



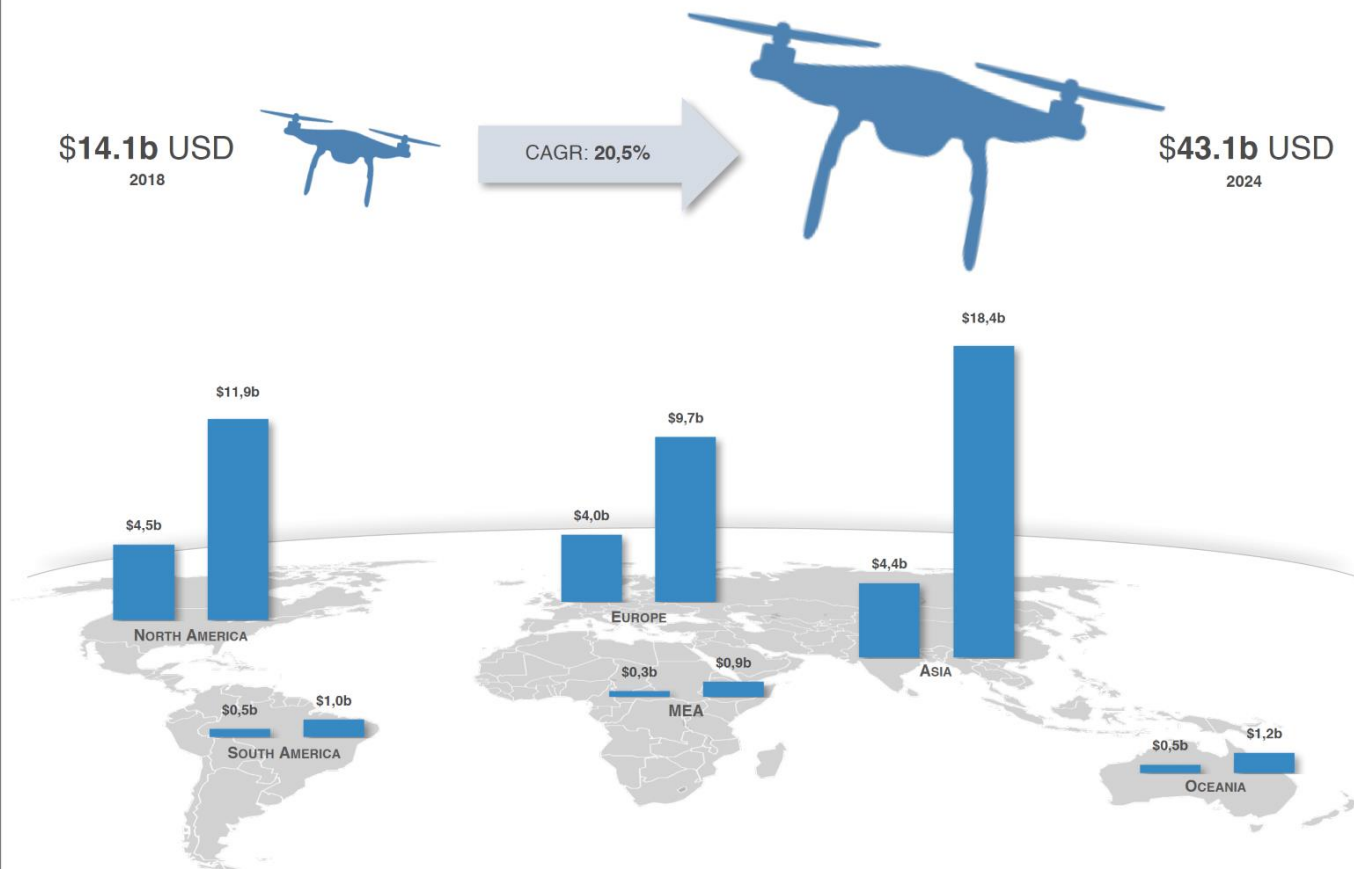
Drone in service

DroLo

27.11.2019

DRONE MARKET SIZE AND FORECAST 2018-2024

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Drone Accelerator Finland



Picture © VTT

- 1. Development of a joint learning-by-doing center**
 - Business-oriented pilot and PoC initiative development
- 2. Finding drone pilots from across relevant existing domain ecosystems**
- 3. Innovation actions for companies facilitated by research institutes**
 - Initiative workshops, think tanks, impact assessments, service concepts, etc.
- 4. Active and continuous piloting and testing**
 - R&D projects support piloting → "Cookbook for Doing Drone Business"
- 5. Commercialization of new innovative drone-related business models**

