

Drönare – ett redskap i samhällets tjänst?

Actual UAV trends and coming applications

Pau Mallol



INKONOVA

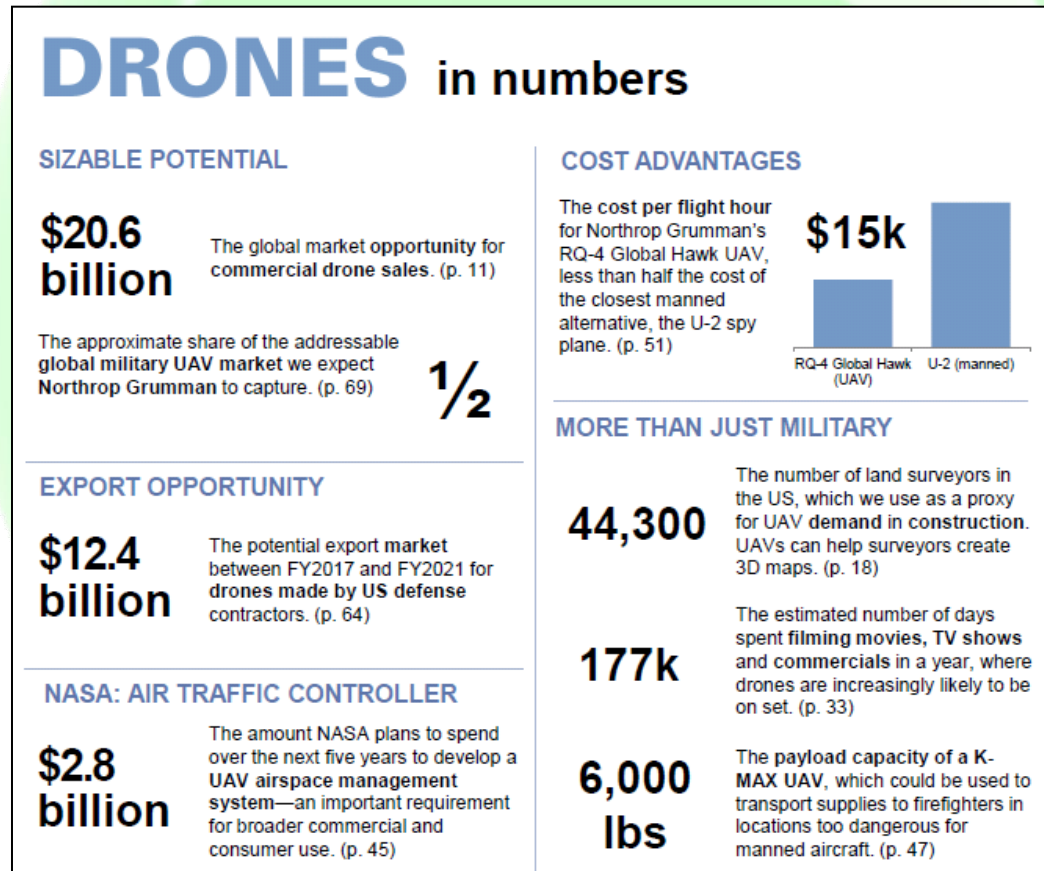
WHO IS PAU MALLOL?

- Entrepreneur
- UAV/Drone and drone systems developer
- Mine drone pilot
- *'Drone culture'* speaker and promoter



THE DRONES PARADIGM

- Its use and numbers of drones sold growing extraordinarily fast



Equity research by
Goldman and Sachs (2016)

WHAT'S COMING STRONG?

