# THE ECONOMIC IMPACT OF VERTICAL AEROSPACE

Final report

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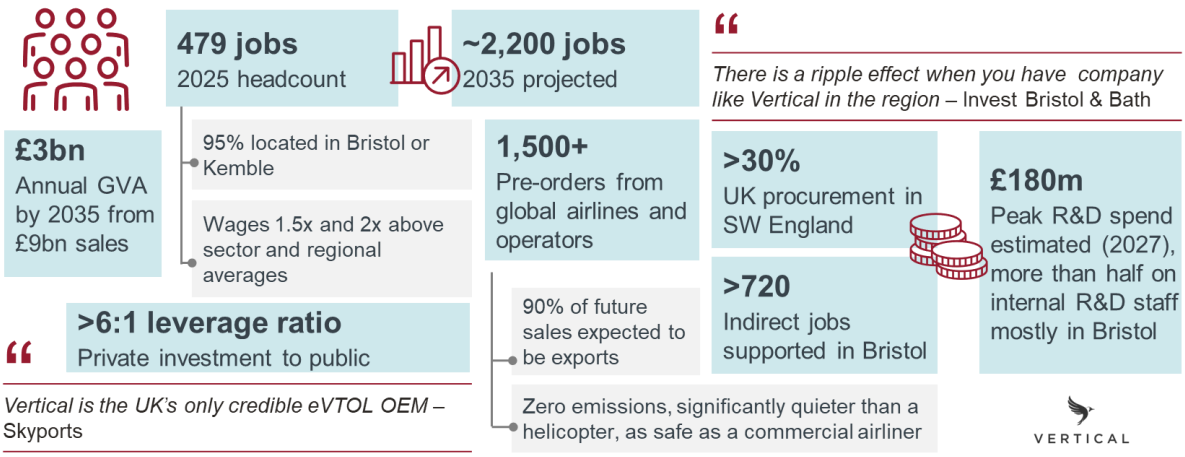
# Contents

# EXECUTIVE SUMMARY

This report provides an independent assessment of the economic contribution of Vertical Aerospace, considering both UK-wide and regional benefits. We consider both the current position and projections of how this economic contribution might evolve to 2035. Evidence is drawn from internal data provided by Vertical, secondary data, interviews with staff and external stakeholders, and desk review to assess three layers of benefit:

- **Direct benefits** of Vertical's immediate operations, including jobs, wages, revenues, exports, tax contributions and investments raised, as well as a measure of economic output (Gross Value Added, GVA).
- **Indirect benefits** arising from Vertical's supply chain expenditure, investments in tangible (e.g. facilities) and intangible assets (e.g. IP), and contributions to regional economic activity particularly around Bristol and the South West of England.
- **Wider benefits** linked to Vertical's operations, including skills, cluster effects, environmental and safety improvements, and induced economic benefits from employee spending in local communities.

Vertical has established itself as a critical anchor for the UK's emerging advanced air mobility (AAM) sector. Even in a pre-revenue phase, the company is already delivering tangible economic benefits. Its trajectory illustrates how an innovative firm can act as a catalyst for economic growth, industrial capability and technological leadership. With sustained investment and supportive policy, Vertical could leverage high-value activity in the UK and help shape the next generation of global aviation, aligned with the Government's industrial, advanced manufacturing and defence policy objectives. Stakeholders consistently emphasise that these impacts are additional: without Vertical, the UK would lack its only credible eVTOL manufacturer, reducing its ability to capture jobs, supply chain investment, and regulatory influence in this fast-growing sector.



- **Jobs and skills**: Employs 479 people (2025), 95% in Bristol and Kemble, paying wages up to twice sector and regional averages. These roles are in highly skilled areas such as battery systems, propulsion, and aerospace engineering. Conservative estimates show employment is projected to grow to around 2,200 by 2035.
- **Export revenues:** By 2035, total revenues are projected to reach nearly £9 billion, with around 90% generated from international sales, positioning Vertical as a future leading exporter in aerospace in the UK.
- **Gross Value Added:** By 2035, Vertical could generate up to £3 billion in GVA, much of which could accrue to the UK depending on where aircraft assembly and battery manufacturing are based.
- **Tax:** Despite being in the pre-revenue phase, Vertical already contributes significantly through PAYE, NICs and VAT, with taxes remitted exceeding the value of R&D tax credits received on average. By 2035, tax contributions could approach £800 million per year.
- **Supply chain and investment**: Over 60% of procurement spend (2022–24) remained in the UK. Stakeholders emphasised that much of this investment and collaboration would not have happened in the UK without Vertical. Within the UK, more than 30% of procurement spending was retained in the South West of England.
- **Local economic benefits**: Government-endorsed local jobs multipliers suggest 1.9 jobs are supported in Bristol for each direct job created, suggesting more than 720 indirect jobs are currently supported in the region by Vertical. Induced spending by those employed in Bristol or Kemble could add almost £21 million to those local economies.
- **Capital investment and infrastructure:** Vertical is currently evaluating its site options for developing new facilities for aircraft assembly and battery manufacturing. It intends to invest significantly (around £400 million) in these facilities between now and 2035. To the extent that these are realised in the UK, these planned investments would further strengthen the UK's advanced manufacturing base, skills and job creation, and reinforce domestic supply chains.
- **Wider ecosystem benefits**: The company builds skills pipelines (e.g. pilot training programme, skills development strategy), fosters research links with UK universities, and plays an active role in regulatory and industry forums shaping regulation and standards.
- **Environmental and safety leadership**: Vertical's eVTOL is zero-emission in operation, directly supporting UK net zero goals, while also being significantly quieter than a helicopter, and designed to meet the highest global safety standards for eVTOL aircraft, equivalent to commercial airliners.
- **Regional and cluster effects:** Vertical is helping to grow the UK's aerospace and clean technology cluster in the West of England, adding a new eVTOL capability to a region already known for advanced manufacturing in aerospace. Its existing and future sites in Bristol, Avonmouth, and Kemble have the potential to create high-quality jobs, support local suppliers, and attract new investment and partnerships. Regional leaders recognise Vertical as a key driver of clean aviation and advanced manufacturing in the area.
- **Alignment with government policy:** Vertical's mission aligns with the UK's Modern Industrial Strategy and Advanced Manufacturing Plan, which prioritise the development

of emerging AAM and battery technologies. It also supports the UK's new defence ambitions through the dual-use of aircraft for military and civilian purposes.

# 1 Introduction

## 1.1 The evolving aerospace sector

The aerospace sector in the UK is evolving rapidly, driven by advances in electrification, automation, and digital integration. In 2024, the sector generated £34 billion in turnover and £14 billion in GVA. It also directly supported around 100,000 skilled jobs with salaries 36% above the UK average, and an estimated 150,000 additional jobs through its supply chains.[1] With 88% of direct employment based outside of London and the South East, it is a key contributor to regional economies, innovation clusters and a catalyst for place-based industrial strategies.[2]

The sector combines high-value production, advanced engineering, and significant spillovers into defence, automotive, energy, and digital. As a strategic industry, it plays a critical role in advancing the UK's objectives in economic resilience, net zero, defence, investment and regional growth. Its importance is recognised in the Government's Modern Industrial Strategy as part of the advanced manufacturing priorities.[3]

Beyond traditional aircraft manufacturing, the sector encompasses a diverse and innovative set of organisations developing technologies for AAM, unmanned aerial systems (UAS), and regional aircraft, particularly those powered by electric or hybrid propulsion. It also includes a growing ecosystem of enabling technologies and infrastructure such as flight safety systems, low-level air traffic management tools, and physical assets like vertiports and charging stations.[4] This broader definition reflects a structural shift towards cleaner, smarter, and more flexible forms of air transport.

Globally, the aerospace sector is undergoing a transformation as countries compete to develop new forms of air mobility that are more sustainable, better suited to urbanisation, and more integrated with other transport modes. The UK is well positioned to compete in this emerging landscape due to its strong aerospace track record, regulatory leadership, internationally recognised research institutions, and clusters of advanced manufacturing and engineering talent.[5] The future aerospace sector also offers opportunities to diversify the UK exports, strengthen domestic supply chains, and shape international aviation and safety standards.

## 1.2 Vertical Aerospace

Vertical Aerospace (Vertical) represents a new generation of aerospace manufacturers developing aircraft and systems aligned with the sector's future direction. The company is

1 UK Government (2025), *Advanced Manufacturing Sector Plan* (available here).
2 ONS Business Register and Employment Survey
3 UK Government (2025), *The UK's Modern Industrial Strategy* (available here).
4 UK Research and Innovation (2021), *Future Flight Vision and Roadmap* (available here).
5 Frontier Economics (2025), Final Evaluation of the Future Flight Challenge (available here).

focused on AAM, specifically on the development and scale up of electric and hybrid vertical take-off and landing (eVTOL) technology through its VX4 aircraft, which has potential dual-use applications in both civil and military contexts.[6] As part of this, Vertical is advancing high-performance battery technology to enhance energy density, safety, and lifecycle performance.

Vertical is a UK-based company headquartered in Bristol, at the heart of the West of England's aerospace ecosystem. The region's aerospace and advanced engineering sector is worth over £2.7 billion and employs almost half of the sector's workforce.[7] The region is home to over 10 world-leading aerospace companies such as Airbus, GKN Aerospace, BAE Systems, Rolls-Royce, Leonardo Group and Boeing, and benefits from strong academic–industry linkages. The University of Bristol, ranked 2nd in the UK for aerospace engineering, further strengthens this innovation ecosystem.[8]

In 2021, the UK's AAM sector comprised approximately 100 organisations, including three passenger vehicle integrators with operations in the UK. Of these, Vertical stands out as the only one headquartered in the UK and the country's sole original equipment manufacturer (OEM) actively pursuing certification from the UK's Civil Aviation Authority (CAA). That year, the sector directly employed around 1,200 people and generated £73 million in revenue, with a direct GVA impact of £32 million.[9]

Estimates suggest that, on top of the economic contribution associated with development and manufacturing, AAM could conservatively contribute at least £2.1 billion per year in wider social benefits, largely through factors such as time savings, reduced emissions, and safety improvements identified for specific use cases.[10]

6 https://vertical-aerospace.com/

7 Invest Bristol and Bath (https://www.bristolandbath.co.uk/key-sectors/aerospace-advanced-engineering/)

8 The Guardian (2024), *Best UK Universities for Aerospace Engineering* (available here).

9 Bryce Tech (2023), *Advanced Air Mobility: An Assessment of a Coming Revolution in Air Transportation and Logistics* (available here).

10 PwC (2023), *Advanced Air Mobility: UK Economic Impact Study* (available here).

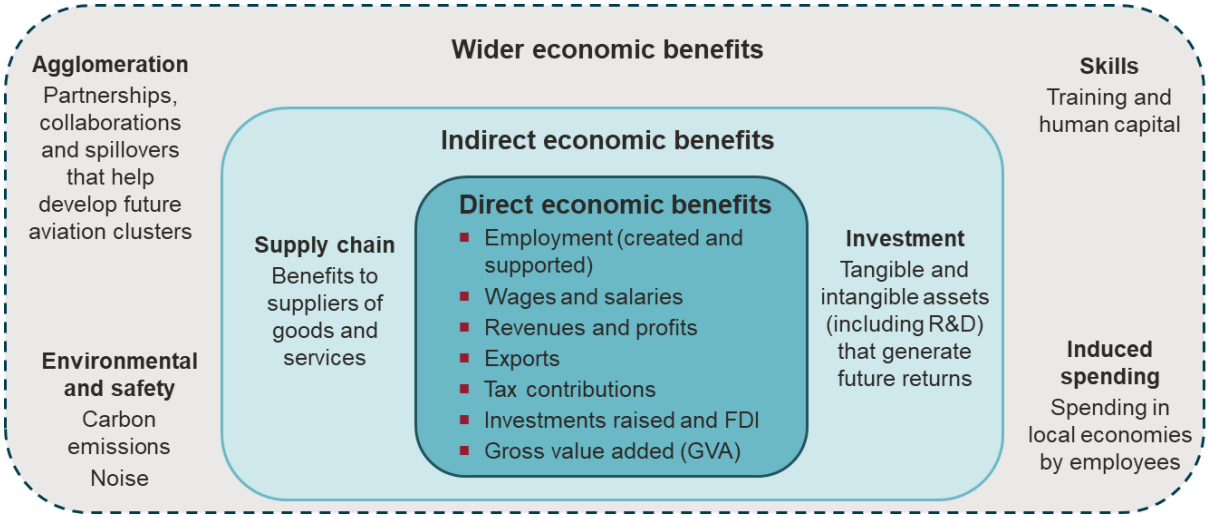
# 2 Objectives and approach

This report, commissioned by Vertical, provides an independent assessment of its economic contribution, considering both UK-wide and regional benefits. We consider both the current position and projections of how the economic contribution might evolve to 2035.

