



ECONOMIC DEVELOPMENT PARTNERSHIP of
NORTH CAROLINA

Automotive & EV in the Battery Belt – North Carolina

Austin Rouse, Director of Business Recruitment

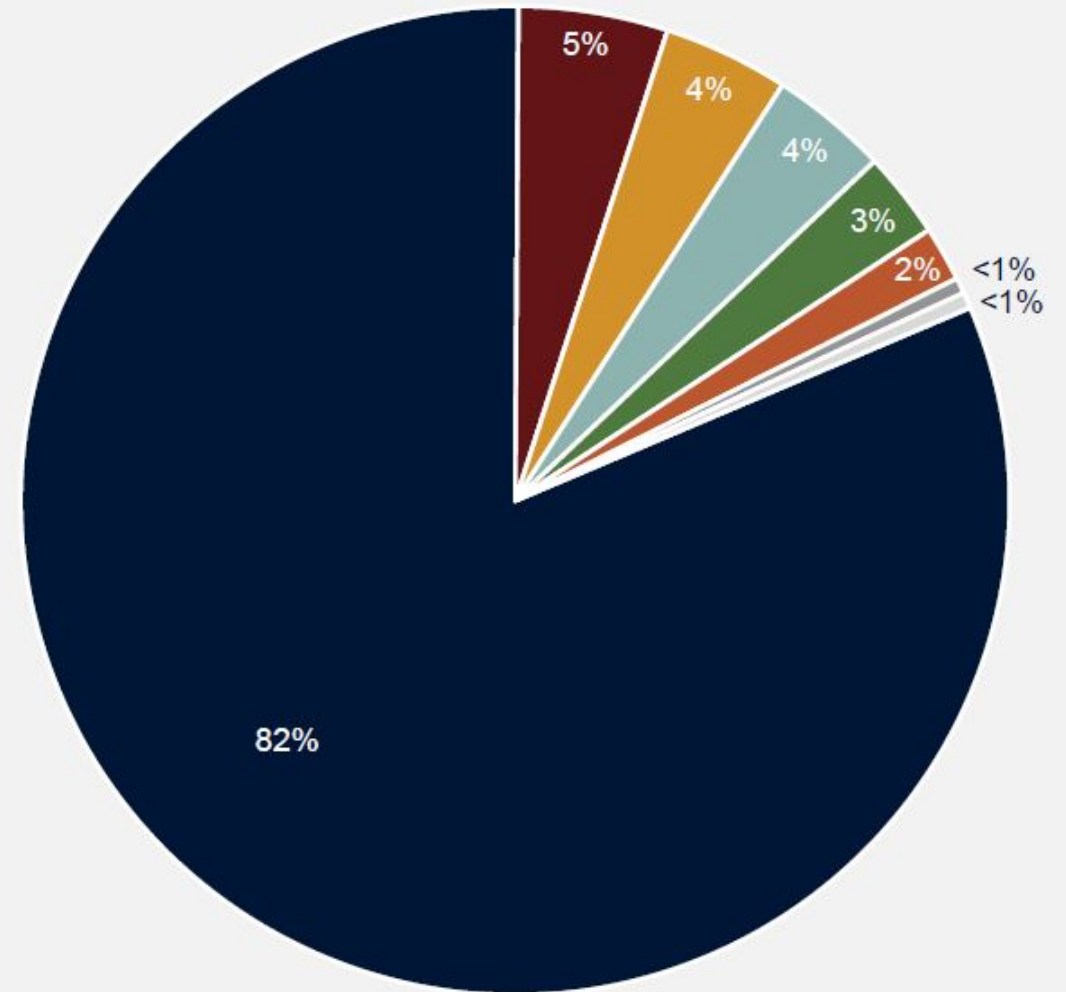


PRIMARY ACTIVITY ALL PROJECTS

387 PROJECTS CREATED IN 2023

- Business Recruitment Projects – 281
- Existing Industry Expansions – 106

- **Manufacturing/Assembly** – 317 projects (82%)
- **Warehouse/Distribution** – 19 projects (5%)
- **Service/Sales** – 16 projects (4%)
- **Corporate HQ** – 15 projects (4%)
- **R&D** – 9 projects (2%)
- **Back Office/Shared Services** – 7 projects (2%)
- **Data Center** – 2 projects (<1%)
- **Call Center** – 2 projects (<1%)

