



# vertiflite Commentary

## Investing in Tomorrow's Civil Rotorcraft

By Mike Hirschberg, Executive Director

The global rotorcraft market is rapidly transforming from one where militaries were by far the dominant customer – particularly in the United States – to one where civil aircraft will be equally important. With \$100B in predicted global civil rotorcraft production over the next decade, companies and governments around the world are investing in near-term products and longer-term capability leaps. The United States government, however, plans to decimate research on addressing civil rotorcraft limitations.

**T**he global defense market has increased nearly fivefold over the past 10 years, from \$4.3B in 2004 to just under \$20B today. Over the next five years, according to Forecast International, global military demand will fall by more than 25% to \$14B in 2019. [All numbers in constant 2014 values.]

In contrast, the value of civil helicopter production was \$3.1B in 2004 and peaked in 2008 at \$7.8B, soon after the beginning of the global economic recession. After a few years of decline and recovery, this figure is expected to exceed this year, with 2014 estimated at \$8.3B. Production is furthermore forecast to continue to increase year after year, reaching \$11.2B in 2019 – an increase of more than 33% from today, and bringing it nearly on par with global defense spending.

Demand predictions more than five years out are obviously increasingly speculative, but Forecast International predicts that civil helicopter production through 2028 will remain above \$10B in nearly every year; defense purchases are forecast to fall below this level beginning in 2025.

In an effort to capture as much as possible of this huge future market and



provide revolutionary new transportation capabilities with a reduced environmental impact, the European Union has launched Clean Sky 2 with the aim of “meeting society’s needs and increasing the global competitiveness of the aeronautics industry in Europe and its supply chain.” Two concepts are being studied under the “Fast Rotorcraft Aircraft” program: the LifeRCraft extrapolation of the Airbus Helicopters X<sup>3</sup> and the Next Generation Civil TiltRotor (NextGenCTR), led by AgustaWestland. Expenditures of more than €250M (\$350M) for each concept are planned, with demonstrator flights beginning in 2019.

Russia and China are also making significant investments in developing next generation civil rotorcraft. The US government, however, appears poised to eschew its opportunity to similarly invest in civil rotorcraft to reduce noise, accidents and impacts on the environment.

With the transformation of the US helicopter manufacturers from a defense-dominated industry to one that will eventually be more balanced with civil rotorcraft (as it was a decade ago), several companies have made

significant investments in new products to meet the growing demand. First flights of at least five completely new aircraft are expected by the end of this year: the Bell 505 Jet Ranger X and 525 Relentless; the Enstrom TH180 trainer; and the Sikorsky CH-53K King Stallion and S-97 Raider – while these final two examples are focused on the military customer, there are equally relevant civil applications for their capabilities. All of these aircraft, with the exception of the CH-53K, were solely funded by the companies.

At the same time that the American defense industry draws down from its war-funded peak, customers and the public are becoming more demanding of civil rotorcraft and discontented with their limitations. Communities are decrying the intrusion of helicopter noise, with politicians legislating solutions or forcing regulations to impair helicopter operations. Accident rates are slowly improving, but fatalities are not. The media often sensationalize accidents – particularly fatal accidents – while the public is coming to expect airliner levels of safety.

**A**gainst this background, recent investments by the US government in civil rotorcraft technology have been steadily dropping. A decade and a half ago, the annual rotorcraft budget at NASA – the primary US government agency responsible for this research – was more than \$50M, while over 2006-2012, funding averaged more than \$30M. In 2013, NASA’s Rotary Wing project, however, was downsized significantly from about 100 civil servants to around 75, working with only \$23M per year.

Unfortunately, the Obama Administration’s budget for Fiscal Year

2015 included even more cuts to NASA rotorcraft research. The request submitted to the US Congress for the rechristened Revolutionary Vertical Lift Technology (RVLT) project was a paltry \$15M. This \$8M reduction is a cut of nearly 30% in just one year, and puts the project at half of what the budget was just three years ago. In fact, the only area that was specifically targeted for reduction in NASA Aeronautics was rotary wing research. This rapid decline over the last three years has created wasteful truncations of promising research and made the agency an unreliable partner, with the fear this could portend a complete divestiture of vertical flight in coming years.

Many of NASA's vertical flight experts will likely be reassigned, and their research discontinued. Their groundbreaking safety-related work in crash safety and survivability, icing research, and handling qualities would all be halted under the President's Budget, ironically submitted just weeks after the National Transportation Safety Board added helicopter accidents to its "Top 10 Most Wanted List."

While even the fully-funded \$30M rotorcraft budget was significantly less than the \$100M+ that the US Army has historically spent each year on military

rotorcraft science and technology, NASA's research is focused on areas that are specifically relevant to civil applications. For instance, rotor acoustic prediction models can benefit noise reduction, but military operators are concerned about detection – caused by factors such as blade loading and thickness noise – while civil operators want to reduce annoyance – primarily a result of Blade-Vortex Interaction (BVI) noise. While "noise reduction" for civil and military rotorcraft may seem the same to budget analysts, the physical mechanisms addressed are completely different.

Congress has been increasingly vocal in demanding that the Federal Aviation Administration (FAA) address the growing noise complaints in areas such as New York and Los Angeles. In spite of this, the budget request for NASA – the only US government agency that can help the FAA with helicopter noise prediction and low-noise concept research – that was submitted to Congress specifically cut rotary wing funding.

Through AHS's advocacy efforts, members of the US House of Representatives and the Senate have been informed of the impacts of the proposed cuts to civil rotary wing

research. The House added \$115M to the overall NASA Aeronautics budget, while the Senate committee responsible for NASA specifically stated that it was "disappointed in the requested reduction in rotary craft [sic] research and encourages NASA to increase funding for this activity within funds provided." If AHS International is successful in convincing Congress to restore NASA's vertical flight budget, then research into new technologies to meet the forecasted long-term demand for civil rotorcraft will be ongoing worldwide.

The global civil rotorcraft market is forecast to continue its boom for at least another decade and a half. New products are now being brought to market to exploit the capabilities of today's state of the art. Many promising next-generation technologies and concepts are also poised for further exploration, but continued investment is necessary to bring them to fruition and overcome the limitations of today's civil rotorcraft. Congress must now decide whether the US will be a leader or a laggard in developing leap-ahead capabilities.



We make sure our employees never work in the dark

Every manufacturing process has a visual aid supported by our Electronic Manufacturing Instructions

