Detroit Regional Partnership

GLOBAL EPICENTER OF MOBILITY

REVOLUTIONIZING THE DETROIT REGION

FUTURE MOBILITY TECHNOLOGY STUDY (FMTS)
BATTERY ANALYSIS

INTRODUCTION

Vehicle Propulsion Battery Key Findings

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VEHICLE PROPULSION BATTERIES

+600% Global Demand Growth
from 2020-2024

For Light Vehicle Applications

U.S. demand accounts for about 13% of the global total

64% Battery Price Drop
Forecast for the U.S. from 2019-2030

Enables higher volumes, increased economies of scale, and deployment in more mobility applications

51% Penetration Rate in Light Vehicle Sector
In U.S. by 2030

Including Battery Electric Vehicles, Hybrids, and Plug-In Hybrids

+297% Employment Growth
from 2014-2024

Michigan Battery Manufacturing Employment

Nearly triple the national average






KEY OPPORTUNITY SECTORS: **Light Vehicle and Medium Vehicle**

Source: DRP/GEM analysis of data from S&P Global Automotive

Vehicle Propulsion Battery Components

Vehicle propulsion batteries are typically comprised of individual battery cells packaged into modules, which are then assembled within a frame.

Thermal management systems and power control electronics are integrated into the assembly to create a flat, slab-like component which is then fitted into the vehicle.