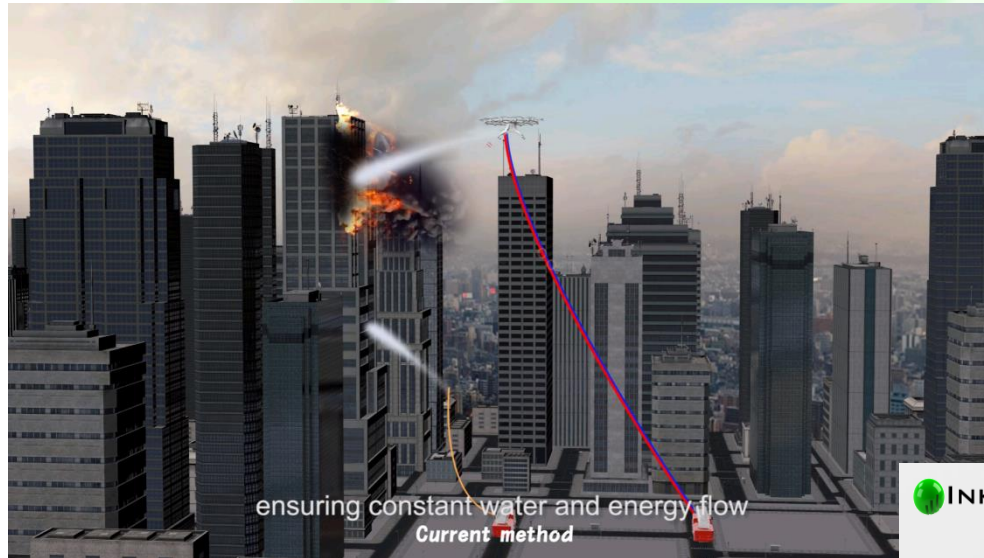
- Construction (surveying and mapping)
- Agriculture (precision agriculture)
- Oil and Gas inspections
- Journalism
- Real Estate
- Mining (3D laser mapping of inaccessible areas)
- Clean Energy (wind and solar inspection)
- Aerial video- and photography
- Delivery by drone (?)
- Insurance sector
- **Disaster management and SAR**

DISASTER MANAGEMENT & SAR

- Pre-event assessment/surveillance
- In-situ assessment of the event
- Post-event evaluation

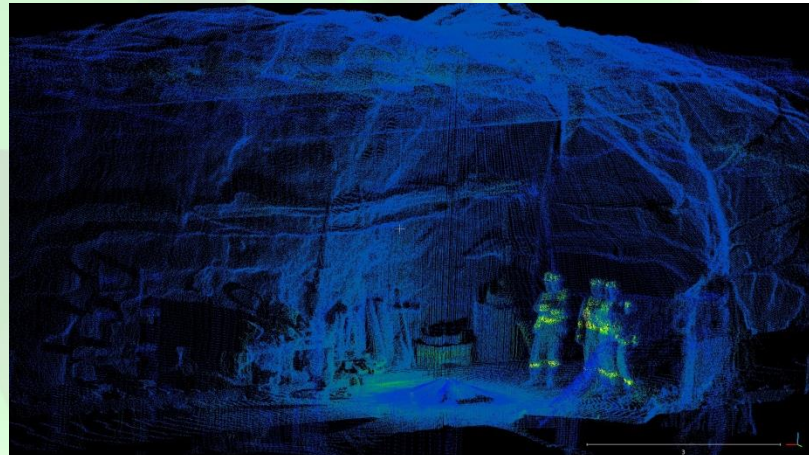


DISASTER MANAGEMENT & SAR



TECHNICAL CHALLENGES

- Intrinsic danger:
 - Kinetic and potential energy > parachute, lighter drones, **sense and avoid systems**
 - Propellers > protectors
 - Lithium Polymer batteries > Ion, **hybrid, fuel cell batteries**
 - Misuse > **Educate in schools, regulate (?), control (transponders)**
 - **Co-existence with manned aerial vehicles**



REGULATORY CHALLENGES

- We'll be soon 'surrounded' by drones and robots of any type (not only aerial)
- Drone market evolves much faster (technology, users, applications...) than law making.
- Lawmakers have three challenges:
 1. Understanding the actual technology and use
 2. Foreseeing the coming technology and use
 3. Elaborating the regulatory framework

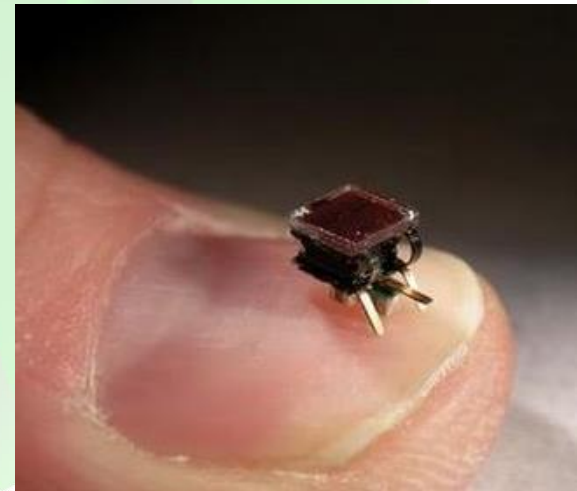
NB: and all this should be within an international framework
- **Regulation + educating today's children and teenagers**

SOCIAL CHALLENGES

- The 'Drone culture': what is it?
- Drone education in schools:
 - How to use drones properly
 - Learn programming, mechanics, aerospace concepts too!
- News and media: too much about the negatives
- Society: too much misled by media news selection and topic ignorance



THE FUTURE IS PRESENT



FINAL REMARKS

- Drones have still an **untapped POSITIVE potential**
- **Education is key** for safe and easier implementation of drones in society
- **Technology development** (SAA and collision avoidance systems) **MUST** be still improved > Tech companies need more money!
- For SAR and disaster relief use, **government departments and agencies** must be more proactive (we need to test in real scenarios)

Thank you for listening!



