

eVTOLs

Do car makers hold the keys to eVTOL growth?

10-minute Insight

AeroHT, an affiliate of Xpeng, staged the first public flight of its X2 Electrical Vertical take-off and Landing Vehicle (eVTOL) in Dubai. Saudi Arabia has also announced the first large-scale order of eVTOLs for use in urban cities.

The concept of flying cars has captured the public's imagination for decades – scaling up eVTOLs from prototypes to mainstream mobility services is likely to take decades. However, the race has started, and car makers may have a bigger role to play than is often assumed.

In this insight we analyze the progress towards deploying eVTOLs and how car makers could leverage their investments in electrification to help eVTOL manufacturers scale-up.

Target audience

Engineering Strategy

Marketing Product Planning

Focus market(s)

Global



What is happening?

Major VTOL announcements from car makers



Aug 2017
Mercedes invests in Volocopter



Jan 2021
Stellantis enters into a partnership with Archer



Jan 2022
GM unveils VTOL concept



Oct 2022
Xpeng's X2 VTOL makes first public flight



Jan 2020
Toyota invests \$394m in Joby VTOLs



Sep 2021
Geely enters into JV with Volocopter



Jul 2022
Hyundai unveils VTOL concept



Key takeaway

Various car makers are exploring eVTOLs as a new diversification opportunity for future revenue. Their intent is to become a bigger part of the multi-modal mobility ecosystem.

- Based on the [Vertical Flight Society](#), there are over 700 concepts around VTOL, with designs from nearly 350 companies catalogued
- Some of these companies have substantial backing from established players in other industries, such as [Xpeng](#) (HT Aero), [GM](#) (Lilium) and Airbus, (City Airbus)
- Xpeng and [Hyundai](#) are among the most advanced car makers in this space and are building up in-house expertise and capabilities to develop and test prototype eVTOLs.
- Ultimately it may end up being the automotive industry's heavy investment in electrification that gives them an edge in the eVTOL market.