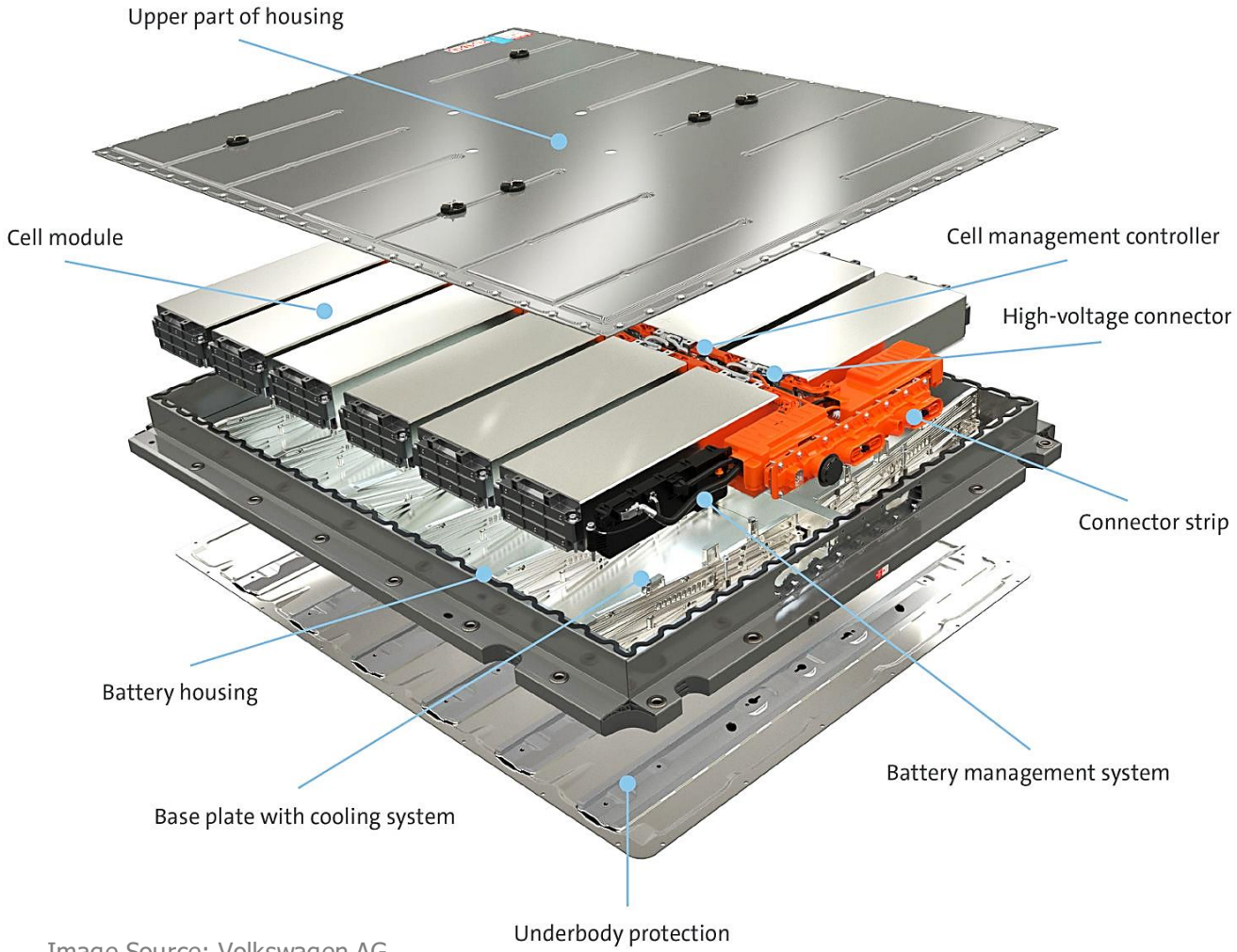


Image Source: Volkswagen AG

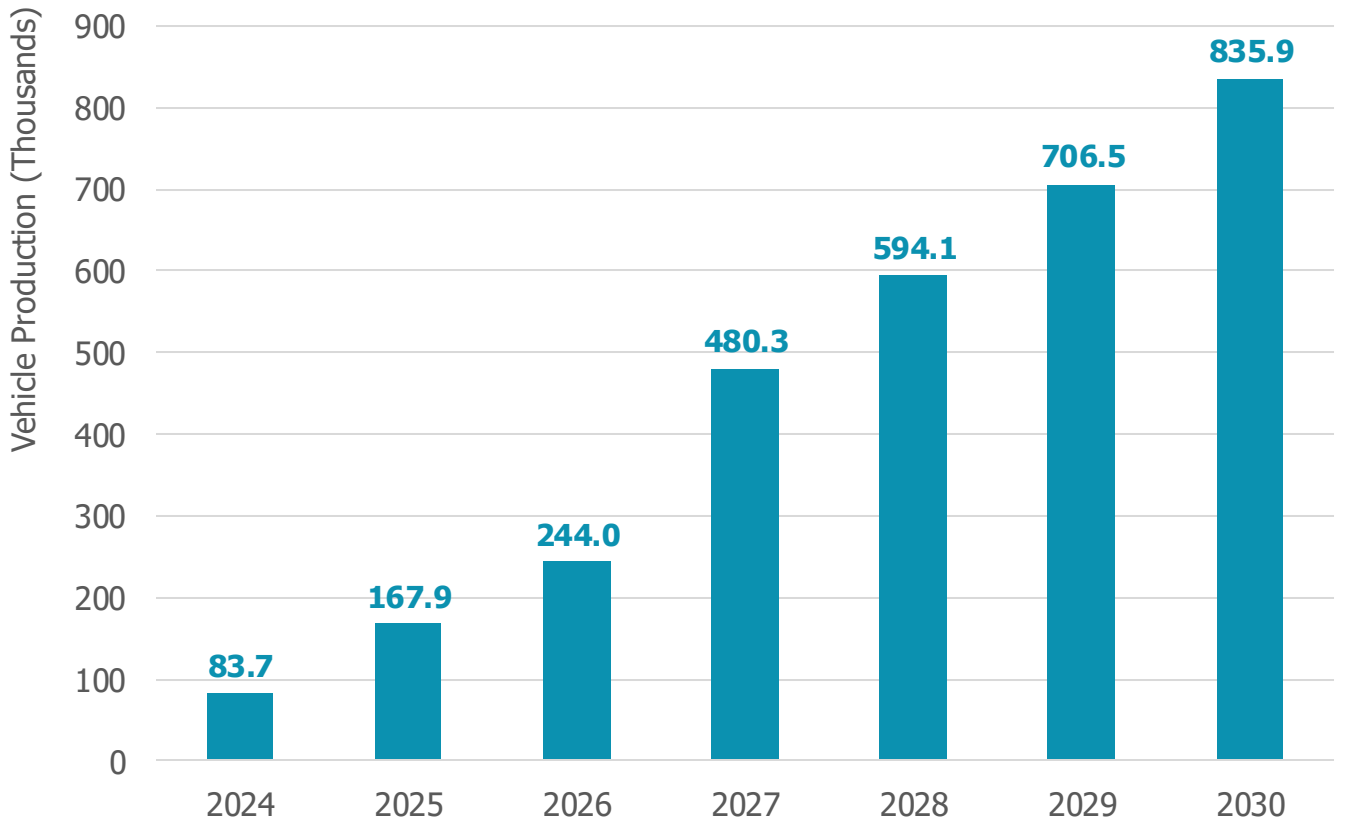
Michigan BEV Production Outlook

Michigan Battery Electric Vehicle production is forecast to increase by 46% by 2030, following similar national outlook trends.

By 2030, more than 40% of Michigan's vehicle production is expected to be BEV-related.

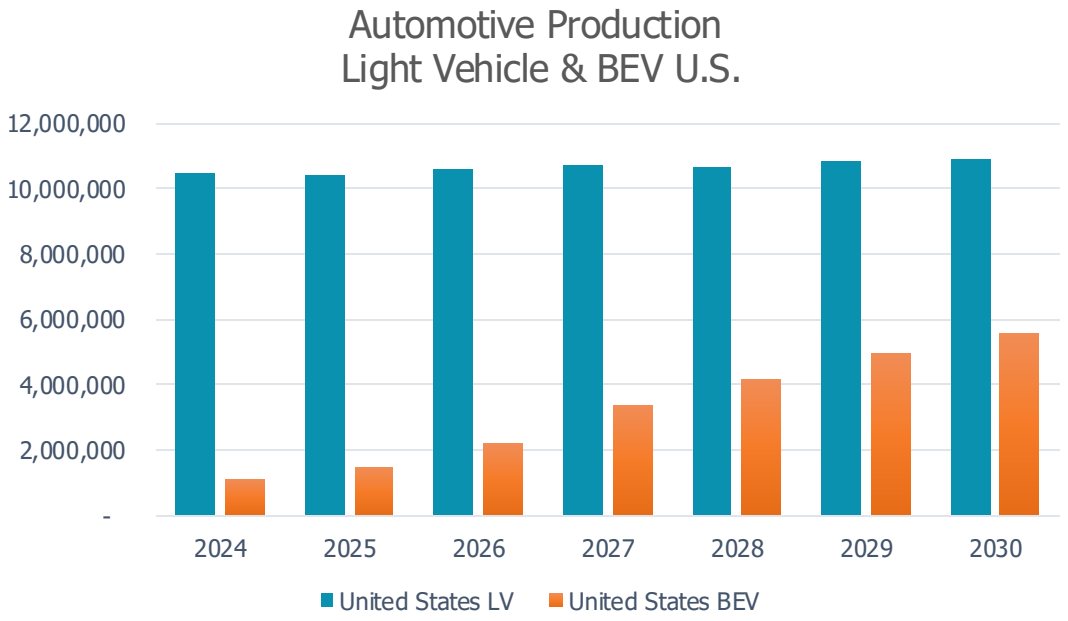
BEV MI Production	Light Vehicle (LV)	Med/Heavy Duty
2024	83,749	78
2025	167,851	463
2026	244,001	811
2027	480,251	1,292
2028	594,072	2,232
2029	706,526	2,800
2030	**835,874**	**3,751**