We consider three layers of economic contribution, summarised in Figure 1.

- **Direct benefits**: From Vertical's immediate operations, including employment and salaries, revenues and profits (including exports), taxes paid on wages and profits, and investments raised (including inward investment). We also estimate a measure of direct economic impact (GVA).
- **Indirect benefits**: From Vertical's expenditures on suppliers across the value chain (both upstream and downstream) locally and nationally, and its investments in physical and intangible assets such as research and development (R&D), which support future economic returns.
- **Wider benefits**: Spillover effects beyond (but linked to) Vertical's operations, including skills development, cluster and agglomeration gains, environmental and safety improvements, and the economic benefits from employee spending in local communities.

## Figure 1 Aspects of economic impact examined in the report




*Source: Frontier Economics*

The findings presented in this report draw on a mixed-methods approach, including:

- Detailed analysis of Vertical's internal financial and human resources data, as well as projections to 2035 (where available).
- In-depth interviews with Vertical staff and external stakeholders, including supply chain companies, industrial/strategic partners, academic partners, potential clients, and local/regional authorities.

- Analysis of secondary data sources including those published by the Office for National Statistics (ONS), Companies House and Crunchbase.[11]
- A targeted literature review, in particular relating to Vertical's operations, the wider AAM sector and economic and industrial strategy documents for the UK and the region.

This approach enables a meaningful and evidence-based assessment of the company's contribution to the economy by triangulating across complementary dimensions of output, income and investment. Our analysis includes both quantitative measures and qualitative insights, examples, case studies and use cases drawing on interviews and desk research.

[11] An online platform that provides information on company profiles, funding rounds, investors and acquisitions.

# 3 Vertical's role in the UK AAM landscape

Vertical was founded in 2016 and listed on the New York Stock Exchange in 2021. At the time of writing, its headquarters in Bristol house the company's engineering and design teams, supported by the Vertical Energy Centre (VEC) in Avonmouth and a flight test centre at Cotswold Airport (Kemble). Vertical recently announced its first manufacturing facilities, including an initial VX4 production line at its Cotswold site and a new battery manufacturing facility adjacent to VEC.[12] Vertical also has a presence in London.

## Figure 2 Vertical's offices and facilities


*Source:* *Vertical Aerospace*
*Note:* **Announced in September 2025.*

Since its inception, the company has focused primarily on R&D in aerospace engineering and eVTOL technologies, including electric propulsion, energy storage, propeller design and flight control systems. Looking ahead, Vertical aims to scale its operations as a key player in the UK's advanced manufacturing sector, ultimately transitioning from R&D to full-scale manufacturing and commercialisation of its aircraft from 2029.

As set out in its "Flightpath 2030" action plan (and subsequent refined versions), Vertical's current priority is advancing the certification of its flagship piloted aircraft, the VX4, while simultaneously developing enabling systems such as proprietary battery packs, and digital

[12] Vertical Aerospace (2025), *Vertical Aerospace Announces Manufacturing Facilities and Updates on Path to Certification During Capital Markets Day*, available here.

flight control technologies.[13] Currently, Vertical is the only eVTOL aircraft OEM actively pursuing certification from the CAA, with expected concurrent validation from the EU Aviation Safety Agency (EASA). It also has live validation programmes with the US Federal Aviation Administration (FAA), the Japan Civil Aviation Bureau (JCAB) and the National Civil Aviation Agency of Brazil (ANAC).

2025 marked major progress in Vertical's flight test programme. In February, the company successfully completed its piloted thrustborne flight testing phase. By May, it had achieved the first piloted wingborne flight test of a commercial eVTOL aircraft in Europe, a key milestone in progressing toward full certification.[14] And in July, Vertical completed another landmark, the world's first public airport-to-airport piloted flight.[15]

The VX4 is marketed as a cleaner, quieter, safer and more cost-effective alternative to helicopters and short-haul aircraft. It is a battery-powered eVTOL aircraft designed for urban and regional passenger transport over short distances of up to 100 miles. Its baseline configuration includes one pilot and four passengers, with future variants expected to support up to six passengers. The battery-powered VX4 is engineered for zero-emission operations, with low acoustic impact (virtually imperceptible in urban environments), and is being developed to meet commercial aviation safety standards. Its design also offers simplified maintenance due to the absence of complex mechanical components found in conventional rotorcraft. Certification is expected by 2028, with commercial roll-out anticipated from 2029.[16]

Vertical is also developing a hybrid VTOL aircraft, designed to offer significantly greater range and payload capacity, opening new market opportunities in long-distance commercial travel, emergency response and defence. The hybrid model will combine electric propulsion with an onboard generator system, making it suitable for routes up to 1,000 miles or 1,100kg payload, and missions in low-infrastructure environments. With low noise, low heat signature, rapid deployability, and a reduced logistical footprint, the aircraft is being positioned as a versatile (dual-use) and competitive alternative to light-medium military helicopters and air ambulances. Flight testing for the hybrid variant is scheduled to begin in mid-2026.[17]

As described in Figure 3 below, Vertical's aircraft is suited to a wide range of use cases, including connecting airports to surrounding areas, tourism and inter-island travel, short-haul

13 Vertical Aerospace (2024), *Vertical Aerospace Launches 'Flightpath 2030', a strategy to Pioneer Electric Aviation*, available here.

14 Vertical Aerospace (2025), *Vertical Aerospace Makes Aviation History with Piloted eVTOL Flight in Open Airspace*, available here.

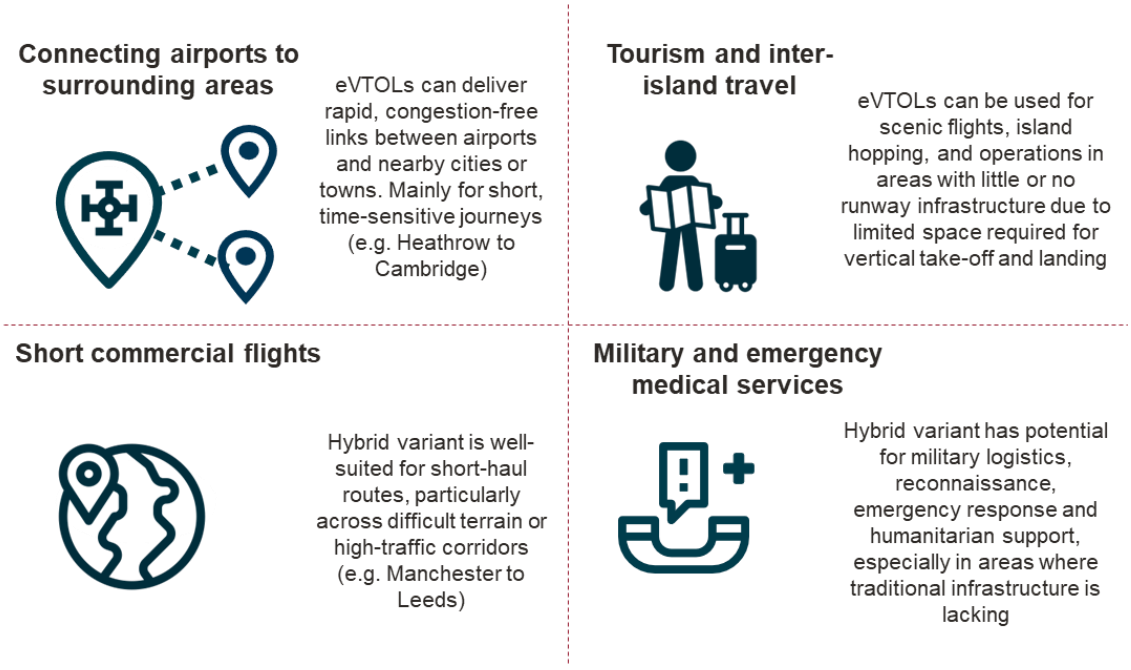
15 Vertical Aerospace (2025), *Vertical Aerospace completes world first public airport-to-airport flight*, available here.

16 Vertical Aerospace (2024), *Vertical Aerospace Launches 'Flightpath 2030', a strategy to Pioneer Electric Aviation*, available here.

17 Vertical Aerospace (2025), *Vertical Aerospace Announces 1,000-mile Hybrid-Electric VTOL Programme to Serve Defence, Logistics and Wider Commercial Markets*, available here.

commercial flights, and military and emergency medical services. Vertical aims to provide OEM products (aircraft and battery packs) and aftermarket services (service facilitation, technicians and pilot training) to traditional airline and helicopter customers (e.g. helicopter operators, commercial airlines, aircraft leasing companies, charter airlines) and customers in non-traditional industries (e.g. tourism, cargo and logistics, healthcare, defence).

## Figure 3 Vertical's aircraft main use cases




*Source:* *Vertical Aerospace*
*Note:* *Includes use cases for both battery-powered and hybrid eVTOL.*

Vertical's activities appear well aligned with the UK's broader priorities for clean growth, advanced manufacturing and industrial innovation, as set out in the Modern Industrial Strategy and its Advanced Manufacturing Plan, as well as supporting defence objectives as outlined in the Strategic Defence Review. By investing in advanced aerospace and battery R&D and developing zero-emission and hybrid-electric aircraft, Vertical helps scale the UK's emerging AAM sector while supporting wider national objectives (see Section 7 for more details).

# 4 Direct benefits

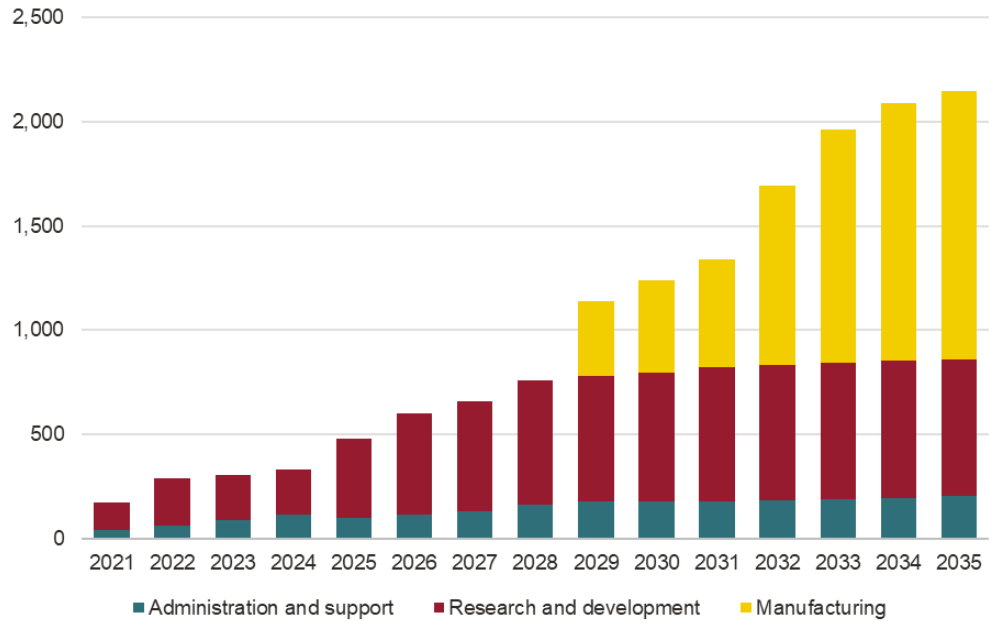
Vertical delivers a set of direct economic benefits that can be clearly attributed to its operations. These include creating high-value jobs, paying wages well above local and sectoral averages, attracting significant foreign direct investment, contributing to the UK tax base, and building measurable GVA. Evidence shows that Vertical is already having a tangible fiscal and economic impact, despite being in a pre-revenue, R&D-intensive phase. Crucially, stakeholders interviewed highlight that these direct contributions would not exist in the absence of Vertical.

## 4.1 Employment and wages

Vertical has made a significant contribution to job creation in the UK, particularly in the West of England, where the company is headquartered. As of 2025, around 97% of its workforce is UK-based, with nearly 80% residing in the Bristol area, 15% in Kemble, 2% in London and the rest abroad. This localised employment footprint reflects the company's role as a regional anchor employer in high-value sectors.