Top themes in drone area

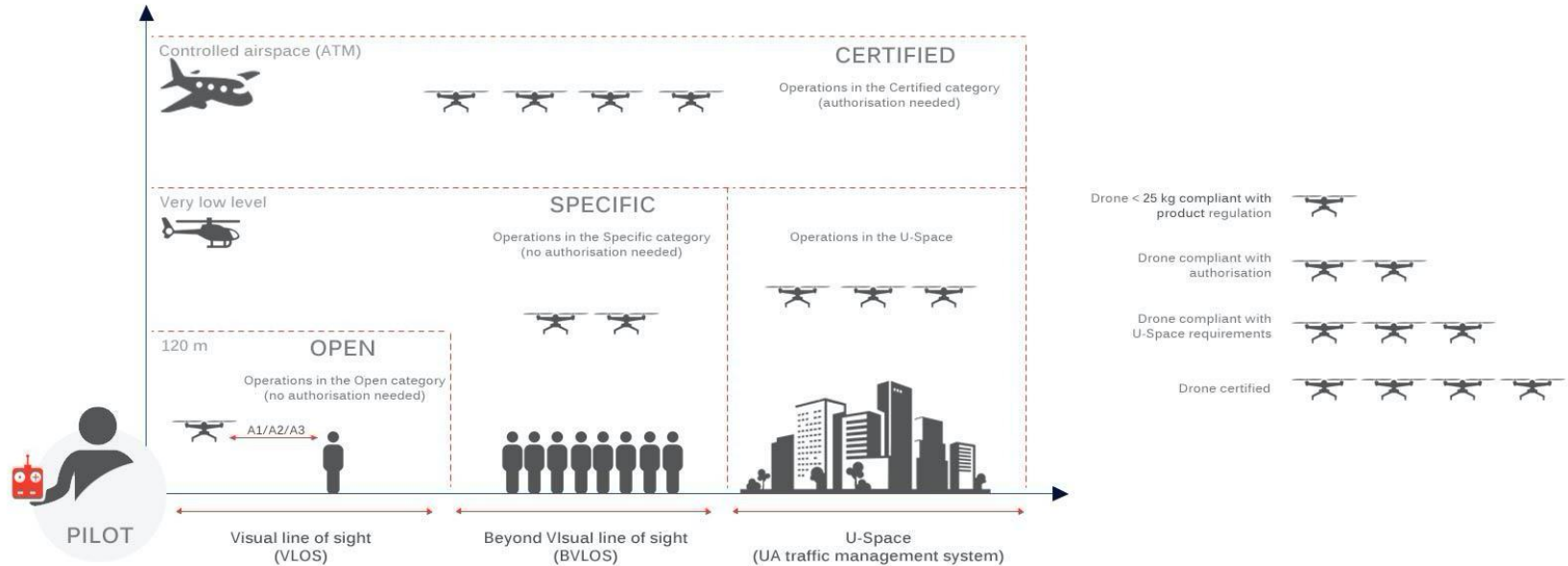
- EU regulation 1.6.2020
 - Specific category (hw requirements)
- Connectivity, 5G radio to replace dedicated LOS radio
- Low emissions
- Autonomy, AI
- Fleet mgmt, swarms
- UTM – U-Space
- New energy options: hybrid, fuelcell (longer flight times)
- Drone as a service, operation capability 365 days / yr
 - All weather capabilities
- Multidrone
- Higher payloads
- UAM
- Landing pads, automatic recharge, automatic load/unload
- Advanced sensing
- Antidrone

Drone usecases (now)