2017

2018

2019

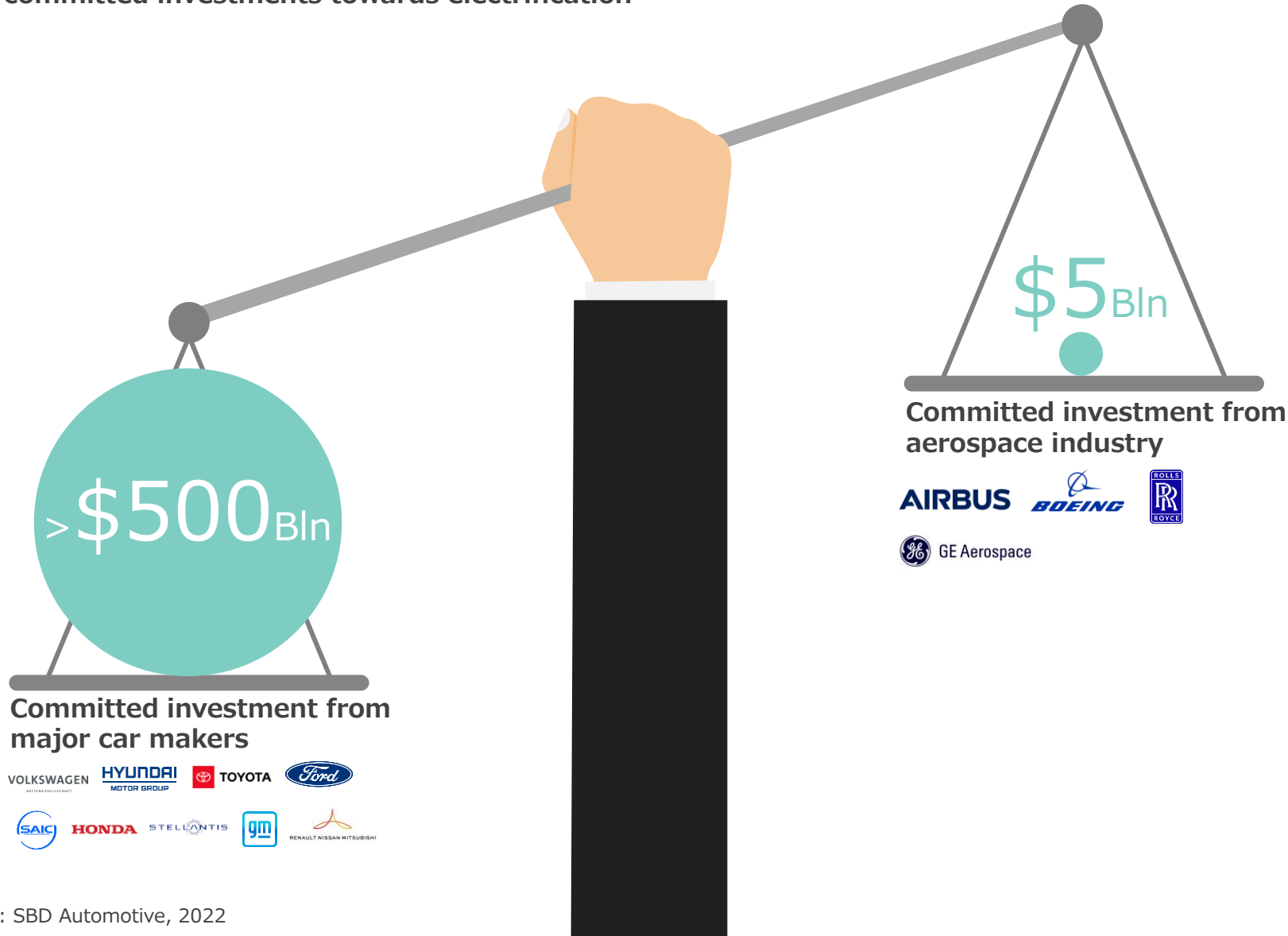
2020

2021

2022

Why does it matter?

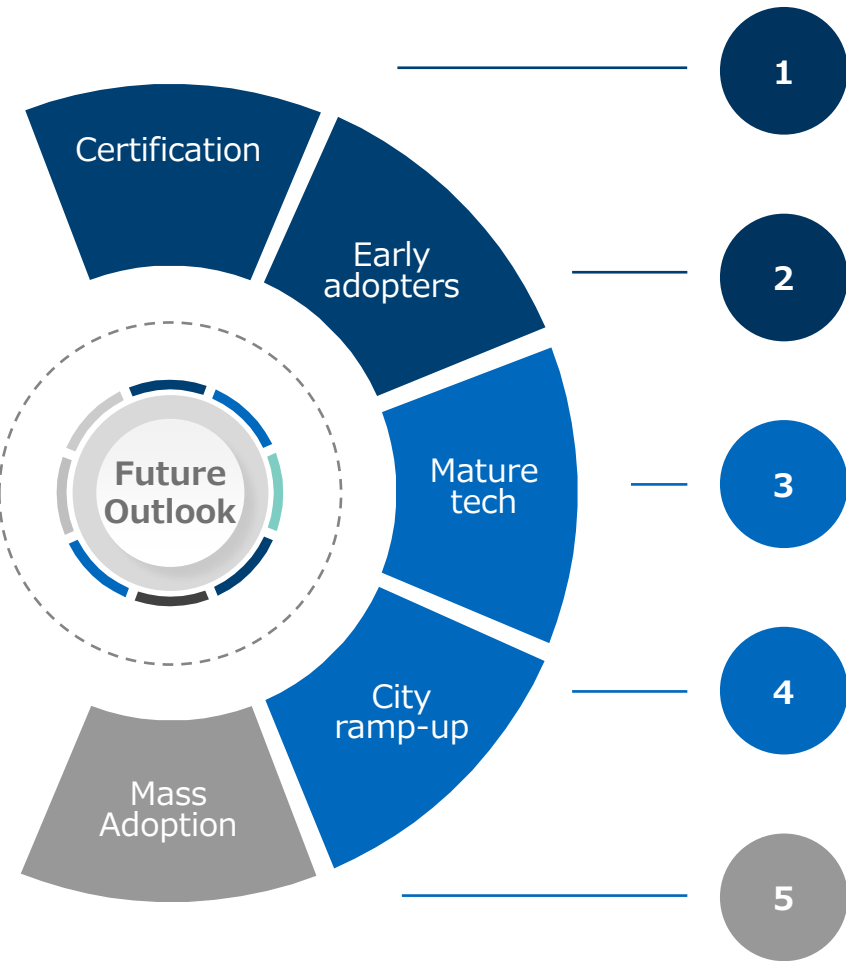
The automotive industry is far ahead in terms of committed investments towards electrification



Key takeaway

Car makers have an opportunity to leverage their electrification investments to gain a strategic advantage in the emerging eVTOL market.