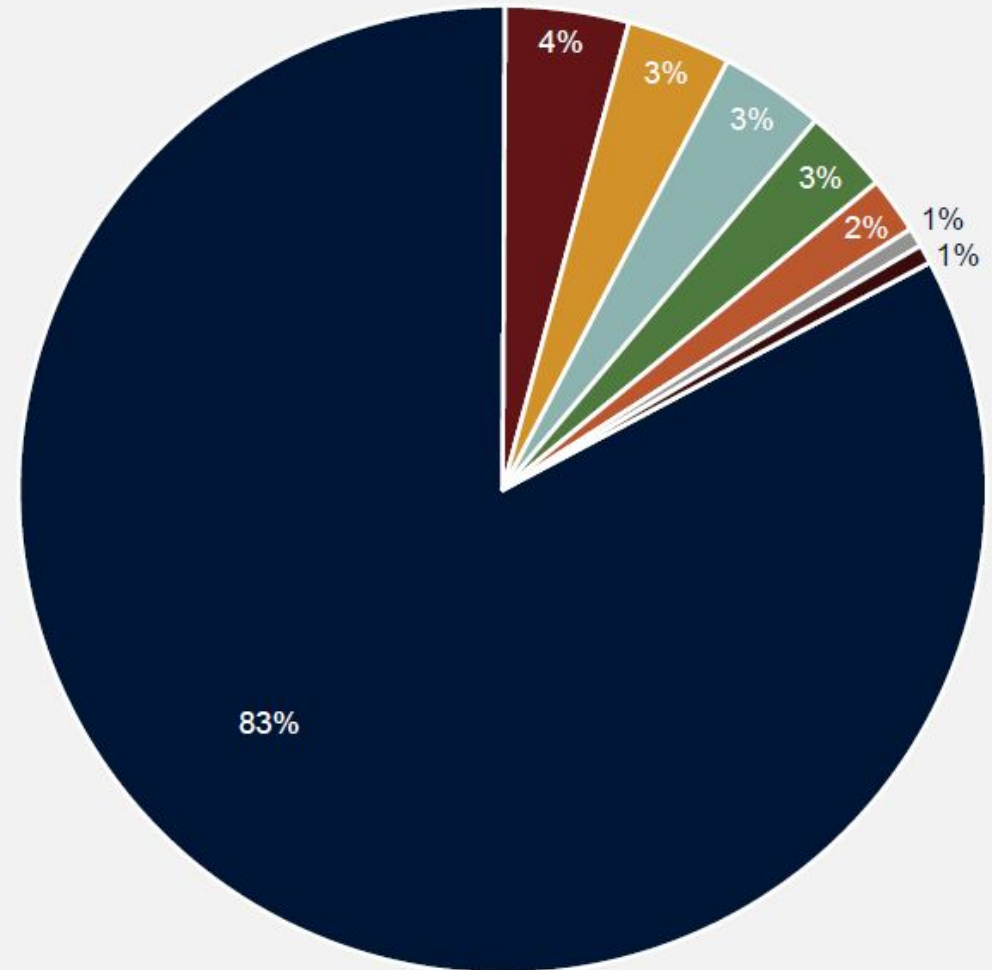




PRIMARY ACTIVITY NEW LOCATION PROJECTS

315* PROJECTS CREATED IN 2023

- Manufacturing/Assembly – 261 projects (83%)
- Warehouse/Distribution – 13 projects (4%)
- Service/Sales – 11 projects (3%)
- Corporate HQ – 11 projects (3%)
- R&D – 9 projects (3%)
- Back Office/Shared Services – 6 projects (2%)
- Data Center – 2 projects (1%)
- Call Center – 2 projects (1%)

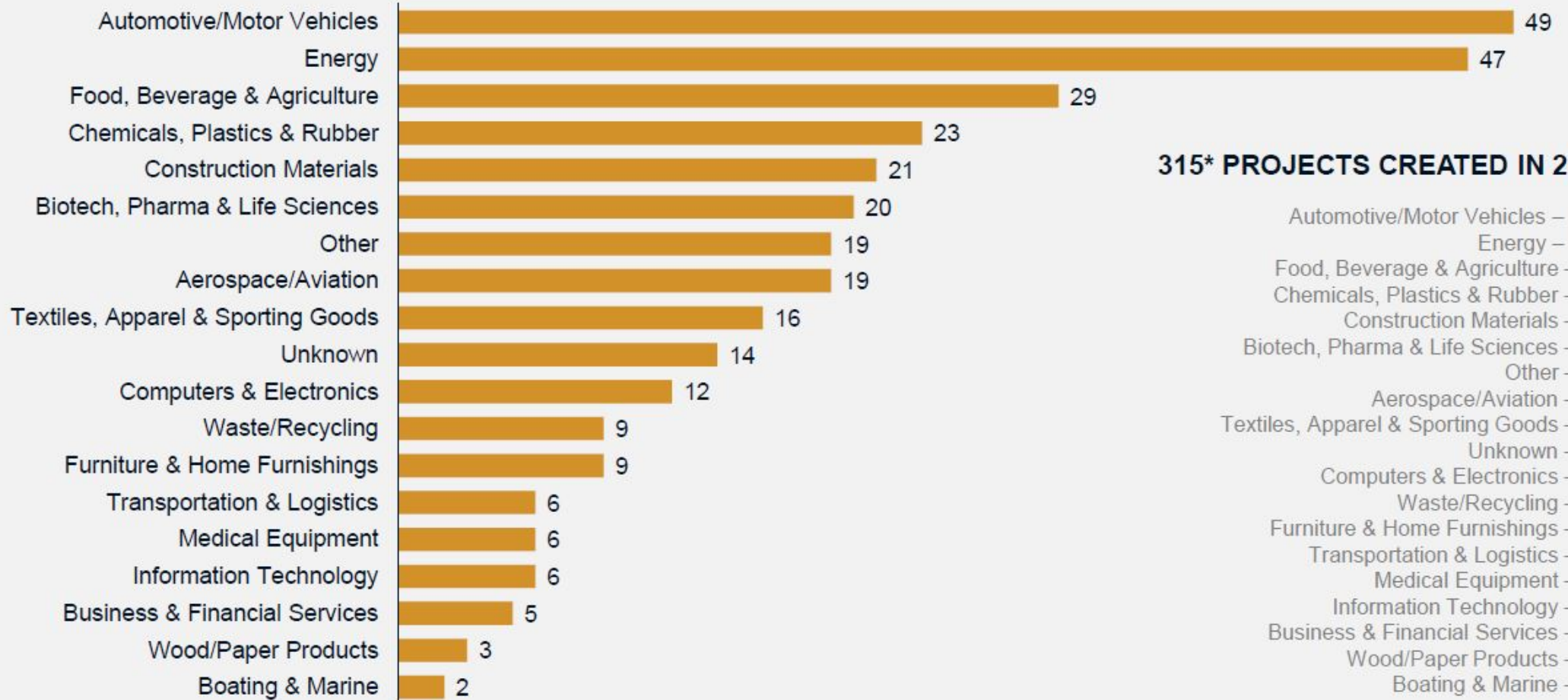


*These are projects that include only companies that were considering a **new facility** to the state. No existing company, same-site expansions are included in this data.



