

Impact overview: Advanced Mobility projects

Site	# of initial jobs	Job multipliers ¹	Jobs impact	Triangulation against case examples ²		
Robson Ranch site	4 – 8k ~5 jobs / acre	Direct	0.41		30k – 40k total jobs	
		Indirect	0.17			
		Induced	0.93			
Tulsa Port of Inola	4 – 8k ~5 jobs / acre	Value-added multipliers				\$3.5 – 5b total value added
		Direct	0.21			
		Indirect	0.07			
Launch Pad Center	5 – 15 ~10 jobs / acre	Induced	0.27			

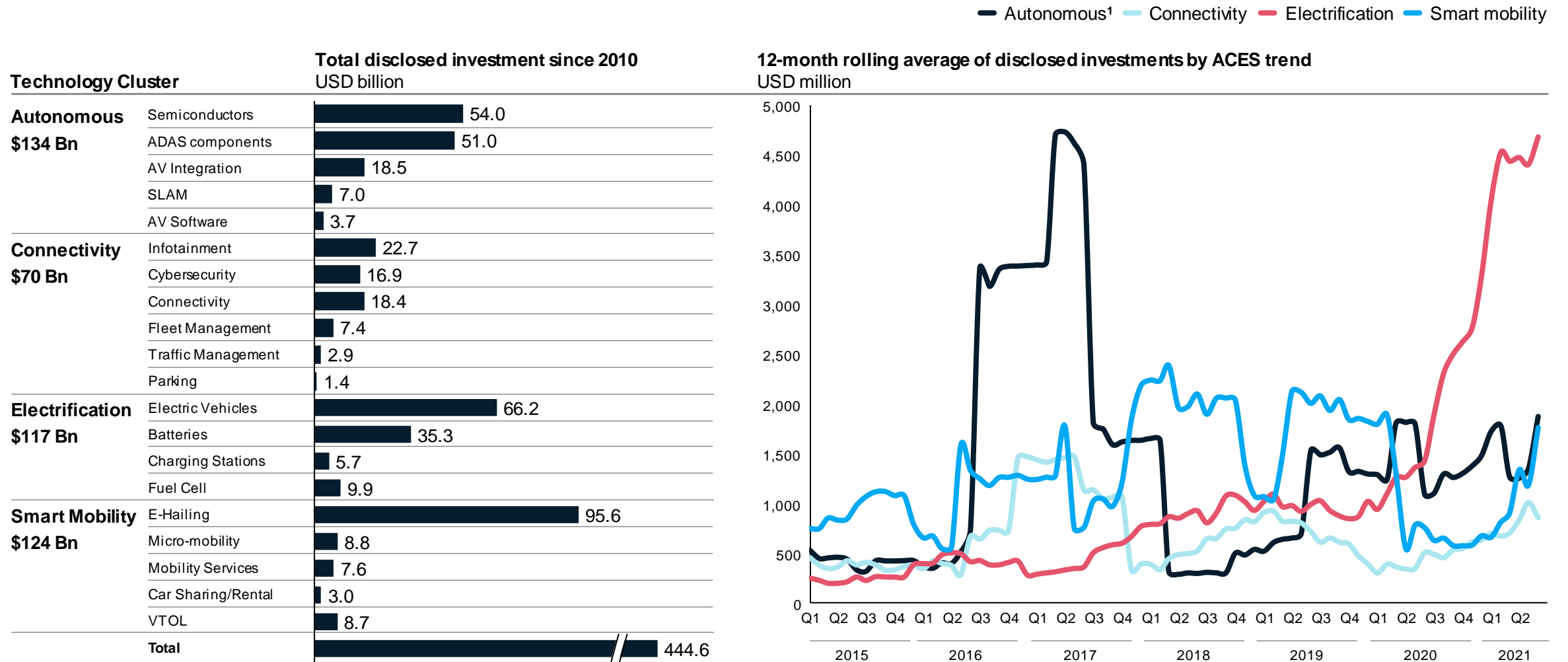
Triangulation against case examples²

MidAmerica Industrial Park	3.5k jobs 2.4 jobs / acre \$1.4b impact
Canoo mfg. facility	2k jobs 5 jobs / acre
Rivian R1T plant	3.2k jobs 4 jobs / acre
Ford BlueOvalSK	5k jobs 4 jobs / acre
Grand Rapids Innovation Park	2k+ jobs \$340m impact
Austin Innovation District	3k jobs \$800m impact
SkySong Innovation District	9k jobs \$1.3b impact
Magnum Innovation Park	10k jobs \$2.6b impact

