

## 1.1.3 Helicopters

Airbus Helicopters is a global leader in the civil and military rotorcraft market, offering one of the most complete and modern range of helicopters and related services. This product range currently includes light single-engine, light twin-engine, medium and medium-heavy rotorcraft, which are adaptable to all kinds of mission types based on customer needs. See “— 1.1.1 Overview” for an introduction to Airbus Helicopters.

### Strategy

#### Business Ambition

Airbus Helicopters continues to execute its ambition to lead the helicopter market, build end-to-end solutions and grow new VTOL businesses, while being financially sound.

The strategic priorities of Airbus Helicopters are:

- *Business Resilience*: Airbus Helicopters' challenge will be the preservation of its resilience in terms of growth, profitability and robustness of its business model for both helicopters and new VTOLS;
- *Customer Loyalty*: Airbus Helicopters continues to offer the best in class products and services to grow in the value chain of its customers and continuously improve customer satisfaction;
- *Future Growing Markets*: Airbus Helicopters continues to develop partnerships and governmental cooperation to reinforce its positioning on the market and influence legislation impacting the helicopters business;
- *Innovation*: Airbus Helicopters continues to build an innovative eco-system, develop demonstrators and deploy platforms and services.

#### Transformation

The Division remains focused on product safety, quality and lead time to continuously improve customer satisfaction.

Airbus Helicopters continues to refine and execute its transformation plan in order to maintain its competitiveness in the face of market evolutions and retain its ability to invest in the future.

#### Commitment to Innovation

After accumulating around 1,500 flight hours, the H160 flight test aircraft have finished the last of the certification flight tests. The prototypes are now being used to develop the specific and optional equipment required for the many missions the H160 will address in the years following its entry into service in 2020 (e.g., emergency medical services, private and business aviation, oil and gas transportation, search and rescue).

The H160 aircraft are also continuing the “Operator Zero” campaign, designed to fine-tune the maintenance plan and associated work cards, 3D technical publication, and tooling to ensure a smooth entry into service for this comfortable, next-generation, urban-friendly helicopter.

The HIL programme, for which the Airbus Helicopters' H160 was selected in 2017, was initially scheduled for launch in 2022 by the current military budget law. Launching the programme earlier will enable delivery of the first H160Ms to the French Armed Forces to be advanced to 2026. The H160 was designed to be a modular helicopter, enabling its military version, with a single platform, to perform missions ranging from commando infiltration to air intercept, fire support, and anti-ship warfare in order to meet the needs of the army, the navy and the air force through the HIL programme.

The new five-bladed H145 is on track for EASA and FAA certification in 2020. To ensure these certifications, two five-bladed prototypes have clocked more than 400 flight hours in extensive flight test campaigns in Germany, France, Spain, Finland, and in South America. First deliveries of the new H145 are scheduled for the second half of 2020, for EMS, parapublic and VIP customers. The helicopter features an innovative, five-bladed bearingless rotor that increases the useful load by 150 kilograms (330 pounds), while also offering crew and passengers a smoother ride and more comfort on-board the helicopter.

Airbus Helicopters has simultaneously been focusing on long term innovation in order to develop and mature the technobricks (e.g., autonomy, electrification, connectivity) that might benefit the “traditional” helicopter platforms of tomorrow as well as new VTOL architectures such as high-speed helicopters (Racer), eVTOL (CityAirbus) or unmanned platforms (VSR700). The light helicopter demonstrator research programme, announced at the Paris Air Show last year, in conjunction with the French Ministry of Transport (DGAC) will deliver new standards in terms of safety by providing pilots of single-engine rotorcraft more flexibility to perform autorotation in case of an engine shutdown thanks to an electrical back-up system. Further evolutions of the same technology could also pave the way to a significant reduction in fuel consumption and sound levels.