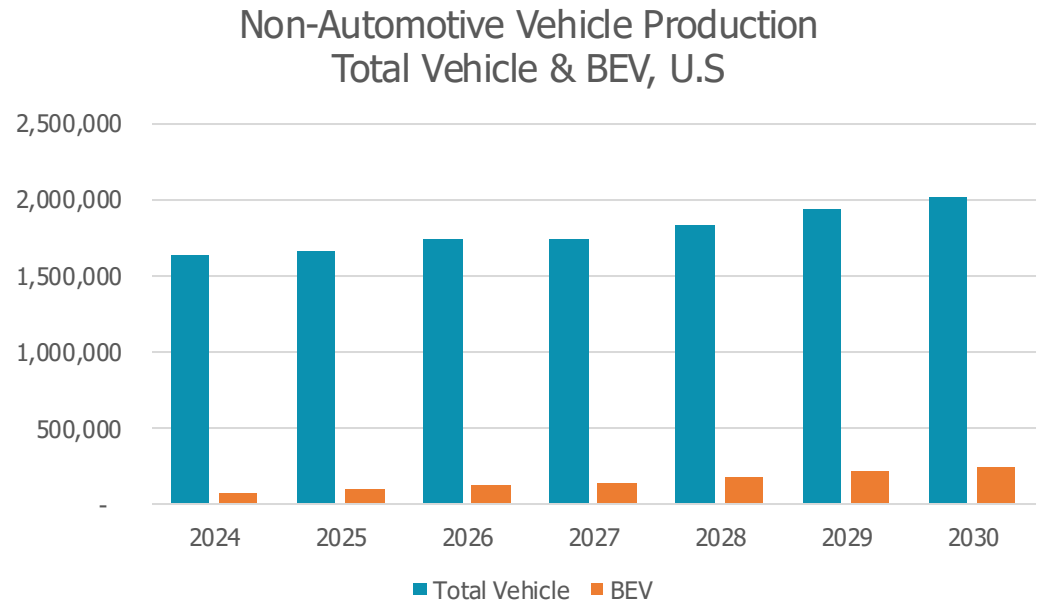
Michigan Battery-Electric Vehicle Production, LV



Source: S&P Global Software Vehicle Domain Forecast, July 2024

Vehicle Production Forecast, U.S. 2024 - 2030





Current BEV production accounts for 10% of total Light Vehicle production but grows to 50% by 2030.

In 2024, Michigan LV BEV accounts for 8% but will grow to 15% by 2030.

BEV Production in non-automotive sectors accounts for 5% of the total vehicle production but will grow to 12% by 2030.

Source: S&P Global Forecasts, July 2024

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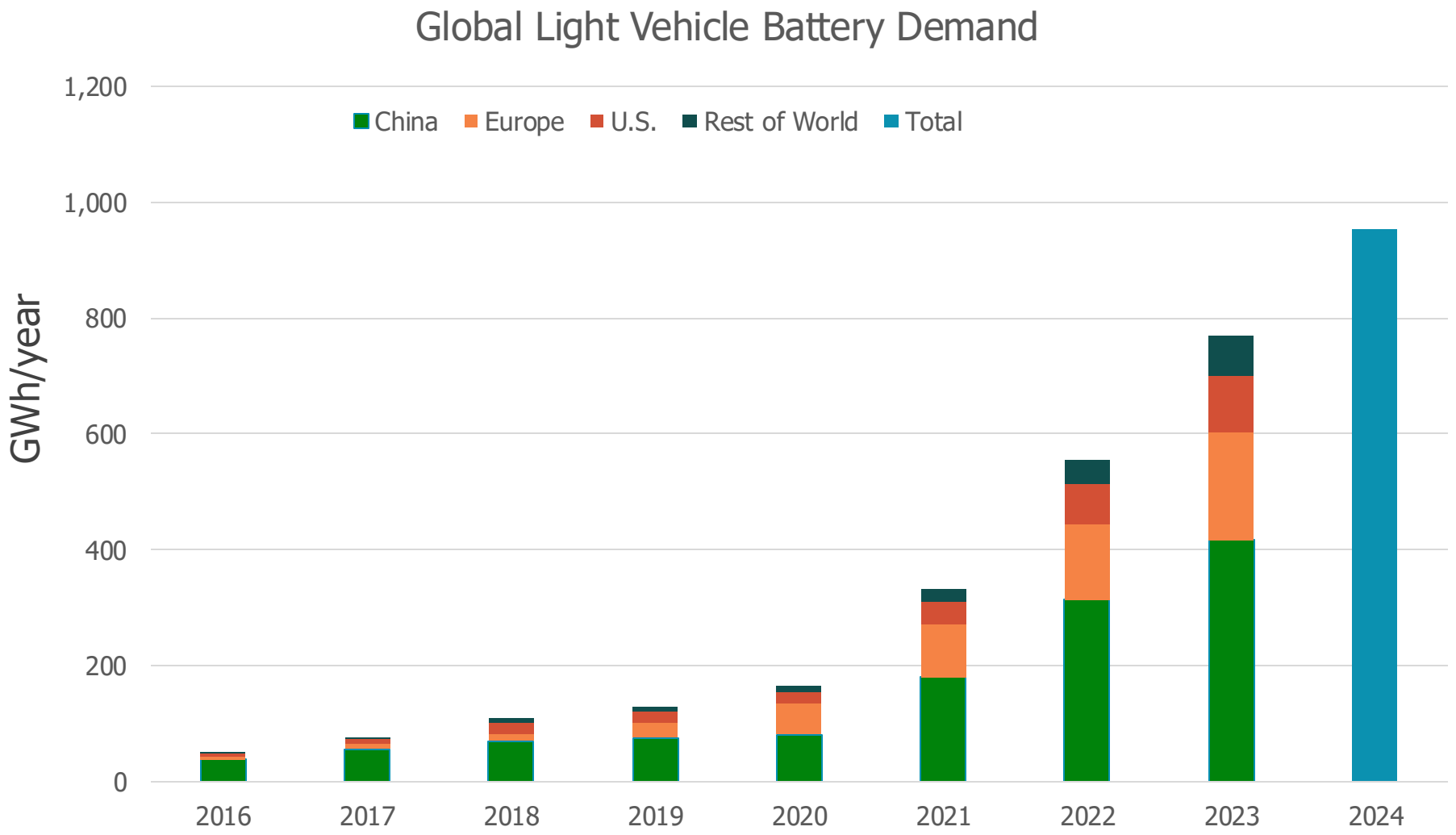
DATA & FORECASTS