1. EMSI input-output model multipliers across component sub-industries within Advanced Mobility

2. Press scan - publicly available information

~\$445Bn invested since 2010 in 20 core technologies fueling ACES trends; EV now leading investments on par with AV 5 years ago



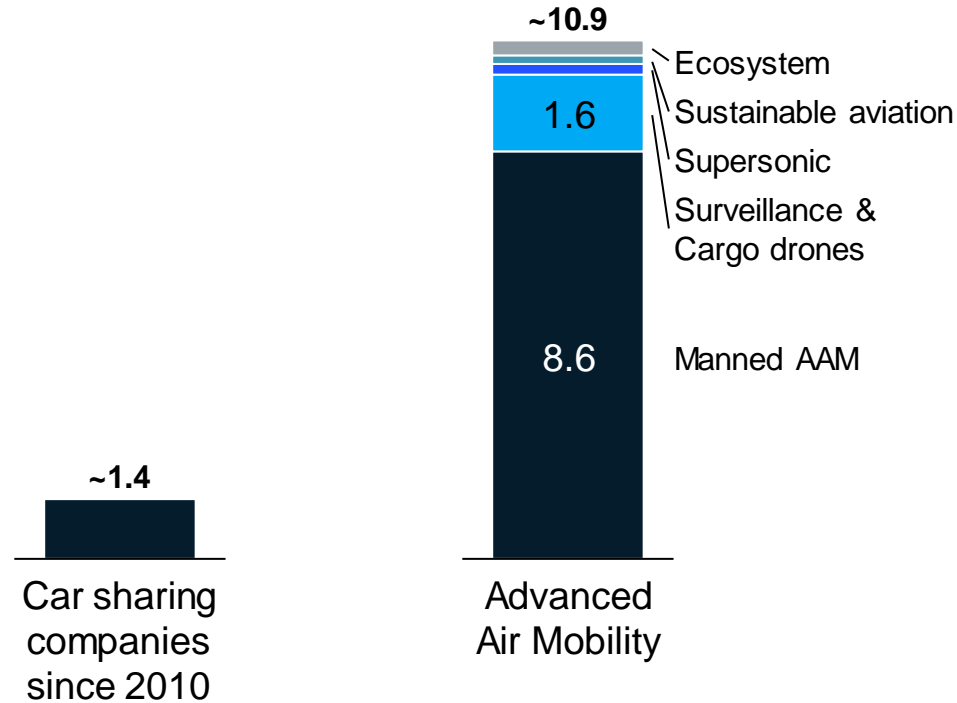
1. \$31bn SoftBank acquisition of ARM Semiconductors (AD chipset company) in 2016; Intel \$15bn acquisition of Mobileye in 2017

2. Total transaction value based on SPAC (Special Purpose Acquisition Company) size and PIPE (Private Investment in Public Equity); in H1 2021 EV 41% SPAC share, AV 13% SPAC share, and Smart Mobility 64% SPAC share

Industry leaders believe in AAM: >10 billion USD has been invested – with ~80% going towards manned AAM