As shown in Figure 4, Vertical's workforce has expanded rapidly from 170 in 2021 to 479 in 2025, and is projected to reach nearly 2,200 FTEs by 2035, largely driven by growth in manufacturing jobs once commercial roll-out begins.

### Figure 4 Vertical's headcount employment 2021–2035 (FTE), by function



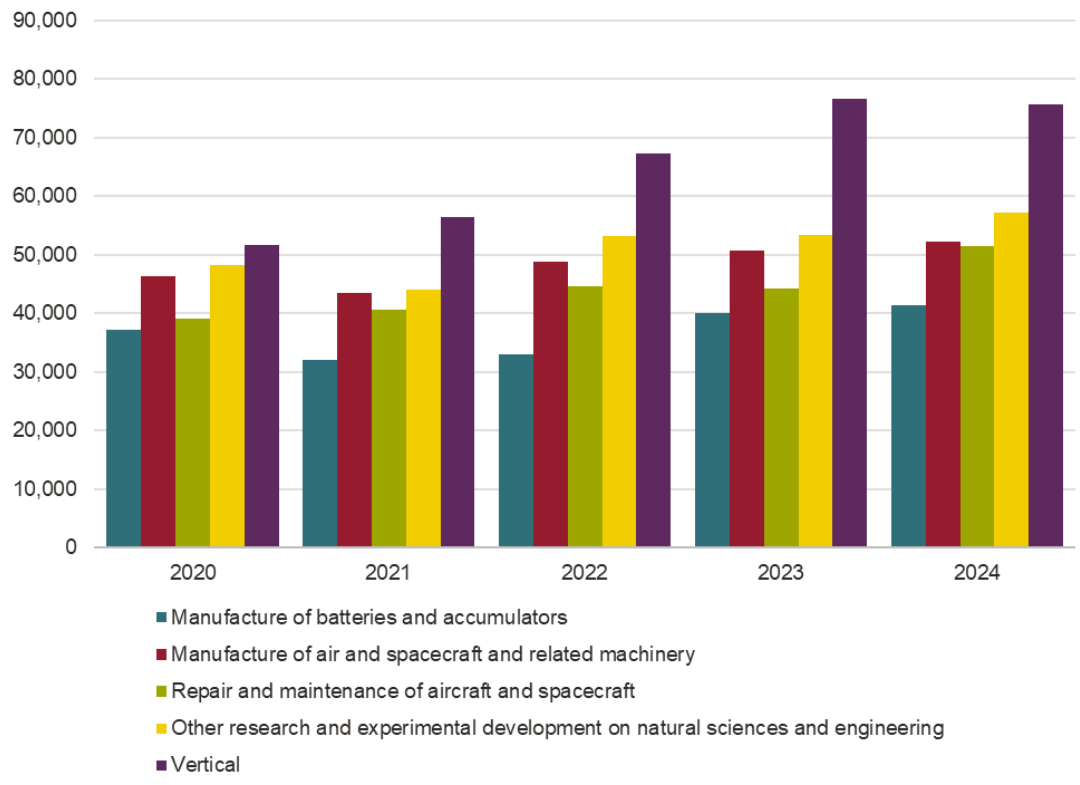

*Source: Vertical's financial accounts submitted to Companies House (2020-2024) and financial projections (2025-2035).*

Vertical is currently evaluating its site options for developing new facilities (covering aircraft assembly and battery manufacturing) across multiple sites. It has already announced its first manufacturing facilities in Cotswold Airport (Kemble) and Avonmouth. These sites will play a central role in supporting the aircraft's certification process. To the extent that additional facilities are based in the UK, these would play a key role in strengthening the UK's advanced manufacturing base and keeping high-value jobs onshore. However, if this is not the case, some production and headcount could be located abroad, meaning future employment projections may include figures outside the UK, especially once worldwide certification is achieved in 2029.

Vertical also offers salaries well above industry and regional averages, with the difference growing over time. As presented in Figure 5, in 2024, average gross annual pay was estimated at around £75,000, significantly higher than typical earnings in related industries such as battery manufacturing, aerospace, and scientific R&D, where averages tend to fall between £40,000 and £55,000. Vertical also exceeds average pay levels in both the South West and the City of Bristol (Figure 6).

*"Vertical provides an aspirational career path locally. Young people can see that they don't have to move away...they can work on cutting-edge aerospace projects right here."*
*– Invest Bristol & Bath*

## Figure 5 Average gross annual pay in selected industries in the UK (£)




*Source: Vertical's financial accounts submitted to Companies House (2020-2024), ONS Annual Survey of Hours and Earnings*
*Note: Excludes social insurance contributions, pensions, etc.*

## Figure 6 Average gross annual pay by region (£)


*Source: Vertical's financial accounts submitted to Companies House (2020-2024), ONS Annual Survey of Hours and Earnings*
*Note: Excludes social insurance contributions, pensions, etc.*

Vertical offers roles that are not only well-paid but also highly skilled and commercially strategic. Roles in aerospace engineering, battery systems, and electric propulsion are among the scarcest in the UK labour market. The ADS Group has consistently highlighted persistent recruitment challenges across the aerospace, defence, and space sectors, exacerbated by growing competition for talent from adjacent high-tech industries.[18]

This is supported by the Institution of Engineering and Technology (IET) Skills Survey 2022, which found that 54% of UK engineering firms were struggling to recruit,[19] with R&D-intensive sectors reporting up to 92% of vacancies hard to fill due to skill shortages.[20] At the 2024 Farnborough International Airshow, industry leaders highlighted growing concerns about their struggles to find skilled workers.[21]

***"Having companies like Vertical who are hiring is really important...providing opportunities beyond graduation, beyond PhD, beyond postdocs...to retain that talent in the UK is important."*** – ***Oxford University***

Vertical plays an important role in retaining highly skilled researchers in the UK beyond graduation, PhD, and postdoctoral study. Stakeholders spotlighted that Vertical's attractive career pathways in emerging fields enable graduates from

18 ADS Group (2024), *Manifesto 2024: Securing UK Advantage* (available here).
19 IET (2023), *Skills for a digital future survey* (available here).
20 UK Parliament POST (2025), *UK STEM skills pipeline* (available here).
21 Reuters (2024), *Struggle for skilled workers in spotlight at Farnborough Airshow* (available here).

UK universities to develop their careers within the UK's innovation ecosystem.

In this context, if Vertical were not offering these high-quality roles (particularly in areas such as electric propulsion, battery systems, and aerospace systems engineering) many of these highly skilled professionals would likely pursue opportunities abroad or transition into other high-tech sectors, further exacerbating existing skills shortages. Therefore, Vertical's contribution goes beyond direct job creation as it helps anchor rare and strategically important talent within the UK's innovation ecosystem, ensuring that capability developed through the UK's universities is retained and applied domestically.

## 4.2 Revenues and exports

Vertical is currently in the R&D phase of its journey toward commercialising eVTOL technology and is therefore not yet generating revenues from the design, development, or sale of its aircraft. Given the scale of upfront investment required, the company's operating income to date has been primarily supported by external capital, as well as some government grants and R&D tax credits.[22] Based on analysis of company statements and Crunchbase financial data:

- **External capital**: More than £500 million raised through private equity and convertible notes since 2018 from US investors.
- **Government grants and R&D tax credits**: More than £20 million in government grants has been awarded through the Aerospace Technology Institute (ATI), Innovate UK, and Horizon Europe programmes (with matched private investment), with a further £14 million in public funding from ATI awarded and expected in the coming years. This sits alongside £46 million of R&D tax credits since 2021.

Between 2021 and 2024, total investments raised were over £500 million, of which £66 million was from UK public sources. This represents a **leverage ratio of more than 6 times**: for each pound of UK public investment, Vertical has raised more than £6 of private capital over this period. This is closely aligned with Industrial Strategy objectives to raise private investment in the UK. Most of the investment is FDI (Figure 7), showing the attractiveness of Vertical's offer as a driver of inward investment.

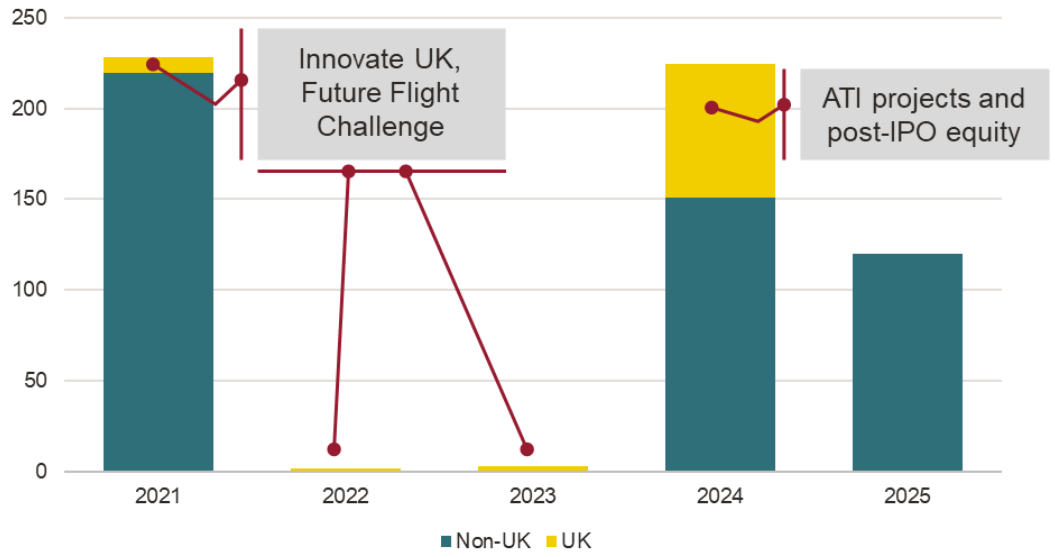
Vertical's business model consists of three distinct future revenue streams:

1. **Battery-powered eVTOL aircraft:** Expected to remain the core business, accounting for around 92% of revenues initially, but declining to around 57% by 2035 as the mix diversifies to support business sustainability.
2. **Hybrid VTOL aircraft:** Expected to account for around 19% of revenues by 2035, reflecting demand for increased payload and mileage for military and emergency response services.

[22] The tax credits relate to the UK's R&D Expenditure Credit (RDEC) scheme and UK SME tax relief scheme, which provides relief for eligible R&D activities.

3. **Aftermarket services:** Offering additional commercialisation opportunities in adjacent markets, primarily through regular replacement of Vertical's proprietary battery technology (battery packs), and (to a lesser extent) spare parts and the provision of technicians and pilot training services.

## Figure 7 Investment raised by Vertical (£m, cash terms)




*Source: Company statements and Crunchbase.*

Following certification and commercial roll-out (expected by 2029), Vertical projects an average annual revenue growth rate of 60% between 2030 and 2035. As shown in Figure 8, by 2035, total revenues could reach up to almost £9 billion. Approximately **90% of revenues are expected to come from exports,** positioning the company as a major UK exporter.

