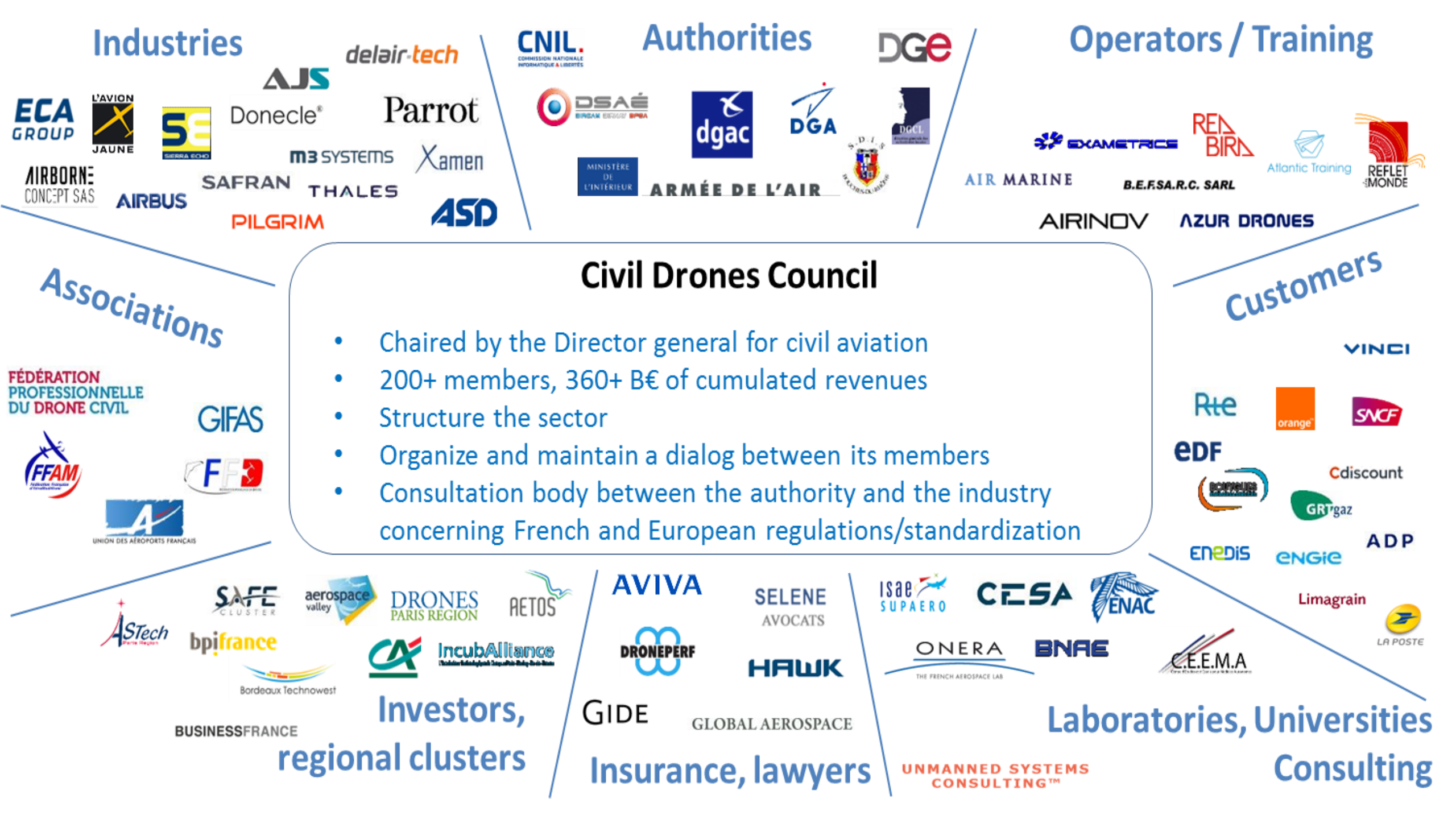
Geofencing

ICAO Drone Enable

September 2017

CONSEIL POUR LES DRONES CIVILS

U-space


Industries
delair-tech
AJS
ECA GROUP
L'AVION JAUNE
Donecle
Parrot
m3 SYSTEMS
Xamen
AIRBORNE CONCEPT SAS
SAFRAN
THALES
AIRBUS
PILGRIM
ASD
Authorities
CNIL.
DGE
DSAÉ
dgac
DGA
DGCL
MINISTÈRE DE L'INTÉRIEUR
ARMÉE DE L'AIR
Operators / Training
EXAMETRICS
REA BIRA
Atlantic Training
REFLET DU MONDE
AIR MARINE
B.E.F.S.A.R.C. SARL
AIRINOV
AZUR DRONES
Associations
FÉDÉRATION PROFESSIONNELLE DU DRONE CIVIL
GIFAS
FFAM
UNION DES AÉROPORTS FRANÇAIS
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
Customers
VINCI
Rte
orange
SNCF
EDF
Cdiscount
GRTgaz
ENEDIS
ENGIE
ADP
Limagrain
LA POSTE
Investors, regional clusters
SAFE CLUSTER
aerospace valley
DRONES PARIS REGION
AETOS
ASTech
bpifrance
IncubAlliance
Bordeaux Technowest
BUSINESSFRANCE
Insurance, lawyers
AVIVA
SELENE AVOCATS
DRONEPERF
HAWK
GIDE
GLOBAL AEROSPACE
Laboratories, Universities Consulting
isae SUPAERO
CESA
ENAC
ONERA
THE FRENCH AEROSPACE LAB
BNAE
C.E.E.M.A
UNMANNED SYSTEMS CONSULTING™

Conseil pour les Drones Civils

What?

