



SUSTAINABILITY REPORT 2023

The road to a better future



Message from the CEO

At Unmanned Life, we are committed to delivering exceptional solutions that enhance the quality of life and promote sustainability through our strategic focus on Security, Sustainability, and Supply Chain via autonomous applications. In alignment with the United Nations' Sustainable Development Goals, we are actively working to advance sustainability for communities globally.

As a company, we firmly believe that the success of businesses is contingent upon their ability to address social, economic, and environmental challenges. In recognition of this, we are dedicated to continuously improving our management and operations from a financial, social, and political perspective in order to stay ahead in a rapidly changing world.



Table of Contents

04	<u>Introduction</u>
05	<u>Who We Are</u>
06	<u>Roles of Robotics</u>
07	<u>Robotics Benefits For Sustainability</u>
08	<u>Sustainability Development Goals</u>
09	<u>Sustainability As A Software Platform</u>
10	<u>Portfolio Of Sustainable Product Applications</u>
22	<u>2022 Successful Deployments</u>
26	<u>Diversity, Equality And Inclusion</u>
27	<u>What Is Next For Us?</u>
28	<u>Conclusion</u>
29	<u>Video Gallery</u>

Introduction

As the world's population and industries continue to grow, the importance of sustainability becomes increasingly critical. The rapid increase in emissions, now at over 34 billion tonnes annually, threatens to deplete the earth's remaining reserves of oil, coal, and gas. Additionally, rising temperatures caused by global warming are causing the oceans to lose oxygen and exacerbating the impacts of climate change. These effects are already being felt around the world, from rising sea levels and extreme weather events to the loss of biodiversity and changes in agricultural productivity.

At Unmanned Life, we understand that our operations rely on the use of natural resources and that our actions have an impact on the environment, economy, and society. As a company, we are committed to creating meaningful value through engagement with various stakeholders. Our focus on sustainability extends beyond environmental protection and includes considerations for economic efficiency and social wellness. Our goal is to minimize our negative impact on the environment and contribute to the well-being of the communities in which we operate.

As a pioneer company in digital transformation and automation, we believe that we have a unique opportunity to drive positive change for future generations. By leveraging our expertise and technology, we can address various sustainability issues and contribute to the creation of a more sustainable future. We strive to transform industries, markets, and behaviours to create a positive, safe, and responsible digital future.

In this way, Unmanned Life is committed to being a responsible corporate citizen and a leader in sustainable business practices. We recognize that sustainability is an ongoing journey, and we will continuously strive to improve our performance and reduce our environmental impact. We believe that by working together with our stakeholders, we can create a sustainable future for all.



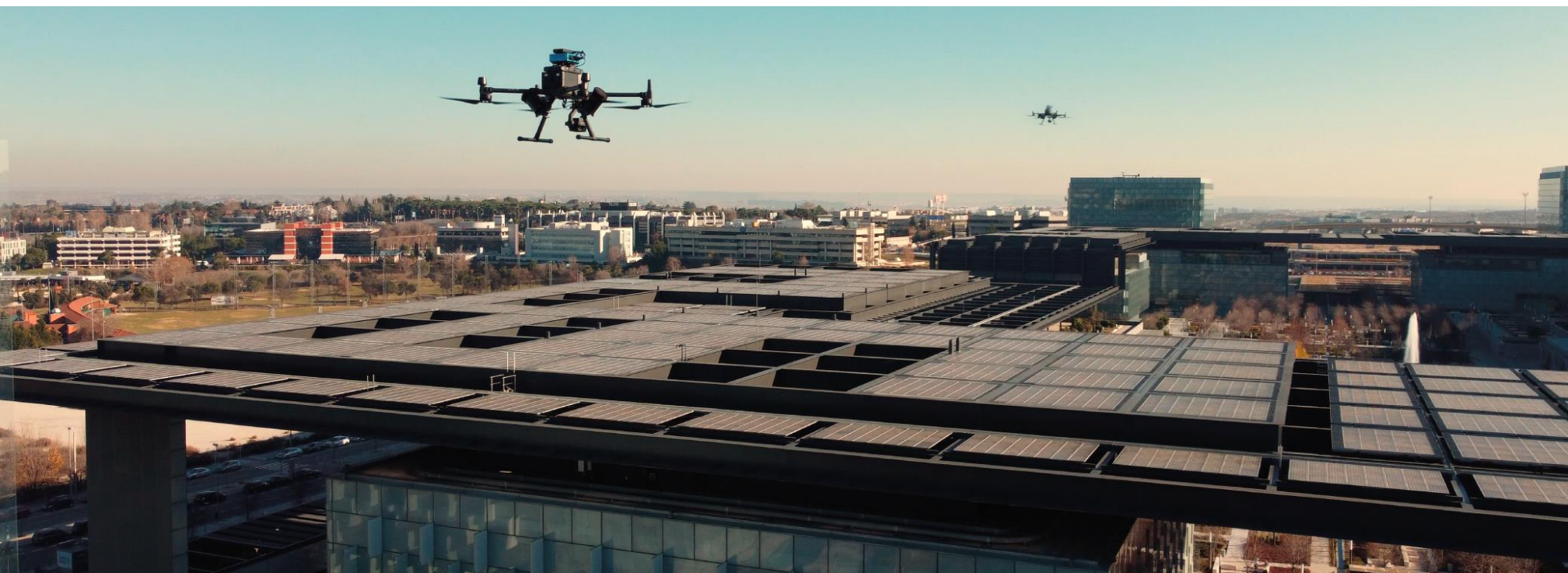
Who We Are

Unmanned Life's Autonomy-as-a-Service platform offers a comprehensive and innovative solution for the orchestration of autonomous robotics, fundamentally transforming the deployment of robotic technology globally. Our platform seamlessly integrates advanced technologies, such as AI, 5G, and Edge computing, to enable the operation of a wide range of autonomous devices, including drones and autonomous mobile robots (AMRs), across various Industry 4.0 and Smart City applications.

Our platform provides unparalleled flexibility and scalability, allowing businesses to quickly adapt to changing market conditions and optimize the deployment of autonomous devices. **This results in significant cost savings, improved operational efficiency, and increased automation**, making it a valuable asset for organizations of all sizes and across various industries.

As a socially responsible company, Unmanned Life is committed to reducing our global environmental impact and has made sustainability a core strategic goal. In alignment with the Paris Agreement's objective to limit global warming to below 2°C by 2030, our goal is to provide the next generation of autonomous robotics technology for security, sustainability, and supply chain purposes, as a step towards creating a more sustainable, environmentally friendly and technologically advanced society.

Our solution is not just about technological advancement but also about how to make it more efficient and environmentally friendly.



Role of Robotics

The utilization of robots has experienced a significant increase in recent years due to the expansion of their capabilities. The advancements in technology have enabled robots to perform a wide range of tasks, from manufacturing and assembly to maintenance and inspection. This has led to a significant shift in the allocation of resources from human capital to robotics. According to a study by the International Federation of Robotics (IFR) in 2020, the global market for industrial robots is projected to reach \$87 billion by 2025, with an annual growth rate of around 10%.