INDUSTRY SECTORS

NEW LOCATION PROJECTS



315* PROJECTS CREATED IN 2023

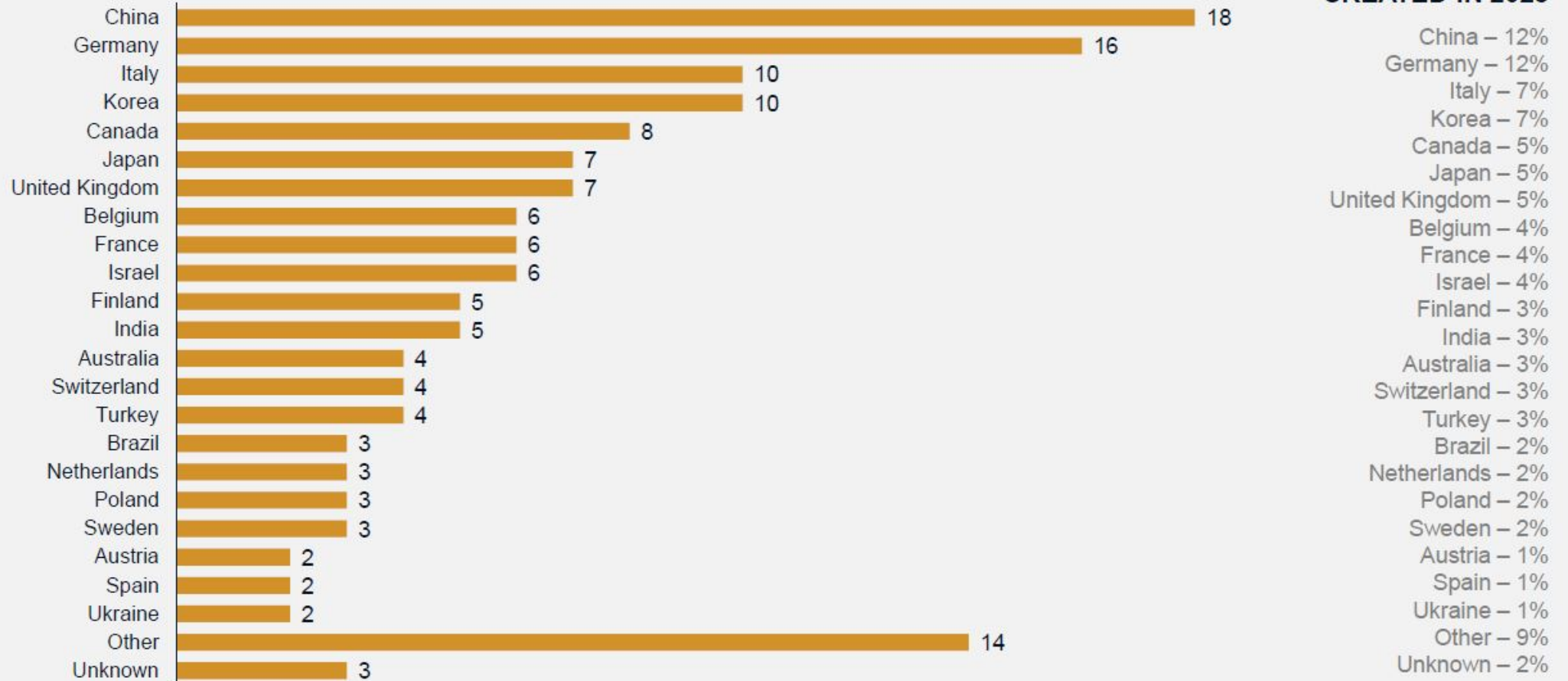


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FOREIGN DIRECT INVESTMENT NEW LOCATION PROJECTS

151* FDI OPPORTUNITIES
CREATED IN 2023



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TOP INDUSTRY SECTORS NEW LOCATION PROJECTS

315* PROJECTS CREATED IN 2023

Aerospace/Aviation

Median Jobs – 100
Median Investment - \$42.8 million
Median Wages - \$65,000
19 Projects

Automotive/Motor Vehicles

Median Jobs – 250
Median Investment - \$150 million
Median Wages - \$55,000
49 Projects

Biotech, Pharma & Life Sciences

Median Jobs – 150
Median Investment - \$100 million
Median Wages - \$69,169
20 Projects

Chemicals, Plastics, & Rubber

Median Jobs - 75
Median Investment - \$36 million
Median Wages - \$60,000
23 Projects

Computers and Electronics

Median Jobs - 135
Median Investment - \$22 million
Median Wages - \$77,203
12 Projects

Construction Materials

Median Jobs - 100
Median Investment - \$5.3 million
Median Wages - \$54,439
21 Projects

Energy

Median Jobs - 265
Median Investment - \$138 million
Median Wages - \$52,184
47 Projects

Food, Beverage & Agriculture

Median Jobs - 85
Median Investment - \$20 million
Median Wages - \$58,574
29 Projects