Global Light Electric Vehicle Battery Demand

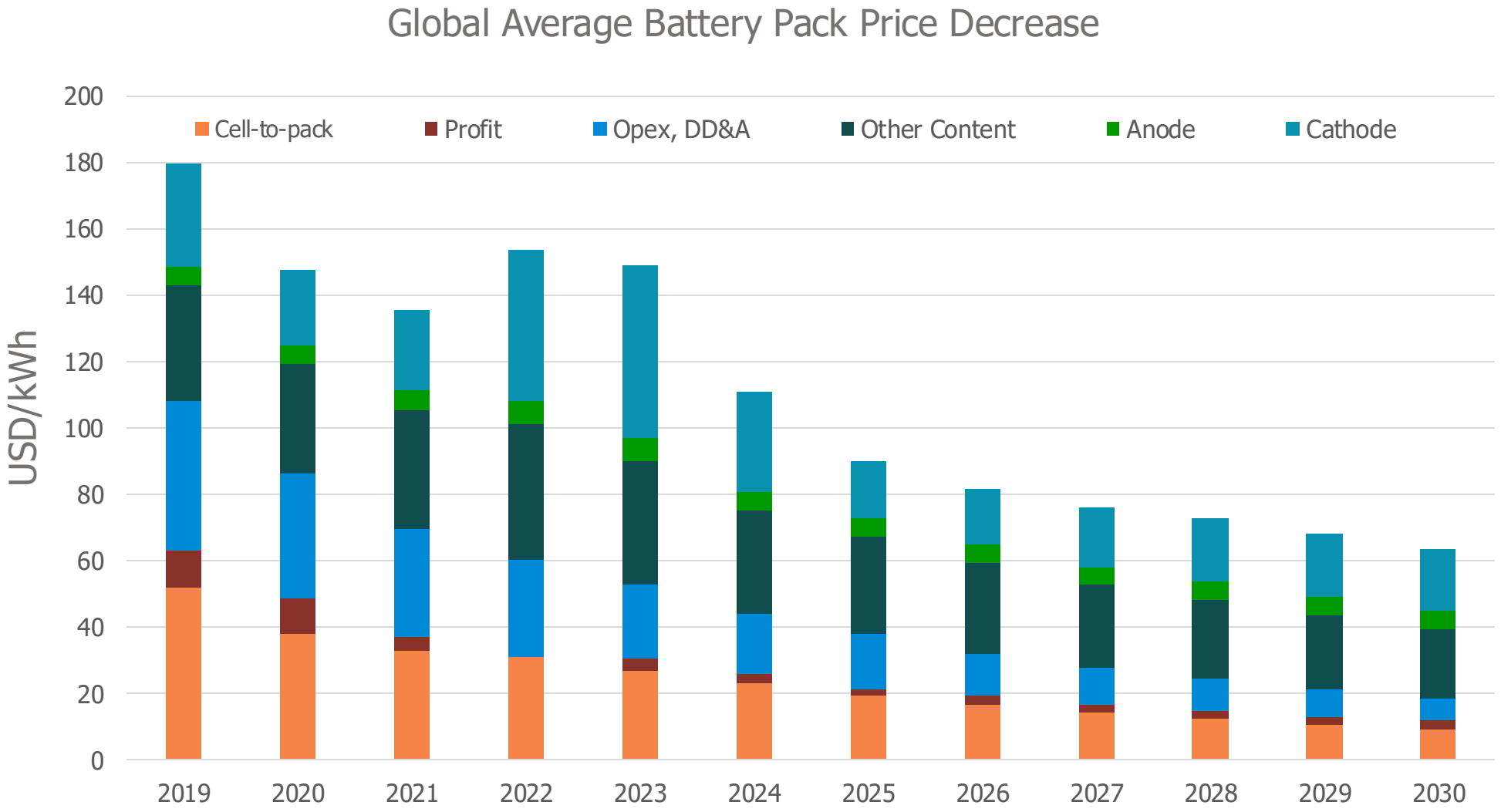
Global production of batteries light vehicles rose nearly sixfold between 2020 and 2024. In 2023, U.S. light vehicle battery demand stood at 12.8% of the global total.