The VSR700 is a fully-fledged unmanned aerial system, capitalising on Airbus Helicopters' extensive experience of advanced autopilot systems and engineering expertise to provide modern militaries with new capabilities. It offers the best balance of payload capability, endurance and operational cost. It is capable of carrying multiple full-size naval sensors for extended periods and can operate in existing ships, alongside a helicopter, with a low logistical footprint. The first flight of the VSR700 prototype took place on 8 November 2019 and was a major milestone for the programme as progress is made on the operational demonstrator for the French Navy that will perform trials in 2021 in partnership with Naval Group.

Airbus Helicopters is also actively involved in Urban Air Mobility (UAM) via several commercial projects, CityAirbus and Racer. Airbus Helicopters has furthermore partnered with EASA to explore to harness their respective experience and know-how to bring the next generation of VTOL platforms to life, along with the necessary regulatory framework to support them.

## Focusing on Customers

Airbus Helicopters' top priority from a customer support and service perspective is to ensure its work results in the best customer experience possible. In 2019, the Division focused on digitisation, analytics and integrated global contracts, such as HCare Smart and HCare Infinite, as key ways to help customers increase availability and mission success, optimise their costs, lower the maintenance burden, and enhance the safety of their aircraft.

With customers at various stages of the digitisation journey, Airbus Helicopters has invested in new services that help operators make the most of their data. These range from setting up the basics of a paperless organisation, to capturing and storing the rich troves of data generated by each flight or activity, to then applying data analytics for better decision-making. By the end of 2019, around 1,000 helicopters were sharing data with Airbus Helicopters. Likewise, the number of helicopters covered by an HCare Smart or Infinite contract increased by approximately 10%, with around 95% of HCare Smart parts-by-the-hour and full-by-the-hour customers opting to extend their contracts with Airbus Helicopters.

## Delivering Safety

Airbus Helicopters' chief priority is to enhance flight safety for the thousands of men and women around the world who are transported in its aircraft every day. It is envisaged to, by 2028, reduce by 50% the accident rate and have no technical contribution to accidents. Airbus Helicopters also aims to be the forerunner of Product & Operational Aviation Safety breakthrough.

In order to achieve these goals, Airbus Helicopters strives to:

- define and develop new safety measures and initiatives to support the safe operation of its aircraft by customers;
- introduce design changes for all families of helicopters with a strong emphasis on safety criteria and leveraging big data to detect weak signals.

This commitment to safety is also reflected across all divisional internal activities involving the lifecycle of a helicopter, with focus on meeting industry quality and safety standards with an emphasis on safety culture development.

## Market Drivers

According to market forecasts produced by Airbus Helicopters, around 22,000 civil helicopters and 14,000 military helicopters are expected to be built globally over the next 20 years. Overall, the global helicopter market is still evolving in a challenging environment.

Helicopters sold in the civil and parapublic sector, where Airbus Helicopters is a leader, provide transport for private owners and corporate executives, offshore oil operations, diverse commercial applications and state agencies, including coast guard, police, medical and fire-fighting services. Thanks to its existing mission segment diversity, the helicopter market (both Platforms and Services activities) is expected to be resilient through the coming decade, even though one of the key segments, Oil & Gas (in value), continues to experience challenging conditions. Airbus Helicopters expects market to remain challenging in the short term but believes that the demand over the next 20 years will be driven by large replacement needs from advanced economies