Tasks such as the maintenance of power and utility infrastructure can now be performed more efficiently, with reduced risk and error. Robots are able to access areas that may be dangerous for humans, such as high-voltage electrical equipment and pipelines. They can also perform repetitive tasks with precision and accuracy, reducing the potential for human error. The use of robots in the power and utility industry has the potential to increase productivity by up to 30% and reduce downtime by up to 50% (Source: National Grid, "The Future of Robotics in Power and Utilities").

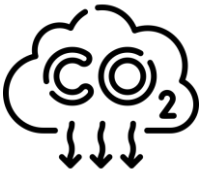
The number of active robots in inspection is rising by over 20% annually, with agriculture at 6% and logistics at an impressive 45% (Source: E-Agriculture In Action – Drones For Agriculture). This trend is expected to continue as more industries realize the benefits of using robots for tasks such as monitoring and maintenance of equipment. The use of robots in agriculture has the potential to increase crop yields by up to 70% and reduce labor costs by up to 80% (Source: Advances in Agriculture Robotics: A State-of-the-Art Review and Challenges Ahead").

The exponential growth of the drone market further highlights the global development of these robotic applications. Drones have the ability to access hard-to-reach areas, such as remote landscapes and offshore platforms. They can also be equipped with cameras and sensors, allowing for real-time monitoring and data collection. The global market for commercial drones is projected to reach \$43 billion by 2023, with an annual growth rate of around 20% (Source: MarketsandMarkets, "Commercial Drones Market").





Examples Of Robotics Benefits For Sustainability



Lowering Emissions

A study by the University of Cambridge found that using drones for emissions monitoring can increase the accuracy of emissions data by up to 50%.



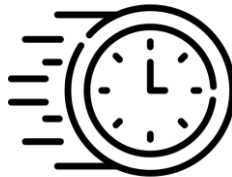
Lowering Costs

A study by the American Society of Civil Engineers found that using drones for surveying and mapping can reduce costs by up to 80% compared to traditional ground-based methods.



Optimising Energy Usage

A study by the University of Cambridge found that using drones for building inspections can reduce energy consumption by up to 50%.



Faster and more efficient

Research conducted by the European Forest Institute has discovered that using drones for environmental monitoring can increase the accuracy of data by up to 90%.



Reducing Humans Risks

Drones can be used to quickly and safely assess emergency situations, such as natural disasters and accidents, reducing the need for human labor and minimizing the risk of accidents and injuries.



SUSTAINABLE DEVELOPMENT GOALS

We Follow And Promote The Sustainable Development Goals:

3 GOOD HEALTH AND WELL-BEING



We believe the use of drones and robots can aid in a safer world through smarter security systems and efficient emergency search and rescue. We place great importance on the well-being and safety of our employees within the work environment.

5 GENDER EQUALITY



We promote a work culture where everyone is respected and given equal opportunities irrespective of age, gender and ethnic background.

8 DECENT WORK AND ECONOMIC GROWTH



We nurture economic productivity through diversification and technological upgrading and innovation.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



We are the key drivers of innovation. Our software provides advanced technological solutions for sustainable industrialization and the tools to maintain quality infrastructure.

10 REDUCED INEQUALITIES



Our business policy promotes equal income, professional development and opportunities without any discrimination.

11 SUSTAINABLE CITIES AND COMMUNITIES



Our technology will provide a safer, efficient and sustainable future for the society, smart cities, and industry 4.0.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



Through our software we can achieve reduced Co2 emissions, control environmental degradation and improve efficiency and sustainable production.

13 CLIMATE ACTION



AI-enabled autonomous applications can accelerate the move to a low carbon world with a potential reduction in worldwide GHG emissions of 0.9 – 2.4 gigatons of CO2 equivalent (GtCO2e) in 2030.

17 PARTNERSHIPS FOR THE GOALS



We only collaborate with companies who share the same principles, values, vision and sustainability goals as us.

Sustainability As A Software Platform



At Unmanned Life, we have carefully laid the foundation for our autonomous applications with a keen focus on promoting environmental and social responsibility. Our platform can be utilized for "robots for good" initiatives, increasing efficiency and providing previously unimaginable solutions in areas such as emergency response, reforestation, and security, among others, through our ability to operate in a variety of industries.

In line with the United Nations' global goal to decrease greenhouse gas emissions by at least 45% below 2010 levels by 2030, as outlined in the 2015 Paris Agreement, we believe that AI-enabled autonomous technology can play a crucial role in accelerating the transition to a low-carbon world.

As we move forward into 2023, our commitment to sustainability will continue to drive us towards new heights. We are currently utilizing drones to minimize emissions in innovative forestry projects in Canada, and this ground-breaking initiative is creating new opportunities for Unmanned Life to expand sustainable applications globally.



Portfolio Of Sustainable Product Applications



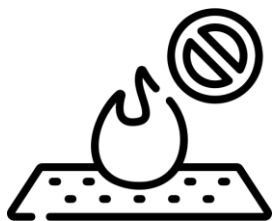
Sustainability

Autonomous robots have proven to be a valuable asset in the drive for sustainability, as they operate without the need for human intervention in safety-critical systems. Their energy-efficient design, coupled with their small environmental footprint, has resulted in a growing adoption of these technologies across various industries.

One key application of autonomous robots is in precision agriculture. According to a study by the National Center for Biotechnology Information (NCBI), the use of autonomous drones for crop monitoring can result in water savings of up to 30%, fertilizer savings of up to 20%, and pesticide savings of up to 50%. Additionally, farmers have reported an increase in crop yields of up to 20% with the use of these drones.

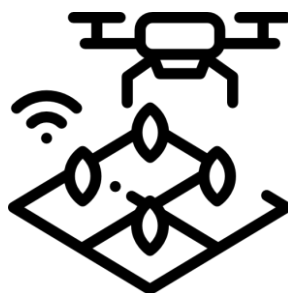
Another area where autonomous robots have made a significant impact is in smart forestry. A study by the University of California, Davis found that the use of drones for forest inventory can result in cost savings of up to 70% compared to traditional methods. These drones can also provide valuable data on soil conditions, crop health, and other key factors, which can be used to optimize land management and planting conditions. This leads to improved yields, with a reduction in environmental impact. Furthermore, drones can plant trees at a rate of up to 1,000 trees per day, which is significantly higher than the rate of 25-50 trees per day that can be planted by humans.

Main Verticals



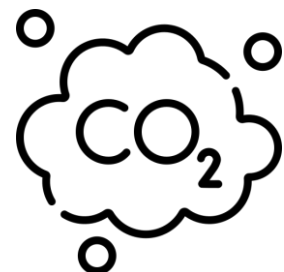
Fire Mitigation

Fleets of drones can be used to monitor areas for fire breakouts, or respond directly to a detected fire for situational awareness.