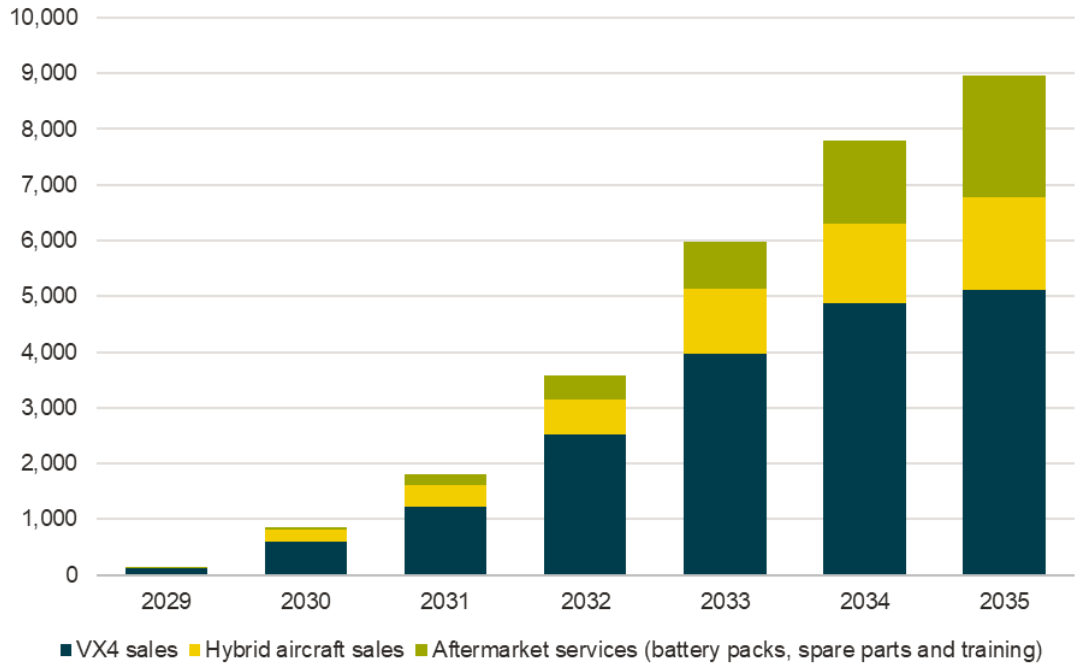
***"Having a UK-based OEM building a complex new aircraft with so much new technology is something that hasn't happened for a long, long time. Vertical is clearly in the lead in the UK for the advanced mobility sector."*** – ***Bristow***

***"Vertical is the only credible eVTOL in Europe"*** – ***Skyports***

This trajectory reflects the broader high-growth trend in the global AAM sector. Globally, the top five electric aircraft manufacturers have secured more than 8,000 pre-orders.[23] Vertical alone has over 1,500 pre-orders, making it one of the leading OEMs worldwide.[24] Stakeholders reinforced the company's market positioning and growth potential.

[23] UKRI (2024), *Future Flight Use Cases: 9 Ways Future Flight will Transform Aviation* (available here).
[24] https://vertical-aerospace.com/order-book/

## Figure 8 Vertical's projected revenue, 2029–2035 by source (£m, cash terms)




*Source:* *Vertical Aerospace projections*

*Note:* *90% of projected revenues expected to come from exports. Aftermarket services includes batteries, spares and training (technicians and pilots).*

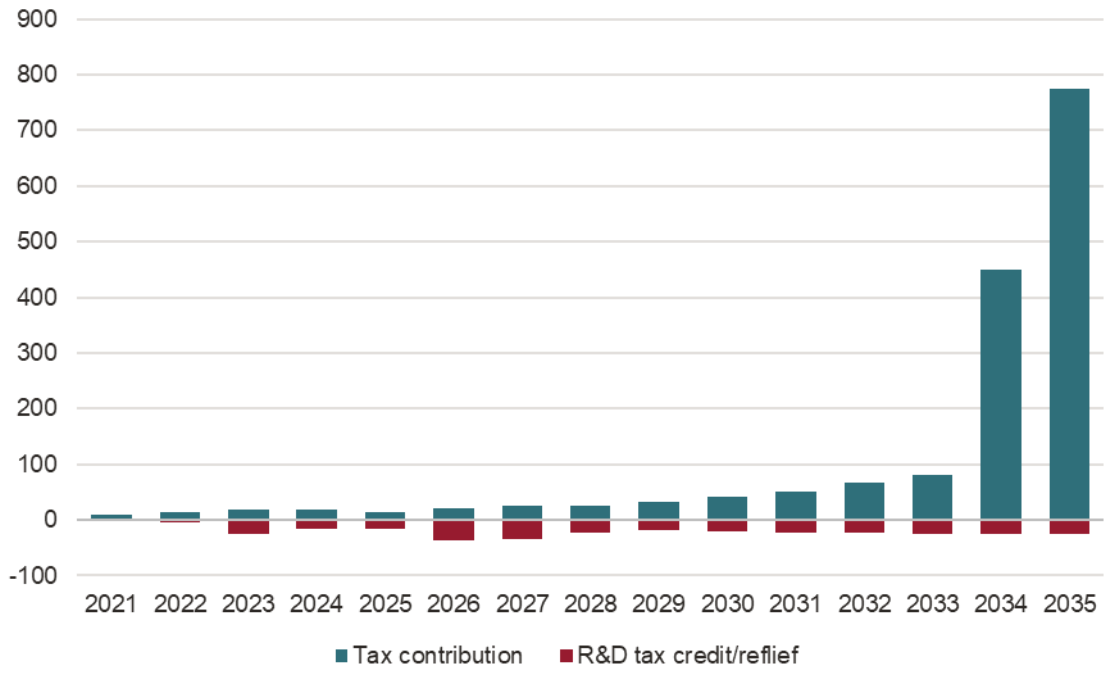
## 4.3 Tax contributions

Although Vertical is still in the pre-commercialisation phase, it already makes a significant contribution to the UK public finances through its tax payments. These contributions are primarily in the form of Value Added Tax (VAT) on goods and services purchased in the UK, Pay-As-You-Earn (PAYE) income tax deducted from employee salaries, and National Insurance Contributions (NICs), paid both by employees and as employer contributions.

As shown in Figure 9, Vertical's gross tax contributions have increased steadily between 2021 and 2024, reflecting the company's rapid growth in headcount and wages over this period, and remaining above the tax credit payments received against R&D spending. Tax payments through VAT and PAYE/NICs amounted to £18 million in 2024, for example, outweighing the £15 million received in R&D tax credits.

Frontier modelling suggests that total tax contributions will rise sharply, particularly once commercial operations begin in 2029, reaching nearly £800 million in 2035. This comprises VAT payments on UK input costs, PAYE and NICs from the increased payroll costs as employment increases, and corporate taxes on future profits. By 2035, corporation tax payments are expected to account for around 70% of total tax contributions, reflecting Vertical's transition from an R&D-focused firm to a major contributor to the UK's public finances.

## Figure 9 Vertical's tax contributions, 2020–2035 (£m, cash terms)




*Source:* *Vertical's financial accounts submitted to Companies House (2020-2024), and Frontier projections (2025-2035) based on Vertical data and independent modelling.*

*Note:* *Tax contributions include VAT on goods and services, PAYE, NICs and corporate tax. Excludes VAT related to aircraft and aftermarket service sales.*

VAT will also be generated on sales of Vertical aircraft and aftermarket services to UK purchasers once commercial roll-out begins in 2029. Frontier estimates, based on projected sales and assuming no change in the standard rate of VAT, suggest the associated VAT on these sales could be £17 million in 2030, rising sharply to around £179 million by 2035.

These figures demonstrate that even during its pre-commercialisation phase, Vertical is already delivering tangible fiscal benefits to the UK. The company's employment of highly skilled, high-wage staff translates into disproportionately high PAYE and NICs compared to regional averages, while supply chain activity generates VAT returns. It also shows that government support through innovation grants and R&D credits is compensated by taxes paid as Vertical nears commercialisation.

## 4.4 Gross Value Added

GVA is generally considered the most comprehensive single measure of direct economic contribution. It measures the economic value generated by a firm (i.e. turnover) after subtracting the cost of intermediate goods and services used in production. Firm-specific GVA

data is typically approximated by combining information on total compensation to employees and retained operating profits or shareholder returns attributable to UK-based activities.[25]

We derive GVA estimates using Vertical's financial accounts submitted to Companies House (2021 to 2024) and the company's own financial projections from 2025 onwards, specifically covering the manufacturing and commercialisation of eVTOLs, hybrid VTOLs and aftermarket services (i.e. battery packs, spare parts and training). Our two-step approach aligns with the income-based method.[26]

1. **Compensation of employees:** Estimated annually (covering wages and salaries, social security contributions, pensions, and other staff-related expenses) and multiplied by the average monthly FTEs employed by Vertical.
2. **Gross operating surplus:** Approximated using EBITDA as a proxy which reflects interest, tax, depreciation and amortisation earnings.

As shown in Figure 10, our GVA estimates reflect Vertical's current focus on R&D, which results in negative GVA in early or pre-commercialisation phases. This arises because large upfront investments in intellectual property, product development, and highly skilled labour outweigh limited revenues from sales. In such cases, the negative EBITDA can exceed the positive GVA contribution from wages and salaries.

This pattern is common in R&D-intensive sectors such as biotechnology, battery technology or advanced materials, and is recognised as a limitation of using GVA as a proxy to assess the economic contribution in nascent industries. Indeed this issue was specifically pointed out in the most recent Industrial Strategy Green Paper, which noted that official measures of GVA often understate the long-term value of early-stage R&D activity to the wider economy:[27]

> *"…traditional metrics such as Gross Value Added (GVA) are problematic for prioritising nascent sectors in early stages of development (e.g. sectors with a large number of firms in the start-up phase could have very low or even negative GVA as their costs exceed their revenues."* (p.19)

***"Thanks to its business model and vision, we believe Vertical has a strong capacity to scale."*** *– Honeywell*

However, as the firm transitions to commercial manufacturing, GVA is expected to increase and quickly turn positive. Once Vertical achieves full commercial roll-out in 2029, the company is projected to contribute up to £3 billion in annual GVA by 2035.

Part of the associated wages and profits may accrue outside the UK if elements of production or service delivery are based overseas. However, if future manufacturing facilities are based

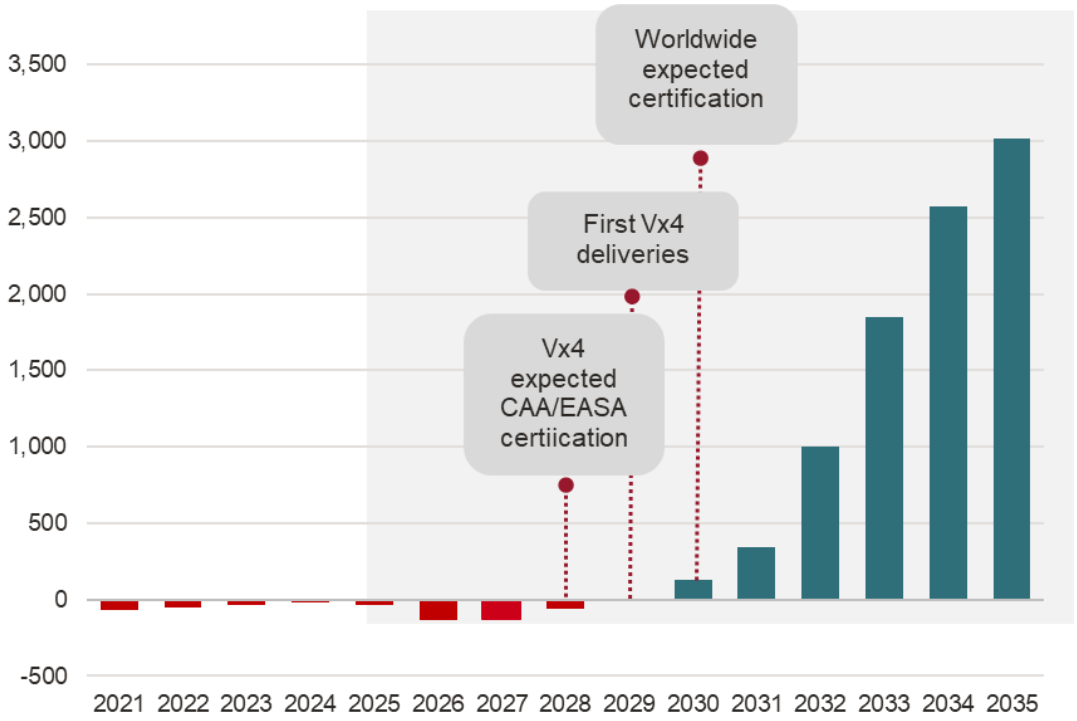
25 This is because GVA at the firm level broadly consists of employee compensation and gross operating surplus, two components often reported in financial accounts.

26 WifOR Institute (2024), *Quantifying The Economic Impact of Companies* (available here).

27 UK Government (2024), *Invest 2035: The UK's Modern Industrial Strategy* (available here).

in the UK, the majority of value generation would be expected to benefit the domestic economy.

