

Due Diligence and Valuation Report

Arrowhead Code:	90-02-08
Coverage initiated:	03 June 2016
This document:	21 November 2018
Fair share value bracket-DCF:	€ 0.51 and € 1.18
Share price (21 Nov 2018):	€ 0.21

Analysts

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Market Data

52-Week Range:	€ 0.24 - € 0.92 ⁱ
Average Daily Volume:	154,139 ⁱⁱ
Market Cap (21 Nov 2018):	€ 6.9 MM

Financial Forecast (in €) (FY ending - Dec)

€	'18E	'19E	'20E	'21E	'22E	'23E
High NI '000	(1,195)	(1,056)	(592)	268	1,386	2,904
High EPS	(0.04)	(0.04)	(0.02)	0.01	0.05	0.10
Low NI '000	(1,329)	(1,266)	(949)	(174)	806	1,835
Low EPS	(0.05)	(0.04)	(0.03)	(0.01)	0.03	0.06

Company Overview: Drone Volt SA (herein referred to as "Drone Volt," "DRV" or "the company") is a France-based company, which specializes in the production, integration and sale of drones or Unmanned Aerial Vehicles (UAVs) and software for professionals. The company, established in 2011, is listed on AlterNext under the stock symbol "ALDRV." The company provides customized drones and several related services (pilot training, regulatory certification, etc.), which enables it to provide turnkey solutions to its clients. Drone Volt presents itself as a one-stop shop offering complete solutions to its customers. Drone Volt is the market leader in the European broadcasting and service drone industry. It has expanded its presence globally and currently serves 13 major countries in Europe and North America. The company's client list includes government organizations and industrial groups such as the French army, the French Ministry of Defense, GDF Suez, Engie, Total, Bouygues ES, ADP, the Air Transport Gendarmerie (GTA) & international government agencies.

Drone Volt's topline declined by 10% from € 5,808k in 9M 2017 to € 5,247k in 9M 2018. The decrease was due to contraction of sales in the distribution segment which fell by 29% on a year-on-year (YoY) basis. Revenue from Drone Volt factory, services and academy jumped to € 1,650k in 9M 2018 from € 726k in 9M 2017.



Company:	Drone Volt SA
Ticker:	EPA: ALDRV.PA, ISIN FR0013088606
Headquarters:	Villepinte, France
Founder	Mr. Dimitri Batsis
Chairman and CEO	Mr. Olivier Gualdoni
VP Sales, U.S.	Mr. Daniel Roe
Website:	www.dronevolt.com

Arrowhead is updating coverage on Drone Volt SA with a fair value bracket of € 0.51 (low-bracket estimate) and € 1.18 (high-bracket estimate).

Key Highlights: (1) FY 2017 was an exceptional year for Drone Volt. It achieved the following: Two exclusive platforms, HERCULES and ALTURA ZENITH, and a smart camera (PENSAR); two strategic acquisitions, DANDRONE and AERIALTRONICS; two production sites, in France and the Netherlands; 11 trade shows around the world, mainly in the areas of security / defense and construction; 49 employees at the end of 2017 in Europe and in the US; (2) In Q3 2018, over 70% of the group's gross operating profit came from high-value-added activities compared to 25% in Q3 2017 (3) In Q3 2018, the company produced 19 drones (4) In July 2018, Drone Volt signed an agreement with a government agency in the Netherlands for the supply of complete autonomous systems (5) Drone Volt and DIETSWELL have announced a cooperation project at the EUROSATORY international exhibition in Paris (6) Its financial liabilities amounted to € 2.9 MM, including € 1 million of bonds convertible into shares (7) The company successfully raised € 2.15 MM through private placement in June 2018 to primarily strengthen its balance sheet position and continue funding its software R&D program; (8) On June 30, 2018, the company had a cash position of € 2.2 million (9) Drone Volt entered the South African market in October 2018 through the first delivery of its Hercules 20 heavy-lift drone, which provides entry opportunity into the high potential markets in the agricultural sector.

Risks: The key risks for Drone Volt are evolving regulatory policies for the sector, supplier risk, emerging competition and cheaper alternatives.

Valuation and Assumptions: On the basis of due diligence and valuation estimates, Arrowhead believes that Drone Volt's fair share value lies in the € 0.51 - € 1.18 bracket using a Discounted Cash Flow (DCF) model - our primary valuation methodology.ⁱⁱⁱ In addition, the target P/S multiple and our average revenue per share estimate for 2022 implies fair value of € 1.24 per share, which is approximately 118% above the current share price.

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1. Summary and Outlook

We update coverage on Drone Volt SA. The company, headquartered in Villepinte, France, specializes in designing and marketing civil UAVs for professional purposes. It offers turnkey business solutions to its customers, which include several related services and pilot training. The company is a leader in audio visual drone solutions and also provides aerial photography to public administration and industry.

Key Highlights:

- (1)** The company registered a negative growth of 10% in revenue in 9M 2018 compared to 9M 2017. Its revenue fell to € 5,247k in 9M 2018 in comparison with € 5,808k in 9M 2017. Drone Volt factory, services and academy contributed € 1,650k (31%) to the total revenue in 9M 2018 compared to € 726k (13%) in 9M 2017. Revenue contribution from the distribution segment declined from 88% in 9M 2017 to 69% in 9M 2018 which led to decline in the overall revenue. The gross profit of the company increased by 6% from € 1,470k in 9M 2017 to € 1,556k in 9M 2018. Gross Margin of the high-value-added activities segment registered a sharp rise of 154% from € 325k in 9M 2017 to € 824k in 9M 2018 whereas gross margin from the distribution segment declined by 36% from € 1,144k in 9M 2017 to € 732k in 9M 2018.
- (2)** In June 2018, Drone Volt announced the successful completion of a € 2.15 million capital increase. The company would be utilising the proceeds from this capital increase to reinforce its balance sheet and to fund continued investments in artificial investments and software R&D as well the group's new products. This capital increase was mainly in the form of private placement. The subscription price for the 3,587,927 new shares was set at € 0.60, corresponding to an 11.8% discount to the closing price on June 18, 2018 (€ 0.68).
- (3)** The company registered a growth of 14% in its revenue to €7,778k in FY 2017, in comparison with €6,820k in FY 2016, mainly from the professional segments. Further, the company witnessed a hike of 30% YoY in gross profit; however, the operating profit of the company got impacted by development efforts.
- (4)** FY 2017 turned out to be an exceptional year for Drone Volt wherein it achieved the following:
 - Two exclusive platforms, HERCULES and ALTURA ZENITH, and a smart camera (PENSAR)
 - Two strategic acquisitions: DANDRONE and AERIALTRONICS
 - Two production sites, in France (Villepinte) and the Netherlands (Katwijk)
 - 11 trade shows around the world, mainly in the areas of security / defense and construction
 - 49 employees at the end of 2017 in Europe and in the US
- (5)** The company has approximately 70%-80% share in the French TV market, which uses drones for aerial shots, images, videos, which are otherwise either impossible to attain or costlier if shot using helicopters and cranes.
- (6)** Drone Volt has magnified its customer base by acquiring the assets of Aerialtronics which is a Netherlands-based company which will help the company to enhance its customer offerings, mainly in the field of security. Drone Volt has presence in 13 major territories across Europe and North America. It has also hired experts from the drone industry as key executives to identify further growth prospects in these regions.
- (7)** In June 2017, the company raised € 1.4 million, subscribed mainly by the SmallCaps fund of one of the four largest French collective management institutions. The issue price was fixed at € 0.86 for the issue of 1,655,214 new shares.
- (8)** The company fully customizes the drone parts and applications as per its customers' requirements. This distinguishes Drone Volt from the competition as these features are incorporated to meet specific requirements. These value-added applications will allow the company to generate higher margins and cash inflows in future.
- (9)** The company was awarded a silver innovation award for its HERCULES 10 SPRAY in BATIMAT 2017. This drone is a professional device intended for use in the construction industry. This drone, manufactured in Drone Volt production factory, is available in three variants.
- (10)** Another innovative product by the company, Drone Spray, was launched with the aim to prevent vector-borne diseases. The drone could be used to carry larviciding products in order to kill mosquitoes and their larvae in their breeding areas. The same operation, using helicopters, is costlier and causes pollution. If this drone is successful, it could lead to reduction in mosquito-borne diseases such as malaria, dengue fever, Japanese encephalitis, etc., in the long run.
- (11)** The company has developed several new drones, such as Drone Spray, Drone Paint, Drone Surveillance, for multiple uses in various sectors. These drones could be used for treatment and cleaning of surfaces, inspection of work, paint, live surveillance, mapping, etc.

- (12) For its French customers, the company provides turnkey solutions for immediate use of drones, including arranging regulatory approval, registration and training programs for licenses. This leads to time and cost saving for the customers.
- (13) The company's Janus 360° VR is the only drone dedicated to Virtual reality in movies and games. The drone was awarded the first prize in Mediakwest awards in November 2016.
- (14) The company was one of the six startups selected by the organizers of Viva Technology 2016 to present its innovation to the President.

Key Risks: Key risks for Drone Volt are tougher regulations in the area of operation, along with supplier risk and emerging competition in the foreseeable future. In addition, cheaper alternatives of Drone Volt's products by small players could also impact the company's growth.

Industry Overview: The UAV or drone industry has seen rapid growth over the last decade owing to technological advancements in this sector. New markets, such as civil and consumer drones, have emerged and have been driven by new technologies and keenness regarding the various usages of drones across sectors. There have been varied forecasts by industry experts regarding the likely market growth. Teal Group, a US aerospace consulting firm, estimates the commercial drone market to increase to USD 3.92 BN in the next decade, constituting 28% of the total drone industry (USD 14 BN) in that period. Another US market & research consulting firm, Grand View Research, estimates that the commercial drone industry will reach USD 2.07 BN by 2022, while other experts have different views on the subject. However, all these estimates highlight the view that the commercial/civil drone industry is expected to witness significant growth over the next decade and will be a major contributor to the overall drone industry sales. In addition, the use of commercial drones is likely to increase in areas such as agriculture, media, cinematography and photography, inspection and maintenance, surveillance and real estate. It corroborates our view that there is considerable scope for Drone Volt to capture greater market share with its unique and customized products.