Source: International Energy Agency (IEA) Global EV Outlook 2024 and 2025
2024 data not available by country

Global Average Battery Pack Prices

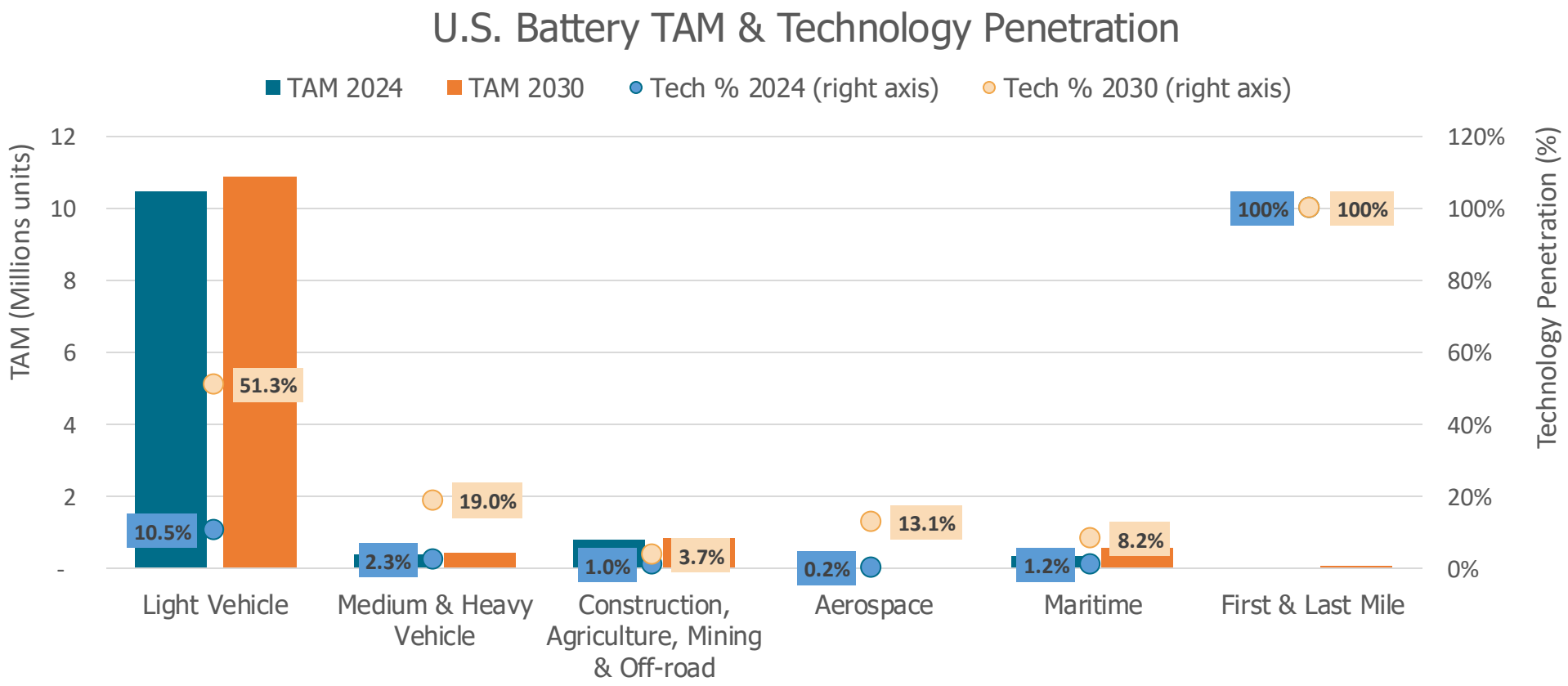
The total global average battery pack cost declined from a high of $180 USD/kWh in 2019 to $111 in 2024. The cost is forecast to drop further to $64 USD/kWh by 2030 – a decrease of over 64% from 2019.



Source: Goldman Sachs, October 2024

Mobility Sector Growth Analysis – Propulsion Battery – U.S.

The light vehicle segment accounts for about 90% of the expected market growth when all mobility sectors are considered – a significant 'Right to Win' and focal point for the Detroit Region.