As of June 18th 2021

Total disclosed investment / funding amount
USD billion



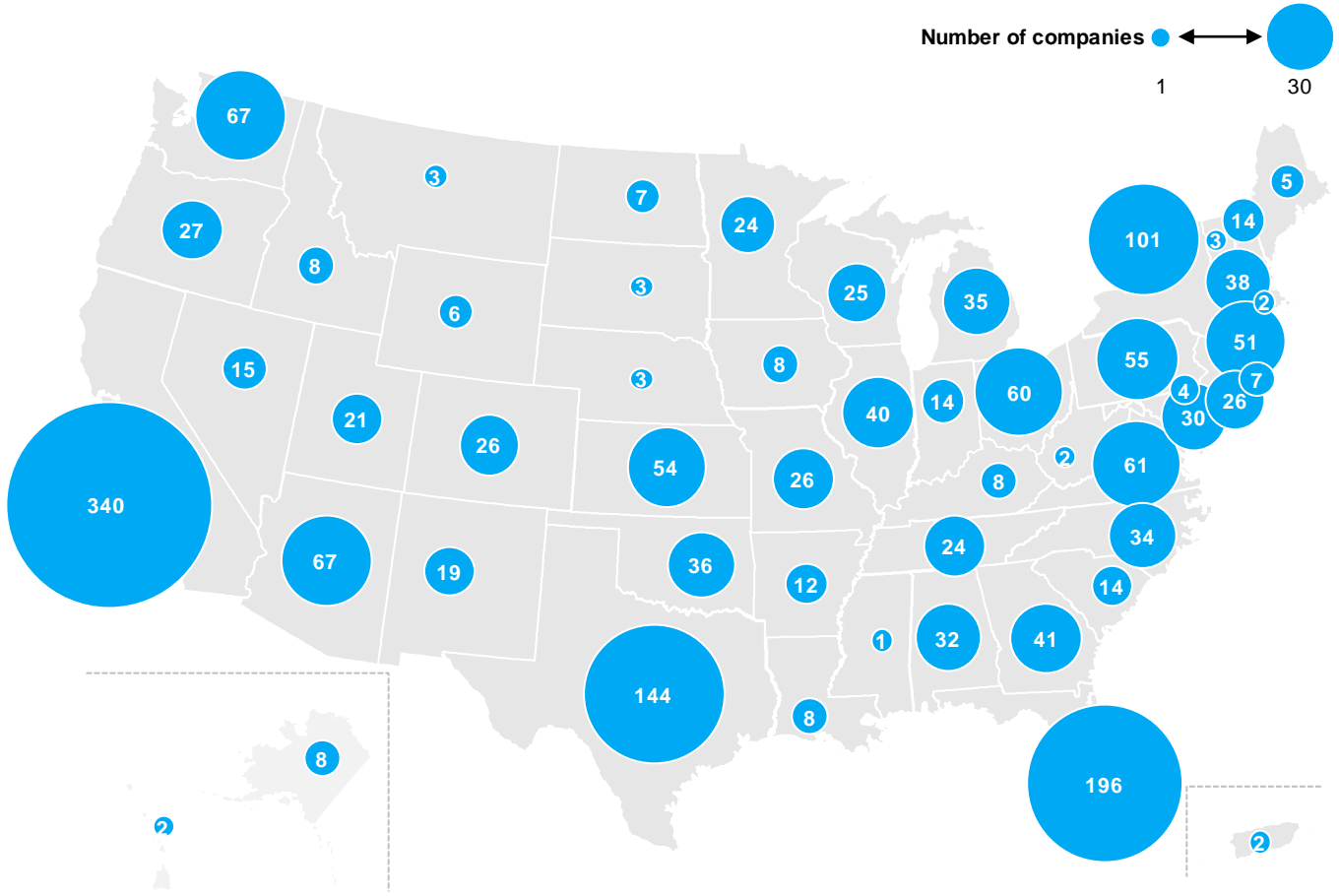
Example investors



Example companies



Aviation & aerospace is contestable, with 65% of companies clustered outside of tech hubs