Furniture & Home Furnishings

Median Jobs - 125
Median Investment - \$25 million
Median Wages - \$39,356
9 Projects

Information Technology

Median Jobs - 80
Median Investment - \$2 million
Median Wages - \$54,265
6 Projects

Textiles, Apparels & Sporting Goods

Median Jobs - 123
Median Investment - \$9 million
Median Wages - \$44,231
16 Projects

Waste/Recycling

Median Jobs - 51
Median Investment - \$19.8 million
Median Wages - \$85,490
9 Projects

These are projects that include only companies that were considering a **new facility to the state. No existing company, same-site expansions are included in this data.*



REAL ESTATE REQUESTS

IN TOP INDUSTRY SECTORS – NEW LOCATION PROJECTS 2023

Automotive/Motor Vehicles

49 Projects Worked

35 Total Real Estate Assists (71% of projects)

- **Building or Site – 8 projects (23%)**
- **Building – 8 projects (23%)**
 - Average Square Footage Request – 435,884 SF
 - Average Ceiling Height Request – 27 feet
- **Site – 19 projects (54%)**
 - Average Acreage Request – 232 acres

Utility Requirements – Sampling of 22 Automotive Projects

- **Power Needs**
 - 14 projects (64%) required over 25 MW
 - 6 projects (27%) required over 150 MW
- **Water Needs**
 - 9 projects (41%) required more than 250,000 gallons/day
- **Wastewater Needs**
 - 6 projects (27%) required more than 250,000 gallons/day
- **Rail Needs**
 - 9 projects (41%) required rail
 - 3 projects (14%) preferred rail
- **Renewable Energy** – 73% of projects had interest in understanding renewable energy sources

Energy

47 Projects Worked

32 Total Real Estate Assists (68% of projects)

- **Building or Site – 13 projects (41%)**
- **Building – 9 projects (28%)**
 - Average Square Footage Request – 395,773 SF
 - Average Ceiling Height Request – 28 feet
- **Site – 10 projects (31%)**
 - Average Acreage Request – 230 acres

Utility Requirements – Sampling of 22 Energy Projects

- **Power Needs**
 - 9 projects (41%) required over 25 MW
 - 4 projects (18%) required over 100 MW
- **Water Needs**
 - 8 projects (36%) required more than 250,000 gallons/day
- **Wastewater Needs**
 - 9 projects (41%) required more than 100,000 gallons/day
- **Rail Needs**
 - 3 projects (14%) required rail
 - 2 projects (9%) preferred rail
- **Renewable Energy** – 64% of projects had interest in understanding renewable energy sources

These are projects that include only companies that were considering a **new facility to the state. No existing company, same-site expansions are included in this data.*



REAL ESTATE REQUESTS

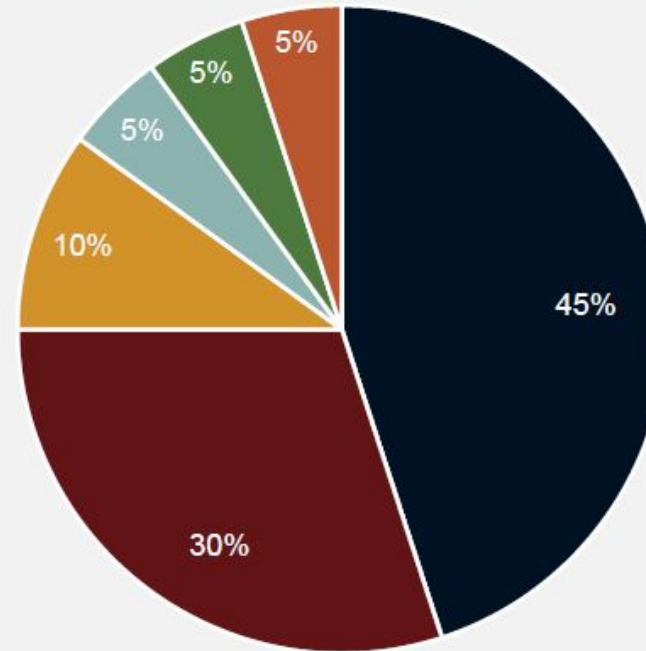
\$1 BILLION+ CAPITAL INVESTMENT – MANUFACTURING PROJECTS

IN 2023, EDPNC ASSISTED WITH 20* REAL ESTATE REQUESTS FOR MANUFACTURING PROJECTS EXCEEDING \$1 BILLION IN CAPITAL INVESTMENT

- ▶ This is a 37% decrease from projects of this size EDPNC assisted with in 2022
- ▶ Top industry sectors of projects this size are the same as in 2022
- ▶ All 20 of these large project requests were for sites

PROJECT INDUSTRY SECTOR

- Automotive/Motor Vehicles – 9 projects (45%)
- Energy – 6 projects (30%)
- Computers & Electronics – 2 project (10%)
- Aerospace/Aviation – 1 project (5%)
- Biotech, Pharma & Life Sciences – 1 project (5%)
- Chemicals, Plastics & Rubber – 1 project (5%)



Automotive/Motor Vehicles

9 Projects
Average Jobs – 1,355
Average Investment - \$1.65 billion
Average Acreage Request – 419 acres
Average Power Need – 109 MW
Average Water Need – 1.65 million gallons/day
Average Wastewater Need – 1 million gallons/day

Energy

6 Projects
Average Jobs – 1,485
Average Investment - \$1.73 billion
Average Acreage Request – 315 acres
Average Power Need – 129 MW
Average Water Need – 1.9 million gallons/day
Average Wastewater Need – 987,500 gallons/day

