



STAND DER TECHNIK VON DROHNEN UND NEUE EU DROHNEN- VERORDNUNG

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Drohnen-Technologie: Multi- /Quadcopter (0-25kg)



Im Vergleich klassische bemannte Luftfahrt und unbemannte flugtaxis

Hubschrauber EC 135
ca. 1.455 kg



Vermessungsflugzeug Beechcraft KA 350
ca. 4.500 kg



Volocopter Velocity
ca. 700 kg

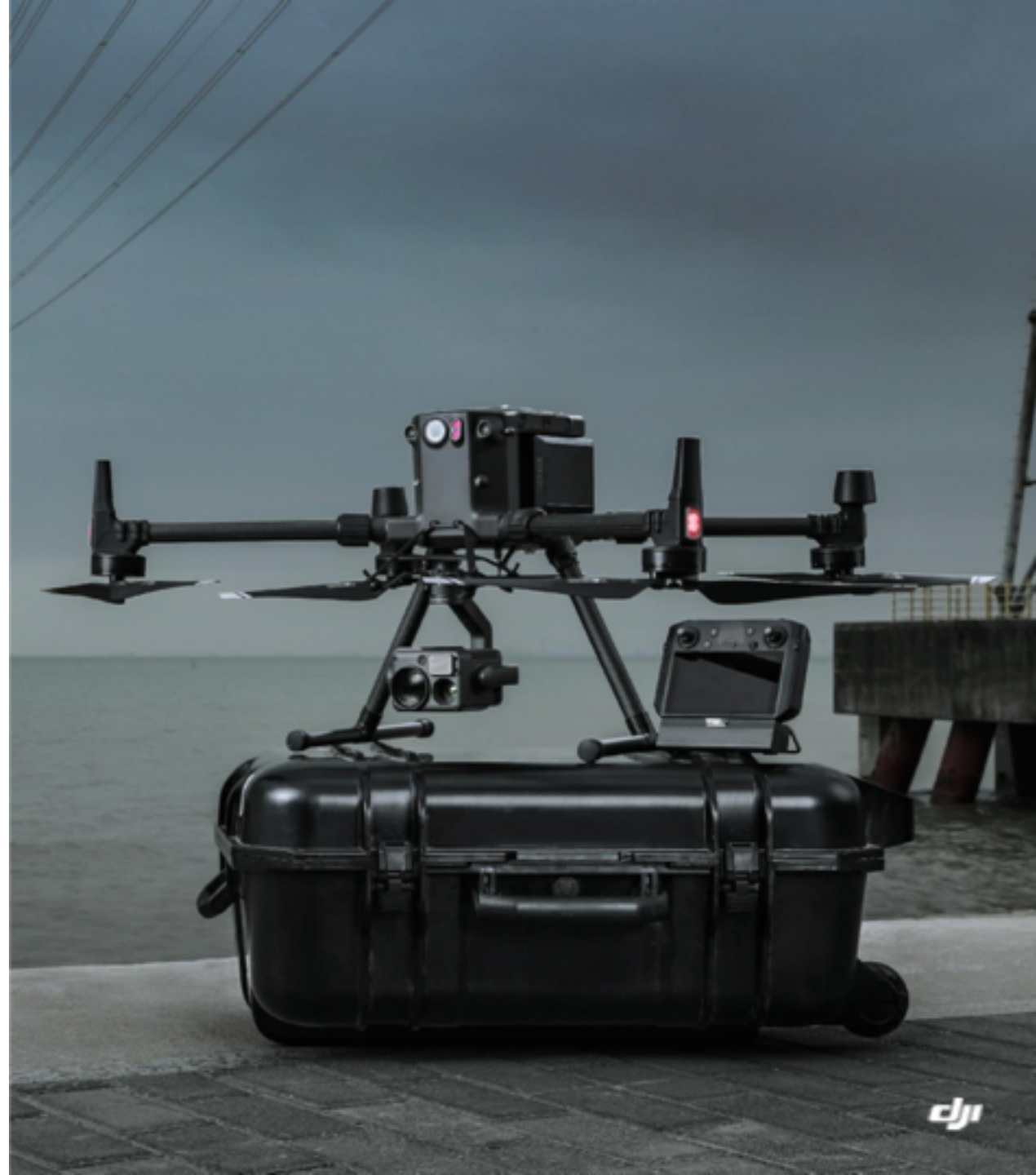


Lilium Jet (2-Sitzer)
ca. 640 kg



STAND DER DROHNEN- TECHNIK

DJI M300 RTK



Superior Performance: Matrice 300 RTK

Increased Max Take-off Weight

- Maximum take-off weight: 9.0kg
- Payload capacity of up to 2.7kg
- Triple gimbal support
- Multiple payload configurations