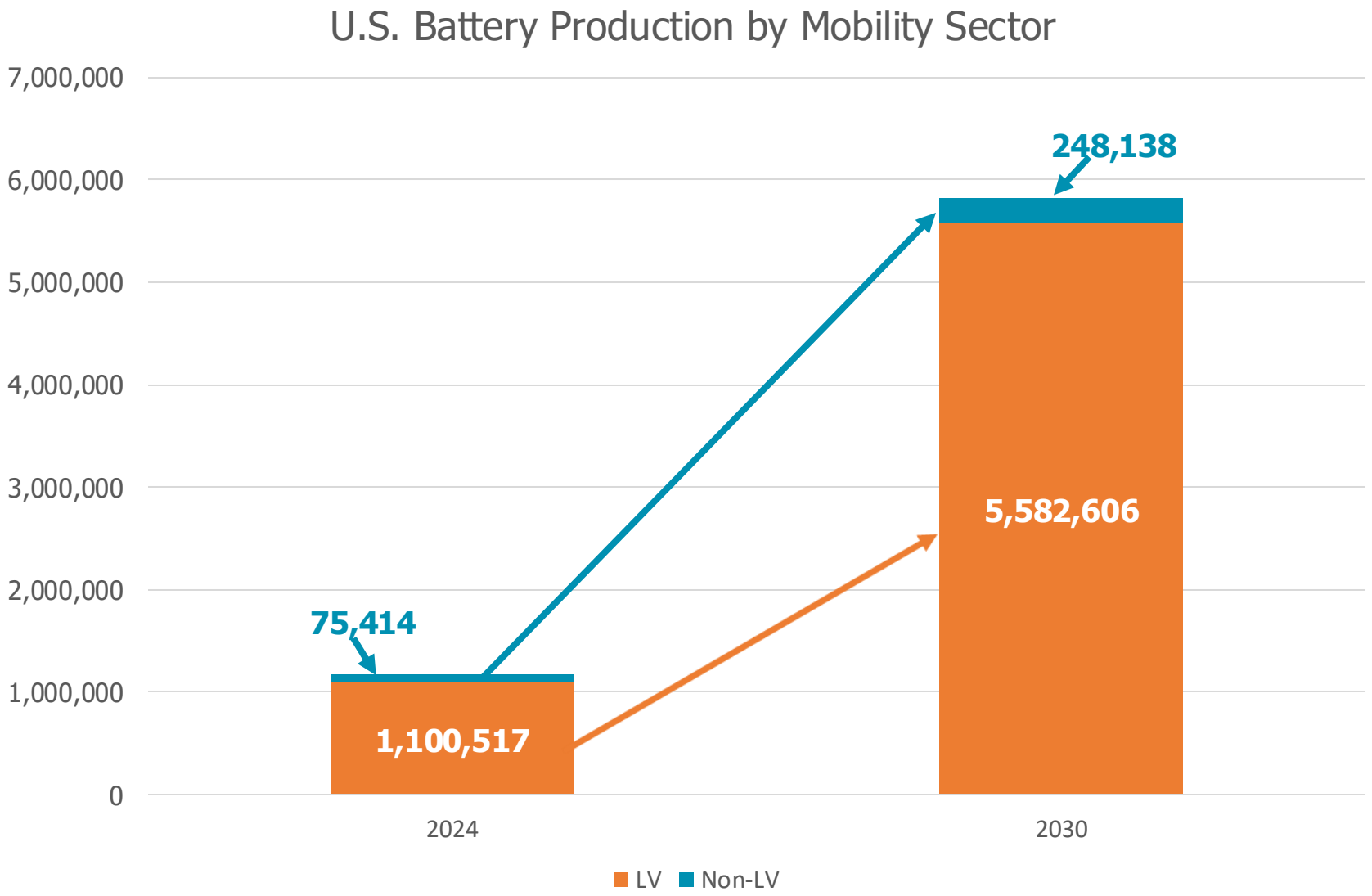


Source: S&P Global LV/MHCV/Off-Highway Production Forecasts, S&P Global analysis with industry sources (GAMA, NMMA, FAA, AUVSI)

Battery Unit Projected Growth by Mobility Sector

U.S. propulsion battery production for light vehicles is forecast to grow nearly fourfold between 2024 and 2030.

Over the same time period, battery production for non-light vehicle mobility sectors is forecast to more than triple to nearly 250,000 units.



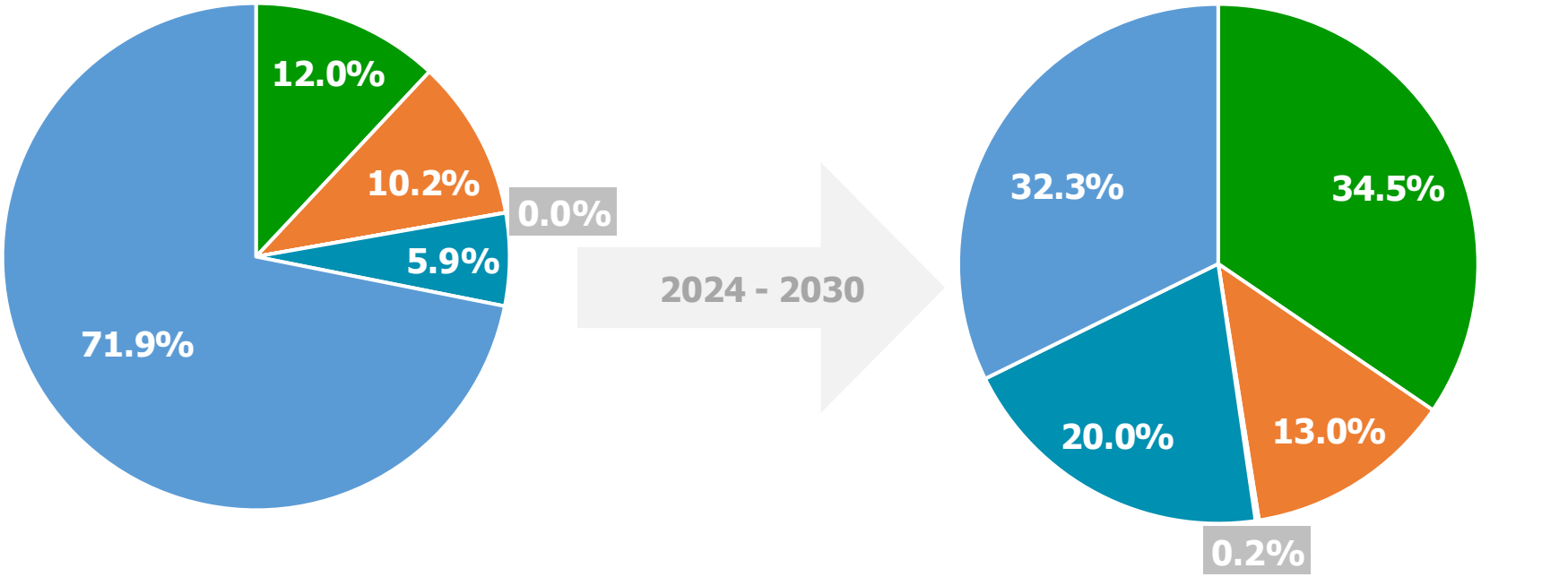
Source: DRP/GEM analysis of data from S&P Global Automotive

Battery Projected Growth (U.S.) – Non-LV Sectors

First/Last Mile (commercial drone) applications dominated U.S. propulsion battery production for non-light vehicle mobility sectors in 2024, with a share of nearly 72%.

Other applications are forecast to grow significantly by 2030, with production for Medium & Heavy-Duty Vehicles and Maritime applications forecast to more than triple.