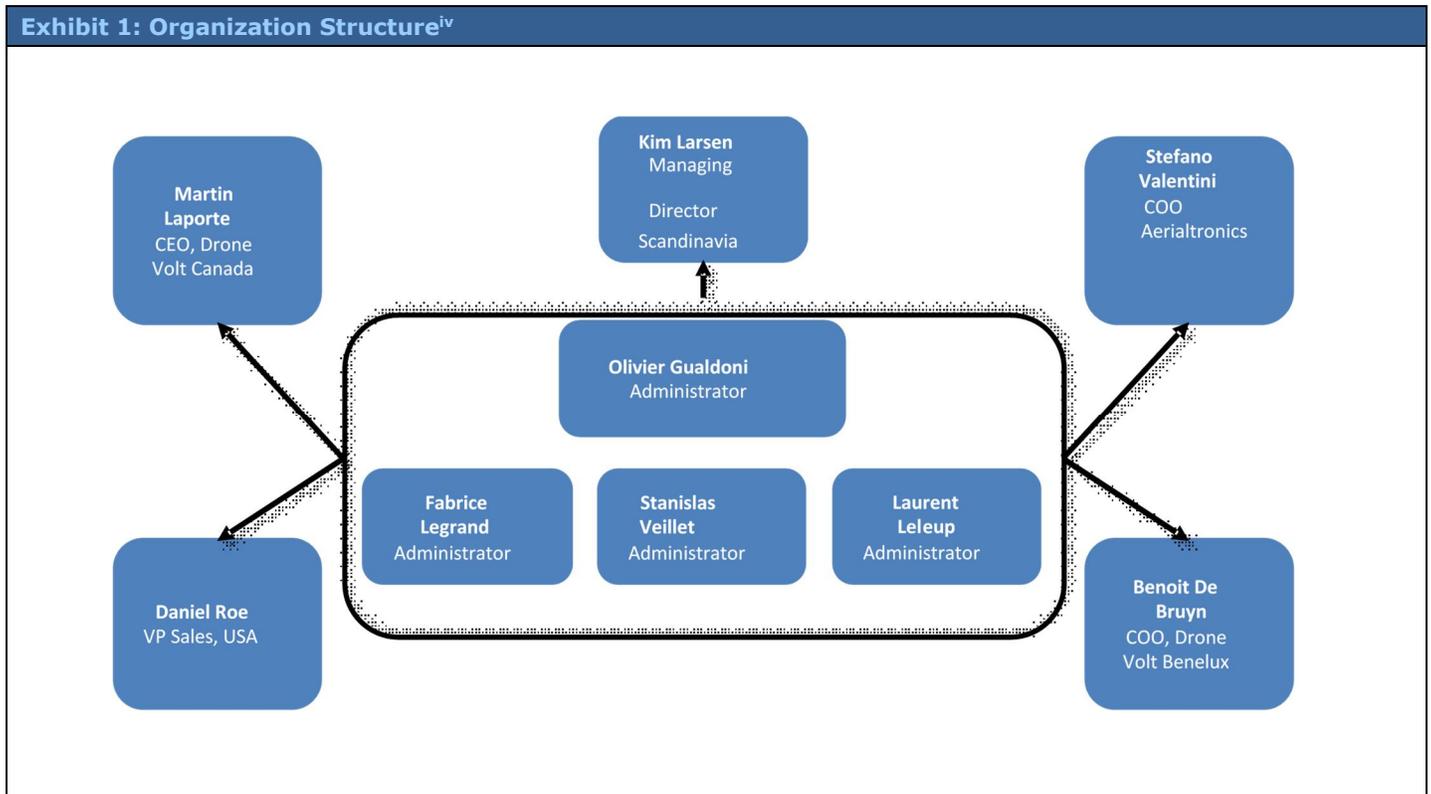
2. Business Overview:

Drone Volt is a leading French company producing civilian drones and specializing in manufacturing, assembling and distribution of professional drones. It came into existence in 2011 as a private limited company, headquartered close to Paris CDG airport, France. It was listed on Euronext marché libre Paris in April 2015, before being transferred to AlterNext Paris in December 2015. The company's shares are traded under the symbol "ALDRV". Drone Volt is self-sufficient in developing new technologies based on UAVs or Unmanned Ground Vehicles (UGVs) used for civil applications since 2011. The company is present in France, Denmark, Belgium, Canada, Switzerland, Italy and the US.

It designs and manufactures innovative commercial service drones useful for agriculture, audiovisual applications, building and civil engineering works and security. The company offers complete solutions for the professional industries. It also provides services such as drone pilot training, repair and maintenance services, or undertaking administrative actions. Drone Volt's customers notably include government organizations and industrial groups such as the French army, the French Ministry of Defense, GDF Suez, Engie, Total, Bouygues ES, ADP, the Air Transport Gendarmerie (GTA) and international government agencies.

2.1 Ownership Structure

Drone Volt SA's organizational chart is as follows:



Source: Company data as of June, 2017

2.2 Business Model

Drone Volt is involved in manufacture and sale of drones to individuals and professionals. Apart from this, the company offers various drone-related services such as pilot training, regulatory certification and engineering consulting, besides providing customized products, which allows it to offer its clients turnkey products.

Drone Volt also provides services such as drone training, repair and maintenance services for drones. It even provides administrative assistance for registering operators with DGCA (French Civil Aviation Regulator), obtaining flight authorizations, training pilots and providing them with requisite certification from DGAC. Resultantly, Drone Volt has become a one-stop shop that provides comprehensive solutions to its customers.

The company follows a sales-based model which provides DRV a competitive edge over its peers who follow a rental model, in terms of availability and customization of drones. Its sales-based model also lowers the risk of obsolescence as the company is not required to store any inventory to rent out its products and can easily adapt to changing technology and market needs.

The company has shifted its focus from distribution to the segment which includes Drone Volt Factory, Services & Academy as the demand has also shifted from low-value products to high-value drones. The company generated € 1,007k from its high-value-added activities from Drone Volt Factory, Drone Volt Services and Drone Volt Academy in H1 2018. Sales from these activities increased by 149% from H1 2017 to H1 2018. High-value Drone Volt drones represented 28% of sales in H1 2018 compared with 10% in H1 2017.

2.3 Products and Services Offered

The company offers a plethora of products from the leading world manufacturers of drones, such as DJI. It also designs and manufactures in-house, particularly focusing on making customized products for sectors such as agriculture, surveillance and security, construction. The following are a few flagship products offered by Drone Volt:

Drone Janus VR

Exhibit 2: Product Image and its Specifications



- Drone Janus 360 is meant for aerial photography, videography with a 12 4k camera recording at 30 fps.
- It can be used in tourism, culture architecture, real estate, etc.
- Janus 360 is equipped with two heads, each carrying five 4K GoPro cameras to cover all angles of a scene.
- With flight times of 15 minutes, it can produce 360° video capturing 150 GB of images per flight.
- The dimensions of the frame are 700x700x400mm, with propellers as long as 15.5 inches.
- This drone’s total weight is 5.8kg (with parachute).

Drone Hercules 5 UF

Exhibit 3: Product Image and its Specifications



- Unlimited flight time.
- Smart power station.
- Secured operations.
- x18 camera zoom.
- Night vision camera.
- The system enables unlimited access to a global aerial vision, in real time and in a secure manner 24 hours a day.
- Data transfer by secured RTMPS server.

Drone Hercules 10 Spray

Exhibit 4: Product Image and its Specifications



- Tethered spraying.
- Designed for precise spraying of liquid products for surface, roof and facade treatments, offering new treatment solutions aimed at a number of applications.
- Foldable system.
- The customizable high-pressure system is fully foldable and makes the HERCULES 10 ultra-compact to facilitate transport.
- HERCULES 10 allows quick and easy access to inaccessible and dangerous areas. It is operational within 10 minutes and reduces the hardware installation and human risk.

Drone Hercules 20 Spray

Exhibit 5: Product Image



- The customizable crop spraying system length is up to 3 meters wide. The fully foldable system that makes the HERCULES 20 - SPRAYER DRONE ultra-compact was designed to facilitate transport.
- The HERCULES 20 SPRAYER DRONE is designed for an accurate and constant spraying for various surface treatments: liquid pesticides, fertilizers, new treatment solutions for a wide range of applications. The flow is manually (with the RC) or automatically adjustable via the application / flight controller.
- The tank, with integrated pump, can load up to 12 liters for crop spraying. It is fully interchangeable and easy to remove because of the quick release system. The HERCULES 20 can take up to 20 kg payload.

Altura Zenith

Exhibit 6: Product Image and its Specifications



- The drone has dimensions of around 600×600 mm with a height of 470-570 mm with a max take-off weight of 9.65kg.
- It has max payload capacity of 3kg. With the largest payload compatibility and the simple and fast "click and go" system, it is the most flexible drone in the market.
- It is equipped with a high-capacity battery and can fly for up to 40 minutes.
- Altura Zenith has a high level of redundancy which is ensured by 8 motors, coupled with redundant IMUs.

HELIPLANE

Exhibit 7: Product Image and its Specifications



- It combines the advantages of multirotor drones with fixed drone wing.
- The unfolded dimensions of the drone are 1000x1300 mm with a height of 200mm.
- It has a maximum payload weight of 1kg and maximum take-off weight of 2.5kg.
- It is equipped with an infrared camera with a daytime zoom of 12.2x.
- HELIPLANE is widely used across the security and construction sectors.

Other drones that DRV offers include DJI Phantom 3 Professional, DJI Phantom 4, Drone Yuneec Q500 Typhoon, FreeFly Alta, FreeFly Movi M15, DV Wing. DRV also sells drone accessories from various manufacturers on its website.

2.4 Company Premiums^v

- 1. Focus on factory, services and academy segment:** The company has shifted its focus to the factory, services and academy segment from distribution. Factory, services and academy constitute a high-performing segment for the company where the turnover has increased by 127% in 9M 2018 on YoY basis. The segment contributed more than 70% in Q3 2018 to the total gross profit, compared with 25% in Q3 2017.
- 2. Strong geographical presence and expertise:** The company is present in 13 countries across Europe and North America: Belgium, Canada, Croatia, Denmark, Finland, France, Italy, Luxembourg, the Netherlands, Slovenia, Sweden, Switzerland and the US. Its employee base includes several experts from the professional drone segment. For instance, in the US, the company hired Daniel Roe as EVP, who was with Freefly systems as worldwide director of sales and an expert in the professional drone field. In North Europe, the company hired Stefano Valentini, former CEO with Cybergun Italia Srl, to manage sales operation in Switzerland, Italy, Adriatic and Slovenia. Their expertise should help the company grow at a rapid pace in these regions. Drone Volt is currently eyeing the US market as its next big growth avenue. In March 2017, the company entered a distribution agreement with a Columbian company for its drones. This marked the entry of the company into the Latin American drone market.
- 3. Customized products:** Drone Volt has launched several new products with multiple applications, such as Drone Spray, Drone Paint and Drone Surveillance. These drones can be used for multiple purposes such as treatment and cleaning of surfaces, inspection of work, paint and live surveillance. Drone Volt focuses on providing customized products to its clients. It is developing drones which can carry extra payloads and give it a competitive edge over its peers. It has also launched drone software Drone Volt Pilot, the application that offers easy access to autopilot for DJI drones.
- 4. Increase in profitability expected in future:** Looking at the expected growth in commercial drone market in the next few years, we estimate the company's top line to reach € 31.57 MM (low bracket) and € 36.98 MM (high bracket) in 2022, a growth of 4.06x (low bracket) and 4.75x (high bracket) from € 7.78 MM in 2017. We expect the company's operating margin to improve in future, ranging between 4.1%-6.1% by 2022. According to our estimates, the company's net margin will be in the range of 2.6%-3.8% by 2022.
- 5. Easy access to additional funding:** The company has successfully raised € 2.15 MM of equity in 2018 through private placement. These proceeds would be used for the reinforcement of Drone Volt's balance sheet and funding of operations.
- 6. Turnkey product:** Drone Volt provides a range of services, including administrative support to comply with French regulations, training to operate the drone, and help to acquire a license for flying the drone for operational purposes. The customers receive turnkey products for immediate use. This business model saves the time and cost involved in getting proper training, acquiring a license and dealing with regulations.
- 7. Partnership with leading suppliers:** Drone Volt has partnered with leading suppliers worldwide including DJI, Yuneec, Freefly and other major manufacturers. These partnerships could benefit the company over suppliers' commercial policies.