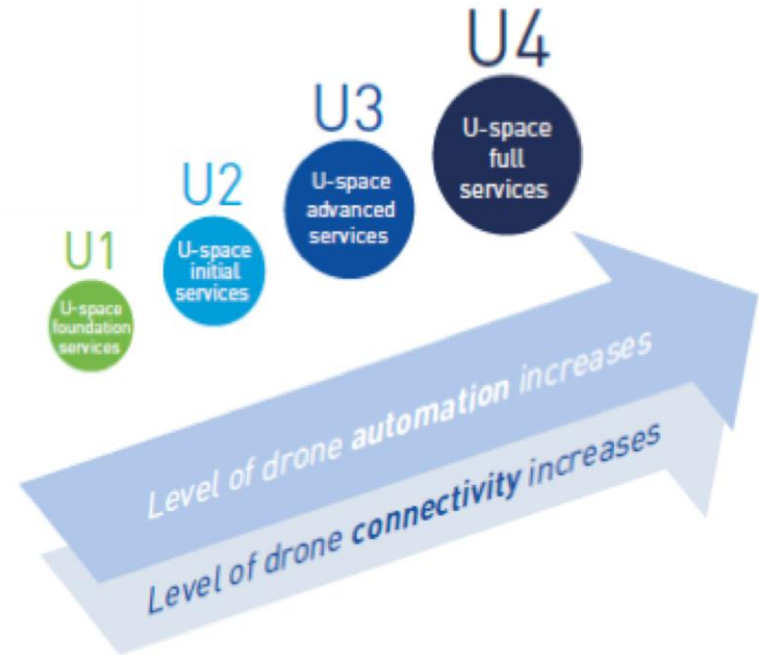
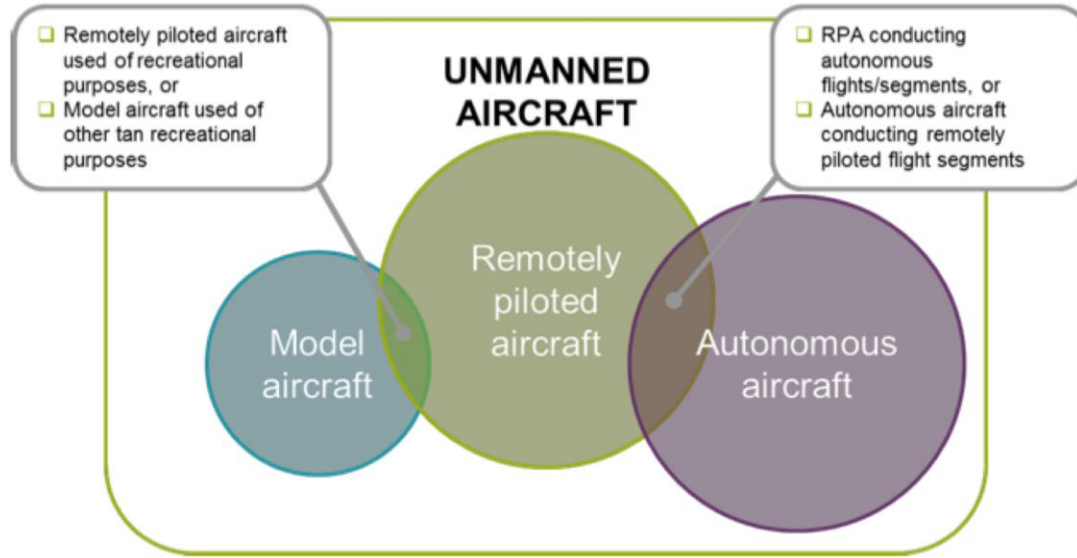
- Military
- Filming video or still pictures
 - Real estate
 - Car selling
 - Movies
 - Advertisement
 - Indie movies
 - Travel guides
 - Sport event
- Measurements
 - Weather
 - Air quality
 - Gas
 - Sample pickings
- 3D modelling
 - Lidar
- Construction
 - Quality checks/
 - Progress monitoring
 - Architecture design
 - Infrastructure work fields
- Security/surveillance
 - Industry areas
 - Public events
 - Parks
 - Parking slots
- Authorities
 - Police
 - Fire departments
 - Border control
 - Ports
 - Search for the lost
 - Situation monitor
- Inspections
 - Road conditions
 - Bridges
 - Water towers
 - Power lines
 - Water / heat / oil pipelines
 - Windmills
 - Roof
- Environmental observation
 - Blue-green algae
 - Animals
 - Traffics congestions
- Mobile nw measurements
- Agriculture
 - Irrigation
 - Fertilization
 - System control
- Forestry
 - Growth measure
 - Storm damage analyse
 - Fire detection
 - Pest detection
- Marine
 - Ice thickness
 - Ferry condition checks
 - Leakage, gas
- Fish farm monitoring
- Beach monitoring
- Deliery
 - Fast food
 - Medicines
 - Small parts
- Audio analyses
 - Noise levels
 - Predictive maintenance
- Mapping
- Anti Drone systems