and by growth from emerging countries (especially in Asia still largely under equipped). Airbus Helicopters' market data indicates that in 2019, worldwide deliveries of civil and parapublic turbine helicopters of five seats and above stood at ~450 units. Demand for military helicopters and related services is mainly driven by budgetary and strategic considerations, and the need to replace ageing fleets. Airbus Helicopters believes that the advanced age of current fleets, the emergence of a new generation of helicopters equipped with integrated systems and the ongoing introduction of combat helicopters into many national armed forces will contribute to increased military helicopter procurement in the medium term. Nevertheless, demand from the military sector has historically been subject to large year-to-year variations due to evolving strategic considerations, and may be limited, due to budgetary constraints on public spending in some regions like Western Europe and Middle East, while other regions like Asia Pacific or Eastern Europe are expected to continue to grow. Despite recent threats and a growing geopolitical instability, which has accelerated military spending and a reassessment of defence budgets, the military market is still low in 2019. Economic difficulties (*i.e.* low commodities prices), saturation of the Western countries markets as well as priorities given to operational needs (*e.g.*, spare parts, availability improvement) have resulted in a decrease for all mission segments. According to Airbus Helicopters' market data, worldwide deliveries of military turbine helicopters have decreased to 560 units in 2019.

## Competition

Airbus Helicopters' primary competitors in the civil and parapublic sector are Leonardo and Bell Helicopter.

The civil and parapublic sector has seen more local competitors in recent years (China, India, Japan, South Korea, Turkey). Airbus Helicopters has maintained its leading market share (in bookings of 2.0t helicopters and five seats and above), in a low market, with 60% in unit in 2019, followed by Leonardo and Bell with respectively 16% and 11%.

Airbus Helicopters' main competitors in the military sector are Sikorsky, Boeing and Russian Helicopters, thanks to large captive market and strong political support for export.

The military sector is highly competitive and is characterised by major restrictions on foreign manufacturers' access to the domestic defence bidding process (*i.e.* USA, China, Russia). Thanks to major military campaigns (NH90, H225 and H145M), in 2019 Airbus Helicopters maintained a market share in this sector of 13%. The Division will continue to focus on large military campaigns in 2020.

## Customers

More than 3,000 operators currently fly Airbus Helicopters' rotorcraft in over 150 countries. Airbus Helicopters' principal military clients are Ministries of Defence ("MoDs") in Europe, Asia, the US and Latin America. In the civil and parapublic sector, Airbus Helicopters has a leading market share in Europe, the Americas and Asia-Pacific.

With 54% of the worldwide market share-based on deliveries in 2019, the versatility and reliability of Airbus Helicopters products have made them the preferred choice of the most prominent civil and parapublic customers (turbine helicopters of five seats and above).

## Products and Services

Airbus Helicopters offers a complete range of helicopters that covers nearly the entire civil and military market spectrum, which it continuously improves with leading-edge technologies. This product range includes single-engine, light twin-engine,

medium and medium-heavy helicopters, and is based on a series of new-generation platforms designed to be adaptable to both military and civil applications. In addition, products share multiple technical features as part of a family concept approach.

The following table sets forth Airbus Helicopters' existing product line, consisting of optimised products for different mission types:

Helicopter Type	Primary Missions
<b>Single Engine ("Ecoureuil" family)</b>	
H125 "Ecoureuil" / H125M "Fennec"	Public Services <sup>(1)</sup> , Military Utility <sup>(2)</sup> & Armed Reconnaissance, Corporate / Private, Commercial Pax Transport & Aerial Work
H130	Commercial Pax Transport & Multipurpose, Emergency Medical, Tourism, Corporate / Private
<b>Light Twin Engine</b>	
H135 / H135M	VIP, Military Utility & Armed Reconnaissance, Emergency Medical, Public Services <sup>(1)</sup>
H145 / LUH (UH-72) / H145M	VIP, Military Utility <sup>(2)</sup> , Emergency Medical, Public Services <sup>(1)</sup>
<b>Medium ("Dauphin" family)</b>	
AS365 "Dauphin" / AS565 "Panther"	Military Naval Warfare Mission & Maritime Security, Public Services <sup>(1)</sup> (in particular Coast Guard & SAR), Oil & Gas, Commercial Pax Transport & Multipurpose
H155	Corporate / Private, VIP, Oil & Gas, Public Services <sup>(1)</sup>
H160	Corporate / Private, VIP, Oil & Gas, Public Services <sup>(1)</sup>
H175	Corporate / Private, VIP, SAR, Emergency Medical, Public Services <sup>(1)</sup> , Oil & Gas
<b>Medium-Heavy</b>	
H215 "Super Puma" / H215M "Cougar"	Civil Utility, Military Transport / SAR, Oil & Gas
H225 / H225M	SAR, Combat-SAR, Military Transport, Oil & Gas, VIP, Public Services <sup>(1)</sup>
NH90 (TTH / NFH)	SAR, Military Transport, Naval
<b>Attack</b>	
Tiger	Combat, Armed Reconnaissance / Escort