Reforestation

Autonomous drones can efficiently perform at all stages of reforestation, from mapping to planting, and then monitoring the health of growing crops.



Emissions Detection

Specific payloads can be enabled on drones and robotics to measure and monitor emissions

Fire Mitigation

The challenges

As global climate change worsens, wildfires are spreading more frequently and claiming the lives of hundreds of people, animals, agriculture and property. As of Nov. 20, the European Forest Fire Information System (EFFIS) estimated that within European Union countries, between 2.07 million acres and 2.17 million acres have burned. In the broader area that EFFIS covers, it is estimated between 4 million acres and 4.2 million burned acres.

The traditional methods to address these challenges are either too costly or time-consuming. Sending firefighters to tackle wildfires puts their health and lives in danger. The world needs a smart solution that can support firefighters in wildfire mitigation and is kind to the environment too.

Our Solution

Our platform can orchestrate fleets of autonomous robots to work together seamlessly to resolve emergency situations within the crucial Golden Hour. As a result, we are able to swiftly intervene within the first hour, potentially saving lives. Our AI-powered orchestration of robotics reacts to crisis by working together as one task force.

Drones can help with situational awareness, firefighter safety, and action planning by facilitating mapping. Drones are small and can reach places inaccessible or dangerous to humans. Drone mounted with cameras can stream live videos and autonomously detect troubled animals or humans by leveraging AI analytics. When needed these drones can also be equipped with payloads like a life jacket, blankets, or water bottles.

Benefits:



Response Within The Golden Hour

- Fast deployment to prevent the spread of fire



Enhanced Safety for First Responders

- Remote monitoring to assess risk before intervening



Increased awareness using Thermal Capabilities

- Thermal imaging allows the detection of intense heat areas



Reforestation

The challenges

Approximately 15 billion trees are lost globally on an annual basis, which poses a significant threat to the environment. Efforts to conserve, regenerate, and grow 1 trillion trees by 2030 have the potential to mitigate the effects of climate change and promote biodiversity. The traditional method of reforestation, which involves manual planting by large teams of volunteers and employees, can be a challenging and labor-intensive process. Alternative methods, such as seed dropping via helicopter, while costlier, often lack precision and are less effective in promoting successful growth and establishment of new trees.

Our Solution

Our platform can orchestrate swarms of autonomous drones to work together seamlessly for reforestation. By leveraging the capabilities of thermal imaging cameras and AI, drones can select ideal site for seeding and physically plant them at a rate of up to 20-40x faster than manual work, with increased precision and accuracy.

Multiple drones orchestrated together via our platform can map the area, sharing video in real-time via the available network. Integrations with third-party systems, such as GIS, AI or carbon credit platforms can then enable us to check crop health after the planting to ensure positive growth rates.

Benefits:



Cover a large area in a shorter amount of time

- A drone can map an area at 2 km²/h



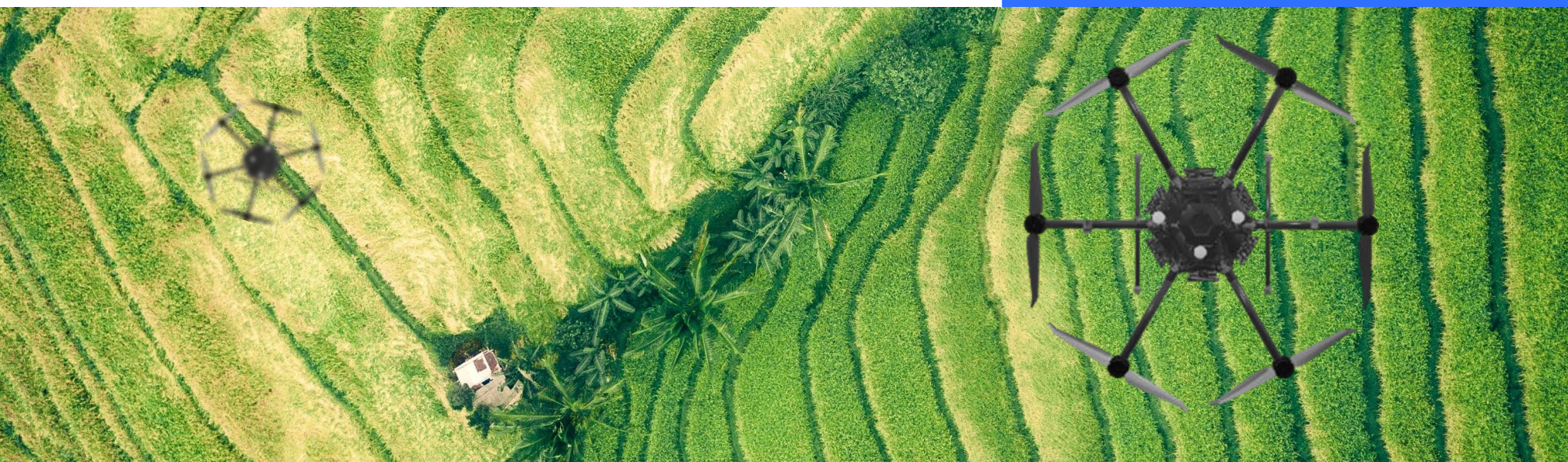
Reduce Operating expenses

- Drones are 25x faster and 80% cheaper



Enable flexible applications

- One platform enables multiple use cases



Emission Detection

The challenges

An increase in greenhouse gases can lead to a range of harmful effects, such as more frequent and severe weather events, sea level rise, the loss of biodiversity, and rising global temperatures. Carbon emissions from factories and automobiles are among the biggest contributors to this effect.

If factories, mining, and manufacturing continue to rely on traditional methods, the environment will suffer greatly and the economy will be severely impacted. The biggest challenge for these industries is to protect workers from harmful processes and emissions while also finding ways to reduce costs and increase efficiency.

Our Solution

Emissions-measuring payloads and sensors can be integrated to the drones to monitor the levels released to the atmosphere from equipment or infrastructure.

Drones empowered by our software platform can provide real-time identification of leaks, accurate quantification of leaks, and process equipment emissions. Our autonomous drone-based application can help the mining industry reduce emissions by providing a better understanding of where leaks occur and at what magnitude. The drones can be deployed autonomously on a schedule to visualise the changing emissions levels over time and quantify emissions by measuring concentrations, and tracing them back to their source.

By utilising fast mobile networks, this data can be sent in real-time, allowing for immediate action to be taken if necessary.

Benefits:



Constant emissions monitoring

- Real-time sensor data allowing leak identification



Increase safety in harsh environments

- Fly in disaster zones and protect workers' safety



Visualise data into one platform

- Centralised data on the Unmanned Life platform





Supply Chain

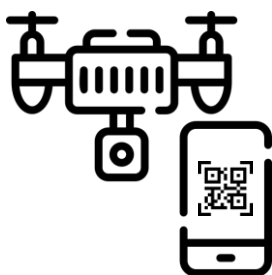
Supply chain management is faced with various challenges such as data management, security risks, quality control, and ineffective operations. According to a study by Deloitte, data management is a critical challenge for supply chain organizations, with a lack of data standardization and siloed data systems being major roadblocks to digital transformation.