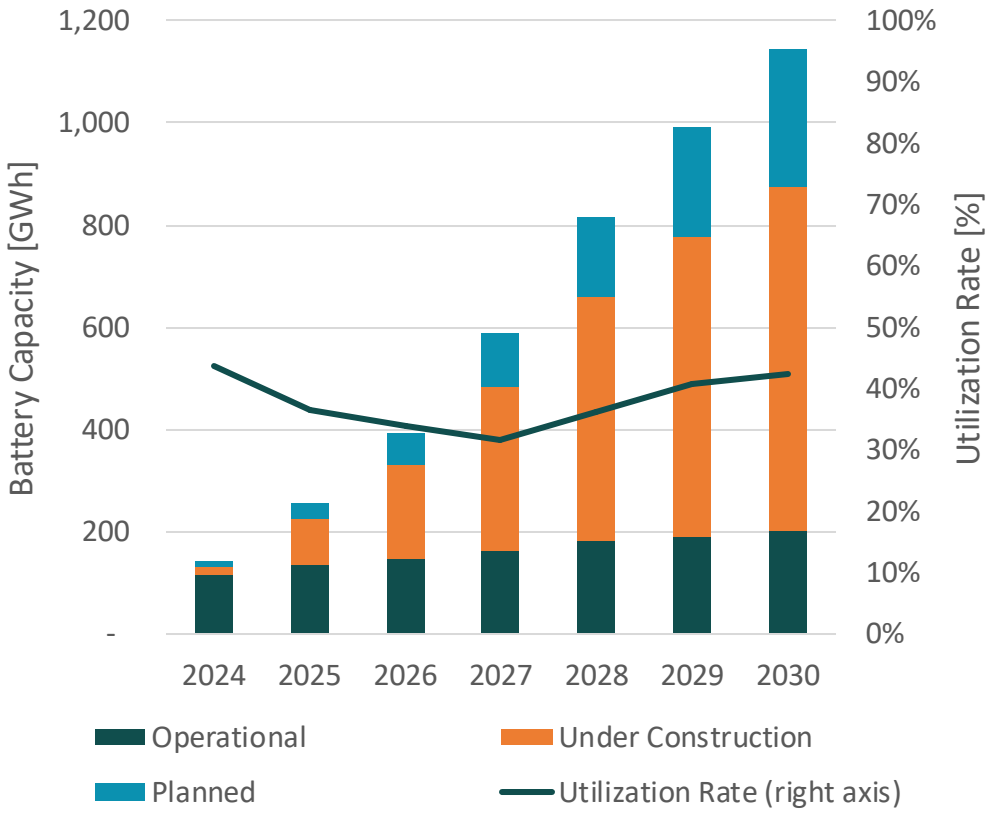
U.S. Non-LV Sector Battery Share Forecast



Source: DRP/GEM analysis of data from S&P Global Mobility

Battery Capacity & Utilization Rate Analysis

U.S. Battery Capacity & Utilization Rate



Michigan Battery Capacity & Utilization Rate

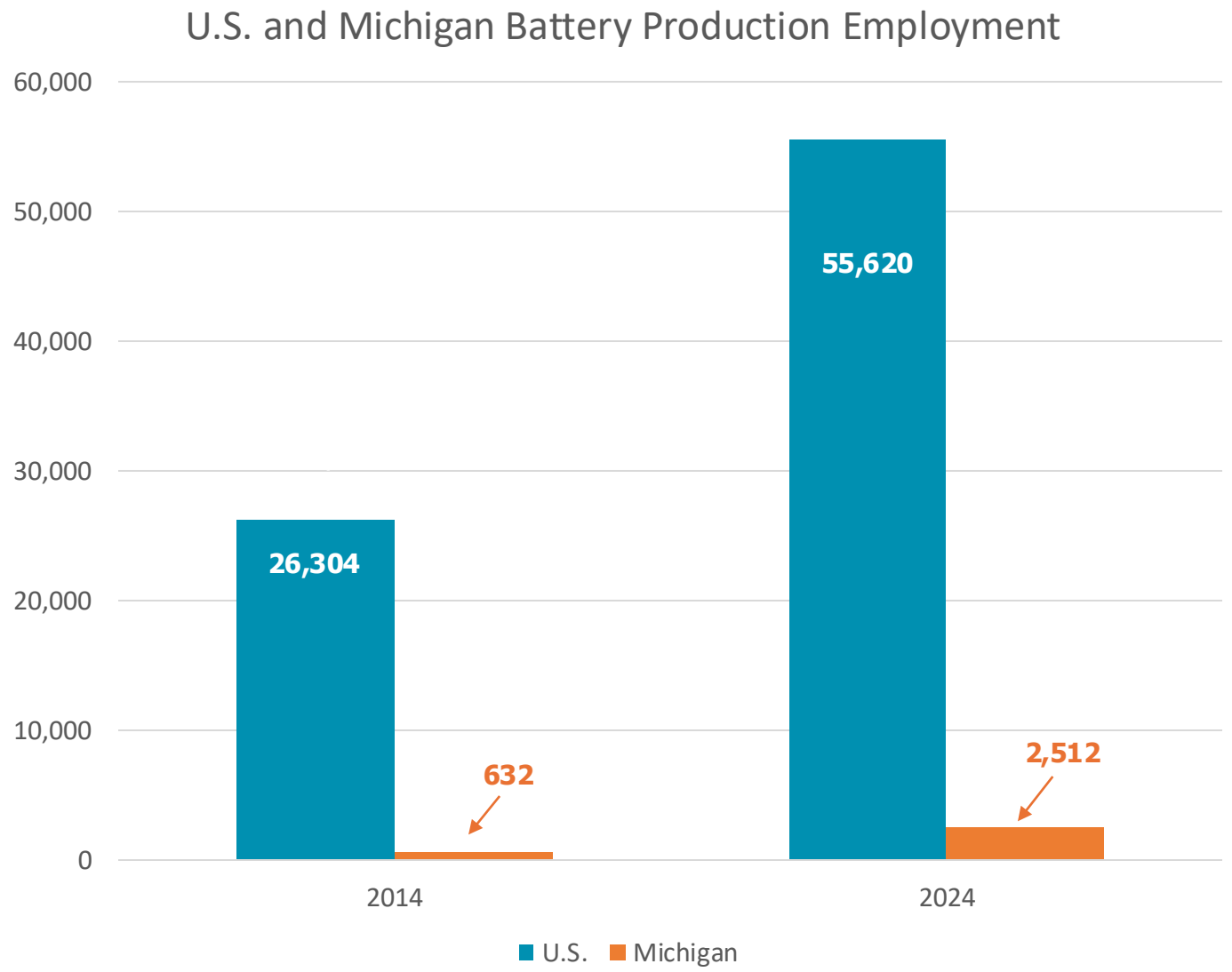
Source: S&P Global Clean Energy Technology Analytics
Note: Battery Capacity includes LV and MHCV sectors only; Utilization Rate is referent to total capacity (operational + underconstruction + planned)