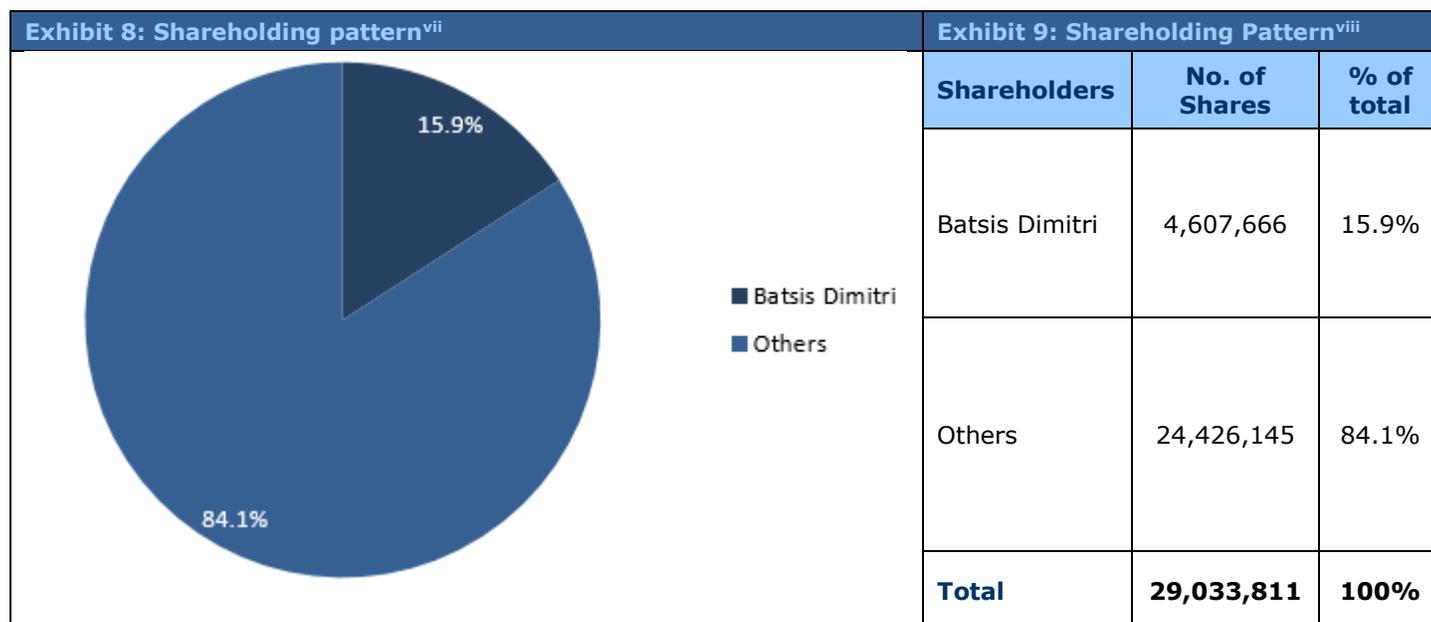
2.5 Company Risks^{vi}

- 1. Regulations:** The varied regulations for use of drones in different countries are expected to pose the main challenge to Drone Volt's expansion plans. With the company looking at expanding its presence worldwide, it needs to follow a different set of rules and regulations for each country. Also, the drones can be categorized differently in each, typically by weight, size, altitude, speed, etc. With many countries still in the process of legislating regulation into law, the expansion plans in some regions may be affected.
- 2. Suppliers' risk:** Currently, Drone Volt relies heavily on products sourced from Chinese maker, DJI. It faces the risk of dependency on the supplier's commercial policies as the company's margins could plunge if the supplier increases prices. The risk is partially mitigated by the fact that the company has already tied up with several leading drone suppliers worldwide. Also, the company is focusing on its R&D and expects to design and develop majority of the drone parts in-house in future. This would help in mitigating this potential threat from suppliers.
- 3. Competition:** While the commercial drone market is still nascent, it is rapidly evolving and the competition within the industry is expected to increase with many small and large players entering the market, eyeing the prospective growth opportunities. The industry may also witness price-based competition, which will impact small players significantly in the market. Another challenge could be the launch of cheap alternative drones in the market, created using copied technology.

- 4. Innovation in technology:** The commercial drone industry is still in its early age and is expected to grow significantly over the next decade, driven by strong innovation in technology. In order to compete, players within the industry need to come out with new and innovative products regularly, which would distinguish them from the others. A lack of innovation, leading to the obsolescence of its products, could hinder performance and in time even threaten the existence of the company.
- 5. Legal Risks:** There are no legal risks associated with the company, to the best of the author's knowledge.

2.6 Drone Volt’s Shareholding Pattern

On November 21, 2018, the number of shares outstanding was 29,033,811.



2.7 Listing and Contact Details

The ordinary shares of Drone Volt are listed on AlterNext Paris (Ticker: ALDRV, Date of Listing – April 28, 2015) and warrant also listed as DRONE VOLT BS FR0012860542 (Ticker: DRVBS).

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3. Key Variable Analysis^{ix}

3.1 Variable 1 – Revenue from Drone Volt Factory, Services & Academy

This segment generates higher margins for the company as it focuses on providing customized products based on client requirements. Given that the company is primarily focusing on growth in the professional segment, we estimate the number of drones sold in professional segment to increase considerably and thereby, the contribution of professional segment to the company's total revenue to be between 88%-90% by 2020.

The following are our estimates for revenues from the drone volt factory, service and academy segment for the forecasted period under two scenarios - low bracket and high bracket:

Exhibit 10: Drone Volt factory, academy and services segment revenue										
In € '000	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Low Bracket	2,771	6,096	11,582	18,532	27,798	38,917	48,646	54,970	62,116	70,191
High Bracket	2,868	6,453	12,584	20,764	32,183	46,666	60,666	69,159	78,841	89,879

3.2 Variable 2 – Revenue from distribution

This segment has traditionally seen lower growth. The company purchases drones and their parts from other manufacturers and then assembles and distributes, renting the final product through the company's website. The consumer segment has been historically contributing more than half of the company's total revenue. However, the company has now shifted its focus on growth in the professional segment. Therefore, the consumer segment may witness lower growth and its contribution to the total revenue is expected to come down significantly in future.

The following is the estimated revenue from the distribution segment for the forecasted period under two scenarios - low bracket and high bracket:

Exhibit 11: Distribution segment revenue										
In € '000	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Low Bracket	5,104	3,828	3,522	3,645	3,773	3,905	4,042	4,163	4,267	4,374
High Bracket	5,785	4,628	4,397	4,572	4,755	4,945	5,143	5,349	5,510	5,675

4. News^x

- **Delivery of Hercules 20 in South Africa:** On October 29, 2018 the company announced the first delivery of its Hercules 20 heavy-lift drone in South Africa. The drone has a payload capacity of over 20 kg with a horizontal speed over 50 km/hr and a high degree of stability. After the success of Hercules 10 and the Altura Zenith, Hercules 20 could arise as the future growth driver for the group by offering solutions such as spraying missions and transporting material in sensitive and risky areas.
- **Drone Volt entered the South African market:** On October 10, 2018, Drone Volt announced its entry into the South African market. This announcement was made in connection with 8th edition of the Africa Aerospace and Defence (AAD 2018) expo.
- **Strong acceleration in drone deliveries:** With production and delivery of 19 drones in Q3 2018, the company demonstrated strong acceleration in drone deliveries. It produced and delivered 18 Hercules drones and one Aerialtronics Altura Zenith drone. It also delivered one Pensar camera piloted through artificial intelligence.
- **Substantial investments made in H1 2018:** Drone Volt made a substantial investment in the first half of FY 2018 which includes integration of Aerialtronics, increased production capacity at Drone Volt factory Increased participation at major trade shows and in international bid tenders
- **Drone Volt signed a new contract with a government agency in the Netherlands:** The company has signed a contract with a government agency in the Netherlands where it will be supplying completely autonomous systems with integrated Altura Zenith drone and the PENSAR camera equipped with artificial intelligence.
- **Increase in contracts with government agencies:** From Q2 2018 onwards, the group has signed multiple contracts with government agencies such as the French army, a government agency in southeast Asia and the armed forces of a Scandinavian country.
- **Drone Volt announced H1 2018 results:** Drone Volt's revenue declined by 8% in H1 2018 compared with H1 2017. The revenue fell from € 3,930k in H1 2017 to € 3,621k in H1 2018. The consolidated gross profit for the group increased by 4% from € 926k in H1 2017 to € 964k in H1 2018 which was directly associated with the increasing importance of high value-added activities. In the first half of 2018, there was a sharp increase in Drone Volt Factory deliveries as the company produced, delivered and billed 26 Hercules and Altura Zenith drones and six Pensar cameras equipped with artificial intelligence, compared with 12 in H1 2017.
- **Drone Volt successfully increased capital by € 2.15 million through private placement:** On June 19, 2018, the company announced that it has successfully completed the € 2.15 million capital increase. Drone Volt will be using these proceeds to reinforce its balance sheet and fund its investments in artificial intelligence and software R&D as well as the group's new products.
- **Drone Volt announced its cooperation project with DIETSWELL at the EUROSATORY international exhibition in Paris:** Both the groups have decided to come together in order to offer personalized and innovative onshore and offshore UAV solutions to international groups in oil & gas and renewable energy industries.
- **Drone Volt presented new products at EUROSATORY:** The company presented the HERCULES 2, the HELIPANE, the new DV CONTROL, the PENSAR camera and the HERCULES 5 at the EUROSATORY exhibition. It also presented the new version of the HERCULES 5, the HERCULES 10, the second version of the HERCULES 20 and the ALTURA ZENITH (ATX8 version).
- **Drone Volt secured € 8 million funding line:** Drone Volt announced that it has signed a financing contract with ATLAS SPECIAL OPPORTUNITIES in the form of convertible bonds with attached warrants for a maximum total of € 8 million. As per the agreement, a maximum of ten tranches of convertible bonds could be issued with warrants.
- **Drone Volt announced FY 2017 results:** The company registered a growth of 14% in its revenue to €7,778 k in FY 2017, in comparison with €6,820 k of FY 2016, mainly coming from the professional segments. Further, the company witnessed a hike of 30% YoY in gross profit; however, the operating profit of the company got affected by development efforts.
- **Drone Volt extended its business in Germany:** Drone Volt announced the extension of its commercial network in Germany through a partnership with Germandrones GmbH. Germandrones is a German leader in drone technology, supported by a powerful safety specialist. In Germany, Germandrones has established itself as a specialist in professional drone technology, because of the development of a unique vertical take-off drone (VTOL) called Songbird.
- **Drone Volt released the new version of its intelligent camera AERIALTRONICS PENSAR:** In February 2018, Drone Volt officially launched the new version of its PENSAR camera-computer driven by artificial intelligence, under the brand AERIALTRONICS. A true technological feat, PENSAR is one of the world's first platforms with dual spectrum

digital vision that allows real-time analysis of images or data. Customizable to a certain extent, it can be mounted on a professional drone, mobile robot or used as an independent camera.