To address these challenges, our company has developed a software platform for multi-robotic orchestration. This platform enables autonomous robotics to work as singular, autonomous workforces, thereby improving the speed and accuracy of supply-chain operations. According to a study by Accenture, the use of autonomous robots in supply chain operations can increase efficiency by up to 85%. Additionally, the use of autonomous robotics in hazardous environments greatly reduces the risk of injury. A report by the International Association of Machinery and Equipment Appraisers states that the use of robots in manufacturing can reduce workplace injuries by up to 85%.

Furthermore, our hardware-agnostic software approach allows for easy upgrading to the latest, most energy-efficient models, eliminating the need for costly system overhauls. A study by McKinsey & Company found that companies that adopt digital technologies in their supply chain operations can reduce their energy consumption by up to 30%.

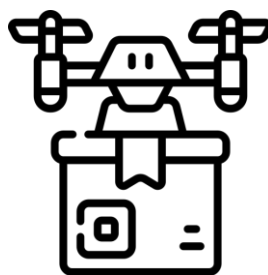
Our unique software platform enables robotic capabilities to provide faster, cheaper, and environmentally friendly solutions that are beneficial for society, the economy, and the environment. By improving business practices and organizational processes, we aim to reduce negative environmental impact, waste, and cost in supply chain management. According to a report by the World Economic Forum, sustainable supply chain management can help companies reduce their environmental impact by up to 40%.

Main Verticals



Smart Logistics

Orchestration of heterogeneous drones and robots to increase the efficiency of industrial processes.



Last mile-delivery

Drones and ground robots can be used to autonomously deliver parts between different production facilities.



Intralogistics

Robots can autonomously deliver parts to their respective destinations in warehousing and factory settings without the need for human intervention.

Smart Logistics

The challenges

As per a Fortune Magazine report, almost 94% of the Fortune 1000 companies faced pandemic-induced supply chain disruptions. Most logistics leaders experienced these disruptions first-hand, as COVID-19 exposed the weaknesses of traditional workflows in the existing supply chain logistics.

The challenges involve increased transportation costs, inefficient means of tracking goods, limited visibility of shipment, poor communication and delivery delays.

Logistics management is fundamental to the distribution of goods and services from the point of production to the point of consumption but during COVID, the supply chain had been completely destroyed due to a lack of upstream and downstream visibility, outdated demand management procedures, a lack of resilience to demand variability, and unexpected outages brought on by reliance on manual labour throughout logistics operations.

Our Solution

Our software platform has an application to enhance inventory management. By integrating our software with third-party systems and equipping drones with cameras and agility, our platform enables them to create a virtual map of all the goods, reducing the costs associated with labour-intensive inventory management procedures like cycle counting. This also helps to minimize disruptions and time spent searching for lost pallets, improving overall inventory accuracy and efficiency.

In addition to inventory management, our platform can also streamline the logistics process. Drones can transport goods across facilities and deliver them to orchestrated mobile robots for end-to-end delivery to a warehouse floor, helping to solve logistical challenges. This not only improves inventory management but also enhances the overall supply chain process by providing greater visibility and control over the inventory cycle.

Benefits:



On-time delivery of goods

- Faster delivery as not affected by traffic



Efficient stock management

- Optimised warehouse stock



Reduce Carbon Footprint

- 54% fewer carbon emissions



Last-Mile Delivery

The challenges

With the impact of the global pandemic affecting most business industries in one way or another, the global eCommerce industry witnessed a 44% rise in 2020, and consumer spending went skyrocketing up to \$861.02 billion.

More than 53% of the shipping expense goes toward last-mile delivery but the challenge is to meet the customer's requirements given that it is expensive and time-consuming. If a delivery is missed because of friction in the last-mile delivery logistics or the entire supply chain, the delivery cost doubles up and can result in severe losses. Poor visibility of the package and inefficient delivery management are some of the common challenges of last-mile deliveries.

Our Solution

Unmanned Life's software platform can orchestrate drones in last-mile delivery environments, whilst providing solutions for the safety and security for these logistics chains. Orchestration is key for hosting large numbers of UAV's safely in busy environments

This is furthered by Unmanned Life's ability to connect drones to mobile networks, meaning bi-directional communication in real-time with UTM platforms, a key enabler for drones in the air in the near future.

Our work with European Research and Development products in this space is leading the way with regulation across the continent, and we hope to scale this vertical in the coming years.

Benefits:



Significant reduction in delivery time

- 4x faster delivery than traditional methods



Reduce Operating expenses

- 55% decrease in operational expenses with drones



Reduce Carbon Footprint

- 2600% decrease in carbon emissions



Security



The implementation of physical security measures can be a challenging task for organizations, as it often entails a significant allocation of human resources and capital expenditure for traditional surveillance methods. These methods, however, may prove to be predictable and ineffective in large-scale operations. Our software platform offers a revolutionary solution by leveraging autonomous robotics for flexible and efficient security monitoring on an ad-hoc, timed, or sensor-triggered basis.

The utilization of drones, outfitted with advanced cameras and sensors, enables the monitoring of designated areas for potential security threats, such as intruders or suspicious packages. This not only enhances security measures but also enables employees to focus on more critical tasks by relieving them of tedious and potentially hazardous duties. A recent study by [MarketsandMarkets](#) found that over 10% of companies are already utilizing drones for security purposes, with over 90% of respondents reporting a positive return on investment within one year of initial purchase.

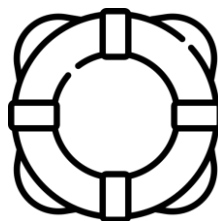
By integrating modern drone technology with our platform for orchestration, we aim to promote autonomy at a higher efficiency, while making it accessible to a wide range of enterprises. We anticipate a growing adoption of drones for security measures in the near future, leading to significant returns on investment and improved safety protocols. Furthermore, the use of drones for security purposes also aligns with promoting sustainability, as they emit significantly lower levels of carbon dioxide compared to traditional forms of transportation.

Main Verticals



Surveillance

Drones can work as fleets to perform ultra-efficient surveillance rounds on demand, on a schedule, or triggered by an on-site event



Emergency Response

Fleets of drones are optimised to provide end-to-end autonomous response, from searching affected areas to dropping emergency payloads.



Assets Inspections

The combined use of fleets of UAVs, AI & relevant payloads can offer quicker, more accurate and cheaper monitoring of critical infrastructures such as roads, solar panels, and cell towers.

Surveillance

The challenges

Manual surveillance techniques are costly and labour-intensive. Security cameras are immobile, have a set viewing range and can easily miss blind spots.