EMPLOYMENT IMPACTS

Battery Manufacturing Employment

U.S. battery employment, including all battery types (NAICS 33591), has more than doubled between 2014 and 2024. Vehicle propulsion batteries have been the main driver of this growth.

Over the same timeframe, battery manufacturing employment in Michigan has nearly quadrupled from 632 to 2,512 – a growth rate nearly triple the national average.



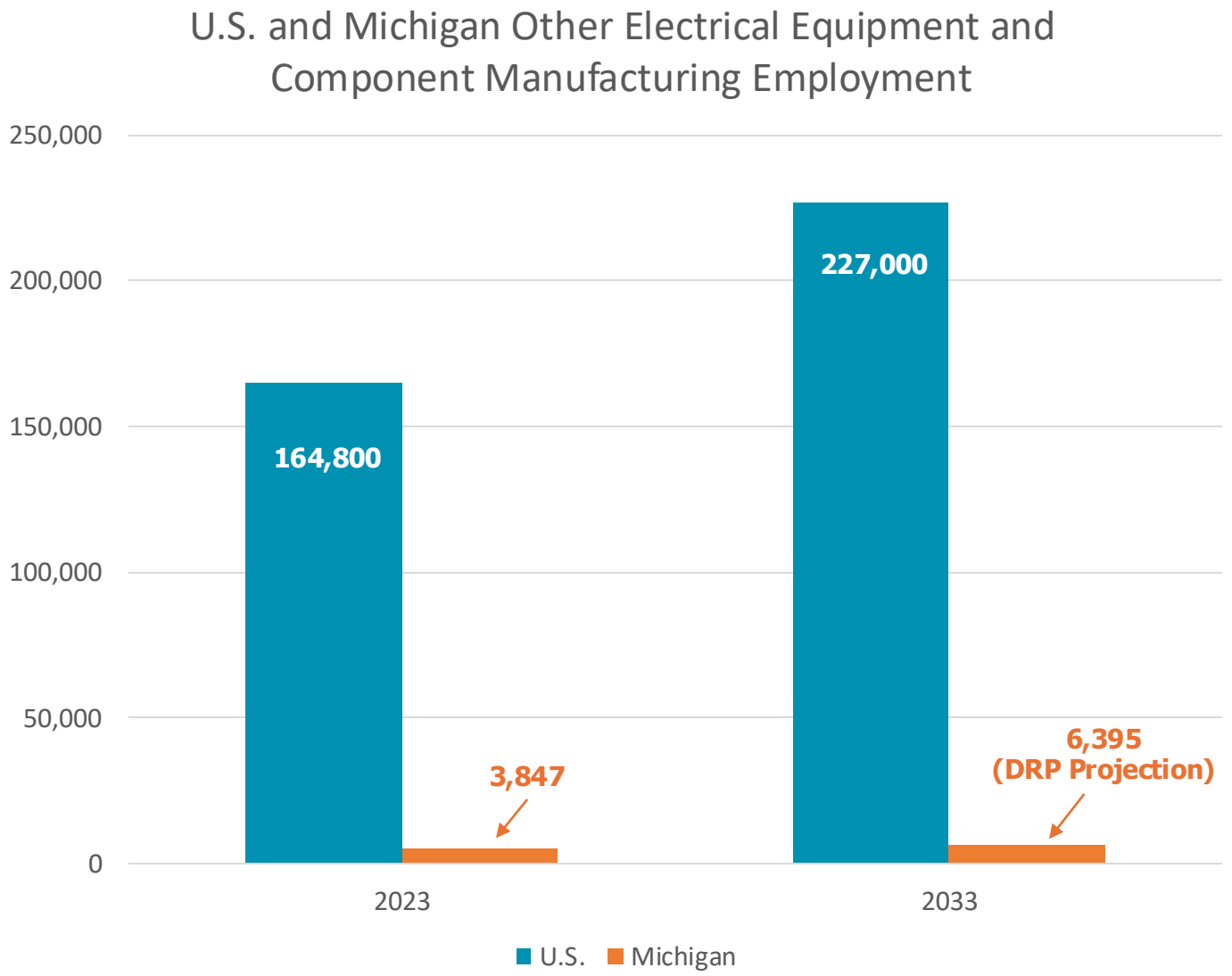
Source: U.S. Bureau of Labor Statistics (BLS) data for NAICS 33591

Electrical Equipment and Component Manufacturing Employment Outlook

The U.S. Bureau of Labor Statistics (BLS) includes battery manufacturing in the broader category of Other Electrical and Component Manufacturing (NAICS 3359).

The BLS forecast for this category calls for U.S. employment to grow from 164,800 in 2023 to 227,000 in 2033 – an increase of nearly 38%.

If Michigan growth in this category continues at its most recent five-year pace, state employment will reach 6,395 in 2033 (DRP projection).



Source: U.S. Bureau of Labor Statistics (BLS) data for NAICS 3359

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