- **Drone Volt successfully completed the capital increase wherein the company maintained the DPS at €3.67 million:** In November 2017, Drone Volt announced the complete success of its capital increase with shareholders' maintained preferential subscription right ("DPS"). This capital increase was expected to provide the company with additional resources to accelerate the improvement of its technology by investing in the expansion of its technical teams and their skills. Targeted acquisitions could also be conducted on an opportunistic basis.
- **Drone Volt and Group Marck signed an exclusive agreement in the security sector:** In November 2017, Drone Volt announced the signature of an exclusive mutual distribution agreement with Group Marck.
Group Marck designs and markets uniforms, equipment and services to administrations and companies in France and internationally. With 946 employees and 6 production sites in France, Group Marck generated € 110 million in revenue in 2016. The agreement is particularly centered around the HERCULES 5 UF drone developed by Drone Volt.
- **Drone Volt opened its first Drone Volt Academy on African soil:** In October 2017, Drone Volt inaugurated the first training course center partnership on African territory, Drone Volt academy Ivory Coast in Abidjan.
- **Drone Volt announced the takeover of assets of Aerialtronics:** The company announced that it will acquire the major control of the main assets of Aerialtronics, which is a Netherlands-based company and has expertise in designing and manufacturing professional drones.
- **Drone Volt awarded in BATIMAT 2017 Innovation Competition:** In September 2017, Drone Volt was awarded the silver innovation award for its drone HERCULES 10 SPRAY. This drone was purposefully invented to be used in the construction industry.
- **Drone Volt raised € 1.4 MM from institutional investors:** On June 07, 2017, Drone Volt announced that the company had raised € 1.4 MM through private placement of shares to institutional investors. A major portion of the issue was subscribed to by SmallCaps fund, one of the four largest French collective management institutions.
- **Drone Volt Academy opens Drone Training School in Reims:** On June 01, 2017, Drone Volt announced that it had deployed its drone training school under the license of DRONE VOLT ACADEMY in Reims.
- **Drone Volt acquired Denmark-based DANDRONE:** On May 22, 2017, Drone Volt announced that the company had acquired Denmark-based e-commerce website DANDRONE. DANDRONE had several prestigious clients including strategic security department. This acquisition reinforced Drone Volt's position as a formidable player in the Scandinavian region.
- **Drone Volt appointed Olivier Gualdoni as the Chairman and General Director:** On May 11, 2017, Drone Volt announced that Mr. Dimitri Batsis had resigned from his position as Chairman for the Board of Directors. Mr. Gualdoni took his place as the Chairman and General Director of Drone Volt.
- **Drone Volt appointed Stampede as distribution partner for selling drones in North America:** On April 3, 2017, Drone Volt announced that it had partnered with Stampede, world leader in distribution, sales and marketing of drones, to sell its service drones to B2B segment and retailers in North America.
- **Drone Volt signed distribution agreement at the Exposecuridad:** On March 17, 2017, Drone Volt announced that it had signed a distribution agreement with a Columbian company at the Exposecuridad (Mexico) Trade fair. This marked the entry of the company into Latin American "surveillance and security" drone market.
- **Drone Volt presented its drones to the President:** On February 21, 2017, Drone Volt was invited to present its innovation to the President of France, Francois Hollande, and Secretary of State for the Digital Domain and Innovation, Axelle Lemaire, at the launch of the second edition of Viva Technology. The company was a part of the delegation of six representative startups selected by the organizers of Viva Technology.
- **Drone Volt signed MoU with Axiscades for co-operation in Indian Defense and Aerospace:** On February 15, 2017, Drone Volt announced signing of an MoU with Axiscades for drones in Indian Defense and Aerospace sector. Under the MoU, both the companies would evaluate opportunities to address aerial surveillance in the Indian Defense and Aerospace sector.
- **Drone Volt launched "DV Wing":** On November 28, 2016, Drone Volt launched "DV Wing", a light-weight drone, targeting agriculture and mapping. The drone was fitted with an 18.2 MP camera and had an autonomous flight capacity of 85 minutes.

5. Management and Governance^{xi}

The company has a team of experienced professionals with expertise in the fields of technology, operations, sales and marketing and finance. These highly qualified professionals have been with the company for a long time, signifying the stability of its management. The management's focus is on improving profitability and creating shareholder value.

Exhibit 12: Management Team		
Name	Designation	Background
Dimitri Batsis	Founder	<ul style="list-style-type: none"> • Dimitri Batsis is the founder of Drone Volt. • During 2008-2010, he worked with various companies in the internet domain. • He founded ZENI Corporation, listed company in Paris and headed it as the President from 1987-2007. ZENI Corporation offered global solutions ranging from consulting in marketing and communication strategy to designing and achieving multi-channel interactive sites on all new media.
Olivier Gualdoni	CEO	<ul style="list-style-type: none"> • Olivier Gualdoni was appointed as the worldwide CEO of Drone Volt on December 21, 2015. On May 11, 2017, the board of directors elected Mr. Gualdoni as the Chairman and General Director. • He formerly served as CEO of Cybergun SA. • He earlier served as European Export Director of Cybergun SA. • Oliver holds a BA in Physical Sciences and a Masters in Marketing.
Sylvain Navarro	Group CFO	<ul style="list-style-type: none"> • Sylvain Navarro was appointed as the worldwide CFO of Drone Volt in May 2018. • He formerly served in companies such as Invest securities (as Head of Cash Equity and Equity Capital Market).
Martin Laporte	CEO, Drone Volt, Canada	<ul style="list-style-type: none"> • Martin Laporte has earlier served as General Manager of KoptR image.
Kim Larsen	Managing Director, Drone Volt Scandinavia	<ul style="list-style-type: none"> • Kim Larsen is in charge of managing Drone Volt's Scandinavian operations.
Daniel Roe	VP Sales, US	<ul style="list-style-type: none"> • Daniel Roe was appointed as Executive Vice President of sales and marketing, US in January 2016. • He earlier served as Director of global sales Freefly System.
Benoit De Bruyn	Managing Director, Drone Volt Belgium	<ul style="list-style-type: none"> • Benoit De Bruyn is in charge of managing Drone Volt's Belgium branch. • He has formerly served as senior manager in Delaware Consulting.

6. Industry Characteristics

6.1 Industry Overview^{xii}

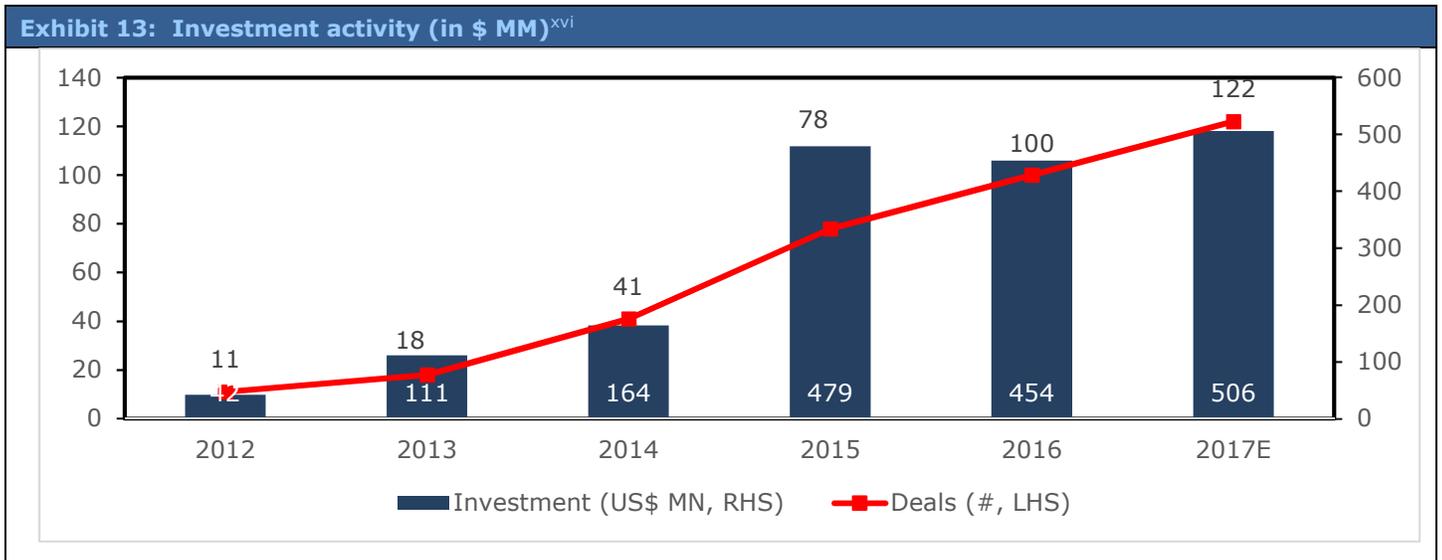
UAVs, popularly known as ‘drones’, are unmanned aircraft or ‘flying robots’. The UAVs evolved during World War I when these were used for military operations. These have improved significantly over time, with use of advanced technology such as miniaturization. The UAV market has grown rapidly in the last decade and has created a lot of eagerness in various parties and companies engaged in UAV technology development. Currently, the UAV market is driven by new technologies such as next-generation unmanned combat systems, and the development of new markets such as civil and consumer drones.

As per GlobeNewswire, the global drones market can reach USD 129.3 billion by 2028 at a CAGR of 20.18% from 2018 to 2028.^{xiii}

The Teal Group expects the UAV industry to triple in size over the next decade, owing to innovations in unmanned combat aerial vehicle programs and strong commercial and consumer spending. It forecasts the non-military UAV production will reach USD 88.3 billion in the next decade climbing from USD 4.4 billion globally in 2018, to USD 13.1 billion in 2027, at a CAGR of 12.9%. As per the company, commercial use will exceed the consumer drone market in 2024 to become the leading segment of the civil market with a market size of USD 7.3 billion in 2027.

Tech giants like Microsoft, Apple, Intel, Qualcomm as well as venture capitalists infused more than USD 500 million into start-up investments in 2017 which was more than USD 2 billion since 2012.^{xiv}

UAV start-up companies raised USD 454 MM through 100 deals in 2016. This figure is expected to rise to USD 506 MM through 122 deals in 2017, almost thrice of the deals closed in 2014. Continued investment from big venture capitalists is expected to further drive innovation in the industry.^{xv}



6.2 Future Outlook

The commercial UAV industry has immense growth potential. However, it is difficult to make a proper market size estimate considering the potential uses of drones in various sectors, such as agriculture, construction, surveillance, aerial photography and media and entertainment. We have compiled market forecasts from different sources. Although the market size estimates vary significantly, all are positive about the industry and expect exponential growth.

Exhibit 14: Outlook on the Commercial UAV industry size

Sources	Market Size	Estimated Period	Published
Teal Group	USD 3.92 BN ^{xvii}	2025	August 2015
Grand View Research	USD 2.07 BN ^{xviii}	2022	August 2015
ABI Research	USD 5.1 BN ^{xix}	2019	January 2015
Lux Research	USD 1.7 BN ^{xx}	2025	October 2014
MarketsandMarkets	USD 1.9 BN ^{xxi}	2020	September 2014
RnRMarketResearch.com	USD 1.27 BN ^{xxii}	2020	June 2015

Note: We have clubbed 23% and 5% market for consumer and civil reported by Teal Group for the projection.

6.3 UAV Components

Unmanned Aircraft Systems (UAS) can range from small drones that fly on a single charge for 10 minutes and cost under USD 200 to commercial-level aircraft that can fly much longer and cost as much as USD 10,000 or more.^{xxiii} Military grade UAVs can cost several million dollars. Some drones are operated by controllers, while others can be operated by operator's smartphone or tablet. A drone's basic elements are frame, propellers, small motor and battery, electronic sensors, global positioning system (GPS) and a camera.

Presently, there are several types of UAVs, depending on the project they are used for, ranging from toy UAV, almost-ready-to-fly (ARF) UAV to ready-to-fly (RTF) UAVs. The essential kit for UAV includes RC transmitter, multi-rotor frame, motors/speed controllers, flight controller and battery charger. Apart from these, optional accessories, such as battery alarm, flight controller add-ons, camera gimbal, telemetry and wireless video, could be added in the drone as per the purpose of a project.