Furthermore, there is the challenge of managing and analysing the vast amounts of data generated by surveillance systems. This can require specialized software and trained personnel to handle and interpret the data, adding to the cost and complexity of surveillance.

In addition, responding to on-site threats put security guards at risk, whilst frequent false reports can also lead to ineffective use of time.

Our Solution

Autonomous drone-based surveillance provides a faster, cheaper and greener high quality data collection method. Our software platform can provide autonomous mission management and path planning, whilst connection to networks ensure real-time data flows to the operator. This connection also provides remote operation capabilities in both launching and viewing the mission.

AI-systems can be integrated to the solution to further enable the drones to detect threat and alert the operator faster than traditional methods. The drones can be set for on demand, pre-planned or reactive autonomous missions, and all of this can be achieved through a central interface that is user friendly and easy to operate.

Drones are not confined to limited search area and due to the orchestration on the platform, they can survey large areas in shorter time. This maximises efficiency in security operations and provides better security. Finally, we can't overlook the low Co2 emitted by drones, compared to helicopters or trucks used for surveillance.

Benefits:



Reduced costs compared to fixed surveillance

- Up to 50% more cost-effective compared to alternatives



Real-time identification of unauthorised intruders

- Highly precise intruder detection with more than 90% accuracy



Advanced AI data analytics

- Large database of object detection and recognition



Emergency Response

The challenges

Traditional search and rescue systems are burdened with outdated systems and suffer as a result. Manual search and rescue endanger the lives of responders due to the nature of rescue operations and the use of helicopters can be expensive and contributes to 2.5% of global CO2 emissions.

Emergency and search missions often take place in environments that are challenging for communication, such as remote or rugged areas. This can make it difficult for the people involved in the mission to communicate with each other and coordinate their efforts effectively. The world needs a faster, cost-effective and safer emergency tool to combat the global crisis

Our Solution

Autonomous drone swarms are an efficient way to respond in emergency search and rescue operations, searching for the individual, dropping life-saving payloads, and informing responders to the exact resource allocation needed for rescue. Our platform can orchestrate fleets of autonomous robots to work together to provide this end-to-end solution for emergencies. With swarms of drones, active crew monitoring is possible from afar to ensure they're safe and heading in the right direction. Network connections on the drone ensure situational awareness in real-time

An entire autonomous drone swarm can be deployed for 95% cheaper than a helicopter, all whilst having increased coverage, flexibility, and fewer errors, as well as demonstrating resilience and consistency whilst working in harsh environments.

Benefits:



Enhance safety for first responders

- Access to inaccessible areas before an intervention is needed



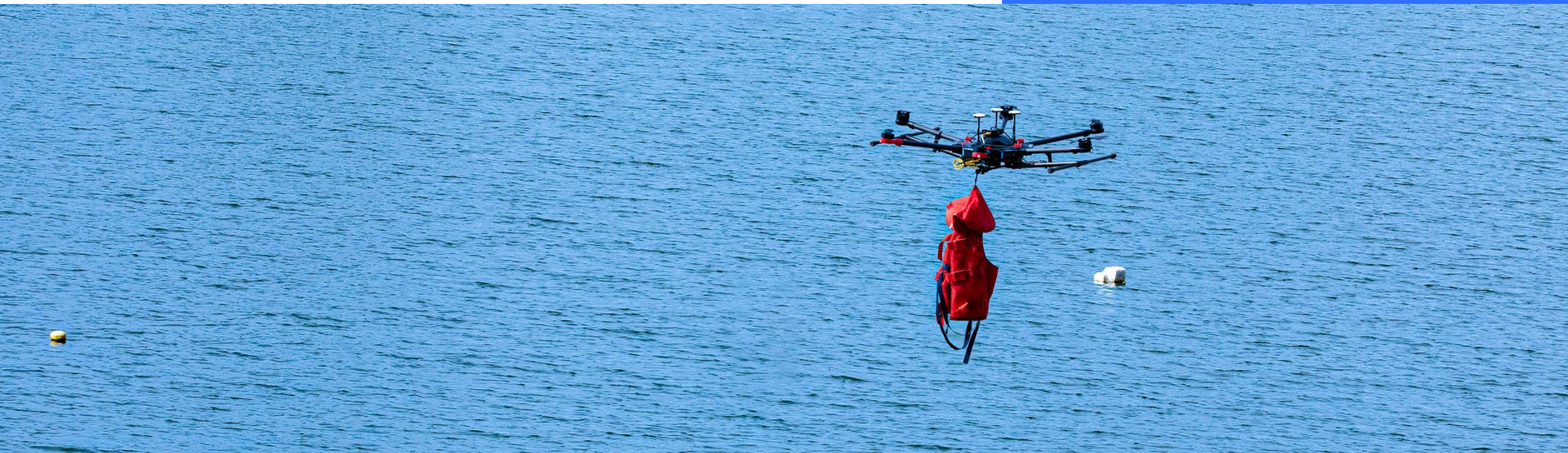
Better allocate emergency responders' staff

- Can reduce up to 70% of first responders' per intervention



Reduce CO2 emissions

- Helicopter emits 3,500x more CO2 than a drone



Asset Inspection

The challenges

Inspecting critical infrastructure presents several challenges, including access, cost, accuracy, and integrity. Traditional inspection methods may be costly and time-consuming, and may not provide a complete picture of the infrastructure being inspected. Additionally, inspections can be hazardous for human workers and can potentially cause damage to the infrastructure.

Data collection will also remain a challenge. Being able to provide data in real-time whilst promoting autonomy during asset inspections will unlock scalability

Our Solution

With our platform, autonomous drones can quickly and safely carry out the inspection of assets for overall monitoring and help in proper maintenance, thus preventing environmental disasters. The integration of a variety of payloads, from thermal to LiDAR, unlocks variability. In inspections across several types of infrastructure

Third-party AI systems can further be brought in to increase the accuracy and autonomy of inspections. This could include hotspot identification, bounding boxes for damage to infrastructure, rust, digital twin modelling, and more! The use of autonomous drones for asset inspections can dramatically increase the number of daily inspections, avoid accidental damage that may occur during manual inspection, and encourage more asset instalments.

Benefits:



Faster data collection

- Data collection is 50x faster compared to manual collection in certain use cases



More regular inspections allowing environmental safety

- Reducing inspection time by 50%



Better accuracy of data processing with AI analytics

- Quality reporting and better decision-making for environmental safety





2022 Successful Deployments





2022 Deployment: Security

An Efficient Security system

As part of our Triple 'S' strategy for 2022, we have focused on providing an efficient surveillance solution to enhance security measures in industrial environments as part of the 5G Logistics Project. Our application has been successfully deployed in Spain, Canada, and the UK.

The 5G Logistics Project, hosted in Bristol Port, UK, is a prestigious R&D initiative aimed at developing new technologies in the Smart Ports sector that leverage an underlying 5G private network and edge computing.