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

Why?

SAFETY

- Manned aviation
- Population
- Infrastructure

SECURITY

- Zone infringement
- Malevolent act
- Privacy

Not properly addressed, as such market is on hold

Geo-Fencing pains - Objectives?

- What are the issues? Pilot Errors? Malevolent acts? Airworthiness? All?
- What needs to be protected? Infrastructure? Aviation? Population? All?

- What is the primary objective of geofencing ?
  - to help the pilot to comply with regulations?
  - to enforce the regulations?
  - Both?

- Should geofencing be mandatory ? For all drones? Or not?
  - Safety/security analysis and “business case”

- UAV or UTM provided service? Onboard or ground function? Both?

The “Why” has to be clarified!

Data availability

- Whatever the assurance provided by the UAV will be, without accurate ground data, it is useless
- New data and data with higher resolution are required
- Data have to be accessible and complete and accurate
- Examples:
  - Airspace structure
  - Terrain
  - Obstacles
  - No-fly/Restricted areas
  - EMC

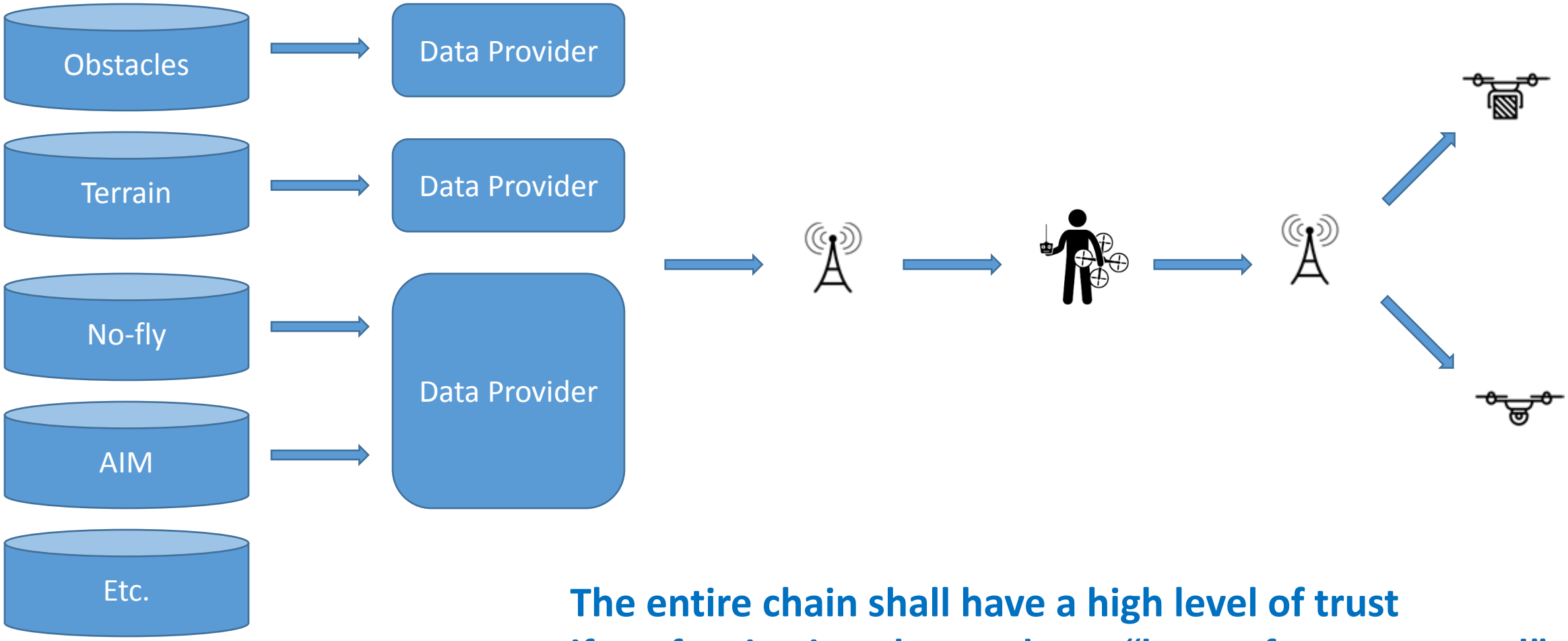
Geo-fencing pains – Integrity

- Data chain
  - Data accuracy (fit for UAV context)
  - Certified data source
  - Certified data distribution
  - Update cycle strategy

- On-board equipment
  - Geo-fencing interacts with several UAV sub-systems
  - Integrity of positioning system? Altitude/height accuracy?
  - Prevalence of geo-fencing over auto-pilot (return to home)?
  - Prevalence of geo-fencing over Detect & Avoid?
  - Protection against unauthorized modification?
  - Secured disabling function? Under which conditions/rules?

Not only a UAV challenge, both ground and air concerns have to be addressed

Geo-fencing pains – Integrity



The entire chain shall have a high level of trust
if geofencing is to be used as a “law-enforcement tool”

Takeaway

- Authorities have to decide on the **geo-fencing objectives (and not all may make the same decision)**
- **One size does not fit all**, define integrity level vs risks/operations/UAVs
- Synchronize **ground and air** initiatives
- **Mutual benefits**: if constraints are correctly addressed, drones will access easily and efficiently to the airspace
- Standardization is **urgent**