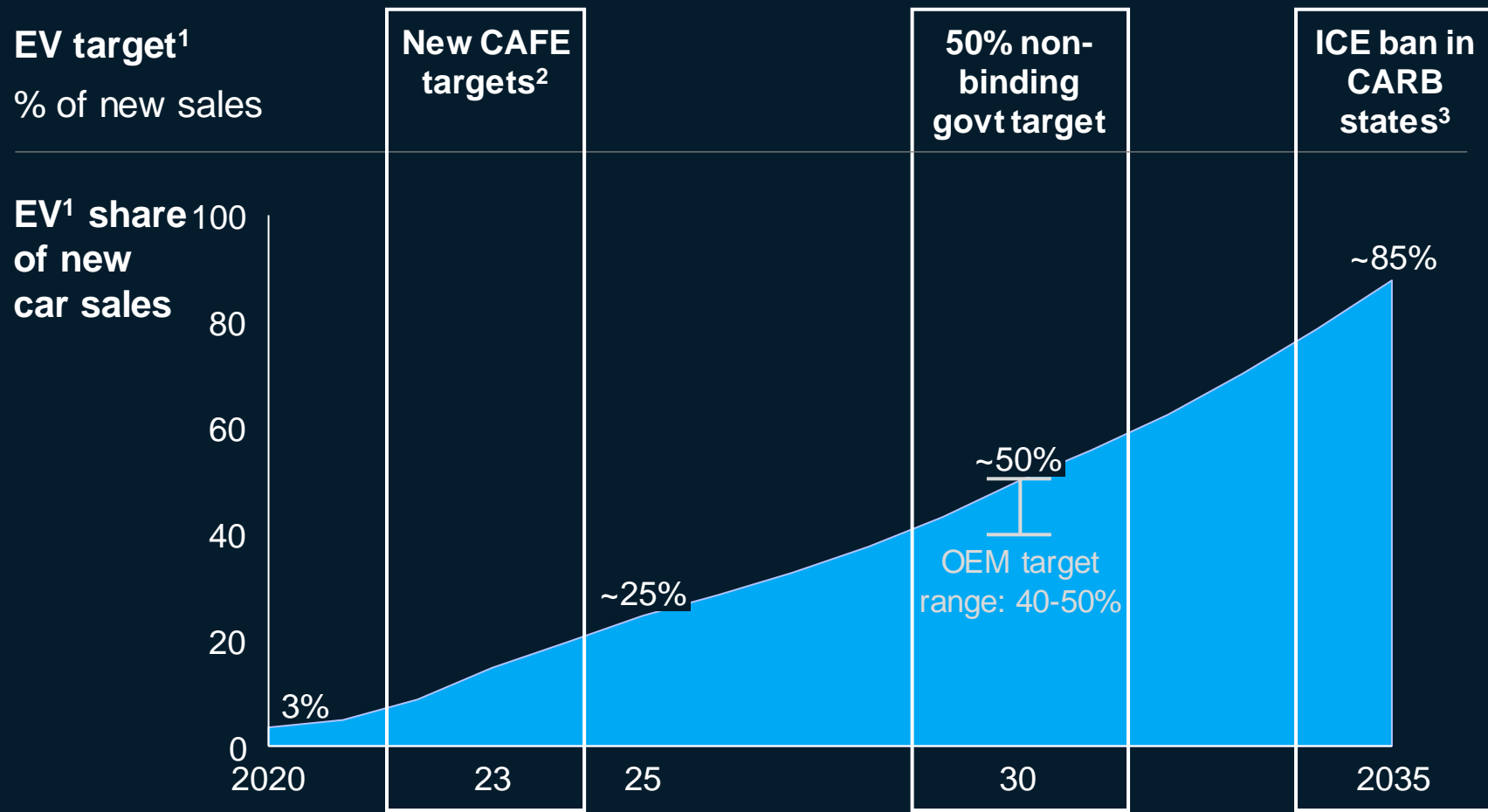
Top states by number of headquartered companies

Cluster name	# of companies outside of tech hubs ¹	%
1 Component manufacturers	181	57
2 MROs	176	64
3 Airport operations	176	72
4 Avionics	121	61
5 Services, solutions, and part sales	132	73
6 UAVs	95	54
7 Flight training	85	82
8 Fluid control	54	52
9 Ground support equip. manufacturing	65	65
10 Gas turbine manufacturers	45	76
11 Safety equipment	33	77
12 Aircraft manufacturers	15	71
13 In Flight entertainment systems	12	57
14 Air traffic control	14	70
Total	1204	65

1. Tech Hubs: CA, IL, MA, NY, TX, DC, WA, GA

New US EV regulation targets 50% EVs by 2030

Passenger vehicles only



1. EVs include BEVs, PHEVs, FCEVs

2. New EPA rules to take effect; NHTSA rules to take effect 2024

3. CA, NJ, MA, WA, and CO have all announced plans to go all-electric by 2035; assumes other CARB states will go all-electric and non-CARB states will hit 80%

Source: White House, NHTSA

On Aug. 5, President Joe Biden announced plans to sign an executive order **calling for electric vehicles to be 50% of new auto sales in the United States by 2030**

The target includes battery electric vehicles, fuel cell vehicles and plug-in hybrids, **but is not legally binding**

Domestic OEMs (+50% of sales today) **have announced the goal of reaching 40 to 50 percent electric vehicle sales share in 2030**