(1) Public Services includes homeland security, law enforcement, fire-fighting, border patrol, coast guard and public agency emergency medical services.

(2) Civil Utility includes different kinds of commercial activities such as aerial works, electrical new gathering (ENG), passenger and cargo transport.

## Civil Range

Airbus Helicopters' civil range includes single-engine, light twin-engine, medium and medium-heavy helicopters, which are adaptable to all mission types based on customer needs. To maintain and strengthen its competitive edge in the civil sector, Airbus Helicopters is maintaining R&D investments including:

- certification of the H160, which performed its first serial flight in December 2018;
- improvement of the existing range (i.e. H145 D3) in the field of performances and safety in order to meet customer's requirements;
- preparing the future H generation with major upgrades and new products pursuing a fast-paced product range renewal.

## Military Range

Airbus Helicopters' military range comprises platforms derived from its commercial range (such as the H145M and H225M respectively derived from the H145 and H225) as well as purely military platforms developed for armed forces (the NH90 and the Tiger).

Designed for modern multi-mission capabilities and cost effectiveness throughout its lifecycle, the NH90 has been developed as a multi-role helicopter for both tactical transport

(TTH) and naval (NFH) applications. The programme, mainly financed by the governments of France, Germany, Italy and the Netherlands, has been jointly developed by Airbus Helicopters, Leonardo of Italy and Fokker Services of the Netherlands as joint partners in NATO Helicopter Industries ("NHI") in direct proportion to their countries' expressed procurement commitments. Airbus Helicopters' share of NHI is 62.5%. There were 32 NH90 deliveries in 2019, for a cumulative total of 412 deliveries as of the end of 2019. The NH90 fleet has accumulated ~230 000 flight hours.

The Tiger combat attack helicopter programme includes four variants based on the same airframe: the HAP (turreted gun, rockets and air-to-air missile); the UHT (antitank missile, air-to-air missile, axial gun and rockets); the ARH (antitank missile, turreted gun and rockets); and the HAD (antitank missile, air-to-air missile, turreted gun, rockets and upgraded avionics and engines). Overall in 2019, 4 Tigers were delivered, for a cumulative total of 184 deliveries by year-end. The Tiger fleet has accumulated more than 136,000 flight hours.

Airbus is also a major contractor to the US Army, having been chosen to supply the service's UH-72A Lakota helicopter. As of 1 January 2020, 468 aircraft had been delivered to the US Department of Defense for operation by US Army and Army National Guard units, the Navy and foreign military sales buyers.

## Customer Services

With more than 3,000 operators in over 150 countries, Airbus Helicopters has a large fleet of some 12,000 in-service rotorcraft to support. As a result, customer service activities to support this large fleet generated 43% of Airbus Helicopters' revenues for 2019.

Airbus Helicopters' customer service activities consist primarily of maintenance, repairs, spare parts supply, training and technical support. In order to provide efficient worldwide service, Airbus Helicopters has established an international network of subsidiaries, authorised distributors and service centres.

## Industrial Strategy

Implementing a new industrial model is one of the fundamental components of the Division transformation, enabling it to be more competitive, by controlling costs, while meeting the highest requirements in terms of quality and safety. The 3 pillars of the new industrial model are site specialisation, a new industrial architecture, and the deployment of flexible assembly lines.