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Project Activity - 2022

- Automotive Projects – 60+ in 2022
 - In previous 5 years – anywhere from 15-30 projects yearly
 - 20% of all project activity
 - Median Project – Before 2021 versus 2021-2022
 - Before 2021 - ~150 jobs, \$20 million investment and \$48K wages
 - 2021-2022 - ~400+ jobs, \$230+ million investment and \$57K wages
- Foreign Direct Investment
 - In 2022, ~65% of project were FDI (compared to low-mid 40's for all projects)
 - Leading countries
 - Korea – 18%
 - Japan – 18%
 - China - 15%
 - Germany – 9%



Project Activity – 2022

- Real Estate Requests (request a building or site)
 - Site – 62% (49% across all project regardless of industry)
 - Building – 25% (34%)
 - Building or Site – 13% (17%)
- Utility Requirements - Sampling of 25 Recent Automotive Projects
 - 20 required more than 30 Megawatts
 - 10 required rail and 7 preferred rail
 - 16 required more than 500,000 gallons of water per day
 - 15 required more than 500,000 gallons of sewer per day
 - More than 90% had an interest in understanding renewable energy
- For automotive related projects, the reasons lost since 2021 were the following:
 - 67% Lack of Suitable Building/Site (compared to 55% for all projects in 2022)
 - 11% Incentives (9%)



Automotive Mega Projects - 2022

- In 2022, EDPNC assisted with 32 real estate requested for MFG projects with \$1 Billion+ Capital Investment
- All requests were for sites and this represented a 250% increase from 2021
- Automotive projects were 18 of these projects, which was ~57%
- Of those 18 projects, here's some core attributes of those projects
 - Average Jobs – 3,127
 - Average Investment - \$3.29 billion
 - Average Acreage Request – 603 acres
 - Average Power Need – 221 MW
 - Average Water Need – 2.1 million gallons/day
 - Average Wastewater Need – 1.3 million gallons/day



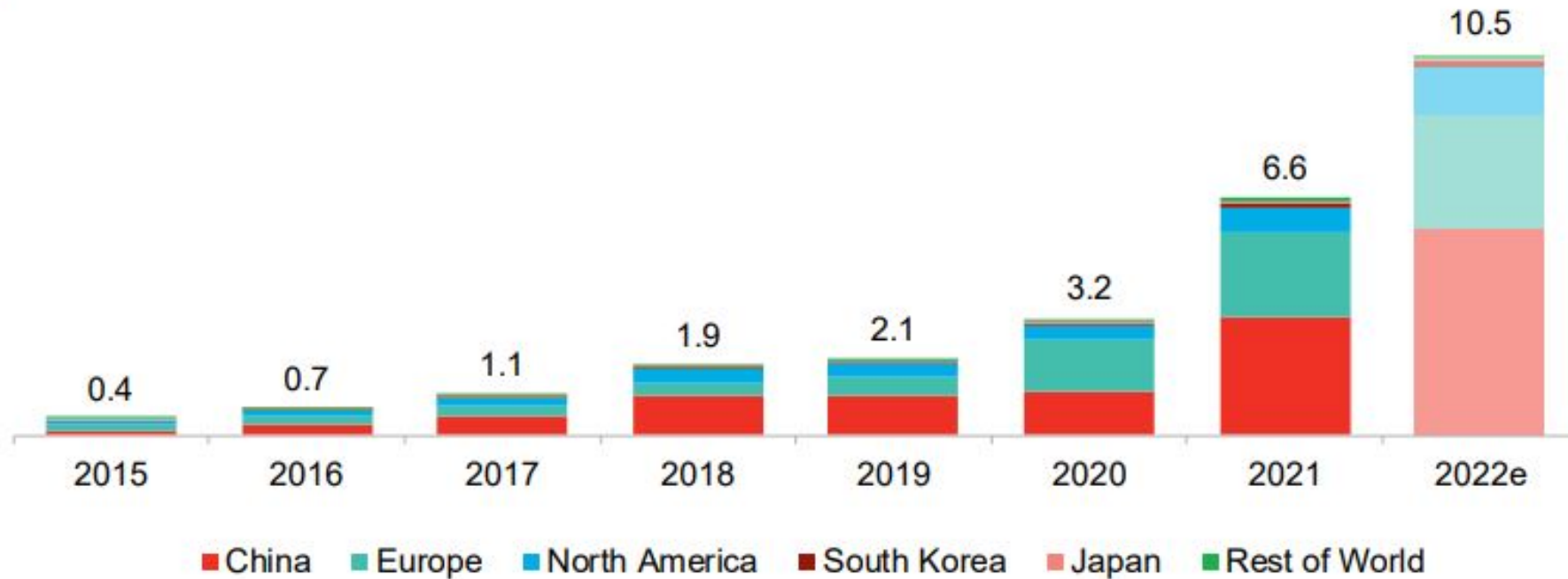


Company	Announced Investment	Announced Jobs	County
Dai Nippon Printing Company, Ltd.	\$233,000,000	352	Davidson
<i>Vinfast</i>	\$4,000,000,000	7,500	Chatham
Epsilon Advanced Materials	\$649,900,000	500	Brunswick
Toyota Tsusho	\$3,815,975	41	Randolph
INEOS Automotive	\$0	25	Wake
Atom Power	\$4,180,000	205	Mecklenburg
Forge Nano	\$142,000,000	204	Wake
Alpitronic	\$18,300,000	300	Mecklenburg
<i>Arrival</i>	\$11,350,000	110	Mecklenburg
<i>Arrival</i>	\$41,200,000	281	Mecklenburg
Toyota Battery Manufacturing North America, Inc.	\$8,000,000,000	3,000	Randolph
Toyota Battery Manufacturing North America, Inc.	\$2,500,000,000	350	Randolph
Toyota Battery Manufacturing North America, Inc.	\$1,290,000,000	1,750	Randolph
Kempower	\$41,250,000	601	Durham
FUJIHATSU & TOYOTSU Battery Components	\$60,424,000	133	Randolph
John Deere Electric Powertrain LLC	\$69,600,000	87	Forsyth
Wolfspeed	\$5,047,413,861	1,801	Chatham
Total	\$22,112,433,836	17,240	