Our orchestration platform was utilized to perform two key use cases:

Security Surveillance: A fleet of drones, augmented with 5G and AI for person detection, were utilized to perform surveillance of the port perimeter and identify any intruders on the site. This was done either on an ad-hoc basis or on a scheduled timer.

Tracked Asset Response: Unmanned Life's platform was integrated into an RFID-based system within the port. When assets were being loaded or unloaded without authorization, our platform was notified, and a drone was triggered to autonomously fly to the precise location. By providing a bird's-eye view of the affected asset, the port was kept situationally aware, preventing asset theft or improving logistical processes.

The solution pioneered benefits in the vertical, with:

- » **54%** reduction in time for incidence response compared to an **on-site** officer
- » **48%** faster perimeter inspection time than manual operations
- » **28x** fewer emissions compares to the alternatives methods



2022 Deployment: Supply Chain

Autonomous Inventory Management

Unmanned Life recently showcased a cutting-edge inventory management system, featuring an autonomous drone capable of navigating confined spaces such as warehouse environments. The drone seamlessly flies along racks, identifying individual boxes and scanning QR codes to create a virtual map of all goods in the racks, including identification and position.

This innovative solution leverages the power of edge computing to demonstrate the future potential of the technology. By utilizing image recognition capabilities at the edge of the network, it is possible to offload data analysis, reducing the weight of the drone and increasing flight times.

The demonstration was carried out in collaboration with Wayra and leveraged Telefonica's 5G network to facilitate real-time data transmission throughout the process. This use case serves as a proof-of-concept for the potential deployment of scaled fleets of drones in the near future. Additionally, it highlights the benefits of the platform in the context of indoor inventory management. This use case is currently being implemented in Madrid, Spain and Munich, Germany.

Autonomous Inventory Management can have significant benefits when compared to manual work:

- » **90%** faster than manual methods
- » **98%** accuracy, compared to just 60% manually
- » **50%** reduction in stockouts



2022 Deployment: Sustainability

A Pioneering System in Reforestation

Unmanned Life recently conducted a ground-breaking use case in a remote forest located in the Sunshine Coast of Canada. The use case involved utilizing a fleet of drones, which were controlled by our software platform and operated over a partner's mobile network, backhauled by Starlink. The drones collected photographic data, which was subsequently analysed utilizing a third-party GIS system. This was a significant achievement as it marked our first deployment beyond visual line of sight, made possible by command and control via our platform over the mobile network.

The goal of this solution is to further develop mapping and monitoring applications for full reforestation efforts. This includes assessing planting conditions, road access for workers, topography, and more by mapping the area. The fleet capabilities of the drones allow for an extremely flexible and efficient planting mechanism using specialized equipment. Additionally, monitoring the growth rates of the planted trees using third-party applications to assess tree health, coverage, and more.

This end-to-end application for drone reforestation is flexible, autonomous, and scalable, and can be applied in various environments around the world, promoting a significant step in global reforestation efforts.

Drones are thought to be a powerful reforestation method, with:

- » **85%** more planting efficiency than traditional methods
- » **80%** survival rates, compared to 50-60% with traditional methods
- » **48x** faster mapping compared to traditional survey methods

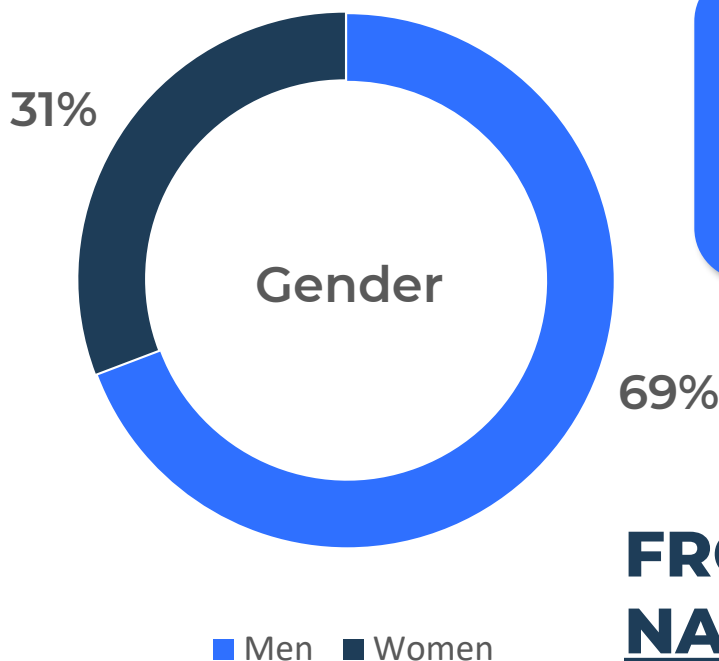
Our application, currently in development, hopes to exceed these numbers by bringing in automation, 5G, and AI capabilities at the edge.



FOSTERING Diversity, Equality and Inclusion

At Unmanned Life, we have always placed a strong emphasis on gender balance, inclusion, and diversity. We firmly believe that a diverse and inclusive workforce leads to more innovative business ideas and fosters a more collaborative work environment. When we first established Unmanned Life, our team was composed of a small number of women employees. However, after receiving funding in 2022, we set a goal to increase the representation of women within our workforce. By the end of 2022, we were pleased to have achieved a significant increase in the number of female employees, with two of them holding managerial positions.

We are committed to fostering a culture of diversity and inclusion throughout our organization. This is reflected in the makeup of our team, which comprises individuals from a variety of backgrounds, including men, women, British, North African, and Latin employees. Each team member brings their unique perspectives and experiences, which contribute to the dynamic and inclusive culture of our company. Our ultimate goal is to create a work environment in which every individual, regardless of their background, gender, or race, feels safe and comfortable.



Our Aim for 2023:

- Increase the number of women workers
- Ensure that employees feel empowered
- Have open communication with employees
- Improve awareness of diversity and inclusion in the workplace

FROM 13 DIFFERENT NATIONALITIES

What Is Next For Us?

A Laser Focus on Security & Inspections in 2023

The path to a sustainable and secure future remains challenging. How can we solve all these global problems at once with our software platform?

The simple answer is, we need to remain focused on providing as much value as we can in certain applications before spreading a focus across several verticals.

Because of this, although we are aiming to continue development across applications such as hybrid logistics and last-mile delivery, security and inspections will remain a key focus throughout 2023. Through our innovative product, we see a technological disruption that will capture some of the \$300 billion physical security markets.

Security at Scale

We know that autonomous drone-based surveillance provides a faster, cheaper, and greener high-quality data collection method, whilst promoting the safety of on-site individuals for enterprises, and leveraging this application for inspections through integrations to third-party AI systems and relevant drone payloads provides a wealth of benefits in inspecting critical infrastructure.

Not only is the act of inspecting with drones greener, but the end result promotes critical infrastructure working with minimal waste or inefficiencies.

The expansive number of sites this can be used on further promotes scalability.

