refining and material production operations. The investment phase includes more than \$3 billion in equipment (63%) and facility/site construction (37%) expenditures to include:

- Site work, utilities, and rail maintenance: \$77 M (2026-32)
- Construction of 16 facilities: \$1.07 B (2027-35)
- Material moving and facility equip. purchases: \$1.93 B (2027-35)

The economic impacts of these investments would be primarily realized in the KC metro, where the capital investments would occur over 10 years (2026-35). This spending would also spur some supply-chain (indirect) and worker purchasing (induced) impacts in Kansas and Missouri. Income, GDP and Gross Output figures are cumulative and reported in 2024 dollars. Job figures represent the average annual employment over the investment period.

### KC Metro – Investment Phase Impacts

Impact	Employment	Labor Income	GDP	Gross Output
<i>Direct</i>	803	\$587.6 M	\$659.7 M	\$1.2 B
<i>Indirect</i>	572	\$477.5 M	\$764.9 M	\$1.4 B
<i>Induced</i>	538	\$326.8 M	\$592.2 M	\$1.0 B
<b>Total</b>	<b>1,913</b>	<b>\$1.4 B</b>	<b>\$2.0 B</b>	<b>\$3.6 B</b>

### Rest of Kansas – Investment Phase Impacts

Impact	Employment	Labor Income	GDP	Gross Output
<i>Indirect</i>	21	\$15.9 M	\$36.1 M	\$134.0 M
<i>Induced</i>	15	\$7.1 M	\$14.0 M	\$25.9 M
<b>Total</b>	<b>36</b>	<b>\$23.0 M</b>	<b>\$50.1 M</b>	<b>\$159.8 M</b>

### Rest of Missouri – Investment Phase Impacts

Impact	Employment	Labor Income	GDP	Gross Output
<i>Indirect</i>	12	\$9.1 M	\$16.7 M	\$41.9 M
<i>Induced</i>	12	\$6.4 M	\$11.8 M	\$20.8 M
<b>Total</b>	<b>24</b>	<b>\$15.5 M</b>	<b>\$28.5 M</b>	<b>\$62.8 M</b>

### Total – Investment Phase Impacts

Impact	Employment	Labor Income	GDP	Gross Output
<i>Direct</i>	803	\$587.6 M	\$659.7 M	\$1.2 B
<i>Indirect</i>	606	\$502.5 M	\$817.7 M	\$1.6 B
<i>Induced</i>	565	\$340.3 M	\$618.0 M	\$1.1 B
<b>Total</b>	<b>1,974</b>	<b>\$1.4 B</b>	<b>\$2.1 B</b>	<b>\$3.9 B</b>

## OPERATIONS PHASE ECONOMIC IMPACTS

Operational activities, from business management, research, refining, manufacturing and other functions, would ramp up over the 10-year period (2026-35) in the KC metro region. By 2035, operational spending would top \$3.9 billion annually in activities such as:

- Battery material refining and manufacturing: \$3.7 B
- Research, development, and testing: \$149 M
- Project mgmt., business and workforce dev.: \$42 M
- Logistics and maintenance support: \$31 M

The economic impacts of these activities occur primarily in the KC metro region, with additional spending due to supply chains (indirect) and workers (induced) impacting the rest of Kansas and Missouri. Income, GDP and Gross Output figures are cumulative figures over 10 years and are in 2024 dollar values. Job numbers represent the average annual employment over the operations phase.

### KC Metro – Operations Phase Impacts

Impact	Employment	Labor Income	GDP	Gross Output
<i>Direct</i>	2,694	\$3.5 B	\$8.1 B	\$24.0 B
<i>Indirect</i>	2,620	\$2.1 B	\$3.8 B	\$7.8 B
<i>Induced</i>	2,750	\$1.7 B	\$3.0 B	\$5.2 B
<b>Total</b>	<b>8,064</b>	<b>\$7.3 B</b>	<b>\$14.9 B</b>	<b>\$37.0 B</b>

### Rest of Kansas – Operations Phase Impacts

Impact	Employment	Labor Income	GDP	Gross Output
<i>Direct</i>	25	\$69.6 M	\$109.7 M	\$265.7 M
<i>Indirect</i>	128	\$100.9 M	\$240.6 M	\$803.5 M
<i>Induced</i>	137	\$63.7 M	\$126.3 M	\$233.4 M
<b>Total</b>	<b>290</b>	<b>\$234 M</b>	<b>\$477 M</b>	<b>\$1,303 M</b>

### Rest of Missouri – Operations Phase Impacts

Impact	Employment	Labor Income	GDP	Gross Output
<i>Direct</i>	93	\$237.6 M	\$305.9 M	\$582.5 M
<i>Indirect</i>	195	\$169.8 M	\$296.3 M	\$694.7 M
<i>Induced</i>	256	\$139.4 M	\$256.2 M	\$452.8 M
<b>Total</b>	<b>544</b>	<b>\$547 M</b>	<b>\$858 M</b>	<b>\$1,730 M</b>