Annual passenger EV sales by region

Million



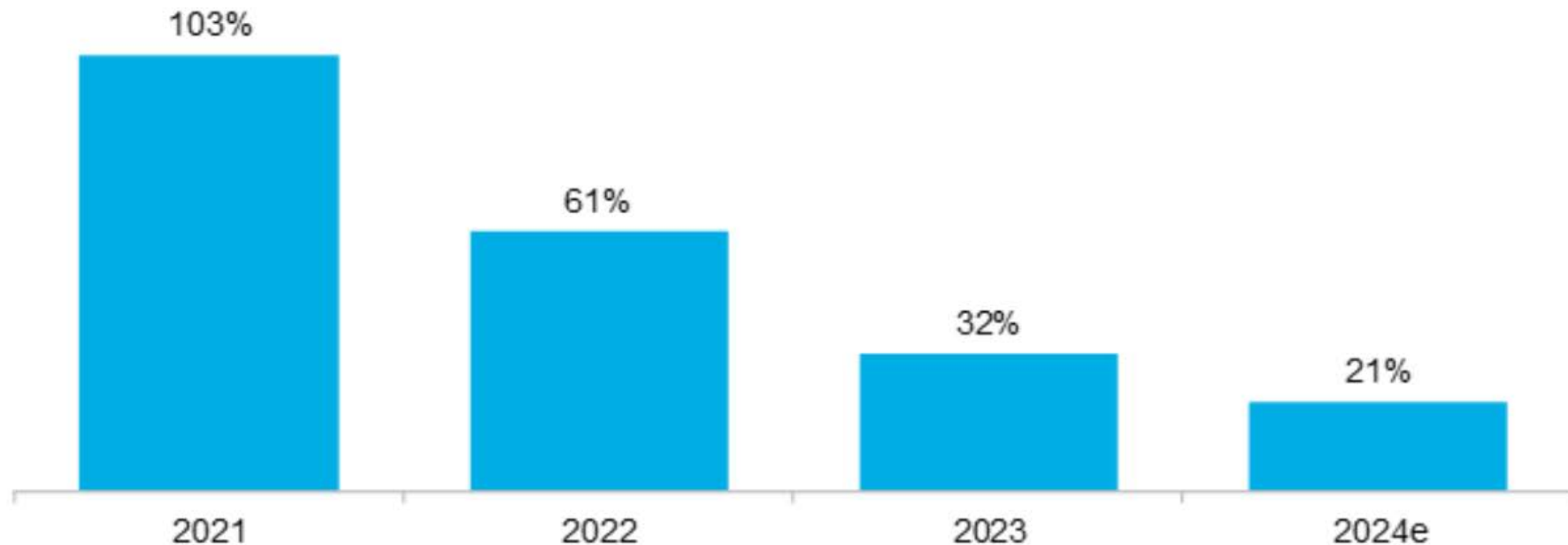
Source: BloombergNEF, Marklines.



Electric Vehicles sales are growing quickly, not exponentially.

...but the growth rate is slowing

Global passenger EV sales annual growth rate



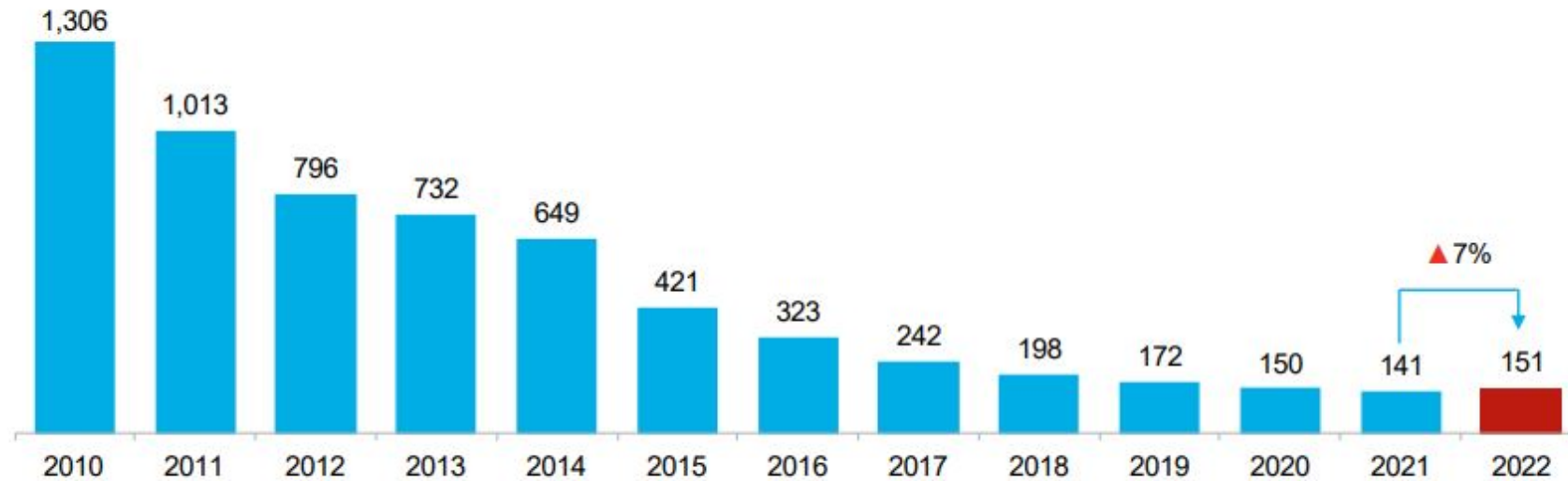
Source: BloombergNEF. Includes battery electric and plug-in hybrid passenger vehicle sales