Multi-Rotor Frame – The frame is the basic requirement of the UAV. The configuration depends on the purpose it is to be used for and the loads to be carried. The most popular designs are quadcopter (4 motors), hexacopter (6 motors) and Octacopter (8 motors).

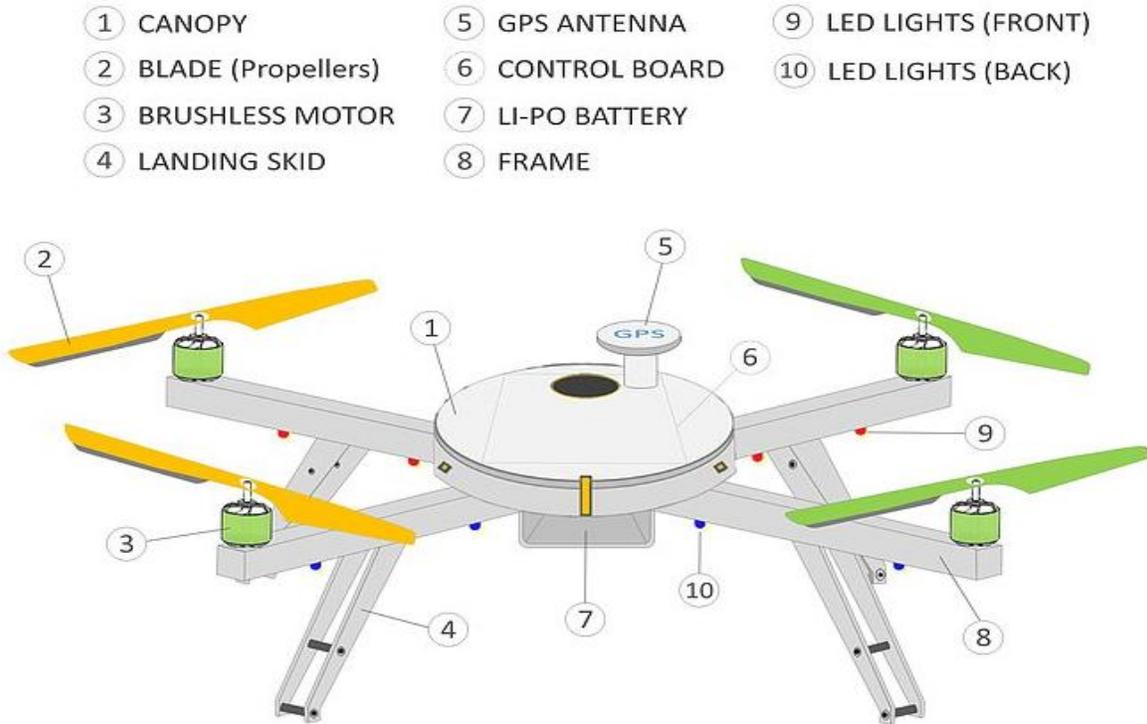
Motors/Speed Controllers and Propellers – The motor is an essential requirement as it impacts the flight time and how much load a drone can carry. It also provides the lift for the UAV. A motor ideally should have less weight with high efficiency. A propeller is an airfoil and consists 2-3 blades; it provides the thrust to the drone and acts as a rotating wing creating a lift force.

Flight Controller – It acts as the brain of the UAV, connecting all the pieces together. It is used to stabilize the multi-rotor and synchronize it. The more advanced flight controllers can take off, fly and land the UAV autonomously with a preprogrammed waypoint.

Battery and Charger – Battery provides the power to the UAV to fly, and would control both motor and flight controller. It is also the heaviest item on a UAV. While choosing the ideal battery, the capacity and voltage factor needs to be taken into account. The Lithium polymer battery is the most ideal and most used battery as this has a high power-to-weight ratio and is readily available.

RC Transmitter – It is possible to fly and control the UAV autonomously without a transmitter, but it is a good idea to have manual backup for the drone in case something goes wrong. A hand-held transmitter is adequate for most cases.

Exhibit 15: Basic Components of a UAV



6.4 Pricing^{xxiv}

Depending on the requirement, the cost of a drone can vary considerably. The drones can be divided into different classes depending on the level of expertise and range they can fly.

Exhibit 16: Basic Components of a UAV

Segment	Entry-Level users	Professional users	Commercial users
Specifications	Kit with drone, four rotors, batteries, charger, GPS and spare propellers	Kit with drone, four rotors, batteries, charger, GPS, spare propellers, advanced cameras and separate controller	Kit with drone, six rotors, larger propeller blades, batteries, charger, GPS, advanced cameras and separate controller
Duration of flight	10 minutes	25 minutes	1 hour
Range	150-200 feet	Half a mile	> a mile
Controll	Smartphone or tablet	Smartphone or tablet	Smartphone or tablet
Cost	USD 500	USD 750-2,000	USD 10,000

6.5 History

Early History - The concept of UAVs is old. In August 1849, Austria used unmanned balloons loaded with explosives to attack Venice.

World Wars - Going back to World War 1 (WWI), necessity, the 'mother of invention,' led to use of flying bombs with the development of first unmanned aircraft. The US army and navy both used aerial torpedoes and flying bombs in WWI but faced difficulties in launching and recovering their UAVs. During World War II (WWII), drones were used as gunnery practice targets by the US forces and for aerial attack missions. Meanwhile, Germany produced its own drones, which used jet propulsion built aircraft.

1950s - A US company, Northrop, developed 'Falconer' and 'Shelduck' UAVs for battlefield reconnaissance. These had an auto pilot system with radio-control backup and video cameras; these also carried flares for night reconnaissance. These were built in great numbers and were used by several military forces internationally. In the 1950s, UAVs were also used as decoys and were released to confuse the radar systems of the enemies.

1960s - This era saw the faster and longer range aircraft, 'Ryan Firebee,' being developed to air bomb targets. UAVs were developed to fly at high altitudes, controlled by radio lines, and to fly at lower altitudes controlled by standoff manned aircraft. These drones carried cameras for reconnaissance over enemy targets.

1970s - During the Vietnam War, drones were used extensively by the US. The drones were used as 'Lightning Bugs.' These were used for intelligence gathering and for taking images from both low and high altitudes. These drones were modified with bigger engines and could carry heavier payloads. In the 1970s, Israel modified the drones it purchased from the US and developed the first UAV with real-time surveillance. It used these in its war against Syria as reconnaissance drones, electronic jammers and as decoys; and had minimal losses.

1980s - In 1982, during the Lebanon War, Israel used its self-made UAVs for images and radar decoying to neutralize Syria's air defenses. By the late 1980s, Israel tested a variety of drones on Lebanon. With rapid advancement in technology, Israel not only outpaced the US in the development of drones, by producing a number of surveillance drones in 1980s, it also sold them to the US.

1990s - US marine, army and navy units, along with coalition forces, used 'the Pioneer' UAV substantially for imagery support during its operations against Iraq. The UAVs were used for bombing target enemy areas. Following bombing raids, it was used to inspect the target area and transmit live coverage of the damage.

2000s - In early 2000, after 9/11, US military used drones for attacks in Afghanistan, Pakistan, Yemen and Somalia. These were also used for the operation to hunt Osama Bin Laden. In 2006, America used drones within the US civilian airspace for search and rescue operations following Hurricane Katrina.

2010s - In 2013, Israel used drones in Gaza during its military operations. In 2013, Amazon, the largest online retailer, announced it is developing drone technology for delivery services.

6.6 Industry Segments

Military Drone Market

Utility in armed conflicts led to the invention of UAVs during World War I and World War II. Drones are normally used in circumstances considered too risky for manned flights. Drones can provide real-time imagery, intelligence and surveillance information by scanning an area and transmitting the information back to the commanders, in order to destroy enemy targets. Military drones are generally used for air strikes and surveillance. As per the Teal Group's projection, worldwide spending on UAVs is expected to triple over the next decade to USD 93 BN. The military segment is expected to contribute 72% of total UAV market spending at USD 67 BN over the next decade, while research spending on military UAVs is likely to add another USD 30 BN.^{xxv} The Teal Group's projections also indicate that the US will account for 64% of the total military worldwide research spending on UAVs. Therefore, the US will be the biggest UAV market over the next decade.^{xxvi}

IHS Jane's Intelligence, a specialist in defense publications, has reported that global defense and security market for UAVs is expected to grow at 5.5% per annum from the current level of USD 6.4 BN and increase to USD 10 BN by 2024.^{xxvii} According to the report, Israel was the biggest exporter of UAVs last year, but the US is expected to overtake its position in the coming years.

Commercial/ Civil Drone Market

As per Teal Group's market estimates, the consumer and civil drone markets will account for 23% and 5% of the drone industry (estimated total market is USD 93 BN) over the next decade.^{xxviii} The civil UAV market is expected to register the highest growth, with the opening of worldwide airspace market due to a low base effect. The commercial drones carrying payloads such as cameras, sensors and packages, can cater to a versatile market within commercial segments. With the cost of drone technology coming down in recent years, the commercial drone's growth is expected to accelerate in areas such as agriculture, media, cinematography and photography, inspection and maintenance, surveillance and real estate.

As per Grand View Research, the commercial UAV market size is estimated to be USD 2.07 BN by 2022.^{xxix} Tractica, a market intelligence firm, estimates worldwide shipments of commercial drones to reach 2.7 MM units by 2025 from 80,000 units in 2015. Also, annual revenue from commercial drone hardware is estimated to reach around USD 4 BN from the current level of USD 283 MM during that period, whereas, annual revenue from commercial drone-enabled-services would generate USD 8.7 BN compared to USD 170 MM currently.^{xxx} The commercial drone sector will be driven by aerial imaging and data analysis applications. Film, media, agriculture and oil & gas will drive the growth in adoption of commercial drones. Whereas, filming and entertainment, mapping, aerial assessment, disaster relief and prospecting will lead to the strong growth in drone-enabled services market.

There is immense scope for drones in the future. The usage of drones is still in early or mid-stages in many sectors and could play a critical role in reviving the growth in various sectors because of its cost-effectiveness and ability to perform tasks which would have been impossible earlier. The table below shows 22 sectors expected to benefit from the use of drone technology; most are in either early or middle stages of adoption and usage growth, and just a handful of sectors have seen the benefits of higher levels of usage of drone technology over a long time. The agriculture sector is expected to account for approximately 80% of commercial drone usage. By using high resolution imaging and aerial mapping, identification of crop conditions, checking for diseases, spraying pesticides and fertilizers, prevention of any disease outburst is possible at a much lower cost.

Commercial drones are also increasingly used for ensuring public safety. For example, drones with high definition and infrared cameras can assist police and fire departments in intelligence gathering, rescue missions, road patrolling, aerial surveillance, etc.

Exhibit 17: Development Stage of Commercial drones used in different sectors^{xxxii}

	Early Stage	Middle Stage	Late Stage
Application			
Aerial photography			L
Border patrol			L
Construction and real estate images and monitoring		M	
Emergency management		M	
Infrastructure monitoring		M	
Mail and small package delivery	E		
Filmmaking and other media uses		M	
Oil and gas exploration		M	
Precision agriculture			L
Public safety			L
Weather forecasting and meteorological research		M	
Wildlife and environmental monitoring		M	
Technology			
Advanced manufacturing techniques		M	
Batteries and other power	E		
Communication systems			L
Detect, sense, avoid capabilities		M	
GPS			L
Lightweight structures		M	
Microprocessors			L
Motors			L
Engines		M	
Sensors			L

6.7 Uses of drones across sectors

1. Agriculture

Agriculture is expected to benefit significantly from the use of drone applications. Monitoring fields from the sky would drive the new farming revolution. The US-based Association for Unmanned Vehicle Systems International predicts that agricultural uses will eventually account for 80% of the commercial market for drones. With the help of drones, it is possible to capture images of fields at a much cheaper cost compared to when using helicopters or satellite imagery. Drone technology with cameras could enable farmers to monitor their crops, check for diseases or spray pesticides and fertilizers and prevent any disease outburst.