## Figure 10 GVA generated by Vertical, 2020–2035 (£m, cash terms)




*Source: Frontier modelling based on Vertical's financial accounts submitted to Companies House (2020-2024) and financial projections (2025-2035).*

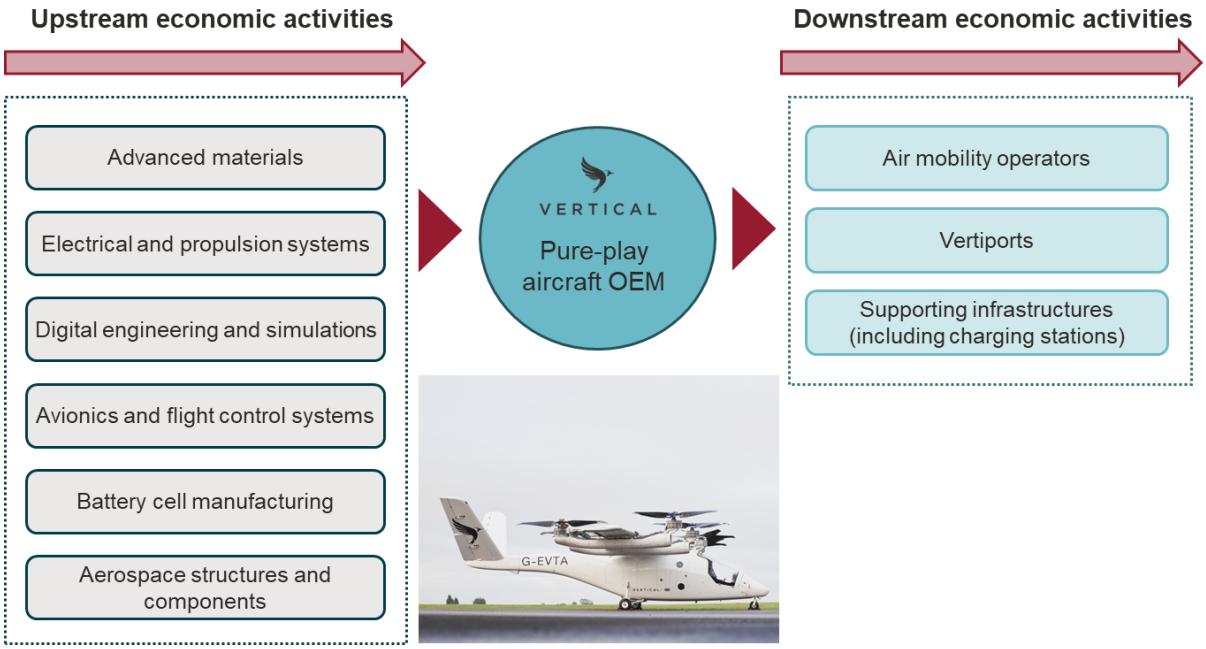
# 5 Indirect benefits

In addition to its direct contribution, Vertical generates a wide range of indirect economic benefits. These stem from its position at the centre of a growing AAM ecosystem, linking upstream suppliers, downstream operators, academic institutions, and providers of enabling infrastructure. Evidence from interviews and procurement data shows that Vertical is not only sourcing locally and stimulating supplier investment, but also anchoring new capabilities in the UK that might otherwise not have developed.

## 5.1 Development of supply chain

Vertical is a pure-play aircraft OEM, meaning its core business is entirely focused on the design, development, and eventual manufacturing of its own aircraft. As such, Vertical operates at the centre of a complex supply chain, relying on upstream suppliers for key components and technologies required to design and build its aircraft (e.g. batteries, avionics, fuselage structures, and actuation systems), and on downstream suppliers for certification, distribution, operation, and customer delivery. Figure 11 below illustrates in a simplified way the main components of Vertical's value chain.

### Figure 11 Overview of main components of Vertical's value chain




*Source: Frontier Economics*

Vertical's technological development strategy is built around a collaborative and integrated approach that brings together an international network of leading industrial partners from adjacent sectors. Notably, Vertical has established strong relationships with Honeywell (avionics and flight controls), Leonardo (fuselage and pylons), Rockwood Composites (propellers), GKN Aerospace (electrical wiring and wing structures), Molicel (battery cells), Synsqo (composite materials), Dassault Systèmes (3D design and engineering), Hanwha (blade tilt mechanisms and actuators), and more recently Aciturri Aerostructures (airframes). By working closely with these partners on co-design and testing, Vertical helps tailor specialist technologies to its aircraft requirements while enabling suppliers to grow into new areas that would not have been pursued without this anchor customer. Vertical has also expanded its long-standing partnership with Honeywell through a new agreement with a projected contract value of up to US$1 billion over the next decade, underlining the scale of commercial opportunities linked to the VX4 programme.[28]

*"We would expect as Vertical grows that the ecosystem of suppliers matures around them as well."* – *Honeywell*

*"The whole AAM cluster revolves around Vertical's operations…from the start of the supply chain to certification."* – *Rockwood*

## Rockwood Composites: Bespoke propellers in the West of England

Rockwood Composites, based in the South West, is working with Vertical to supply propellers as part of the aircraft's development and testing programme. Propeller production is one of Rockwood's specialist offerings, and its innovative compression moulding technology has proved well suited to Vertical's needs, allowing the company to produce lighter, stronger, and more cost-efficient components.[29]

*"Being based in the same geographical area as Vertical has been a key aspect of the partnership's success."* – *Rockwood*

The collaboration goes beyond a simple supplier relationship. Rockwood's engineers have been directly involved in co-developing designs that meet the technical and practical requirements of the VX4. This joint approach has allowed Rockwood to adapt its technology to aerospace applications in ways that would not have happened otherwise.

The partnership has also encouraged Rockwood to invest in additional capacity in anticipation of future demand. The company has committed to maintaining engineering and support functions in Bristol, even if higher-volume manufacturing might eventually be located abroad. At the same time, working with Vertical has raised Rockwood's profile within the aerospace cluster, opening up new commercial opportunities and networking visibility that would not otherwise have been accessible.

[28] Honeywell (2025), *Vertical Aerospace, Honeywell Expand Partnership To Bring VX4 EVTOL To Market* (available here).
[29] The Rockwood Group Case Study (available here).

Downstream, Vertical aims to provide OEM products (aircraft and battery packs) and aftermarket services (maintenance) to a wide range of customers. These include traditional airline and helicopter operators (e.g. commercial airlines, aircraft leasing companies, charter airlines) and non-traditional sectors such as tourism, cargo and logistics, healthcare, and defence. To date, the company has secured around 1,500 pre-orders for its flagship VX4 aircraft from leading global clients, including American Airlines (US), Bristow (US), Avolon (Ireland/UK), Air Asia (Malaysia), GOL Airlines (Brazil), Flying Group (Belgium), Kakao Mobility (South Korea), and Japan Airlines (Japan), among others.

## Bristow Group: Full-service 'ready-to-fly' model

Bristow Group, one of the world's largest helicopter operators, with presence across 18 countries, has developed a close partnership with Vertical since 2021. Initially focused on providing technical advice based on Bristow's years of operational experience, the collaboration has evolved into the creation of a full-service "ready-to-fly" operating model. Bristow has placed a pre-order for 50 of Vertical's aircraft. Under this approach, Bristow could operate Vertical's aircraft on behalf of airlines and other customers, lowering barriers to adoption for carriers that do not have the capacity to develop in-house eVTOL expertise.

The partnership also demonstrates how collaboration with Vertical supports the UK's broader industrial base. By working with a domestic OEM, Bristow helps bring operational expertise directly into the design and certification of a new aircraft class. Its extensive UK bases (including search and rescue services for HM Coast Guard and offshore energy operations in Aberdeen) position the company to integrate Vertical's aircraft without the need for major new infrastructure.

> *"For us to already have infrastructure in these regions, to have that already in place in the UK means we wouldn't necessarily have to build a whole new management structure."* – *Bristow*

The model also creates opportunities for new socially valuable services. Bristow sees potential for early deployment on routes such as connecting remote Scottish islands with mainland airports, before scaling into feeder services for major airlines. In this way, the partnership with Vertical extends beyond commercial opportunities, offering the chance to enhance connectivity and deliver wider social benefits.

> *"There is a real opportunity for some socially beneficial work in the islands of Scotland as a stepping stone…but then there's the potential for support of airlines and being able to do flights into large airports from remote areas."* – *Bristow*

Vertical is also working with Skyports to advance the enabling infrastructure required for AAM, including vertiports and charging stations. This collaboration helps align infrastructure planning with aircraft design requirements from the outset, reducing uncertainty and accelerating deployment. Vertical's presence in the UK has added credibility to the sector, encouraging earlier investment in infrastructure than would otherwise have taken place.[30] By working with a domestic OEM, Skyports is also helping to position the UK as a leader in shaping global standards for vertiport design and operation, rather than simply adopting frameworks developed overseas.

> *"We've been working with Vertical from a very early stage…over that time we have we've written the playbook for advanced mobility within the UK, linking everything from how we build a network of landing infrastructure…to how they would operate from an airspace perspective."* – *Skyports*

## 5.2 Procurement spending

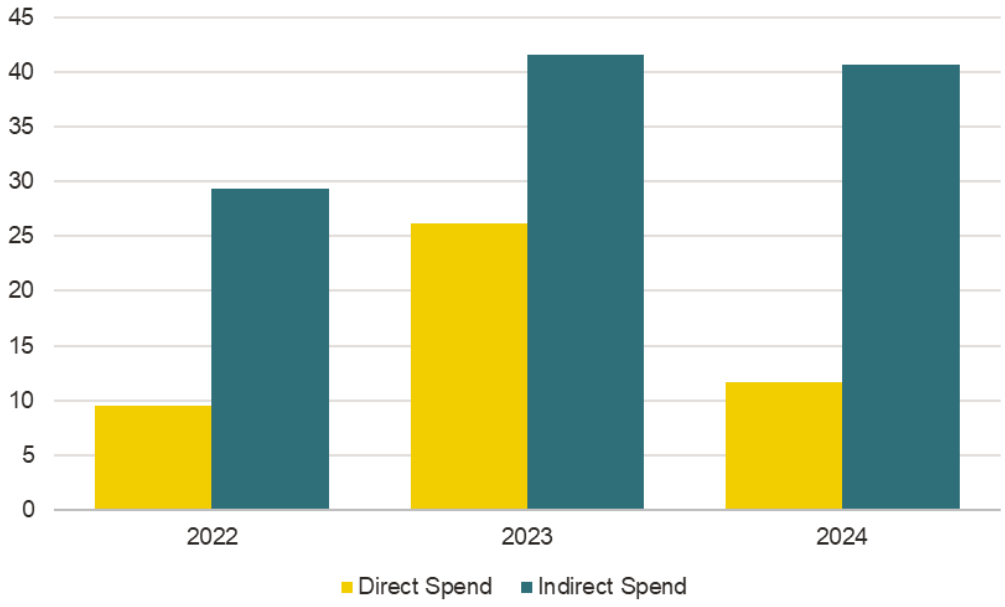
Vertical's procurement spending reflects a mix of direct and indirect expenditure. **Direct spending** relates to activities tied directly to R&D and high-value manufacturing activities (e.g. purchase of specialist components, battery cells, avionics, fuselage structures, and other inputs into Vertical's engineering and testing programme). **Indirect spending**, by contrast, captures the wide range of supporting services required to sustain the business during its development phase, including administrative support, consultancy, legal services, professional software licences, etc.

Indirect expenditure accounted for the largest share of procurement between 2022 and 2024 (Figure 12), though the balance between direct and indirect spending has fluctuated. Direct spend rose sharply in 2023 as aircraft development activity accelerated, before easing again in 2024 as more resources shifted back toward supporting services. This pattern is typical for firms in an intensive R&D phase, where peaks in core engineering and testing alternate with periods requiring greater reliance on external advisory and support services.

Vertical's role as a regional catalyst is evident in the geographic footprint of its procurement spending. Between 2022 and 2024, more than 60% of total expenditure (£112 million) was retained in the UK (Figure 13), with around £35 million directed to suppliers headquartered in the South West, including £15 million in Bristol alone (Figure 14). Key UK-based suppliers contribute across both technical and strategic domains, from advanced manufacturing (e.g. GKN Aerospace) and actuation technologies (e.g. Olsen Actuation), to simulation software (e.g. Dassault Systèmes) and engineering consultancy.

[30] Vertical Aerospace (2024), *Vertical Aerospace to fly at UK's first vertiport testbed* (available here).