However, battery prices **increased** for the first time in 2022

Volume-weighted average lithium-ion battery pack prices

Real 2022 \$/kWh



Source: BloombergNEF. Note: Historical prices have been adjusted using June 2021 to June 2022 inflation rates based on the US Consumer Price Index (CPI) index.



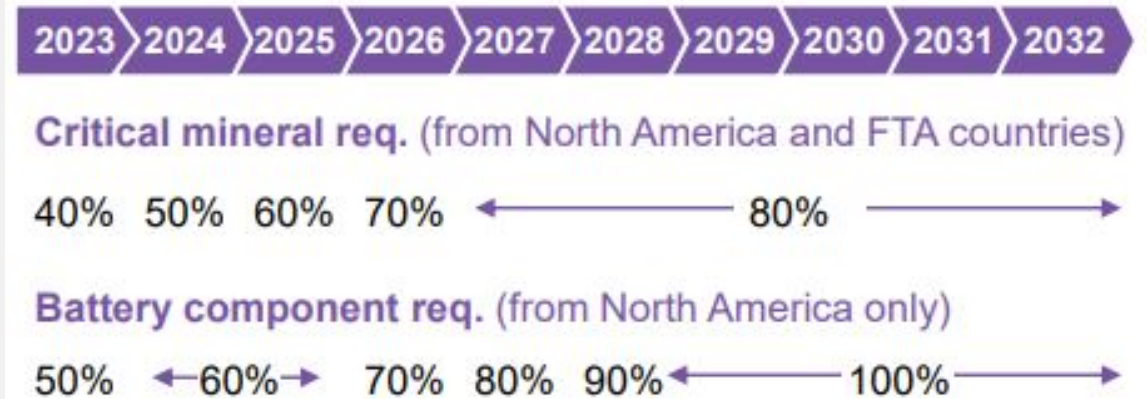
EV and Battery Supply Chains are Emerging

- Inflation Reduction Act (IRA) is a gamechanger - due to introduction of battery related tax credits
- Federal Government is also playing a role through grant and loan programs at the U.S. Department of Energy and Defense

Tax credits

	Area	Tax credit
Input materials	Critical minerals*	10% of costs
	Battery electrode active materials	10% of costs
Batteries	Battery cells	\$35/kWh
	Battery modules**	\$10*/kWh
Applications	EVs***	\$7,500**
	Energy storage****	6% (base credit) Up to 30% + 10%

Requirements to access EV credit






The Challenge – IRA Original Requirements

- Companies awaiting guidance from the U.S. Department of Treasury – Coming in March 2023

Origination requirements for battery supply chain tax credits





Production tax credits

Battery electrode active materials, cells and modules requirement Manufactured in:  US

EV tax credit

Critical mineral requirement Extracted or processed in:  US
 FTA countries* Australia, Bahrain, Canada, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Israel, Jordan, Mexico, Morocco, Nicaragua, Oman, Panama, Peru, Singapore and South Korea

Recycled in:  North America**  US
 Canada
 Mexico

Battery component requirement Manufactured or assembled in:  North America**  US
 Canada
 Mexico

Source: BloombergNEF, state.gov. Note: *US has free trade agreements (FTA) in force with 20 countries. **Table includes selected large countries in North America region.



Graphite producers push for return of Trump-era tariffs

By Hannah Northey | 02/22/2024 01:41 PM EST

They told the Office of the U.S. Trade Representative that tariffs on graphite coming from China are needed to help stand up a North American supply of the ingredient used in EV batteries.

US Bid to Loosen China's Grip on Key Metals for EVs Is Stalling

Moving Metals: Part I ▶ Washington's efforts have so far had limited success, and some mining executives complain of a lack of coherent strategy at a time when metal prices are falling.

By [Mark Burton](#), [Joe Deaux](#), [Michael J Kavanagh](#), [Jennifer A Dlouhy](#), and [Annie Lee](#)

U.S. to investigate national security risks posed by Chinese connected vehicle technology autonews.com/mobility-repor... via [@Automotive_News](#)



U.S. to investigate national security risks posed by Chinese connected vehicle technology