It is difficult for the farmers to collect data of farmland spread across large areas. With the help of drones, valuable information can be collected with high accuracy in a short span of time, which in turn can be used to avoid damage caused by various means.

Drones can provide infrared pictures, which help farmers identify exact locations of weed emergence or insect infestations, and enable them to quickly focus on the targeted areas. Drones have potential applications in precision agriculture, which involves the use of detailed data on soils, crops, nutrients, pests, moisture and yield to increase farm productivity.

2. Real Estate

Aerial videography and photography are the new perquisite provided by high-end real estate marketers. Drones effortlessly cover areas, which would be difficult to access otherwise and provide perfect images and videos. For real estate clients, it could provide a virtual tour with interactive and realistic presentations. UAVs can be used as maintenance tools to inspect large commercial places such as malls, undeveloped lands and office parks. These can also be useful for inspecting places after incidences of storm or vandalism, for example.

3. Media and Entertainment

The use of UAVs in the media sector has grown substantially and it is said that 'the age of drone journalism' has started. Drones are used by the media industry in numbers. These have become significant instruments for news gathering by leading media players. News agencies can use drones for capturing images and videos of events from different height and angles. Drones can act as a powerful tool in the hands of journalists with proper training, who know the capabilities of the vehicles. Due to their small size, flexibility and ability to perform in the harshest weather, these could be used to take aerial surveys of places and events such as volcanos, demonstrations or warzones, which were not possible to get up close to by manned aircrafts before. Also, as they would not require the direct presence of reporters, news stories which were earlier missed due to risk of personal injuries to reporters on the ground, could be covered.

Also, using drones is changing the way films are made as these are better than traditional methods for capturing perfect aerial shots. These are also cheaper, safer and faster solutions. As drones cost a fraction of helicopter or crane shoots, these open new avenues for filmmakers looking to capture aerial shots impossible in the past. Drones will continue to change the way movies are filmed. Their use in the film industry will increase with continual improvement in the quality of drones and decrease in the cost of drones.

4. Surveillance

The trend of using UAVs for commercial aerial surveillance is rapidly increasing, with the development of automated and low-cost drones and technology for object detection. Drones with high definition and infrared cameras can access areas not accessible otherwise, due to the small sizes of drones. UAVs are used for gathering intelligence against enemy targets by government agencies and competitors in business. Drones can help in search and rescue missions, scientific research, wildfire mapping, road patrols, anti-piracy and aerial surveillance of large areas at a low cost. However, the widespread use of drones for domestic surveillance raises serious privacy concerns. These present a threat to privacy as drones are capable of monitoring personal conversations, peeking into many places.

Beside the mentioned sectors, drones can also be used for a wide range of activities, including archaeological surveys, firefighting, healthcare (including medical supplies/delivery), delivery in commercial use, wildlife conservation, monitoring marine life, etc.

6.8 UAV Market in France

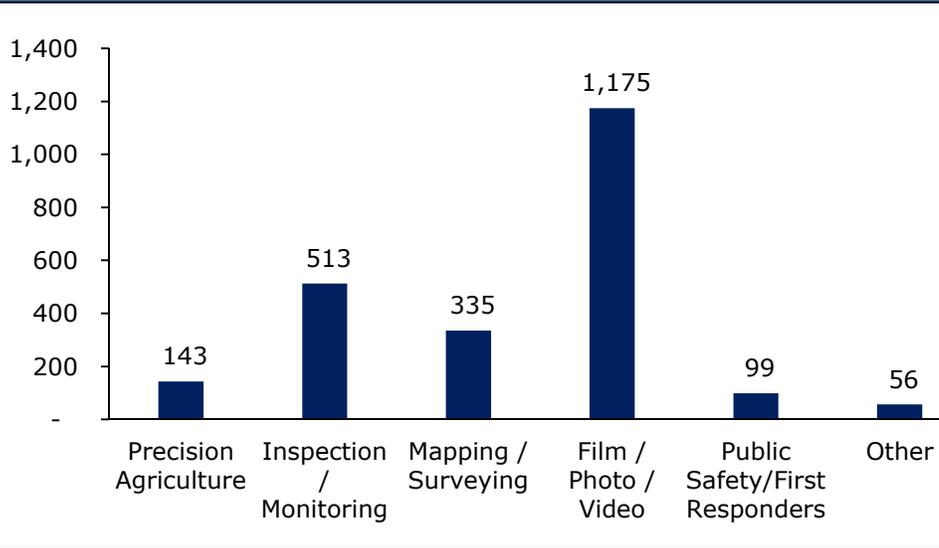
Globally, France has been the pioneer in the commercial drone market. It was one of the first countries to regulate the use of commercial drones. In 2012, the Ministry of Transport's Civil Aviation Authority, DGAC made a law relating to design and use of drones in French airspace. Also, the manner in which drones can be used depends on their types and design. However, the legislation does not apply to military or state-operated drones. France had registered 1,250 commercial drone operators as of January 2015.^{xxxii}

The global UAV industry is forecast to reach USD 93 BN over the next decade, with consumer and civil drone markets expected to contribute 23% and 5% share, respectively. Teal Group expects that French companies are well-positioned to benefit from this growth. France has established drone regulations. Operators must pass a theory exam and show an aptitude for flying a drone. For flying drones beyond the line of sight, a pilot license is needed for the operators, which requires 20 hours of drone training and 100 hours of flying experience.

6.9 UAV Market in the US

In the US, drones have been primarily used in war zones to deliver weapons and for US military reconnaissance. But, now some new technologies and pending federal regulations are enabling the manufacture and use of UAVs for domestic commercial purposes, giving rise to a growing commercial UAV industry. The commercial drone market in the US is still less advanced due to the Federal Aviation Administration (FAA) regulations, which have closed American airspace for UAV trial flights. The FAA, in May 2014, has granted exemption permitting specific use of commercial drones for agriculture, real estate, film and broadcasting, oil and gas and construction activities. The Teal Group's study revealed that 64% of worldwide military spending on drone technology (Research Development Test and Evaluation) over the next decade is expected to be contributed by the US, and 38% of military procurement spending.^{xxxiii}

Exhibit 18: FAA Exemptions Operation / Mission^{xxxiv}



There is significant investment potential in this sector in the US. According to the study conducted by the Federal Aviation Administration (AUVSI), by 2025 about 100,000 jobs could be created in the American economy through the use of drones and would generate about USD 80 BN between 2015 and 2025.

6.10 Regulatory Framework

Despite the significant interest in drones expressed by various sectors, the UAV industry faces major obstacles, which could cut short this sector’s growth story. Regulatory policies, safety and privacy concerns, and public awareness regarding drones are key concerns. Currently, there is no uniform global approach to the legal use of drones by either

hobbyists or businesses. Many countries differentiate drones by weight category, wherein drones weighing more than 55 pounds are considered in a heavier category. Drones weighing less than 4.4 pounds are dealt with differently than the heavier ones as these have lower safety risks. There are other risks related to regulations such as sharing of frequencies and radio link; quality of drones (especially the heavier drones); and safety from mid-air collision.

1. Regulations in the US

The US has clearly lagged in creating a framework to support the UAV industry and therefore, US drone companies are at a serious disadvantage as they are unable to test commercial drone applications in the US. The FAA has set its regulations for use of drones and prohibits their usage for commercial purposes with some exemptions for some specific activities, such as for companies conducting agriculture, real estate, film and construction activities. AUVSI has estimated that each year of delay in regulatory constraints has a USD 10 BN economic impact for the US.^{xxxv}

Under the FAA regulations, drones weighing less than 55 pounds are

Exhibit 19: Types of UAVs in Commercial Operation^{xxxvi}

UAV Platforms Approved Through FAA Exemptions		
Industry	Average Weight (in pounds)	Average Endurance (in minutes)
Agriculture	9.14	37.59
Real estate	5.37	23.10
Film and TV	12.39	19.05
Oil and gas	9.83	97.40
Construction	7.22	26.85

allowed to fly for commercial operations during day time within limited locations, and within the line of sight of the operator. The final set of rules were not expected to be issued until late 2016-17. ^{xxxvii}

FAA has been moving in the right direction. Since May 2014, it has permitted a range of commercial enterprises to use drones. The FAA granted 500 exemptions in its first year in over 20 different industries.^{xxxviii} As of September 2015, FAA had issued 1,407 exemptions to US companies under Section 333 to operate drones for commercial purposes. ^{xxxix}

2. Regulations in Europe

The European Aviation Safety Agency (EASA) has been assigned by the European Commission to set up a common regulation for drones across Europe. The set of standards should cover security, safety, privacy, data protection, insurance and liability. Europe aims to become a global leader in emerging drone technology industry, with the right set of regulations to safeguard the countries’ interest. Currently, within the European Union, different states have regulated, or are planning to regulate, different characteristics of civil drones less than 150 kg in weight.

The EASA has recently released a roadmap for UAV airspace integration to operate and fly in the EU, specifying three categories based on operational parameters:

Open Category: Under this category, it's not necessary to get permission, approval or a license from the Aviation Authority for drones weighing 25 kg or less. However, UAVs need to meet the defined limitations, such as flying within the line of sight of the operator and within a defined altitude and distance; flying over a crowd is not permitted.

Specific Category: This category covers characteristics that have not been covered under 'open' category. Under this category, the drone operator has to undergo a safety risk assessment and identify a mitigation structure that needs to be reviewed and approved by the National Aviation Authority.

Certified Category: This category includes large unmanned aircraft and their operations. These would be treated as manned aircraft in terms of rules. The operators engaged in this category would require licenses.

3. Regulations in France

France was one of the first countries to implement legislation on civil drones. The DGCA has classified UAVs under seven categories segmented by weight, the model design and the accessories that these must contain. Along with this, DGCA has identified four scenarios in which UAVs can be used.

Exhibit 20: Possible Scenarios for using UAVs in France ^{xi}				
	Scenario 1	Up Scenario 2	Scenario 3	Scenario 4
Line of Sight	In Direct View	Beyond the remote pilot's sight	In Direct View	Beyond the remote pilot's sight
Area	Clear of populated area	Clear of populated area	Within populated area or close to a gathering of persons/animals	Clear of populated area
Distance (Horizontal)	100m	1Km	100m	Specific activities and flight that do not meet scenario S2 criteria
Height	150m	50m	150m	150m

6.11 Major Drone Manufacturers

Dajiang Innovation Technology (DJI) – DJI, a Chinese company headquartered in Shenzhen, Guangdong, manufactures commercial UAVs for aerial photography and videography. The company offers powerful drones, including its popular Phantom series, which are easy to fly and can shoot high-definition footage. The company is a leader in commercial and civilian drone industry, accounting for over 70% of the market. DJI reported revenue of around USD 2.83 BM in 2017^{xii}, more than 5 times its revenue in 2014. The company received its last round of funding of USD 75 MM from Accel Partners, the venture capital firm, in May 2015 and has managed to become the first-billion dollar commercial drone company. Currently, the company is focusing on manufacturing agricultural drones and is planning to lower its prices to penetrate this segment.