EXTRA SLIDES

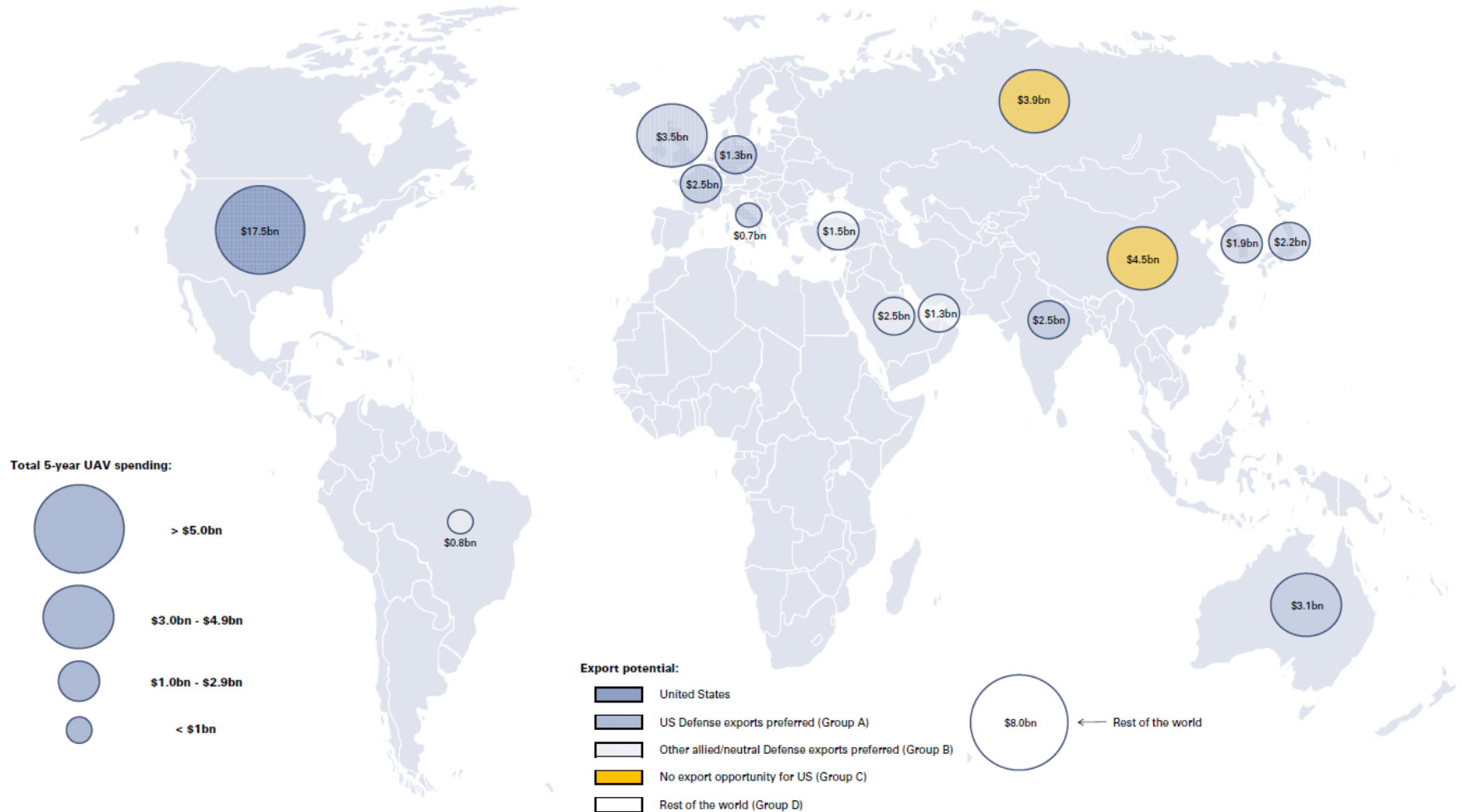
VENTILATION SHAFT FLIGHT TESTS



(video link in picture)

THE DRONES PARADIGM

Exhibit 54: Estimated global 5-year UAV spending map and US export potential
Key markets center in Europe, APAC, and the Middle East



Source: DoD, Government of the UK, SIPRI, Defense News, Goldman Sachs Global Investment Research.