## Figure 12 Vertical's procurement expenditure, 2022–2024, by type (£m, cash terms)

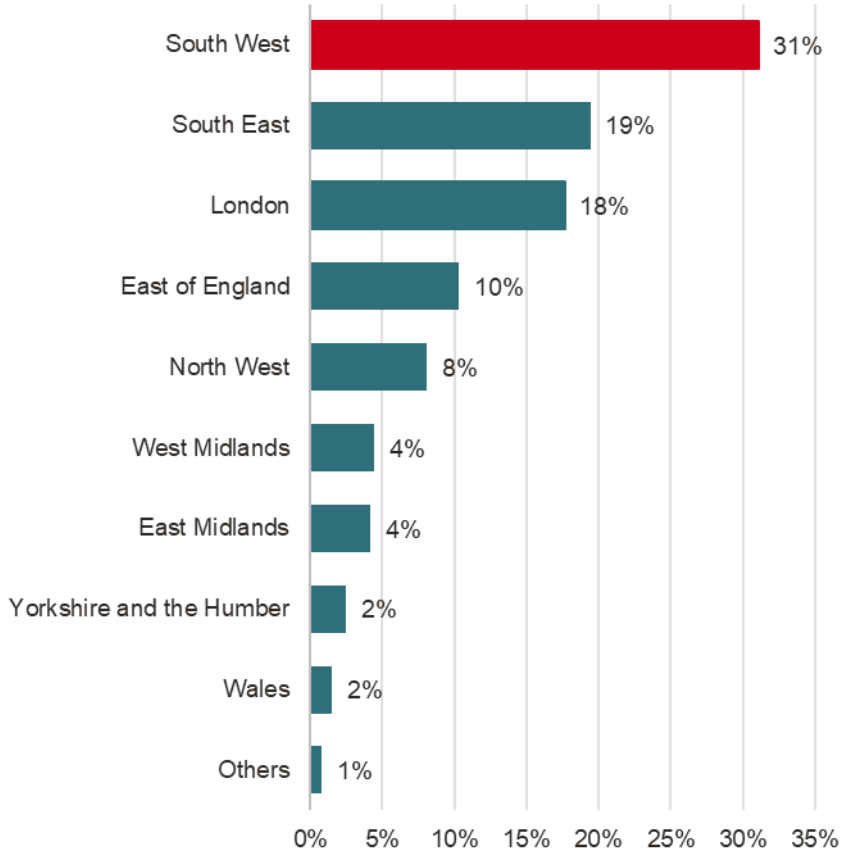



*Source: Vertical's historic procurement information.*

## Figure 13 Share of procurement expenditure by country (cumulative 2022–2024 expenditures)


*Source: Vertical's historic procurement information.*

## Figure 14 Share of UK procurement expenditure, by region (cumulative 2022–2024 expenditures)

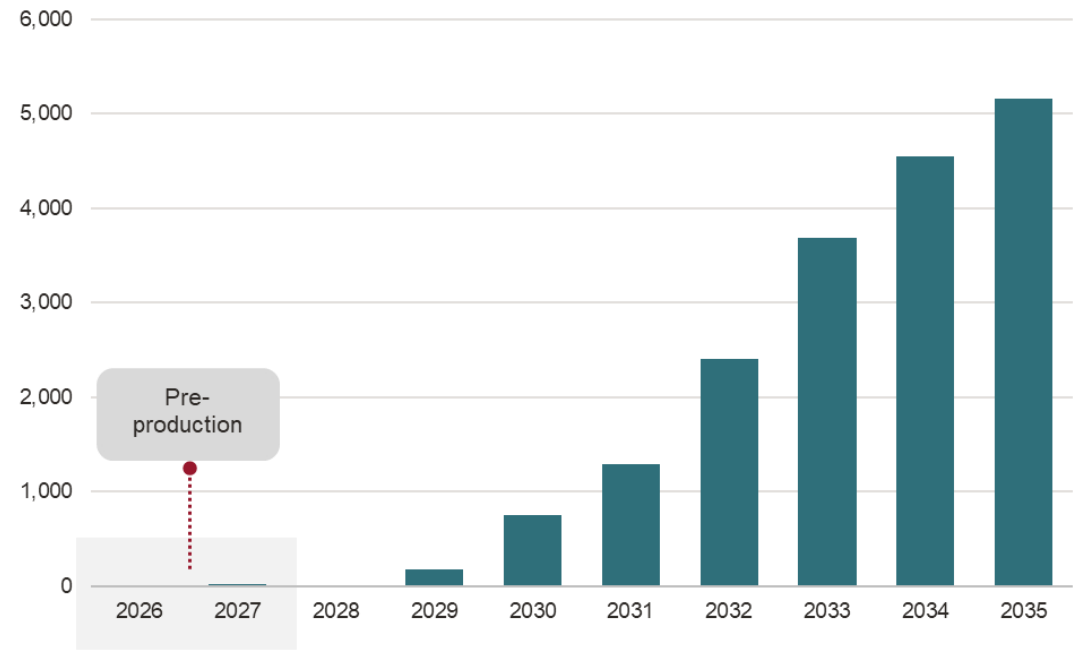



*Source: Vertical's historic procurement information.*
*Note: Others includes Scotland and Northern Ireland*

Vertical's forward projections on direct material expenditure (Figure 15) provide insights into the scale of activity expected during the pre-production and certification phases, as well as the ramp-up to commercial manufacturing. These purchases primarily capture direct inputs required to assemble eVTOL and hybrid VTOL aircraft, as well as battery packs. These material inputs are unlikely to be sourced to a significant degree from the UK, given the need to remain cost-competitive.

However, this specific metric underestimates Vertical's total future procurement expenditure, as it excludes the wide range of indirect costs and services that will accompany full-scale production. It also excludes ongoing external R&D expenditure related to future product development. These expenditures, whose scale is hard to project robustly, are much more likely to be retained in the UK.

## Figure 15 Direct material purchases from aircraft and battery manufacturing (£m, cash terms)




*Source:* *Vertical Aerospace projections.*
*Note:* *Excludes services and indirect costs*

### Local economic benefits around Bristol

Suppliers and local stakeholders see Vertical as a strategically-valuable customer, already stimulating investment and capability-building across the aerospace ecosystem. Several partners remarked that collaboration with a domestic OEM is prompting them to scale up resources and invest in areas of technology that they would not otherwise have pursued, underscoring the additionality of Vertical's role as an anchor customer. By generating demand for advanced inputs such as avionics, composites, and battery systems, Vertical is encouraging suppliers to commit long-term resources to the UK aerospace cluster.

> ***"There is a ripple effect when you have a company like Vertical in the region. They bring in suppliers, they commission research, they partner with universities, and it cascades through the local economy."*** *– Invest Bristol & Bath*

Invest Bristol & Bath also underlined the longer-term significance of Vertical's procurement, pointing out that once commercial operations begin, the maintenance and management of the aircraft fleet will generate many high-value jobs in the Bristol and wider South West area.

The potential economic benefits to the local area can be estimated drawing on government best practice approaches to local economic multipliers, set out in the *Green Book* which sets out how policies and programmes should be subject to economic appraisal. The *Green Book*

recommends that, for high-tech jobs in tradeable sectors (those predominantly selling outside the local area, such as Vertical), a central local employment multiplier value of 1.9 can be applied.[31] Applying this to Vertical's current employment in Bristol estimated at 380 people in 2025, suggests that **more than 720 indirect jobs** could be supported by Vertical in the Bristol area through supply chain and consumption effects. This multiplier potential is aligned with the significant procurement spend in the region highlighted above. The scale of indirect jobs supported will grow in line with direct employment in the region.

## 5.3 Investment in tangible and intangible assets

Investment plays a critical economic role in driving innovation and long-term growth. As part of its journey toward commercialisation, Vertical has invested heavily in R&D to support the design, engineering, and testing of both fully electric and hybrid technologies. These efforts include developing electric propulsion systems, high-performance battery solutions, and advanced flight control technologies, all of which are critical to the UK's ambitions in next-generation aerospace.

*"The pace of innovation with Vertical and the level of collaboration has been top-notch, and what we believe is necessary to succeed in this new market."* – *Honeywell*

As shown in Figure 16, Vertical's R&D expenditure has increased significantly in the last years, rising from under £5 million in 2020 to more than £60 million in 2023, and is projected to peak at nearly £180 million in 2027 before stabilising at around £100 to 120 million per year through to 2035. This sustained investment reflects the company's long-term commitment to innovation and its role in supporting the UK's position in next-generation aerospace and clean technology. For context, Vertical's R&D spend in 2024 is close to the threshold for inclusion in a list compiled by the European Commission of the world's 2,000 largest R&D-investing private companies.[32]

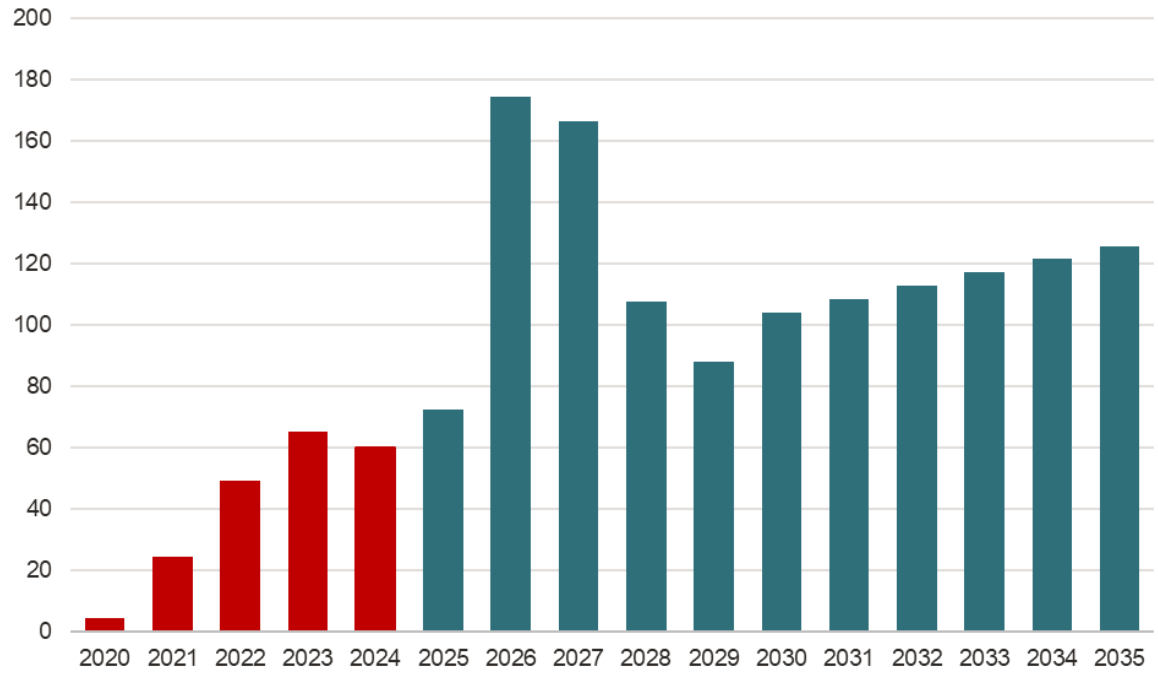
Although significant amounts of R&D spending has been spent overseas on partnerships with external supply chain vendors such as Honeywell, Leonardo and Molicel, more than half of R&D spending is allocated to R&D staff largely located in Bristol.

A share of this expenditure is channelled into collaborative R&D projects, many of which are co-funded (with matched funding from Vertical) through the ATI, Innovate UK and Horizon Europe programmes. These initiatives highlight the important role of public investment in de-risking early-stage innovation, fostering cross-industry and academic collaboration, and enabling companies like Vertical to accelerate the development and commercialisation of next-generation aerospace technologies. These projects are presented in Figure 17.

