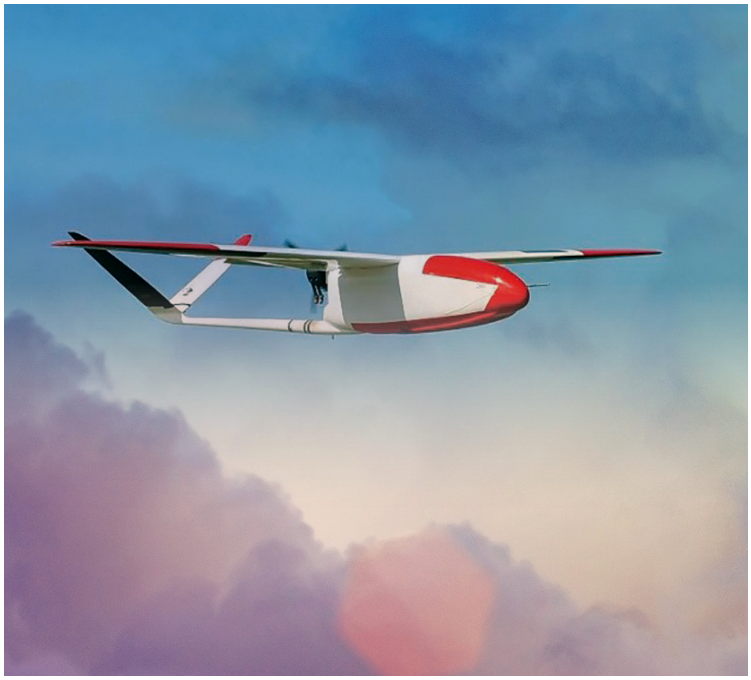
World Civil Unmanned Aerial Systems

2020/2021 MARKET PROFILE & FORECAST



TEAL GROUP
CORPORATION

World Civil Unmanned Aerial Systems

Market Profile & Forecast

2020/21 Edition

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The Civil UAS Market Outlook

Summary

The civil government and commercial drone markets are growing rapidly as UAS proves its worth across several different fields.

The United States and Europe are forging ahead with costly new deployments of UAS to protect their borders. China is reshaping the agricultural market with the rapid spread of subsidized UAS technology for spraying and imaging. Traditional aerospace and defense firms are competing to develop new solar-powered systems to provide low-cost internet. Test programs are operating around the world intended to integrate delivery drones into airspace.

New milestones are being reached that show the extent of the development. In the United States, 484,000 commercial drones have been registered and 188,395 remote pilots certified as of early August 2020. Another 1.2 million recreational drones have been registered. (Yet it is important to remember that these drones have been registered in the period since Part 107 went into effect in August 2016. Since the effective commercial life of prosumer drones is about a year and a half on average, many are no longer in the fleet.)

In terms of aerospace, the market for civil UAS promises to be one of the most dynamic growth sectors for the next decade, emerging from a $5 billion market (value of air vehicles) in 2020 to nearly quadruple to $18.5 billion by 2029. That represents a 15.7% compound annual growth rate (CAGR) in constant dollars. Over the next 10 years the market will total $108 billion.

Although the consumer systems and commercial systems segments begin the forecast period (2020) relatively close in annual production value of air vehicles at 55% and 42%, respectively, the later segment will exhibit the fastest growth in the market. By the end of our 10-year forecast, commercial systems will command 83% of the overall civil UAS market, while the consumer systems will slip to 15% of the air vehicle production value.