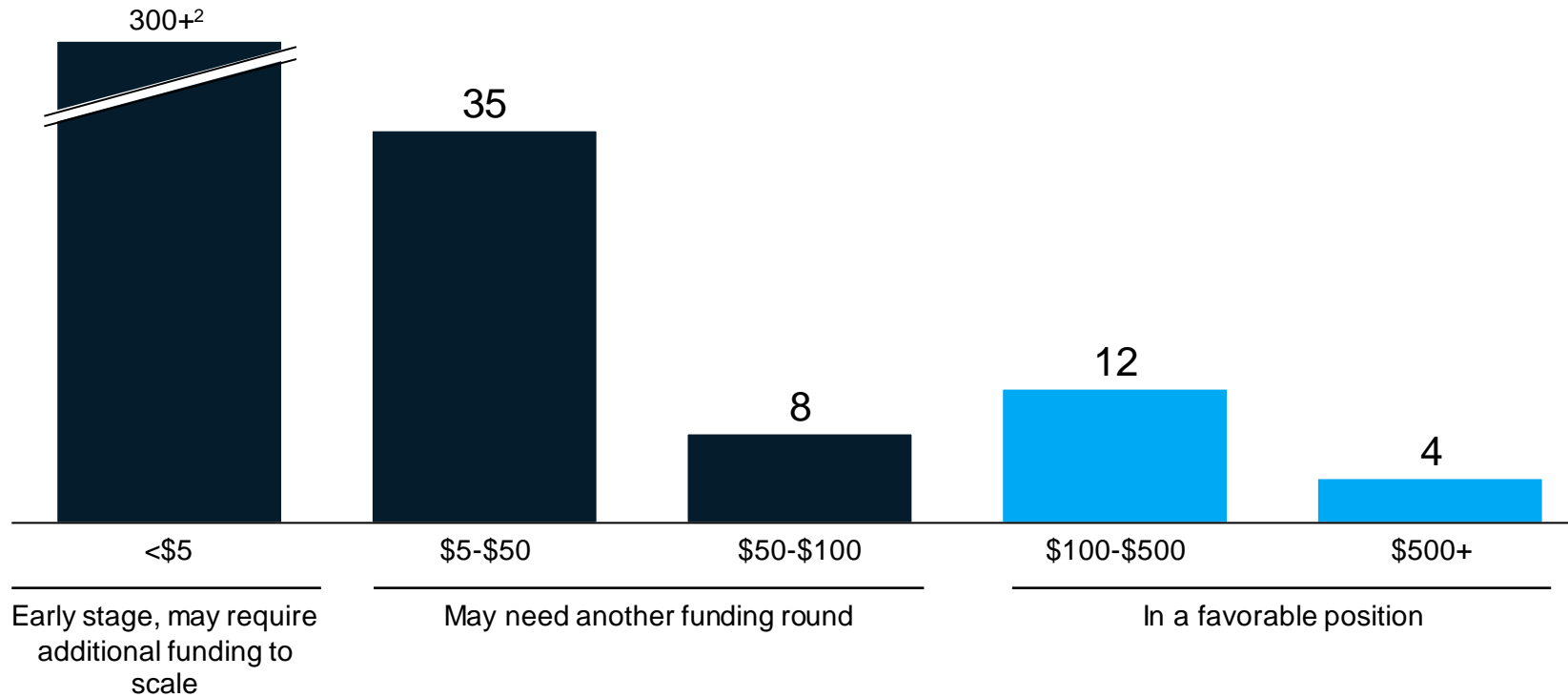
New EPA fuel economy targets will take effect in 2023 and aim to increase fuel economy by 12 MPG by 2026 relative to 2021

Increasing funding is deployed to fewer AAM players as certification becomes more real

As of August 23rd, 2021

Company funding¹

of companies, Funding received, \$M USD



1. Includes venture capital, estimated internal funding, announced SPAC deals, and private placements.

2. Total number of projects based on 240 eVTOL and 100+ surveillance & cargo companies.

Potential implications

Certification becomes more real:

Certifying a passenger aircraft is costly, with estimates of \$1-2B+, depending on aircraft size and complexity