AeroVironment (NASDAQ:AVAV) – AeroVironment, a California-based technology company, designs, develops, and produces drones for video surveillance as well as for tactical purposes. It is a leader in the military drone space and offers a portfolio of unmanned aircraft systems to the U.S. Department of Defense and international allied governments. The company reported revenue of USD 271 MM in 2018 and is expected to cross USD 300 MM in 2019. AeroVironment has now ventured into the commercial drone space with its simple yet powerful drone, Quantix.

Parrot – Parrot, a French wireless products manufacturer, specializes in technologies involving voice recognition and signal processing for embedded products and drone manufacturing. The company has captured the consumer drone market in a short period of time with its most popular product, AR.Drone and AR.Drone 2.0, a mid-range hobby drone with integrated FPV system controlled by a smartphone app. The company's Bebop series is one of the most popular camera drones in the market due to its affordability and is giving stiff competition to DJI's products. The company reported total revenues of EUR 152 million in 2017, of which drones constituted almost 79% of the total.

3D Robotics – 3D Robotics, an American company founded in 2009, manufactures consumer drones and offers a range of drones for everyday exploration and business applications. Its popular drone 'Solo' released in May 2015 is argued to be the smartest drone ever. It captures breath-taking aerial imagery and data analysis, enabling mapping, surveying, 3D modelling and more. The company raised USD 53 MM in its latest round of capital infusion in April 2017^{xiii} to support product development. Though the company was an early entrant into the consumer drone space, it has recently exited the market and started building software for commercial drone use.

Competition in UAV industry

Exhibit 21: Peer Comparison		
	Country	Segments
DJI	China	Consumer drone maker; the leader in this category; makes drones for hobbyists and professionals; 'Phantom' series is said to be the most popular drone worldwide; widely used by videographers globally
Parrot	France	Second-largest civil & consumer drone manufacturing company
3D Robotics	US	Consumer drone manufacturer; offers drones for exploration and business applications
Dassault Aviation	France	Designs, manufactures and sells combat aircraft for the military sector; also sells products ranging from business jets to military drones
Delta Drone	France	Designs and manufactures civilian and commercial drones and provides a range of payloads. It also offers consulting, technical assistance and maintenance services
Fly-n-Sense	France	Designs and sells end-to-end commercial UAVs for security, agriculture, environment and industrial activities
RedBird	France	The company analyzes and processes the data acquired by drones and offers data processing solutions to optimize resources, improve performance and secure operations with drone-based information
SurveyCopter	France	Designs and manufactures remote-controlled drones and robots; considered to be a pioneer in mini UAVs; offers products for civilian and military uses
AeroVironment Inc.	US	The company makes small UAVs for the US army for real-time reconnaissance, intelligence gathering and surveillance

7. Valuation

The Fair Market Value of all the company shares stood between € 14.71 MM and € 34.16 MM on November 21, 2018. The Fair Market Value for one of the company's publicly traded shares stood between € 0.51 and € 1.18 on November 21, 2018. The valuation approach followed was the DCF method.

7.1 DCF Method

Valuation	
WACC	
Risk-free rate	0.76% ^{xliii}
Beta	0.88 ^{xliv}
Market Return	9.9% ^{xlv}
Additional Premium	0.00%
Cost of Equity	8.77%
Cost of Debt	2.33%
Terminal Growth Rate	2.00%
WACC (Discount Rate)	7.48%

Figures are '000 €, unless indicated otherwise

KEY VARIABLES

No. of drones sold	Average Selling price per drone
Refer to <i>Key Variables Analysis</i> section	

Year Ending - Dec	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
FCFF (High)										
Net cash from operating activities	(107)	(1,476)	(170)	(317)	1,568	1,684	5,576	5,642	8,148	8,683
Capital Expenditure	(606)	(776)	(1,019)	(1,520)	(2,216)	(2,323)	(3,290)	(3,725)	(5,061)	(5,733)
Free Cash Flow to Firm	(713)	(2,252)	(1,189)	(1,837)	(648)	(639)	2,286	1,917	3,087	2,950
Discount factor	0.99	0.92	0.86	0.80	0.74	0.69	0.64	0.60	0.56	0.52
Present Value of FCF	(707)	(2,078)	(1,021)	(1,468)	(482)	(442)	1,471	1,148	1,719	1,529
FCFF (Low)										
Net cash from operating activities	(18)	(1,798)	(284)	(806)	1,326	783	4,287	3,412	6,036	5,528
Capital Expenditure	(591)	(744)	(906)	(1,331)	(1,894)	(1,927)	(2,634)	(2,957)	(3,983)	(4,474)
Free Cash Flow to Firm	(609)	(2,542)	(1,190)	(2,137)	(568)	(1,144)	1,652	455	2,053	1,054
Discount factor	0.99	0.92	0.86	0.80	0.74	0.69	0.64	0.60	0.56	0.52
Present Value of FCF	(604)	(2,346)	(1,022)	(1,707)	(422)	(791)	1,063	272	1,144	546

Arrowhead Fair Value Bracket	High	Low
Terminal Value (TV)	62,918	33,211
Present Value of TV	24,435	12,898
Present Value of FCF	9,738	1,827
Present Value of TV+FCF	34,173	14,724
Equity Value Bracket		
Shares O/s (000's)	29,033	29,033
Fair Share Value Bracket (€)	1.18	0.51
Current Market Price (€)	0.21	0.21
Upside/(Downside)	460%	142%
Current Market Cap. (€ '000)	6,968	6,968
Target Market Cap. Bracket (€ '000)	34,173	14,724

Sensitivity Analysis

Sensitivity Table - High		WACC (%)				
		5%	6%	7%	8%	9%
Growth Rate (%)	1.5%	2.48	1.61	1.10	0.79	0.58
	1.8%	2.62	1.68	1.14	0.81	0.59
	2.0%	2.78	1.75	1.18	0.83	0.60
	2.3%	2.97	1.84	1.22	0.85	0.62
	2.5%	3.19	1.93	1.27	0.88	0.63

Sensitivity Table - Low		WACC (%)				
		5%	6%	7%	8%	9%
Growth Rate (%)	1.5%	1.19	0.73	0.47	0.30	0.20
	1.8%	1.26	0.77	0.49	0.31	0.20
	2.0%	1.35	0.81	0.51	0.32	0.21
	2.3%	1.45	0.85	0.53	0.34	0.21
	2.5%	1.56	0.90	0.55	0.35	0.22

Peer comparison on valuation multiples

Using an industry average P/S for 2018 of 1.30x, our 2022 average estimate of revenue implies fair value of € 1.53 in 2022. Discounting the 2022 fair value to 2017 using WACC, we have arrived at a fair value of € 1.24, which is c. 515% higher than the current share price of € 0.24.

Exhibit 22: Valuation Multiples ^{xlvi}							
	Market Cap (USD MM)	EV/EBITDA		Price to Book Value		Price to Sales	
	2018	2018	2019	2018	2019	2018	2019
Nordex SE	834	7.3	5.8	0.8	0.9	0.3	0.2
Ingenico	4,587	10.8	9.2	2.0	1.9	1.5	1.4
Schindler Holdings	21,183	13.3	12.0	5.7	5.0	1.9	1.9
Workhorse Group Inc	42	NM	NM	NM	NM	3.2	0.4
Kuka AG	3,026	9.1	NM	3.5	3.3	0.8	0.8
Total/ Average	29,673	12.3	10.1	4.7	4.2	1.7	1.6

Note: Peer group comprises of companies related in new technologies.

Approach for DCF Valuation

Time Horizon: The Arrowhead fair valuation for Drone Volt is based on the DCF method. The time period chosen for the valuation is 205 months (2018E-2035E).

Terminal Value: Terminal value is estimated using a terminal growth rate of 2.0%.

Prudential Nature of Valuation: It should be noted that this Arrowhead Fair Value Bracket estimate is a relatively prudential estimate, as it discounts the eventuality of any new products being launched in the market or any significant change in the strategy.

Key Variables: The upper and lower bounds in the estimation correspond to the extreme positions taken by the following key variables:

Variable 1 – Drone Volt factory, academy and services segment revenue

Exhibit 22: Drone Volt factory, academy and services segment revenue										
In € '000	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Low Bracket	2,771	6,096	11,582	18,532	27,798	38,917	48,646	54,970	62,116	70,191
High Bracket	2,868	6,453	12,584	20,764	32,183	46,666	60,666	69,159	78,841	89,879

Variable 2 – Distribution segment revenue

Exhibit 23: Distribution segment revenue										
In € '000	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Low Bracket	5,104	3,828	3,522	3,645	3,773	3,905	4,042	4,163	4,267	4,374
High Bracket	5,785	4,628	4,397	4,572	4,755	4,945	5,143	5,349	5,510	5,675

Important information on Arrowhead methodology

The principles of the valuation methodology employed by Arrowhead BID are variable to a certain extent depending on the subsectors in which the research is conducted, but all Arrowhead valuation research possesses an underlying set of common principles and a generally common quantitative process.

With Arrowhead Commercial and Technical Due Diligence, Arrowhead extensively researches the fundamentals, assets and liabilities of a company, and builds solid estimates for revenue and expenditure over a coherently determined forecast period.

Elements of past performance, such as price/earnings ratios, indicated as applicable, are present mainly for reference purposes. Still, elements of real-world past performance enter the valuation through their impact on the commercial and technical due diligence.

Elements of comparison, such as multiple analyses may be to some limited extent integrated in the valuation on a project-by-project or asset-by-asset basis. In the case of this Drone Volt report, there are no multiple analyses integrated in the valuation.

Arrowhead BID Fair Market Value Bracket

The Arrowhead Fair Market Value is given as a bracket. This is based on quantitative key variable analysis, such as key price analysis for revenue and cost drivers or analysis and discounts on revenue estimates for projects, especially relevant to those projects estimated to provide revenue near the end of the chosen forecast period. Low and high estimates for key variables are produced as a tool for valuation. The high-bracket DCF valuation is derived from the high-bracket key variables, while the low-bracket DCF valuation is based on the low-bracket key variables.

In principle, an investor who is comfortable with the high-brackets of our key variable analysis will align with the high-bracket in the Arrowhead Fair Value Bracket, and likewise in terms of low estimates. The investor will also take into account the company intangibles – as presented in the first few pages of this document in the analysis on strengths and weaknesses and other essential company information. These intangibles serve as supplementary decision factors for adding or subtracting a premium in the investor’s own analysis.

The bracket should be understood as a tool provided by Arrowhead BID for the reader of this report and the reader should not solely rely on this information to make his decision on any particular security. The reader must also understand that on one hand, global capital markets contain inefficiencies, especially in terms of information, and that on the other hand, corporations and their commercial and technical positions evolve rapidly: this present edition of the Arrowhead valuation is for a short to medium-term alignment analysis (one to twelve months). The reader should refer to important disclosures on page 31 of this report.