After years of delays, civil governments in the United States and Europe are getting serious about deployment of UAS. Civil government

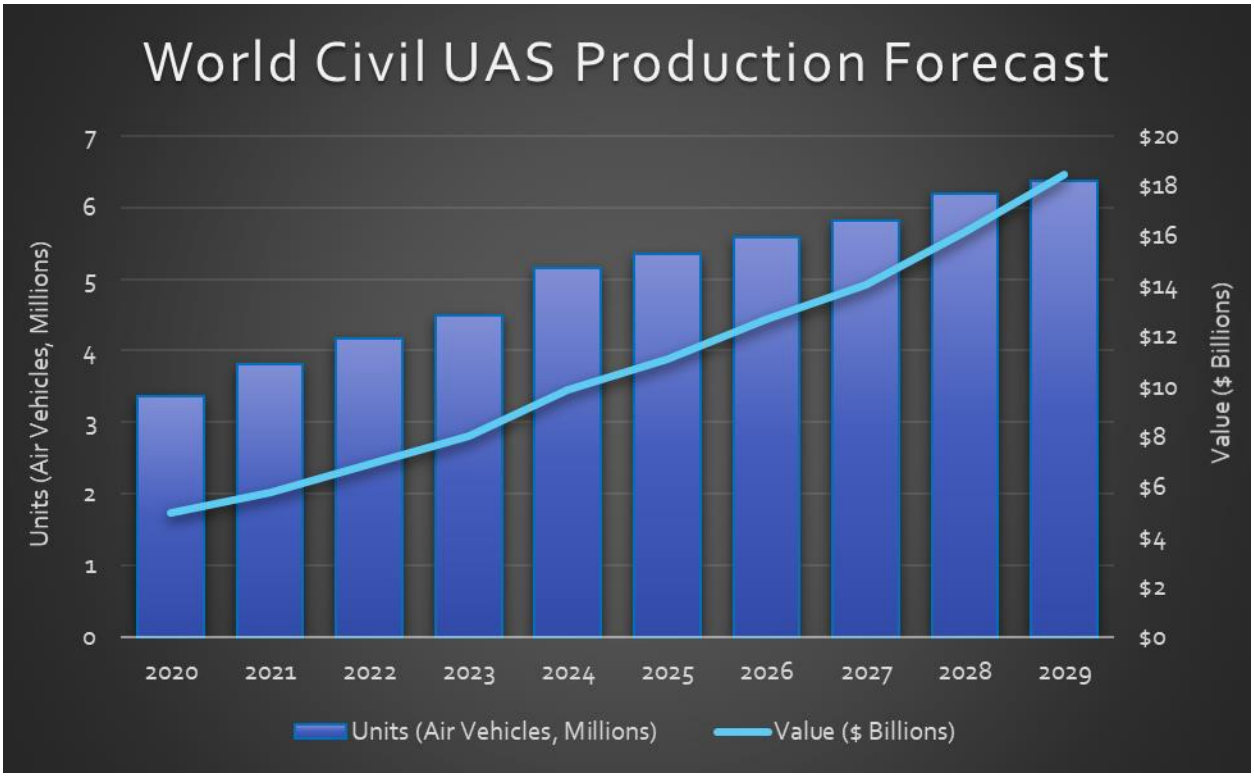

Figure 1

drone spending promises to benefit from growing concerns about border and maritime security in the United States and Europe. Peacekeeping operations for United Nations and other countries will further boost sales. In addition, public safety use for law enforcement and fire control is growing.

The US Coast Guard and the European Maritime Safety Agency are now purchasing UAS services and planning is underway for broader deployment of systems. The US Customs and Border Protection Agency has introduced a pilot program in small UAS. Public safety deployment of drones in the United States is soaring.

Commercial markets are beginning to develop. Many companies are currently doing proof of concept work that creates the foundations for widespread deployment of drones. They are working to prove cost savings and make sure data provided can be integrated into the business' workflow.

Construction, insurance and energy promise to grow quickly in coming years. Large enterprises will deploy fleets of systems. Energy is developing rapidly as multinational companies begin to deploy fleets of UAS. Agriculture, which is currently the largest market thanks to the value of unmanned spraying systems, will grow more slowly due to the currently depressed profitability of the sector and the diffuse nature of decision-making. Delivery eventually promises to be a very large market but will develop first in narrow niches such as delivery to very remote areas such as islands or ships or delivery of high-value, time-sensitive products such as medical supplies.