Thriving on Large Challenges

As a company in the autonomous drones and robotics industry, it is essential to stay at the forefront of technological advancements. This means investing in research and development to create innovative products and services that meet the changing needs of customers.

In addition to staying ahead of the curve in terms of technology, it is also crucial that we continue to drive our ethical business practices and deliver high-quality products and services to customers.

Having a deep understanding of the market and competition is also important for effectively positioning our company and its offerings. We will continue to conduct detailed market research and analysis, as well as monitoring industry trends and developments.

By focusing on these key areas, Unmanned Life can thrive and succeed in a rapidly-evolving market.



Conclusion

The integration of autonomous robotics in the field of sustainability has the potential to revolutionize the way we approach environmental conservation and resource management. Autonomous robots, equipped with advanced sensors and artificial intelligence, can perform a wide range of tasks in an efficient and environmentally-friendly manner.

One of the key areas where autonomous robotics can contribute to sustainability is in waste management. Autonomous robots can be used for tasks such as sorting and recycling waste, monitoring landfills, and cleaning up litter and debris. These robots can work around the clock, reducing the need for human labour and increasing the efficiency of waste management operations. For example, a study from the University of Cambridge estimates that the use of autonomous robots for waste sorting could increase recycling rates by 30-40%.

Another promising application of autonomous robotics in sustainability is in the generation of renewable energy. Autonomous drones, for instance, can be used to inspect and maintain solar panels and wind turbines, reducing the need for human workers to climb to these heights and potentially increasing the efficiency of the energy generation process. According to a report by the International Renewable Energy Agency (IRENA), the use of drones in the maintenance of wind turbines could reduce costs by up to 20%.

In addition to these applications, autonomous robots can also play an important role in conservation efforts. For example, autonomous drones and underwater robots can be used to monitor wildlife populations and habitats, gathering valuable data on the health of these populations and the environments they live in. This can help conservationists make more informed decisions about how to protect and preserve these ecosystems. Furthermore, autonomous robots can also be used for tasks such as monitoring air and water quality, and detecting and removing invasive species.

The use of autonomous robotics in sustainability efforts has the potential to greatly improve the efficiency and effectiveness of these efforts, reducing the environmental impact of human activities and helping to protect the planet for future generations. However, it is important to note that the development and deployment of autonomous robots for sustainability must be done in an ethical and responsible manner, taking into account potential impacts on employment, privacy, and security.

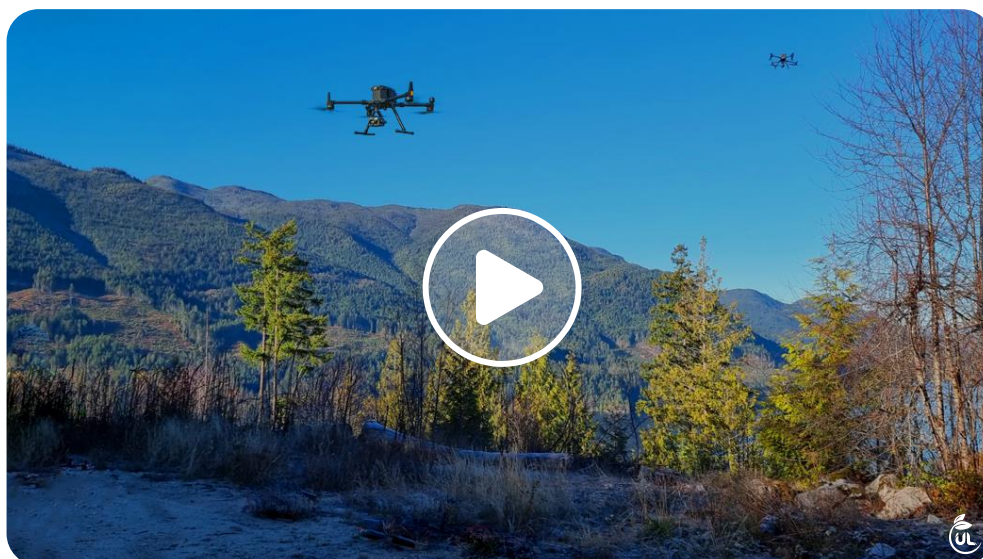
Overall, the integration of autonomous robotics in sustainability initiatives could have a significant impact on the way we approach environmental conservation and resource management. It can help to improve the efficiency and effectiveness of these efforts, reduce the environmental impact of human activities and safeguarding the planet for future generations. It's important to mention, that the development and deployment of autonomous robots for sustainability must be done ethically, taking into account potential impacts on employment, privacy, and security.



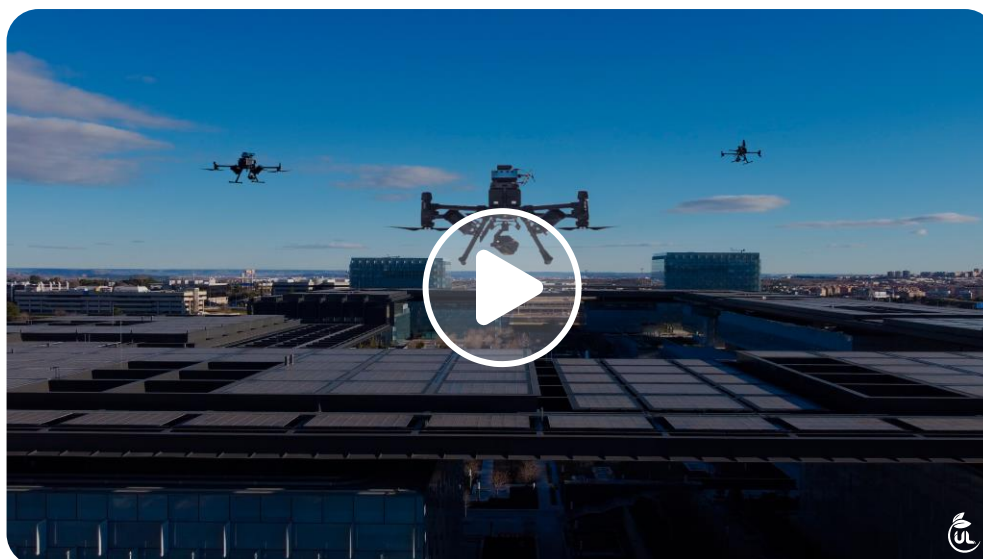
Video Gallery



The Road To a Better Future



Reforestation: Mapping & Monitoring



Who is Unmanned Life?