- So far the early stages of the eVTOL race have been dominated by start-ups like [Velocopter](#) and [Joby](#).
- These companies have led the way in optimizing vehicle designs, gaining regulatory approval and exploring commercial applications (including city transport, cargo and agriculture).
- The [first concrete eVTOL deals](#) are now being signed, which will require these start-ups to begin ramping up production – but most do not yet have mature supply chains to source electric batteries.
- This is where car makers have an advantage – in their rush to deploy BEVs, car makers are investing heavily to secure access to the raw materials required to develop batteries.



1 The eVTOL regulatory framework is still nascent in most markets, making it hard for companies to homologate and launch services – this is the main short-term priority for the sector.

2 Early orders are already in – other cities (particularly in Asia & Middle East) are expected to follow, but with initially limited volumes.

3 Further improvements to various parts of the tech stack over the next 5-10 years (battery cells, noise reduction, automation) will make scale-up more viable.

4 Expect a gradual city-by-city launch scenario, as local approval and infrastructure partnerships take time to build. City restrictions on private car ownership could accelerate deployments.

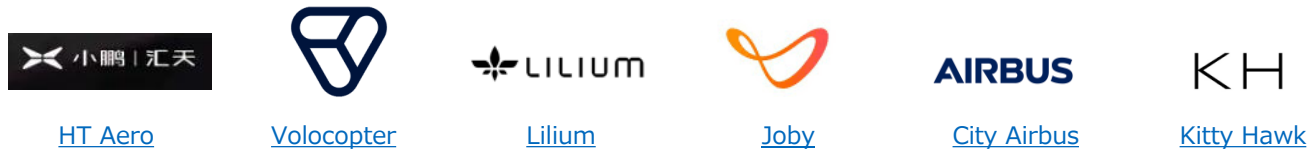
5 The eVTOL vision of a fully-integrated multi-modal experience available across (and between) cities globally is unlikely before 2050.

Key takeaway

eVTOLs face a multi-decade climb towards becoming a mainstream form of transportation globally – but that climb is already underway.

- According to a [report](#) published by Rolls Royce and Rolland Berger, only 7,000 VTOLs are expected to be in operation by 2030, each generating around \$300k in revenue. By 2040 50,000 are expected to be operating globally.
- This slow growth reflects the regulatory challenge of gaining approval and commercial challenges of building up physical infrastructure (vertiports and air traffic management).
- An important enabler to further increasing the addressable market and growth of eVTOLs will be battery technology: even if the range requirements remain similar to BEVs, eVTOLs will need >200kWh capacity due to extra weight and safety/redundancy requirements.

Who to watch out for?



	HT Aero	Volocopter	Lilium	Joby	City Airbus	Kitty Hawk
Headquarter	China	Germany	Germany	USA	France	USA
Founded Date	2014	2011	2015	2009	1970	2010
Funding Status	Early Stage Venture	Early Stage Venture	-	-	-	Early Stage Venture
Last Funding Type	Series A	Series E	Post-IPO	Post-IPO	Post-IPO	Grant
# of Employees	501-1000	501-1000	501-1000	501-1000	10,000+	11-50
Funding Rounds	1	8	7	8	-	2
Total Funding	\$500M	\$780.6M	\$826.4M	\$1.7B	-	\$1M
# of Lead Investors	3	8	4	6	-	2
# of Investors	8	26	13	24	-	2

Key takeaway

The eVTOL ecosystem is already crowded, despite the limited short-term commercial opportunities for operators.

- Building and prototyping eVTOLs is a capital-intensive venture – those that are still operating pilots are having to raise larger sums from investors as each milestone in the race for urban air mobility is a costly one.
- SBD believes a pressure **to raise capital** combined with a realization that VTOLs **are taking longer** to commercialize, will lead to a ramp up of M&A and closures.
- This will create opportunities for companies with longer outlooks and deeper pockets.
- The players shown here are ones that likely have a path to longer-term success – ones that are worth monitoring for partnerships, deals, sub-sector expansions and technological breakthroughs.

How should you react?



1

Monitor

The eVTOL sector will not take off on a mass scale in the short-term. But monitoring key players and their progress will help outsiders gauge whether commercial opportunities will emerge within the next decade, or whether resources are better spent elsewhere.

2

Partner

Given the long timescales and complexities of launching eVTOL services, the appetite for partnerships across the eco-system is high. Car makers and Tier-1 suppliers have a lot to offer and a lot to learn, making partnerships a natural first step.

3

Align

If eVTOLs becomes a strategic priority for players in the automotive sector, existing mobility strategies will need to be adjusted to accommodate the additional requirements of air travel (e.g. investing in extra battery capacity that may not be required for BEVs).

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