As the commercial market develops, it mostly will be based on inexpensive prosumer and mini UAVs and will be much more price sensitive than the governmental market. Even local law enforcement agencies will be buying mainly prosumer and inexpensive mini systems rather than much costlier larger UAVs.

While the unit numbers of these UAVs purchased to serve the commercial market promise to be substantial, their value will be a small fraction of that of the costly, sophisticated systems that dominate the military market such as Global Hawk and Predator.

Consumer UAS will continue to grow but its most explosive growth is behind it. It is a much more mature market that has lost some of its novelty and technological innovations that will attract buyers are becoming fewer. Still, the market will continue to expand for several more years thanks to new technological developments and a wider range of product offerings. Moreover, there promises to be considerable crossover between the consumer and the commercial UAS markets. Some consumer drones are used for low-end commercial tasks such as real estate. Consumer drone manufacturers are also moving up the value chain to create more capable, complex systems able to take on more demanding commercial work. Consumer systems are reaching the saturation point in the United States and Europe by 2024.

The battle for the consumer drone manufacturing market is over, with China's DJI Innovations dominating the market.

Yet the market in commercial drone manufacturing, services and analysis are still up for grabs.

A monumental battle is shaping up as US, European and Asian companies expand to be in a position to compete worldwide in systems and services to address this market. The drive for scale has begun as mergers and acquisitions nationally and across borders accelerate.

National and regional advantages are emerging as the worldwide industry develops.

The United States is the clear leader in analytics and the development of service offerings. Tremendous interest by technology leaders such as Intel Corp., Amazon, Facebook, Google, Sony, Verizon, Mitsubishi, General Electric Co., Microsoft, Apple and Samsung is adding to the speed of development by providing financing and an infusion of new technology and talent. Major technology firms such as Intel, Microsoft and Qualcomm are working to apply their technologies to making drones effective work tools.

An infusion of venture capital is creating an industry of startups in both manufacturing and the services that will be critical to development of the commercial market. Two-thirds of the venture capital money worldwide is going into the US drone industry.

They also have an advantage in their analytical capabilities which generally are well above competitors. In many cases, US companies are working with Chinese drones to give them the capabilities to perform inspections. As a result of this analytical advantage, China's DJI often work with US analytical companies that can process and analyze the data produced by DJI's UAVs.

China's clear advantage is in manufacturing. The nation is seeking to expand from dominance in consumer UAS manufacturing to leadership in commercial UAS. Government and industry are working together to build their country's market presence in agricultural and delivery drones in particular, two of the largest potential sectors in the future. Yet other Chinese companies are working to move into drone production for specialized inspection areas such as powerlines and wind turbines.

Despite vocal support from the Japanese government, Japan is falling behind China. Japan emerged as an early leader in civil UAS development thanks to an unmanned agricultural spraying industry that dates back three decades. Japan's most promising potential areas to play a role in the worldwide UAS industry come in agricultural spraying, smart construction work, and services. In each of those cases, Japan's lack of manpower is driving national adoption of unmanned systems.