31 HM Treasury (2022), *The Green Book* (available here).

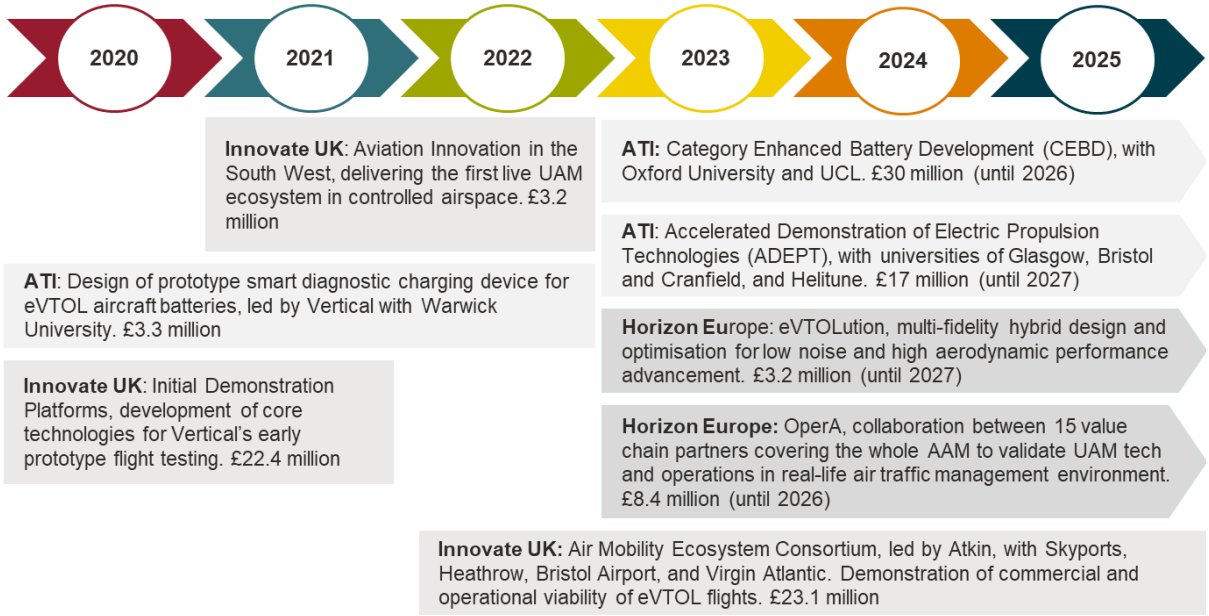
32 European Commission (2024), *The 2024 EU Industrial R&D Investment Scoreboard* (available here).

## Figure 16 R&D expenditure, 2021–2035 (£m, cash terms)




*Source: Vertical's financial accounts submitted to Companies House (2020-2024) and financial projections (2025-2035).*

## Figure 17 Vertical's involvement in R&D projects with public funding




*Source: ATI, UKRI – Gateway to Research, EU Horizon Europe / CORDIS*
*Note: Amounts presented represent total cost of project.*

## Unlocking growth in the battery sector

The battery sector is a strategic priority in the UK Industrial Strategy, recognised as critical for supporting the country's transition to sustainable and secure energy.[33] UK research bodies such as the Faraday Institution are pioneering innovations to meet global demand, with applications that span military systems, freight and logistics, automotive, and energy storage.[34] For Vertical, investment in battery innovation not only supports its aircraft programme but also provides a pathway to diversify revenues and strengthen the long-term sustainability of its business model.

A key example is Vertical's collaboration with the University of Oxford through the Category Enhanced Battery Development (CEBD) initiative, where researchers are studying the performance and safety of lithium-ion batteries for aerospace. The project, supported and partly funded by Aerospace Technology Institute (ATI), is producing peer-reviewed research on new approaches to performance improvement and safety assessment. Vertical's engagement has also created spillovers beyond aerospace. CEBD builds on previous advances in electric vehicle (EV) batteries, and Oxford researchers noted that Formula E (the world's first all-electric motorsport championship) has benefitted from Vertical's thought leadership in battery development.

> ***"We have been able to test (battery) cells that we just simply wouldn't have access to for probably three more years if we went through the university supply chain."*** – ***University of Oxford***

Vertical's approach also supports the circular economy as batteries that have reached the end of their operational life in eVTOL aircraft remain of sufficiently high-quality to be redeployed in other sectors, such as ground electric vehicles or energy storage. This not only reduces waste but also reinforces the sustainability of Vertical's business model while contributing to UK and global decarbonisation goals.


In addition to intangible assets such as intellectual property and technical know-how, Vertical is also investing in tangible infrastructure to anchor capability in the UK. The most significant example is the Vertical Energy Centre (VEC) in Avonmouth, a dedicated facility for battery testing, prototyping, and assembly. Adjacent to this, the company has announced a new battery production facility at the Avonmouth site. Together, these facilities represent a capital investment of approximately £6.4 million across


33 UK Government (2025), *Advanced Manufacturing Sector Plan* (available here).
34 DBT (2023), *UK Battery Strategy* (available here).

2026 and 2027. By locating these facilities in the South West, Vertical helps retain high-value elements of the supply chain within the UK, rather than offshore. The facilities also create spillovers into adjacent industries such as automotive, defence, and energy storage, establishing the first aerospace-focused battery hub in the region.

Vertical is also investing approximately £12.8 million in its first aircraft manufacturing site at Cotswold Airport (Kemble), which will host the initial final assembly line for the VX4 aircraft. The site will play a central role in supporting the aircraft certification process, enabling the production and testing of early production models under regulatory oversight. Further capital investment of around £385 million is planned across five additional sites for aircraft assembly and battery manufacturing. Vertical is currently evaluating location options for these new facilities. Should they be established in the UK, they would further strengthen the country's advanced manufacturing base, create high-value employment and reinforce domestic supply chains.

# 6 Wider benefits

In addition to its direct and indirect contributions, Vertical generates a set of wider benefits that strengthen the UK's advanced aerospace sector and deliver value to society. Evidence from interviews and project data shows that Vertical is not only advancing new technologies but also catalysing spillovers into adjacent sectors, shaping future skills, and supporting the UK's transition toward cleaner, safer aviation.

## 6.1 Skills development

Vertical's operations create significant opportunities for skills development across multiple domains. The company's in-house expertise spans aircraft design, certification, advanced manufacturing, pilot training and customer services. These capabilities are reinforced through partnerships with universities, specialist training providers and global operators.

A flagship initiative is the exclusive partnership with CAE, a global leader in aviation training, to design and deliver the world's first eVTOL-specific pilot training programme. This will combine ground school, simulator sessions and live flight training, based initially in the UK. By 2035, with an estimated 700 aircraft in service worldwide, the programme is expected to train thousands of pilots, including around 300 based in the UK to serve Bristow's fleet. Vertical is also expected to train the first promotion of instructor pilots, who will play a critical role in scaling the programme globally. The scheme provides a continuing revenue stream for Vertical as part of its "ready-to-fly" model, which allows airlines to adopt eVTOL services without having to build in-house expertise.

Vertical has a strong track record of investing in skills development and continues to build capability across the UK's aerospace and innovation ecosystem. In previous years, the company has run internship and research programmes with the University of Bristol and participated in R&D projects such as the ATI-funded CEBD programme, providing structured opportunities for PhD students and postdoctoral researchers to gain industry experience. These initiatives have helped bridge the gap between academia and employment, creating early examples of how Vertical supports skills transfer into the private sector.

> *"There is a lot for postdoctoral research staff to learn, both technically and in terms of work environment. Gaining exposure to wider industry engagement is very helpful."* – *Oxford University*

Vertical's current mid-term skills development strategy focuses on four strategic areas as illustrated in Figure 18. In the long term, Vertical plans to establish the Vertical Aerospace Innovation Academy as the UK's leading hub for future-flight and sustainable aviation skills. The Academy will provide integrated training pathways from entry to Master's level (Levels 3–7), combining aerospace engineering, battery systems, and hybrid-electric propulsion. It will also include a dedicated battery R&D centre linked to Vertical's Avonmouth facility, positioning

the Academy as the UK's flagship for sustainable aviation apprenticeships and advanced manufacturing capability.

## Figure 18 Vertical's mid-term skills development strategy


*Source: Vertical Aerospace*

## 6.2 Induced spending

Induced spending refers to the wider economic activity generated when employees use their wages and salaries to purchase goods and services in the wider economy. This covers everyday expenses such as housing, food, transport, leisure, and local services. It reflects how income earned by Vertical employees circulates through the local community, supporting additional jobs and businesses beyond the advanced aerospace sector.

The scale of this effect depends on where employees live and spend their income. Current data indicates that approximately **95% of employees reside in the Bristol and Kemble areas,** suggesting that the majority of wages paid are likely spent within the local economy. In 2024, the average salary of a Vertical employee, excluding social contributions and pensions, was approximately £70,000. Based on estimated tax payments for higher earners, this equates to an annual take-home wage of around £51,000 per year. According to ONS data, UK households saved an average of 10.5% of their disposable income in 2024,[35] leaving approximately £45,000 per employee available for consumption.

Given that Vertical currently employs around 479 people (including administrative, support, and R&D roles), 455 of which live in Bristol or Kemble, this would equate to an estimated £20.8 million in annual spending available for injection into the local economies. This underlines the company's broader economic contribution to the South West region, beyond its direct operations and supply chain impact.

35 ONS household saving ratio data (available here).

## 6.3 Cluster and agglomeration effects

Vertical is contributing to the strengthening of the UK's advanced aerospace clusters, particularly in the West of England, which is already recognised as one of the country's strongest centres for innovation in advanced manufacturing. The UK Government's Innovation Clusters initiative highlights Bristol and the South West as a hub for aerospace, defence, and clean technology, where leading firms such as Airbus, Boeing, Rolls-Royce, BAE Systems, GKN, and MBDA are co-located with specialist SMEs and research institutions.[36] Within this environment, Vertical adds a new dimension as the only UK-based pure-play eVTOL OEM, helping diversify and modernise the cluster's technological profile of the region.

> *"It would be very difficult to have a UK market without Vertical…there's not really another OEM who is interested in launching within the UK from day one."* – *Skyports*

Vertical's presence brings credibility and visibility to the UK AAM sector internationally. Invest Bristol & Bath, the inward investment service for the West of England Combined Authority (WECA), have highlighted that the company helps put the South West aerospace cluster *"on the map"* not only by investing in new facilities such as the Vertical Energy Centre in Avonmouth but also by hosting foreign delegations and trade missions. This role as a visible anchor firm contributes to the region being recognised as a leader in next-generation aerospace technologies, alongside its established position in commercial aircraft and defence manufacturing.

> *"They [Vertical] have demonstrated an unwavering commitment in the region, it is not just the fact they have their headquarters here where they do a lot of their design and assembly….they invested in their state-of-the-art battery facility here…they do their testing here…so they're much committed to investing and remaining in the West of England."* – *Invest Bristol & Bath*

Vertical has built a network of industrial partners, academic collaborators, and regulatory stakeholders spanning the supply chain. These partnerships generate knowledge spillovers by adapting established technologies to new applications, encouraging suppliers to diversify into areas such as electric propulsion and lightweight materials. Academic engagement further amplifies this role. By linking universities, research institutes, and industry partners into a shared innovation network, Vertical helps translate academic research into commercial solutions while giving students and researchers exposure to real-world challenges. In this way, the company acts as a bridge between research and application, supporting the diffusion of skills and technology across the wider aerospace cluster.

> *"Certifying flight controls for an eVTOL or hybrid is new for us and the industry…so we are learning along with Vertical through their engagement with regulators."* – *Honeywell*

[36] https://www.innovationclusters.dsit.gov.uk/

Importantly, Vertical's close engagement with the UK Civil Aviation Authority (CAA) plays a role in shaping emerging frameworks for eVTOL certification and operations, promoting the integration of UK perspectives rather than leaving standards to be defined entirely by other jurisdictions. This reduces the risk that UK firms are forced to retrofit or adapt to foreign standards, while giving suppliers and operators a clearer pathway to scale. Vertical's progress has effectively brought regulators into the development process, making certification a joint conversation rather than a sequential hurdle.

> ***"Vertical are always in the room with their views on regulation. With Vertical being the most progressed of any UK-based OEM... that naturally brings the CAA on the journey. It's very much a joint conversation."*** *– Bristow*

Knowledge exchange is also facilitated through Vertical's active role in wider industry networks. It has previously contributed to policy development through the Future Aviation Industry Working Group on Airspace Integration (FAIWG:AI),[37] and the Future Flight Community Integration Group,[38] helping to shape early thinking on regulatory and operational frameworks for AAM in the UK. Today, its role as a visible representative of the UK's AAM sector is reinforced by participation in major events such as the Farnborough International Airshow and the Royal International Air Tattoo. In parallel, Vertical continues to play an active part in UK and European R&D consortia (including UKRI's Future Flight Challenge, ATI programmes, and Horizon Europe projects) which help disseminate new insights in propulsion, batteries, and materials across academic, industry, and government partners.

## 6.4 Environmental impact, noise and safety

Vertical aims to deliver an eVTOL aircraft that is as safe as a commercial airliner, quieter than a helicopter, and operates with zero direct emissions. This ambition aligns closely with global demand for cleaner, quieter, and safer modes of transport, particularly in the context of growing urban congestion and environmental targets.