New EU regulation is coming, replaces national rules

Specific/certified categories (professional usage drones)



Source: projectgauss.eu

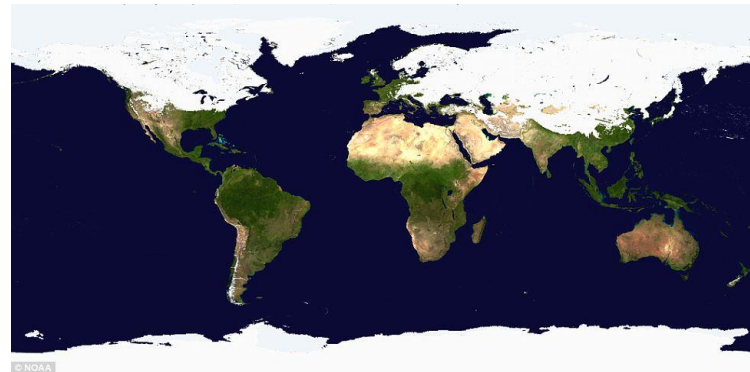


DroLo Project focus

- From basic pilots to bigger system solutions
- Autonomous systems, fleets
- UTM in use
- 5G radio usage
- EU regulation needs for products
- Specific category features
- Multidrone
- Surveillance, monitoring
- Several drone hw manufacturers

The international market potential

- Finnish products are typically associated with good quality
 - Drone technologies validated in the challenging Nordic conditions will set an even greater safety margin when applied in the rest of world
 - Development of relevant know-how will also form the basis of a sustainable export potential from Finland
- Canada, Denmark, Iceland, Northern USA, Norway, Russia, Sweden, and some Asian countries have similar weather conditions as Finland has
 - Organisations in these countries utilise drone technologies in the same application areas as some of the Finnish drone users
- USA is one of the leading countries in the area of AI use in drones
 - AI technologies are utilised to compliment and substitute human actions in drone missions as well as process the data collected by using drones



DroLo project partners

- **The project partner network consists of different actors in the value chain:**
 - Developer organisations:
 - Fleetonomy.AI
 - Company x
 - Company x
 - Research organizations:
 - VTT
 - FMI
 - Public orgs. :
 - End-users:
 - Securitas
 - Company x
 - Company x

Key contacts of the DroLo project

- Mika Aro & Matti Helén, Securitas
- Hannu Karvonen (RAAS Coordinator) & Virpi Oksman, VTT
- Timo Lind, VTT
- Anne Hirsikko, Finnish Meteorological Institute
- Markus Kantonen, Fleetonomy.AI



FLEETONOMY

Fleetonomy & VTT Operations 2020

PROBLEM: FOR ANY COMMERCIALY VIABLE DRONE FLEET OPERATION YOU NEED UTM, & MVP OF MULTIPLE DEDICATED AND INTEGRATED SERVICES

PROBLEM: REGULATORY REQUIREMENTS UNDER DEVELOPMENT AND OUT OF SYNC WITH ECOSYSTEM SERVICE LEVEL CAPABILITY

PROBLEM: OPERATIONS ARE MANUAL, INEFFICIENT, BENEFITS HARD TO UNDERSTAND AND EXPENSIVE

PROBLEM: REPLICATION AND SCALING OF OPERATIONS OUTSIDE OF HELSINKI AND FINLAND

Partners:

RumbleTools

Securitas

Avartek

Research project scope

- The aim of the project is to produce research data, international market research, experiments and case studies to support business decision making.
- The research project is based on the growth prospects of the Finnish drone business, according to which drone utilization in business will grow strongly
 - The project is carried out by VTT and the Finnish Meteorological Institute and an international consortium (AIST, MOU/Japan)
- The focus areas of the study are: Focus Area 1 - Drone Weather Resistance, Focus Area 2 - Robust Platforms and 5G, and Focus Area 3 - Business Models, International Markets, Customer Focused Solutions and Social Acceptance



Research project focus areas