8. Appendix

8.1 Drone Volt's Financial Summary

Exhibit 23: Financial Summary		<i>Low Bracket Estimates</i>								
<i>Year Ending - Dec</i>	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Revenue (€ '000)	7,875	9,924	15,104	22,177	31,571	42,822	52,688	59,133	66,383	74,565
Operating Profit (€ '000)	(1,296)	(1,181)	(796)	5	1,308	2,970	4,660	5,546	6,660	7,445
Net Income (€ '000)	(1,329)	(1,266)	(949)	(174)	806	1,835	2,945	3,543	4,288	4,829
EPS	(0.05)	(0.04)	(0.03)	(0.01)	0.03	0.06	0.10	0.12	0.15	0.17
Growth rates (%)										
Revenue	1.3%	26.0%	52.2%	46.8%	42.4%	35.6%	23.0%	12.2%	12.3%	12.3%
Operating Profit	NM	NM	NM	NM	NM	NM	56.9%	19.0%	20.1%	11.8%
Net Income	NM	NM	NM	NM	NM	NM	60.5%	20.3%	21.0%	12.6%
EPS	NM	NM	NM	NM	NM	NM	60.5%	20.3%	21.0%	12.6%
Margins (%)										
EBITDA Margins	(13.1%)	(8.9%)	(2.9%)	1.8%	5.8%	8.6%	10.1%	10.8%	11.5%	12.3%
Operating Profit Margin	(16.5%)	(11.9%)	(5.3%)	0.0%	4.1%	6.9%	8.8%	9.4%	10.0%	10.0%
Net Profit Margin	(16.9%)	(12.8%)	(6.3%)	(0.8%)	2.6%	4.3%	5.6%	6.0%	6.5%	6.5%
Ratios										
Price / Earning ratio	NM	NM	NM	NM	7.6x	3.3x	2.1x	1.7x	1.4x	1.3x
EV/Revenue	0.5x	0.4x	0.3x	0.2x	0.1x	0.1x	0.1x	0.1x	0.1x	0.1x
EV/EBITDA	NM	(4.3x)	(8.7x)	9.5x	2.1x	1.0x	0.7x	0.6x	0.5x	0.4x
EV/EBIT	NM	(3.2x)	(4.8x)	771.3x	2.9x	1.3x	0.8x	0.7x	0.6x	0.5x

Exhibit 24: Financial Summary		<i>High Bracket Estimates</i>								
<i>Year Ending - Dec</i>	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Revenue (€ '000)	8,653	11,081	16,980	25,336	36,939	51,611	65,809	74,508	84,351	95,554
Operating Profit (€ '000)	(1,161)	(970)	(441)	568	2,270	4,568	7,134	8,461	10,113	11,392
Net Income (€ '000)	(1,195)	(1,056)	(592)	268	1,386	2,904	4,601	5,498	6,612	7,489
EPS	(0.04)	(0.04)	(0.02)	0.01	0.05	0.10	0.16	0.19	0.23	0.26
Growth rates (%)										
Revenue	11.3%	28.1%	53.2%	49.2%	45.8%	39.7%	27.5%	13.2%	13.2%	13.3%
Operating Profit	NM	NM	NM	NM	NM	NM	56.2%	18.6%	19.5%	12.6%
Net Income	NM	NM	NM	NM	NM	NM	58.5%	19.5%	20.3%	13.3%
EPS	NM	NM	NM	NM	NM	NM	58.5%	19.5%	20.3%	13.3%
Margins (%)										
EBITDA Margins	(10.3%)	(6.1%)	(0.5%)	3.9%	7.7%	10.4%	12.0%	12.7%	13.4%	14.2%
Operating Profit Margin	(13.4%)	(8.8%)	(2.6%)	2.2%	6.1%	8.9%	10.8%	11.4%	12.0%	11.9%
Net Profit Margin	(13.8%)	(9.5%)	(3.5%)	1.1%	3.8%	5.6%	7.0%	7.4%	7.8%	7.8%
Ratios										
Price / Earning ratio	NM	NM	NM	22.7x	4.4x	2.1x	1.3x	1.1x	0.9x	0.8x
EV/Revenue	0.4x	0.3x	0.2x	0.1x	0.1x	0.1x	0.1x	0.1x	0.0x	0.0x
EV/EBITDA	NM	(5.6x)	(43.7x)	3.8x	1.3x	0.7x	0.5x	0.4x	0.3x	0.3x
EV/EBIT	NM	(3.9x)	(8.6x)	6.7x	1.7x	0.8x	0.5x	0.4x	0.4x	0.3x

8.2 Drone Volt's Balance Sheet Forecast

Exhibit 25: Consolidated Balance Sheet		All figures in € '000, unless stated differently						<i>Low Bracket estimates</i>			
<i>Year Ending - Dec</i>	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	
Total current assets	7,519	7,574	6,573	6,556	6,384	8,263	9,465	11,156	12,348	14,360	
Total non-current assets	5,772	6,217	6,765	7,701	9,082	10,306	12,264	14,380	17,373	20,130	
TOTAL ASSETS	13,291	13,791	13,338	14,256	15,466	18,569	21,729	25,536	29,721	34,490	
Total current liabilities	2,570	3,136	3,133	4,025	4,228	4,896	5,011	5,176	5,273	5,413	
Total non-current liabilities	3,271	4,471	4,971	5,171	5,371	5,971	6,071	6,171	5,971	5,771	
TOTAL LIABILITIES	5,841	7,607	8,104	9,196	9,599	10,867	11,082	11,347	11,244	11,184	
Total shareholder's equity	7,450	6,184	5,234	5,061	5,867	7,702	10,647	14,189	18,477	23,306	
TOTAL LIABILITIES & EQUITY	13,291	13,791	13,338	14,257	15,466	18,569	21,729	25,536	29,722	34,490	

Exhibit 26: Consolidated Balance Sheet		All figures in € '000, unless stated differently						<i>High Bracket estimates</i>			
<i>Year Ending - Dec</i>	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	
Total current assets	7,787	7,916	7,340	7,582	8,011	10,702	13,399	16,212	19,265	22,879	
Total non-current assets	5,787	6,267	6,932	8,034	9,683	11,202	13,702	16,407	20,243	23,814	
TOTAL ASSETS	13,575	14,183	14,272	15,615	17,693	21,904	27,101	32,620	39,508	46,693	
Total current liabilities	2,719	3,184	3,365	4,240	4,733	5,439	5,935	5,856	6,333	6,230	
Total non-current liabilities	3,271	4,471	4,971	5,171	5,371	5,971	6,071	6,171	5,971	5,771	
TOTAL LIABILITIES	5,990	7,655	8,336	9,411	10,104	11,410	12,006	12,027	12,304	12,001	
Total shareholder's equity	7,585	6,528	5,936	6,204	7,590	10,494	15,095	20,593	27,204	34,693	
TOTAL LIABILITIES & EQUITY	13,575	14,183	14,272	15,616	17,694	21,904	27,101	32,620	39,509	46,694	

9. Analyst Certifications

I, Parvati Rai, certify that all of the views expressed in this research report accurately reflect my personal views about the subject security and the subject Company, based on the collection and analysis of public information and public Company disclosures.

I, Sumit Wadhwa, certify that all of the views expressed in this research report accurately reflect my personal views about the subject security and the subject Company, based on the collection and analysis of public information and public Company disclosures.

Important disclosures

Arrowhead Business and Investment Decisions, LLC received fees in 2017 and will receive fees in 2018 from Drone Volt for researching and drafting this report and for a series of other services to Drone Volt, including distribution of this report and investor relations services. Neither Arrowhead BID nor any of its principals or employees owns any long or short positions in Drone Volt. Arrowhead BID's principals intend to seek a mandate for investment banking services from Drone Volt and expect to receive compensation for investment banking activities for Drone Volt in 2018.

Aside from certain reports published on a periodic basis, the large majority of reports are published by Arrowhead BID at irregular intervals as appropriate in the analyst's judgment.

Any opinions expressed in this report are statements of Arrowhead BID's judgment to this date and are subject to change without notice.

This report was prepared for general circulation and does not provide investment recommendations specific to individual investors. As such, any of the financial or other money-management instruments linked to the Company and Company valuation described in this report, hereafter referred to as "the securities", may not be suitable for all investors.

Investors must make their own investment decisions based upon their specific investment objectives and financial situation utilizing their own financial advisors as they deem necessary.

Investors are advised to gather and consult multiple sources of information while preparing their investment decisions. Recipients of this report are strongly advised to read the Information on Arrowhead Methodology section of this report to understand if and how the Arrowhead Due Diligence and Arrowhead Fair Value Bracket integrate alongside the rest of their stream of information and within their decision making process.

Past performance of securities described directly or indirectly in this report should not be taken as an indication or guarantee of future results. The price, value of, and income from any of the financial securities described in this report may rise as well as fall and may be affected by simple and complex changes in economic, financial and political factors.

Should a security described in this report be denominated in a currency other than the investor's home currency, a change in exchange rates may adversely affect the price of, value of, or income derived from the security.

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10. Notes and References

- i 52 weeks to November 21, 2017. Source: Bloomberg, November 21, 2018
- ii 3 months to September 21, 2018. Source: Bloomberg, November 21, 2018
- iii Arrowhead Business and Investment Decisions Fair Value Bracket – AFVBTM. See information on valuation on pages 25-27 of this report and important disclosures on page 31 of this report.
- iv Source: Company data
- v Source: Arrowhead BID analysis
- vi Source: Arrowhead BID analysis
- vii Source: Company filings
- viii Source: Company filings
- ix Source: Arrowhead BID estimate
- x Source: Company Website
- xi Source: Company Reports, LinkedIn
- xii Source: Europe Consumer Centre (ECC)
- xiii Source: <https://globenewswire.com/news-release/2018/08/27/1557151/0/en/Drones-Market-Size-to-Mushroom-to-129-300-Mn-by-2028-at-20-18-CAGR-Security-Concerns-to-Carry-Drone-Industry-to-New-Heights.html>
- xiv Source: <http://www.tealgroup.com/index.php/pages/press-releases/54-teal-group-predicts-worldwide-civil-drone-production-will-soar-over-the-next-decade>
- xv Source: <https://www.cbinsights.com/blog/drone-funding-2015/>
- xvi Source: <http://www.asprs.org/a/publications/proceedings/UASReno2015/Snow.pdf>
- xvii Source: <http://www.tealgroup.com/index.php/teal-group-news-media/item/press-release-uav-production-will-total-93-billion>
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- xxiii Source: Unmanned Aircraft Systems (UAS): Commercial Outlook for a New Industry, September 9, 2015
- xxiv Source: Unmanned Aircraft Systems (UAS): Commercial Outlook for a New Industry, September 9, 2015
- xxv Source: <http://www.tealgroup.com/index.php/teal-group-news-media/item/press-release-uav-production-will-total-93-billion>
- xxvi Source: <http://www.tealgroup.com/index.php/teal-group-news-media/item/press-release-uav-production-will-total-93-billion>

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- xxvii Source: IHS Jane’s Intelligence report
- xxviii Source: <http://www.tealgroup.com/index.php/teal-group-news-media/item/press-release-uav-production-will-total-93-billion>
- xxix Source: <https://globenewswire.com/news-release/2015/11/24/789792/0/en/Commercial-Drone-Market-Size-Worth-USD-2-07-Billion-By-2022-Radiant-Insights-Inc.html>
- xxx Source: <https://www.tractica.com/newsroom/press-releases/commercial-drone-shipments-to-surpass-2-6-million-units-annually-by-2025-according-to-tractica/>
- xxxi Source: http://www.oliverwyman.com/content/dam/oliver-wyman/global/en/2015/apr/Commercial_Drones.pdf
- xxxii Source: <http://www.bloomberg.com/news/articles/2015-03-16/what-the-french-know-about-drones-that-americans-don-t>
- xxxiii Source: <http://www.tealgroup.com/index.php/teal-group-news-media/item/press-release-uav-production-will-total-93-billion>
- xxxiv Source: <http://www.asprs.org/a/publications/proceedings/UASReno2015/Snow.pdf>
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