In 2021, the UK set out a Net Zero Strategy, outlining a pathway to decarbonise all sectors of the economy by 2050.[39] While aviation was projected to make a relatively modest contribution to net zero targets compared with other high-emission sectors such as road transport, stakeholders emphasised that aerospace can *"lead by example"* in accelerating clean technology and influencing adjacent sectors.[40] The current government, in its 'Clean Energy Superpower' mission, spotlights the economic opportunity associated with net zero.[41]

37 UKRI (2023), *Let's get flying: Our plan for action – Future Aviation Industry Working Group on Aerospace Integration* (available here).

38 Innovate UK Business Connect (2023), *Transforming aviation together: launching the Future Flight Community Integration Group* (available here).

39 HM Government (2021), *Net Zero Strategy: Build Back Greener* (available here).

40 Frontier Economics (2025), Final Evaluation of the Future Flight Challenge (available here).

41 https://www.gov.uk/missions/clean-energy

AAM technologies such as eVTOLs are increasingly recognised as part of this transition. A recent report estimated that widespread deployment of AAM could reduce UK carbon emissions by up to 222 million tonnes of $CO_2e$ per year by 2040,[42] which is equivalent to over £24 billion in monetary value to society based on UK carbon values.[43] Vertical's aircraft is designed to contribute to these gains by offering a zero-emission alternative to short-haul flights and high-pollution ground transport. Stakeholders also stressed that eVTOLs can substitute for existing helicopter services (where emissions per passenger are disproportionately high) making their contribution to decarbonisation particularly valuable.

*"eVTOLs in the South West can help creating a cluster for green energy in aerospace."* – *Bristol Airport*

Noise reduction is another central element of Vertical's design philosophy. Internal studies suggest that the VX4 produces noise levels that are nearly inaudible above typical city environments, broadly comparable to household appliances. The company's target is to cut operational noise to around half that of helicopters, which is critical both for regulatory approval and for gaining public acceptance of urban air mobility. The Department for Transport estimates that a 1 dB reduction in daytime aviation noise can generate between £22 and £176 per affected household in social value, while a similar reduction at night is valued at between £53 and £134 per household, reflecting the costs of sleep disturbance.[44] By achieving substantially lower noise than helicopters, Vertical's aircraft could therefore deliver significant and valuable social as well as environmental benefits.

*"We are fully committed to go for the highest standard...we think the public would expect the same level of safety as they would when they fly on a large aeroplane."* – *Vertical*

Safety is an area where Vertical has sought to differentiate itself most clearly from competitors. The company is adopting a 'safety-first' philosophy, designing the VX4 to meet the same certification standards as traditional commercial aircraft, applying a systems engineering approach grounded in redundancy, robust validation, and certification readiness. In particular, the company follows the EASA safety target, which requires that catastrophic failures must not occur more than once in a billion flight hours, ten times stricter than the equivalent US standard of one in 100 million hours. To meet this, the VX4 will incorporate triple-redundant flight control computers, each built on different specifications, ensuring that a systemic error or software bug cannot compromise all three simultaneously.

42 PwC (2023), *Advanced Air Mobility: UK Economic Impact Study* (available here).

43 DESNZ (2024), *Traded carbon values used for modelling purposes, 2024* (available here).

44 See https://www.gov.uk/guidance/noise-pollution-economic-analysis for an explanation of the principles of valuing noise reduction and https://www.gov.uk/government/publications/tag-data-book (Table A3.1) for the detailed marginal values.

# 7 Strategic alignment with government policy

Vertical's activities align closely with the UK Government's Modern Industrial Strategy (in particular, its Advanced Manufacturing Plan) as well as wider national priorities. These frameworks emphasise innovation-led growth, advanced manufacturing, the UK's new defence obligations, and the transition to a net zero economy, all areas where Vertical is delivering tangible contributions.

In particular, the Industrial Strategy highlights the importance of the 'IS-8' sectors – eight key areas identified as having the greatest potential to deliver new economic opportunities for the UK.[45] One of these is Advanced Manufacturing, where the sector plan emphasises the need to invest in developing *"…the next generation of more efficient and zero emissions aircraft."* It further recognises the emerging role of the AAM sector, stating that:[46]

> *"The Government will support the development of safe, secure, and sustainable advanced air mobility aircraft, such as drones and electric vertical take-off and landing (eVTOLs) aircraft..."* (p.39)

Within this policy landscape, Vertical directly supports several national missions:

- **Advancing place-based growth:** A core feature of the Industrial Strategy is its place-based approach, which positions city regions and industrial clusters as drivers of long-term growth. In the West of England, the Combined Authority has identified aerospace as a flagship sector within its forthcoming 10-year Local Growth Plan. Vertical plays a leading role in this regional strategy as an anchor employer and innovation catalyst, with its sites in Bristol, Avonmouth, and Kemble supporting high-value jobs, supplier investment, and R&D capacity. According to Invest Bristol & Bath, the company is expected to feature prominently in forthcoming regional growth plans, reflecting its pivotal role in clean aviation and advanced manufacturing.

> ***"Vertical has acted as a catalyst for a huge amount of activity in this area, attracting not only highly skilled people but also significant investment from abroad...we are working on a plan in line with the Industrial Strategy...Vertical will be a key player."*** *– Invest Bristol & Bath*

- **Driving innovation and manufacturing capability:** Vertical supports the IS-8 Advanced Aerospace and Battery Hub priority by investing in electric propulsion, battery systems, and hybrid technologies that strengthen the UK's competitiveness in next-generation aerospace manufacturing.
- **Scaling emerging markets and attracting investment:** Through the VX4 eVTOL and hybrid VTOL programme, Vertical is helping establish a UK-led AAM market with strong export potential. Its activities are already attracting private and foreign investment, anchoring R&D and supply-chain capabilities domestically

45 UK Government (2025), *The UK's Modern Industrial Strategy* (available here).
46 UK Government (2025), *Advanced Manufacturing Sector Plan* (available here).

- **Supporting decarbonisation:** The VX4 eVTOL is designed as a zero-emission aircraft with substantially lower noise levels, directly contributing to the UK's Net Zero 2050 ambitions while meeting the highest safety standards.

Vertical is still relatively early in its journey, but it is laying the foundations for technologies with the potential to generate major economic returns over the next decade. Experience from other UK regions (Figure 19), demonstrates how innovative clusters can deliver sustained benefits. Vertical is well positioned to play a comparable role in aerospace for the West of England.

## Figure 19 Examples of UK regional development from innovative industries

### The 'blue economy' in the Scottish Highlands

There is a pressing need to decarbonise shipping, with maritime accounting for around 8% of the UK's transport emissions.[1] The 'blue economy' relates to sustainable economic activities associated with coastal regions and seas. In recent years, the Scottish Highlands and Islands have seen a strong cluster emerge, building on traditional strengths in shipping and maritime.

The broader marine economy was estimated to employ 22,200 people in the region in 2019, contributing more than £700 million in GVA. The blue economy represents an adaptation to the new economic opportunities associated with sustainability to provide new jobs, businesses and activity to the region, anchored by the presence of large multinationals in the area, innovative SMEs and key research expertise.[2]

Recent Highlands and Islands Enterprise analysis has suggested that marine energy projects could attract almost £2.9 billion of investment to the region by 2040, supporting more than 12,000 jobs in construction and development. The aquaculture sector generated almost £340 million in GVA for Scotland in 2022, the majority within the Highlands and Islands region.[3]

[1] Department for Transport (2025), Maritime Decarbonisation Strategy
[2] Innovation Caucus (2023), Understanding Cluster Growth Potential
[3] HIE (2025), Regional Transformational Opportunities in the Highlands and Islands

### The space sector in North-East England

The space sector has attracted significant attention in the UK for its growth potential building on traditional strengths in aviation and aerospace. The 2021 National Space Strategy estimated that the sector supported more than 45,000 jobs, with opportunities across the UK.[1]

A significant cluster of economic activity relating to space has emerged in North-East England. The sector is estimated to have grown from 34 companies in the region in 2016/17 to 81 in 2022/23, faster than national average growth. Over the same period, regional employment in the sector grew from 910 to 1,310, and income from £95 million to £168 million.[2]

While still a small part of the UK space sector, the North-East cluster has built on historical regional strengths in communications, computing and electronics, local research strengths at Newcastle, Northumbiria and Durham Universities, and the presence of anchor companies like Airbus. The cluster has attracted inward investment, such as the acquisition of innovative SME NORSS by Raytheon in 2022. The sector also benefits from regional networks such as Space North-East England, supported by the UK Space Agency.

[1] HM Government (2021), National Space Strategy
[2] UK Space Agency (2025), The Size and Health of the UK Space Industry 2024

*Source: Frontier Economics*

# 8 Conclusions

This report has assessed the economic and wider impacts of Vertical Aerospace, a company at the forefront of the UK's emerging AAM sector. The evidence presented demonstrates that Vertical is already generating measurable value across multiple dimensions, despite still being in a pre-revenue, R&D-intensive phase.

**Direct benefits** are visible through the creation of 479 high-value jobs as of 2025, with employment projected to reach 2,200 FTE roles by 2035. Vertical pays wages well above regional and sectoral averages, and generates significant tax contributions which already exceed the value of R&D tax credits claimed on average. This net tax contribution is projected to grow significantly as commercial operations begin. With nearly 80% of its staff based in Bristol, and 97% employed in the UK, Vertical is acting as a regional anchor employer, ensuring that the gains from aerospace innovation are embedded in the UK economy.

By 2035, total revenues are projected to reach nearly £9 billion, with around 90% generated from international sales, positioning Vertical as one of the UK's leading future aerospace exporters.

Overall, the company's cumulative GVA contribution to the economy is projected at £3 billion by 2035, much of which could accrue to the UK depending on where aircraft assembly and battery manufacturing are based.

**Indirect benefits** flow through Vertical's procurement footprint, with over 60% of supplier spending between 2022 and 2024 retained within the UK, with the largest share in the South West. This supports additional local jobs, with over 720 indirect jobs supported in the Bristol area based on local employment multipliers recommended by UK Government.

By acting as an anchor customer, the company stimulates supplier investment in advanced inputs such as avionics, battery systems, and composites. These partnerships not only support capability-building among UK-based suppliers but also catalyse broader innovation, with spillovers into adjacent industries including energy storage. Vertical plans to invest significantly (around £400 million) in developing new facilities for aircraft assembly and battery manufacturing. If realised in the UK, this investment would anchor high-value activity domestically and strengthen the country's advanced manufacturing base.

**Wider benefits** extend beyond Vertical's immediate economic activity. The company plays an active role in the diffusion of knowledge and skills development, working with universities and research institutes, investing in early-career training, and engaging in policy forums that shape the regulatory environment. The concentration of local employment around Bristol and Kemble generates significant induced expenditure, further benefitting these local economies.

The company is strengthening the South West's position as a hub for advanced aerospace, attracting foreign delegations, and contributing to the UK's visibility as a leader in next-generation aviation. Its environmental and safety ambitions (i.e. developing aircraft that are

zero-emission, substantially quieter than helicopters, and designed to meet the highest certification standards) further align its activities with national policy priorities and societal expectations.

Looking ahead, the greatest opportunities lie in the scaling of Vertical's operations post-certification. Manufacturing, aftermarket services, and commercial deployment will multiply its economic footprint, creating new jobs and deepening supply chain engagement. At the same time, its work on hybrid-electric platforms opens new markets in defence, logistics, and long-range travel, reinforcing the UK's potential to lead in sustainable aviation technologies. Some of these benefits, however, depend on whether Vertical bases manufacturing in the UK. Vertical is currently assessing options for future production sites, and if manufacturing were to take place overseas, the scale of domestic employment and GVA impacts would be correspondingly reduced.

Stakeholder interviews confirm that Vertical has established itself as a critical anchor for the UK's AAM sector, with particularly strong impacts around the Bristol region. Its role spans direct employment, supply chain development, and wider benefits in research, skills, and regulation. A consistent theme across interviews is that these outcomes would not have occurred without Vertical. The company is widely viewed as the UK's only credible eVTOL OEM, positioning both the region and the country as a serious global player in this nascent sector. Stakeholders repeatedly emphasised that Vertical's presence provides credibility, visibility and momentum to the UK's AAM industry at a pivotal stage.

Overall, Vertical Aerospace exemplifies how a single innovative firm can act as a catalyst for economic growth, industrial capability, and technological leadership. Its trajectory illustrates the importance of sustained investment in R&D-intensive companies, not only for the economic value they generate directly but also for the broader ecosystems they enable. With continued support and effective policy alignment, Vertical has the potential to play a transformative role in the UK's aerospace future, anchoring high-value activity, advancing the net zero transition, and shaping the next generation of global aviation.

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