Registration, Electronique Identification, Tracking

ICAO Drone Enable

September 2017
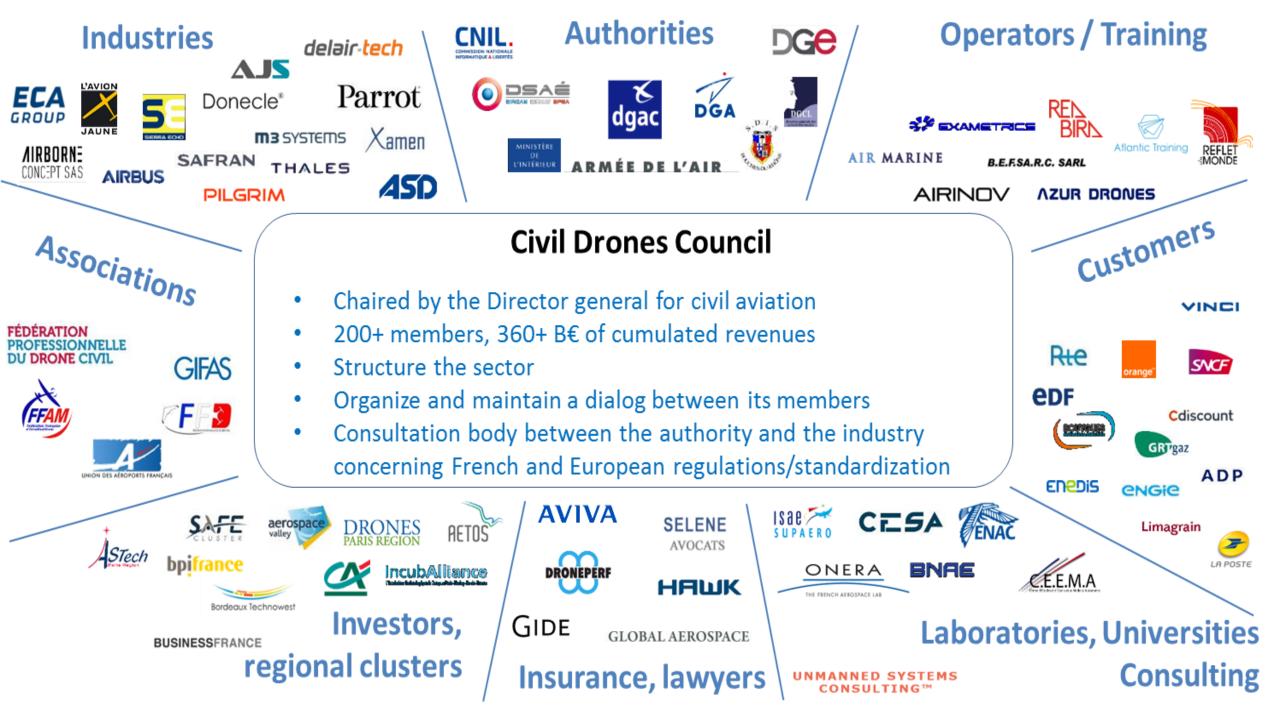
Civil Drones Council

- Chaired by the Director general for civil aviation
- 200+ members, 360+ B€ of cumulated revenues
- Structure the sector
- Organize and maintain a dialog between its members
- Consultation body between the authority and the industry concerning French and European regulations/standardization

Industries

Authorities

Operators / Training

Associations

Customers

Investors, regional clusters

Insurance, lawyers

Laboratories, Universities Consulting

Photography & Movies | Building/Mining Progress | Agriculture
Critical Infrastructure Examination | Bushfire Surveillance

Tower Maintenance | Traffic Watch | Shark Watch
News Reporting | Police Monitoring | Crime Scene Exams
Medical Sample

Point-to-Point & Package-to-Pickup Point Delivery
Transplant Delivery | HA Loons

Point-to-Many Point Delivery
Direct-to-Home Delivery

Personal Air Transport

- **Grams to tons**
- **Line of sight to long range**
- **Quadri, octo, fixed, mixed**
- **Rural to urban**
- **Ground to strato**

NOW   1   2   3   4   5   6   7   8   9 YRS

SAFETY	SECURITY
❖Manned aviation ❖Population ❖Infrastructure	❖Zone infringement ❖Malevolent act ❖Privacy

Not properly addressed, as such market is on hold

❖ An **international format** with country code defining common information

❖ Registries are managed at **national** level (short term) and/or at **international** level (mid/long term)

❖ **Common information** will be accessible by other nations, **specific information** remains restricted to a nation

International format is key to prevent inconsistent formats between nations and impacting UAV manufacturers

❖Basic: ID, position, altitude/height, timestamp

❖Optimum: Speed vector, angular speed

Generic

❖Performance: reference system, resolution, accuracy, availability, integrity, cyber-security, data protocol

❖3 data sources with different integrity level

  ❖UAV Operator application / Ground Control Station
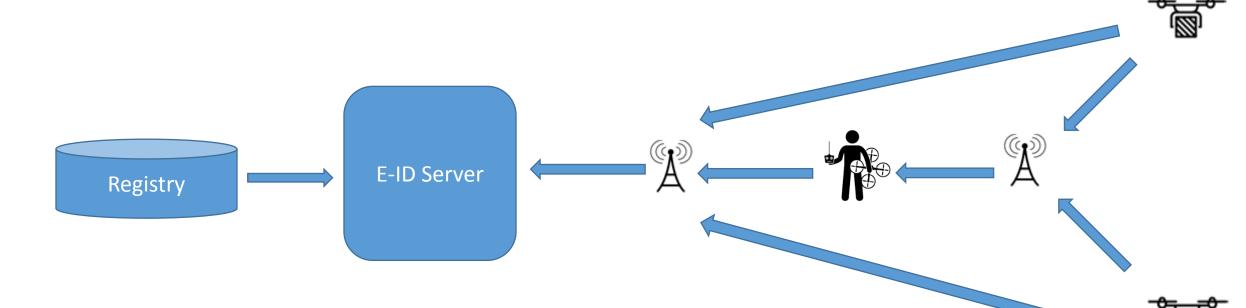
  ❖Add-on

  ❖Built-in

❖Communication Infrastructure

Classes

Flexible, pragmatic, technology agnostic and feasible.

❖E-Identifier protected against **usurpation** and **repudiation**

❖Communication infrastructure protected against **jamming** and **spoofing**

❖E-ID Server and Registry shall be **fortresses** and protected against **intrusion**

❖**Cost** to be balanced with needs/constraints

❖ Cooperative based tracking except for special areas of interest

❖ Non aviation infrastructure may fit for purpose, performance (guarantee of) and integrity should be better demonstrated. Various levels of integrity/performance might be accommodated

❖ Basic: Position

➡ Initial air situation (conformance monitoring)

❖ Optimum: Trajectory

➡ Advanced air situation (conflict detection and resolution, airspace capacity management)

➡ Ground support to DAA function

Tracking will enable further UTM services (conformance, airspace capacity management, conflict detection and resolution, etc.)

- ❖Regulations and standards **shall not be technologies prescriptive**
- ❖**Step by step** approach
- ❖**One size does not fit all** (solutions/risks/type of UAV/operations)
- ❖**Safety and security** come together
- ❖**Mutual benefits**: if constraints are correctly addressed, drones will access easily and efficiently to the airspace
- ❖Standardisation (data format, protocols, class of performance) is **urgent**