From autonews.com

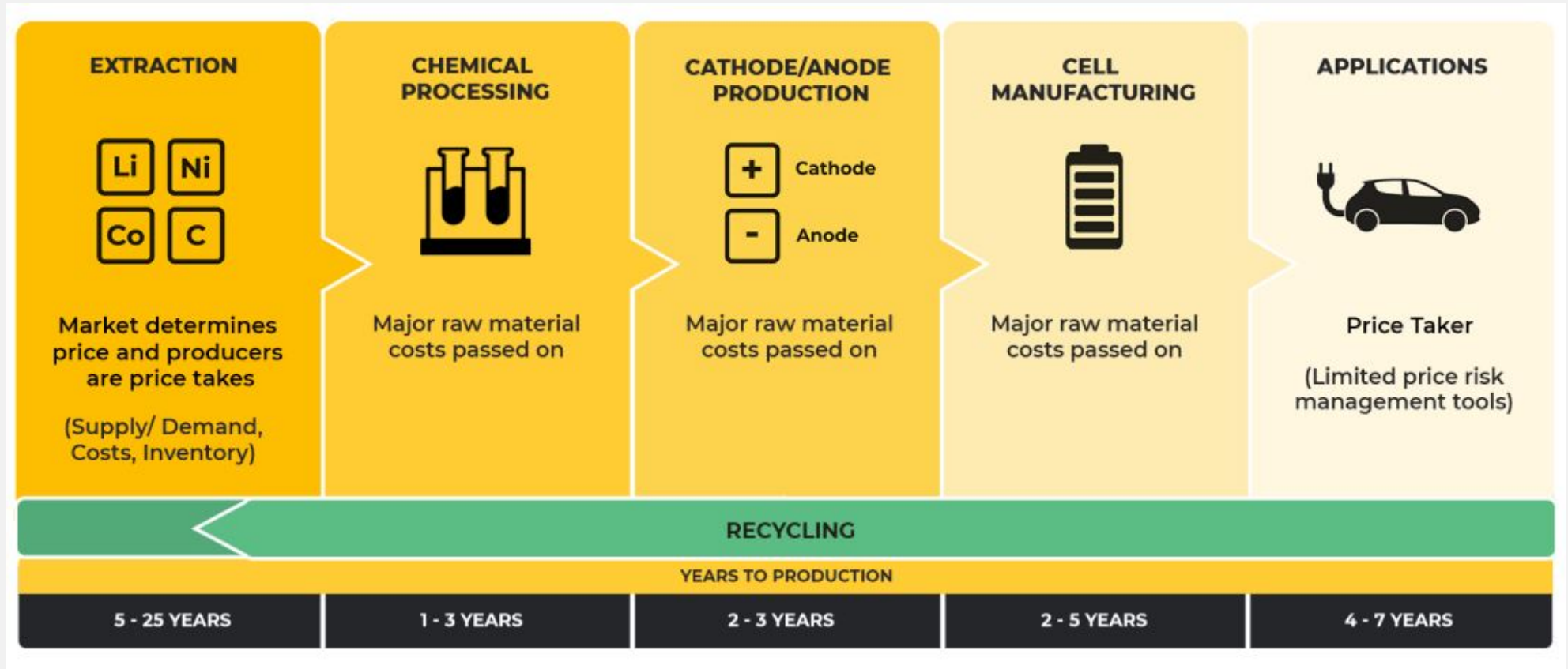
EV makers fret over pace of Treasury's plan to block China

By Hannah Northey | 01/24/2024 01:28 PM EST

Systems to trace the minerals contained in electric vehicle batteries might not be ready in time to meet federal government deadlines, automakers warned the department.



Battery Lifecycle & Supply Chain Opportunities





OEM Battery Supply Chain Landscape

Current supplier
 Future supplier
 Undisclosed/None

OEM	Mining resources			Battery Materials				Batteries
	Lithium	Nickel	Cobalt	Cathode	Anode	Electrolyte	Separators	
	Albemarle, Ganfeng, Yahua	Vale BHP Talon metals	Glencore	Sumitomo	BTR, Shanshan, Chinese suppliers Syrah (2024+)	Mitsubishi Chem, Tinci high-Tech	Sumitomo	Panasonic, LGES, CATL
	Ganfeng, Vulcan Energy (2026+)	Huayou cobalt Tsingshan	Huayou cobalt Tsingshan	Umicore (2025)				LGES, CATL, SDI
				Sumitomo				PPES
	Controlled Thermal Resources (2024+)	QPM		POSCO (2024+) BASF	POSCO (2024+)			LGES, CATL
								LGES, SDI, CATL
DAIMLER								SK On, AESC, LGES, CATL
	Vulcan Energy (2026+), Controlled Thermal Resources (2024+)	Terrafame (2025+)						CATL
	loneer, Compass, Liontown	Vale, Huayou, BHP						SK On, LGES, CATL
	Vulcan Energy (2026+)	Terrafame						LGES, AESC
	Ganfeng, Livent		Glencore, Managem Group					CATL, SDI, AESC

*This table indicates public announcements and is not an exhaustive list. For full details, please contact info@benchmarkminerals.com



Takeaways

- Big Questions and Next Steps for NC
 - Major Product Development Initiatives – Megsites and Select Sites
 - Up to 7 megasites (1,000 +acres)
 - Up to 15 Select Sites (less than 1,000 acres, 7 below 500 and 2 below 100)
 - What will supplier opportunities from Toyota and VinFast look like?
 - Can new sites be identified? Site identification and development is paramount, particularly for heavy industrial sites
 - How long will it last this decade?
- Project Priorities
 - Electric – Duke Energy and other electric providers – **critical** partner
 - Community Support of Project - *The Rivian Effect*
 - Workforce – What’s your gameplan?
 - Infrastructure – Ensure you know what your team’s response will be before the site visit
 - Heightened Expectations with Incentives
 - Following up quickly

These are Business Recruitment projects that include only companies that were considering a **new facility to the state. No existing company same-site expansions are included in this data.*