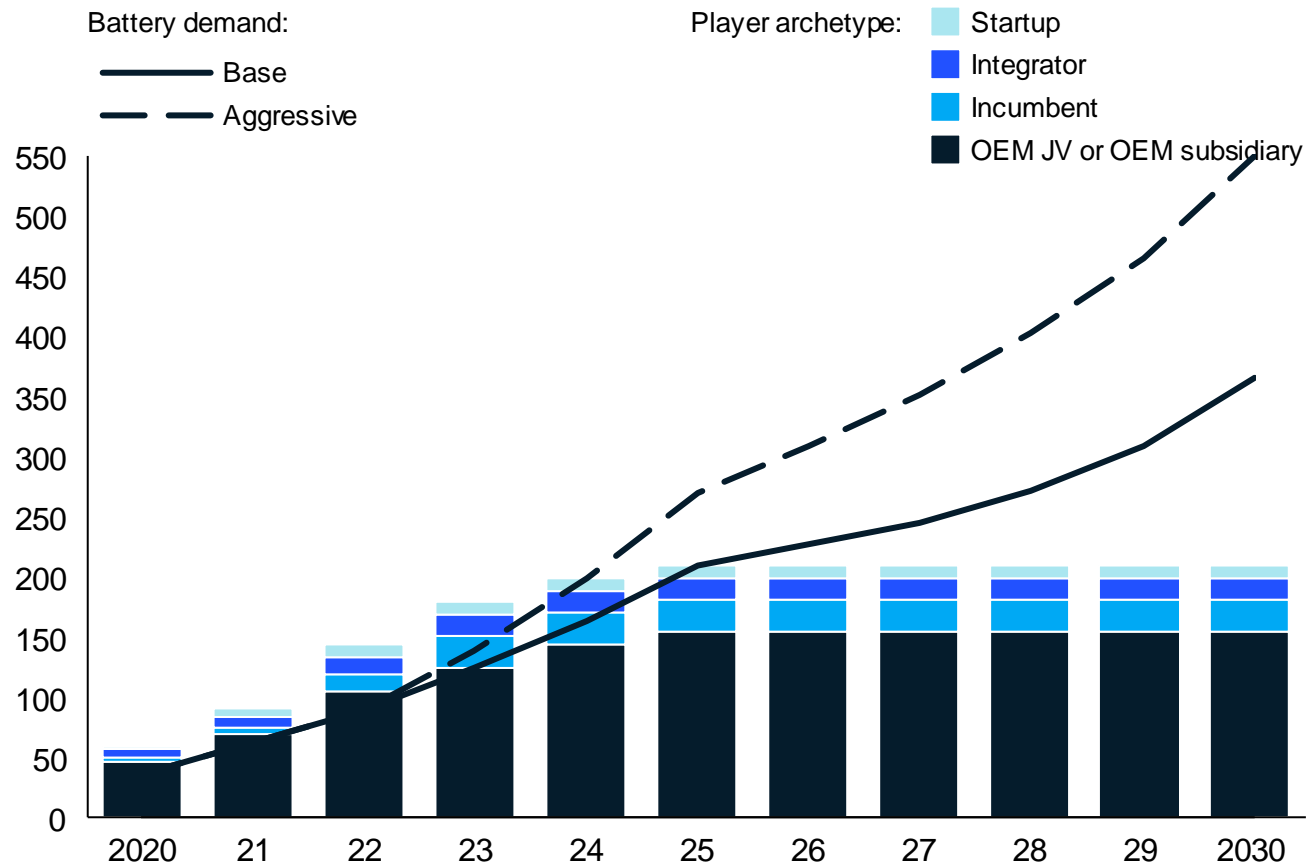
Potential future consolidation:

We see an increasing bifurcation between those with substantial funding and those with immaterial funding, which may spur consolidation and acceleration

We expect that U.S. battery production capacity will meet demand of 2025, but gap will persist in 2030

As of April, 2021

US EV LiB cell supply capacity and demand, in GWh



1. Comparison of 2019 vs 2020

Source: McKinsey Battery Demand and Supply data, Pressresearch; Company websites

Key announcements autumn/winter 2020

September

Panasonic Panasonic announced to expand battery factory capacity at Tesla Gigafactory operating in Nevada by 10%

October



Tesla announced to expand US production capacities but hasn't yet confirmed the location. According to the list, the Tesla Roadster 2 and the electric Semi truck will be built in this not yet confirmed third US plant