Sources

1. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement#:~:text=Its%20goal%20is%20to%20limit,neutral%20world%20by%20mid%2Dcentury>
2. <https://www.un.org/en/climatechange/net-zero-coalition>
3. <https://www.weforum.org/agenda/2017/06/drones-plant-100000-trees-a-day/>
4. <https://www.ctif.org/news/co2-emissions-wildfires-highest-decades>
5. <https://www.wwf.org.uk/learn/effects-of/deforestation>
6. <https://fortune.com/2020/02/21/fortune-1000-coronavirus-china-supply-chain-impact/>
7. <https://www.upperinc.com/blog/last-mile-delivery-challenges/>
8. <https://www.dartdrones.com/security-drones/>
9. <https://ourworldindata.org/co2-emissions-from-aviation>
10. <https://www.biggerinvesting.com/what-is-the-idea-of-sustainability/>
11. <https://ourworldindata.org/co2-emissions>
12. <https://www.farmersjournal.ie/sustainability-isn-t-just-about-the-environment-725478>
13. ["Drone Inspection of Renewable Energy Facilities" - National Renewable Energy Laboratory \(NREL\)](#)
14. ["Energy Efficiency with Drones" - University of Cambridge](#)
15. ["Drones in Smart Grid" - IEEE Xplore](#)
16. ["Predictive Maintenance with Drones" - Uptake](#)
17. ["Drones in Electric Vehicle Charging" - IEEE Xplore](#)
18. ["Environmental Monitoring with Drones" - ConservationDrones.org](#)
19. ["Drone Inspection of Renewable Energy Facilities" - National Renewable Energy Laboratory \(NREL\)](#)
20. ["Drone Inspection in Construction" - Propeller Aero](#)
21. ["Precision Agriculture with Drones" - European Commission](#)
22. ["Robotic Sorting System" - Machinex](#)
23. ["Autonomous Electric Vehicles" - National Renewable Energy Laboratory \(NREL\)](#)
24. ["Robotic Inspection of Civil Infrastructure" - American Society of Civil Engineers](#)
25. ["Drone-based Forest Mapping" - European Forest Institute](#)
26. ["Inventory Management using Autonomous Drones," University of Texas at Austin](#)
27. <https://www.cam.ac.uk/research/news/drones-prove-85-more-efficient-than-manual-planting>
28. <https://www.utwente.nl/en/eemcs/geo-information-science-and-remote-sensing/research/publications/efficiency-of-drone-based-mapping-a-case-study/>
29. <https://www.utwente.nl/en/eemcs/geo-information-science-and-remote-sensing/research/publications/efficiency-of-drone-based-mapping-a-case-study/>

Sources

30. [\[https://www.dslrpros.com/dslrpros-blog/how-drones-are-saving-lives/\]\(https://www.dslrpros.com/dslrpros-blog/how-drones-are-saving-lives/\)](https://www.dslrpros.com/dslrpros-blog/how-drones-are-saving-lives/)
31. [\[https://www.euronews.com/green/2022/05/20/this-australian-start-up-wants-to-fight-deforestation-with-an-army-of-drones\]\(https://www.euronews.com/green/2022/05/20/this-australian-start-up-wants-to-fight-deforestation-with-an-army-of-drones\)](https://www.euronews.com/green/2022/05/20/this-australian-start-up-wants-to-fight-deforestation-with-an-army-of-drones)
32. [\[https://www.sciencedirect.com/science/article/pii/S2666389922001805\]\(https://www.sciencedirect.com/science/article/pii/S2666389922001805\)](https://www.sciencedirect.com/science/article/pii/S2666389922001805)
33. [\[https://www.itskrs.its.dot.gov/its/benecost.nsf/ID/2a2bec888987d95d852584be00596bf8\]\(https://www.itskrs.its.dot.gov/its/benecost.nsf/ID/2a2bec888987d95d852584be00596bf8\)](https://www.itskrs.its.dot.gov/its/benecost.nsf/ID/2a2bec888987d95d852584be00596bf8)
34. [\[https://www.wipro.com/business-process/the-future-of-delivery-with-drones-contactless-accurate-and-high-speed/\]\(https://www.wipro.com/business-process/the-future-of-delivery-with-drones-contactless-accurate-and-high-speed/\)](https://www.wipro.com/business-process/the-future-of-delivery-with-drones-contactless-accurate-and-high-speed/)
35. [\[https://www.commercialdroneprofessional.com/medically-equipped-drones-three-minutes-faster-than-ambulances-study-finds/#:~:text=Comparably%2C%20drones%20were%20able%20to,a%20speed%20of%206.54mph\]\(https://www.commercialdroneprofessional.com/medically-equipped-drones-three-minutes-faster-than-ambulances-study-finds/#:~:text=Comparably%2C%20drones%20were%20able%20to,a%20speed%20of%206.54mph\)](https://www.commercialdroneprofessional.com/medically-equipped-drones-three-minutes-faster-than-ambulances-study-finds/#:~:text=Comparably%2C%20drones%20were%20able%20to,a%20speed%20of%206.54mph)
36. [\[https://www.firstnet.gov/newsroom/blog/view-above-increasing-first-responder-situational-awareness-drones#:~:text=These%20%20E%80%9Ceyes%20in%20the%20sky,keeping%20responders%20safe%20and%20aware\]\(https://www.firstnet.gov/newsroom/blog/view-above-increasing-first-responder-situational-awareness-drones#:~:text=These%20%20E%80%9Ceyes%20in%20the%20sky,keeping%20responders%20safe%20and%20aware\)](https://www.firstnet.gov/newsroom/blog/view-above-increasing-first-responder-situational-awareness-drones#:~:text=These%20%20E%80%9Ceyes%20in%20the%20sky,keeping%20responders%20safe%20and%20aware)
37. [\[https://thedronelifenj.com/5-major-benefits-of-drone-cell-tower-inspections/\]\(https://thedronelifenj.com/5-major-benefits-of-drone-cell-tower-inspections/\)](https://thedronelifenj.com/5-major-benefits-of-drone-cell-tower-inspections/)
38. [\[https://www.prosperevents.com/drones-to-replace-human-inspection-of-wind-assets/\]\(https://www.prosperevents.com/drones-to-replace-human-inspection-of-wind-assets/\)](https://www.prosperevents.com/drones-to-replace-human-inspection-of-wind-assets/)
39. [\[https://www.linkedin.com/pulse/drones-infrastructure-inspection-airserve-initiatives/?trk=organization-update-content_share-article\]\(https://www.linkedin.com/pulse/drones-infrastructure-inspection-airserve-initiatives/?trk=organization-update-content_share-article\)](https://www.linkedin.com/pulse/drones-infrastructure-inspection-airserve-initiatives/?trk=organization-update-content_share-article)
40. [\[https://www.heliguy.com/blogs/posts/drones-for-solar-panel-inspections\]](https://www.heliguy.com/blogs/posts/drones-for-solar-panel-inspections)
41. [\[https://ieeexplore.ieee.org/document/10007285\]](https://ieeexplore.ieee.org/document/10007285)
42. <https://railway-news.com/how-green-is-satellite-monitoring-lets-do-the-math/#:~:text=Jet%20Fuel%20causes%20CO2%20at,helicopter%20emits%20500%20kg%20CO2>
43. <https://envirotecmagazine.com/2021/10/26/commercial-drones-have-the-potential-to-half-co2-emissions-for-freight/>



SUSTAINABILITY REPORT 2023

the road to a better future