### Total – Operations Phase Impacts

Impact	Employment	Labor Income	GDP	Gross Output
<i>Direct</i>	2,812	\$3.8 B	\$8.5 B	\$24.8 B
<i>Indirect</i>	2,943	\$2.4 B	\$4.3 B	\$9.3 B
<i>Induced</i>	3,143	\$1.9 B	\$3.4 B	\$5.9 B
<b>Total</b>	<b>8,898</b>	<b>\$8.0 B</b>	<b>\$16.2 B</b>	<b>\$40.0 B</b>

## ECONOMIC IMPACT METHODOLOGY

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The IMPLAN input/output economic model, provided by the IMPLAN Group, LLC, was used for this analysis. Commonly employed by universities, consultants, and economic development organizations, the model helps assess the economic impact of business projects and the model is updated annually with data from various U.S. statistical agencies.

The IMPLAN model provides job, income, GDP, Gross Output and tax estimates based on typical consumer and industry spending patterns within an area. This report highlights the expected economic gains for the KC Metro Energy Materials Ecosystem and the rest of Kansas and Missouri during two phases of development:

- The **investment phase** includes site work, facility construction and equipment expenditures totaling more than \$3 billion in the KC metro region during the analysis period (2026-35). Investments were modeled on expenditure data that separated equipment purchases (63%) for facility operations and material moving from facility construction and site work spending (37%).
- The **operations phase** includes a range of business, research, support, refining and manufacturing activities that scale up over several years following the investment phase. Using detailed expenditures from the client, several modifications were made to improve modeling accuracy:
  - Spending information was analyzed to ensure that similar expenditures already included in the model's input purchasing pattern for the battery materials refining and manufacturing were removed to avoid double-counting economic impacts.
  - Supply-chain commodity purchases for refining and manufacturing operations were adjusted to better reflect the larger feedstock inputs needed.
  - A feedstock supplier in Kansas and mining operations in Missouri were added to capture inputs specific to those states.

The economic analysis covers three geographies and state totals to track supply-chain and household spending impacts across Kansas and Missouri:

- **KC Metro Region** impacts are effects that are expected to occur within the 14 counties of the KC metro region. It includes economic benefits from direct spending during the investment phase and research, refining, manufacturing and support activities during the operations phase. Supply-chain (indirect) and household spending (induced) effects also occur in the region.
- **Rest of Kansas** impacts estimate the supply-chain (indirect) and household spending (induced) effects in other Kansas counties stimulated by the direct investment and business activities in the KC metro region. Some of that spending would go to other firms in the state, creating additional economic benefits within Kansas.
- **Rest of Missouri** impacts estimate the supply-chain (indirect) and household spending (induced) effects in other Missouri counties stimulated by the direct investment and business activities in the KC metro region. Some of that spending would go to other firms in the state, creating additional economic benefits within Missouri.
- **Total** impacts are the sum of the KC Metro Region, Rest of Kansas, and Rest of Missouri impacts.



## IMPLAN Economic Model Terminology

Economic models track the flow of spending that moves around an economy through the primary relationships between businesses and consumers. They consider typical company supply-chain purchases needed to produce goods or services and how workers spend the income. The models follow these spending patterns to understand the broader economic impacts and income leaks due to imports.

**Spending effects** describe how the output of a business causes money to flow to other businesses in the region or state:

- **Direct Effects** include the sales, income and jobs from selling a product or service for consumption.
- **Indirect Effects** are the supply-chain impacts of spending when a business purchases goods and services inputs for their operation. Some inputs are provided by local suppliers while others are imported from other states or countries, especially when those inputs are specialized.
- **Induced Effects** capture the household spending of owners and workers when items such as groceries, clothing, etc. are purchased in the region's economy. Just like suppliers, workers also spend some of their income outside the region for things like travel, online purchases, specialized goods, etc. which represents spending leakages.
- **Total Effects** combine the direct effect of jobs and income with the ripple effects of supplier and household spending within the region, supporting additional employment and wealth.

**Economic impact terms** used in this analysis:

- **Job Estimates** are the annual average full- or part-time employment supported by investment or operational phase activities. Jobs may be held by residents or in-commuters from outside the area.
- **Labor Income** describes wages and benefits, such as healthcare and retirement, along with proprietor income.
- **Gross Domestic Product (GDP)** is value of final sales in a region, representing new wealth to citizens and businesses. Also known as value added, it is total sales minus the costs of supply-chain input goods and services that leaves money to pay wages, profits, rents, interests and taxes.
- **Gross Output** represents the total value of all sales, including both the input cost of production and the final sale value of the product or service (GDP).

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