November

LG Chem



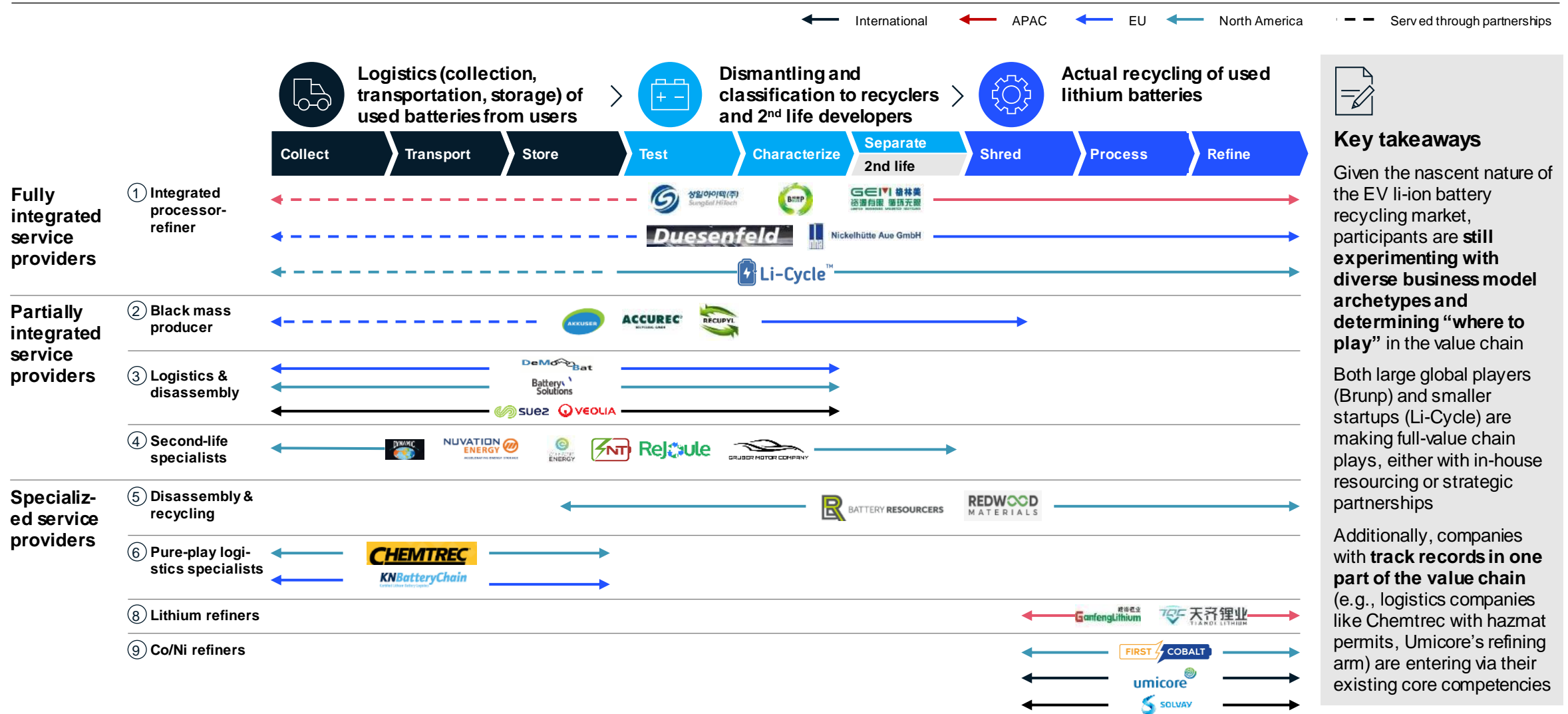
GM-LG Chem battery plant in Ohio announced that its plant planned for operation in 2022-2023 is ahead of schedule and began hiring

December

SK innovation

SK Innovation announced it will invest 1.1 Tn KRW (~10 Bn USD) to build second plant (11.7 GWh) in Georgia

Players are still experimenting with diverse business model archetypes across the battery reuse and recycling value chain



Key takeaways

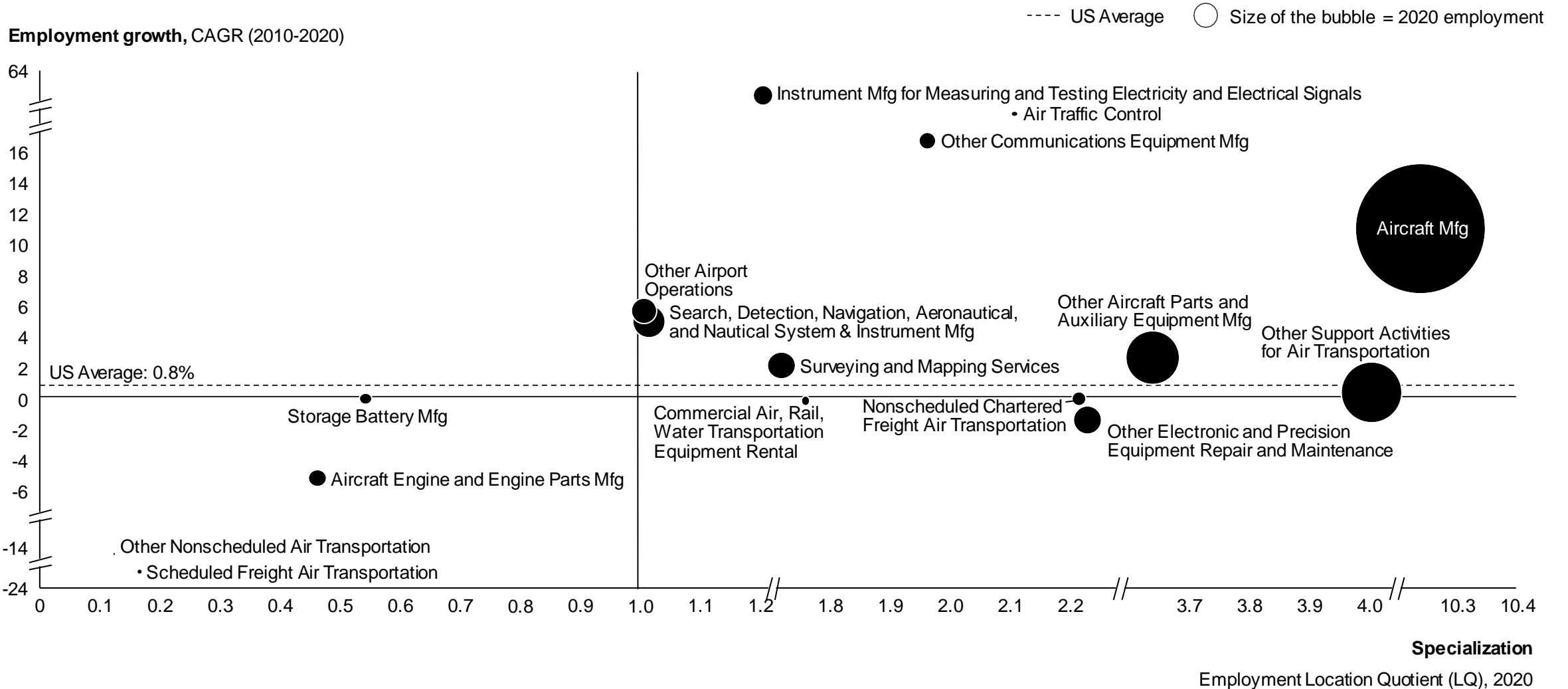
Given the nascent nature of the EV li-ion battery recycling market, participants are **still experimenting with diverse business model archetypes and determining “where to play”** in the value chain