Specialised sites contribute to anchoring quality and safety fundamentals while boosting Airbus Helicopters' competitiveness. Like many manufacturers, one of the objectives is to produce each helicopter sub-assembly at a dedicated site. This means that the

production sites are focused either on manufacturing operations with high added value or with a specific technological content. A good example of this transformation is the Paris-Le Bourget site, where all of Airbus Helicopters' blade design, industrialisation and production activities will be concentrated. The specialisation of these sites makes it possible to avoid the duplication of skills and industrial means.

Thanks to the redistribution of operations and economies of scale, each site contributes to the optimised production of the entire range and becomes more resilient to market fluctuations.

The helicopter is divided into major sub-assemblies that can be produced, assembled, and tested in parallel, thus shortening the industrial cycle. The H160 is designed to be assembled in just 40 days thanks to this new architecture. Reducing end to end cycles is a key driver of competitiveness as well as an answer to customer requirements.

Rendering industrial system more modular through flexible assembly lines is an additional means to enhance its competitive edge on the market.

In a versatile market context, our assembly lines must be able to assemble several different types of helicopters. This multi-product capability will be a key factor in terms of flexibility.

## 1.1.4 Defence and Space

Airbus Defence and Space develops, produces and maintains cutting-edge products, systems and services, enabling governments, institutions and commercial customers to protect people and resources.

Airbus Defence and Space is organised in four Programme Lines: Military Aircraft; Space Systems; Connected Intelligence; and Unmanned Aerial Systems, which focus respectively on the following key activities:

- Military Aircraft designs, develops, delivers and supports military aircraft. It is the leading fixed-wing military aircraft centre in Europe, and one of the market leaders for combat, mission, transport and tanker aircraft worldwide. Key products include the Eurofighter Typhoon, the A400M, the A330 Multi Role Tanker Transport (“MRTT”) and the C295;
- Space Systems covers a broad range of civil and military space offerings. Its satellite solutions for telecommunications, earth observation, navigation and science include spacecraft, ground segments and payloads for institutional customers as well as the export market. It also manufactures orbital and space exploration systems. Space transportation capabilities (comprising launchers and services) are offered via ArianeGroup, a 50/50 Airbus-Safran joint venture;
- Connected Intelligence includes five main business clusters: Secure Communications, Intelligence, Cyber Security, Security Solutions and Secure Land Communications. These clusters develop specific solutions for defence, governmental, civil and commercial customers;
- Unmanned Aerial Systems (“UAS”) develops, delivers and operates UAS and UAV (unmanned aerial vehicles) solutions for airborne intelligence, surveillance, reconnaissance, and combat missions.

## Strategy

The strategic ambition of Airbus Defence and Space is to shape and deliver the future of European Air and Space and become one of the world's leading providers of smart aerospace and defence solutions.

To achieve this, Airbus Defence and Space is applying its strategy across three domains:

- **Defence:** Airbus Defence and Space is leveraging momentum in Franco-German cooperation and pursuing new European programme opportunities as it works to deliver its vision for Future Air Power. Key opportunities include FCAS, Eurodrone, Maritime Airborne Warfare System, special mission aircraft, and space situational awareness initiatives, among others. The Division is concurrently working to shape and address future secure, upgradeable, and dynamic network and Command and Control architecture requirements while continuing to evolve existing platforms and capabilities (e.g., Eurofighter Typhoon, A330 MRTT, A400M, C-295, predictive aircraft maintenance) for long-term competitiveness and value to future force structures;
- **Space:** Airbus Defence and Space will leverage its position as Europe's space leader to drive market competitiveness, working with European governments and institutions to ensure the long-term health of the entire European space industrial base. In tandem, Airbus Defence and Space will evolve its product portfolio (e.g., equipment, satellites, vehicles and infrastructure) and take a targeted approach to international expansion. In parallel, Airbus Defence and Space is developing end-to-end solutions and accelerating new products and services to strengthen its position across the space value chain;