Europe has already ceded its early lead in drone market development to

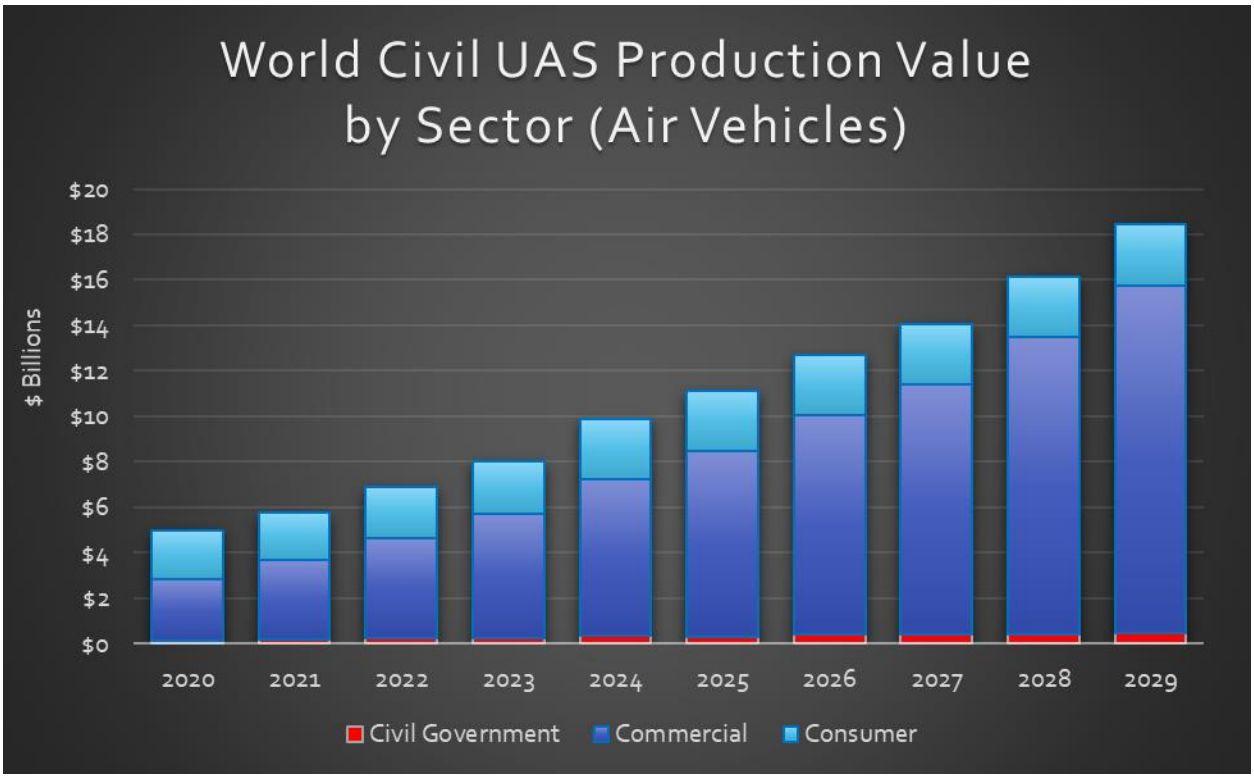

Figure 2

the United States and China. Europe is working to avoid being left behind by enacting standardized airspace rules that will create a single market. The European Aviation Safety Agency (EASA) is working to harmonize European national regulations by establishing rules for small UAS across the European Union beginning at the end of 2020.

European UAS firms are falling behind in this flurry of activity. They lack the strong venture capital funding and large, unified domestic drone market enjoyed by US firms. As a result, some European drone firms have either moved their headquarters or significant operations to the United States. The new EASA rules should go far to remedy this situation.

The worldwide drone market's evolution is clear from venture capital trends. Increasingly venture capital funding is shifting from hardware to software and services that will make existing drones more useful. Funding is being used to develop the business tools that are needed to quickly allow industry to develop scale, such as national networks of service providers and improved analytics to make UAS easier to use and more proscriptive. It is also going to the companies that will lay the foundations for access to airspace such as detect and avoid technology and unmanned traffic management.

Despite its promise for future growth, the current market is cutthroat. Market development is rapid, but a gap has emerged. While the market is growing, the massive number of startups and investments by existing companies has created capacity that outstrips the market. That is being aggravated by the impact of the pandemic.

A large number of drone manufacturers are pursuing a nascent market. Drone service prices have fallen rapidly to accommodate the large influx of providers, particularly in providing simple services such as real estate photography.

The industry shake-up will intensify in coming years. As companies are forced to evolve quickly to deal with intense competition, consolidation promises to accelerate in the industry. Teal Group anticipates that well over half of the companies now involved in commercial drones will be out of the market in five years. Some well-known companies are already bankrupt, and more will follow in coming years. Others will be sold.

The fleet of systems purchased for potential low-end applications has outstripped demand. Hobbyists are entering the market to make a profit from their interest. The result is a swelling of the service fleet beyond what is currently justified by the market. As a result, many systems are little used. That is aggravated by the lack of a nationwide drone service in-