Both large global players (Brunp) and smaller startups (Li-Cycle) are making full-value chain plays, either with in-house resourcing or strategic partnerships

Additionally, companies with **track records in one part of the value chain** (e.g., logistics companies like Chemtrec with hazmat permits, Umicore’s refining arm) are entering via their existing core competencies

1. Archetype plays in distinct value chain featured on subsequent pages

Aircraft manufacturing is Tulsa's largest and most specialized AAM industry



Note: Specialization is measured as the ratio of an sector's share of employment in a given area to that occupation's share of employment in the U.S. as a whole

Overview: AM-Oriented Certification and Training Programs

 Detailed next

Pool of potential candidates

Total# in...

Origin occupations	~18k
Gateway occupations	~4k
Relevant undergraduate programs	40
Primary regional Institutions	12

Annual targets for Training and Certification Programs

Component	Target volume ¹
Retrain Tulsa	3k – 5k
Pilot and ATC curricula	75 – 200
Added undergraduate completions	200 - 300

Impact

Increase in median wage for existing workforce	Up to ~150%
Median wage for target occupations	\$94k+
<p>The programs will address the underrepresentation of people of color across target occupations (currently 24% POC across the occupations)</p>	

1. Based on best practice workforce development programs, and unmet demand among prioritized occupations in the region

20k+ professionals in the Tulsa region today are employed in origin or gateway professions that offer a pathway to target occupations

SELECTED EXAMPLES OF CANDIDATE OCCUPATIONS

Origin occupations

Occupation	Current # employed	Median annual wage, \$k
Laborers and Freight, Stock, and Material Movers	6,546	\$29,277
Maintenance and Repair Workers, General	4,441	\$37,181
Inspectors, Testers, Sorters, Samplers, and Weighers	2,734	\$41,323
Automotive Service Technicians and Mechanics	2,444	\$36,524
Machinists	2,103	\$42,455
Total	18,269	\$ 35,487

Gateway occupations

Occupation	Current # employed	Median annual wage, \$k
Computer User Support Specialists	2,077	\$49,000
Industrial Machinery Mechanics	1,115	\$54,504
Mechanical Drafters	412	\$63,978
Electrical / Electronics / Repairers, Commercial and Industrial Equipment	225	\$61,837
Medical Equipment Repairers	98	\$41,209
Total	3,926	\$ 52,674

Target occupations

Occupation	Median annual wage, \$k
SW Dev, SW QA Analysts / Testers	\$90,710
Industrial Engineers	\$85,563
Electrical Engineers	\$102,971
Mechanical Engineers	\$92,870
Aerospace Engineers	\$96,573
Airline Pilots, Copilots, and Flight Engineers	\$131,120
Air Traffic Controllers	\$94,793
Aircraft Mechanics and Service Technicians	\$65,510
80- 150% increase in median wage	\$95,014