Enhanced Flight Time

- **55 Min Max Flight Time**
- Mission Duration Increased by 140%



H20 Series



Z30



XT2



XT S

6 Directional Sensing and Positioning

A powerful vision system you can rely on

- Visual and TOF sensors on all 6 sides of the aircraft
- Up to 40m max. detection range
- Customizable aircraft sensing behaviour
- Top and bottom anti-collision beacons
- Top and bottom auxiliary lights



Redundant Systems

Multi-Sensor Redundancy

- Dual IMU
- Dual Barometer
- Dual Compass
- **Dual RTK Antenna + GNSS Module**

Advanced Dual Control

Either operator can now obtain control of the aircraft or payload with a single tap, creating new possibilities for mission strategies and increasing flexibility during operations

Dual Battery

In the event that one battery fails, the drone can still return home safely.



Redundant Systems / Flight Safety

Three-Propeller Emergency Landing

Maintain control of the aircraft especially in the case of a motor malfunction.

Extra-wide FPV Camera

Maintain situational awareness even if the camera payload is not functioning properly.

ADS-B Receiver

Enhances airspace safety by providing the operator with real-time information about airplanes and helicopters within a 20km radius.



Click to play video: Three-Propeller Emergency Landing

Smart Pin & Track – PinPoint

Mark objects of interest

- Quickly create a PinPoint with the laser rangefinder or on the map
- View the PinPoint and its distance in real-time
- View the PinPoint's location and its coordinate on the map



Click to play video

Smart Pin & Track – Smart Track

Automatically detect and follow objects

- The gimbal can automatically detect and follow a defined object such as vehicles, people, and boats.
- An auto-zoom function helps to keep the subject centered in the frame for optimal viewing.
- Subject position is displayed on the map in real-time



Click to play video

UAV Health Management System

Professional Maintenance for Your Drone Fleet

- Health status monitoring
- Flight data management
- Flight log management
- Firmware management
- Error records and troubleshooting guidelines



ANWENDUNGS- BEREICHE



VERTEILUNG DER NUTZUNG VON DROHNEN



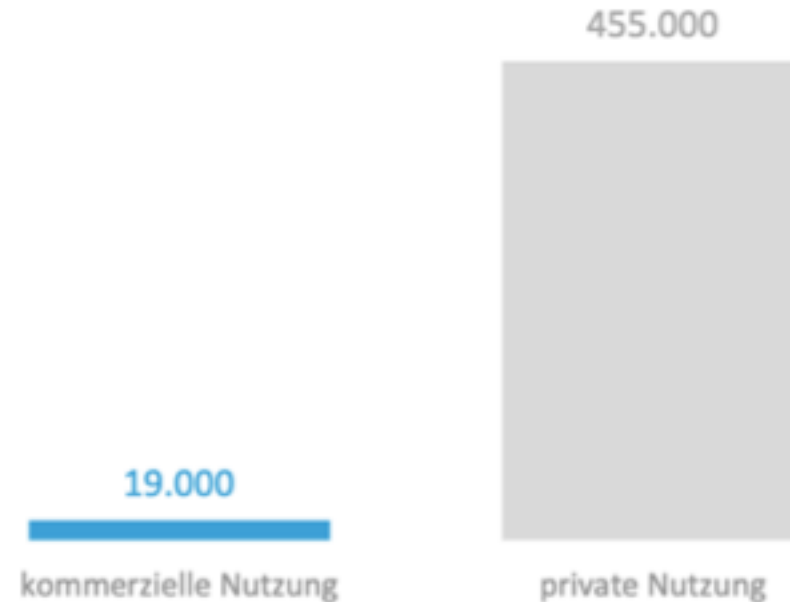
Der deutsche Drohnemarkt

Verband Unbemannte Luftfahrt

Februar 2019

474.000 Drohnen in Deutschland

Wie viele Drohnen sind im privaten und kommerziellen Gebrauch?



VERTEILUNG DER NUTZUNG VON DROHNEN

Piloten

19000

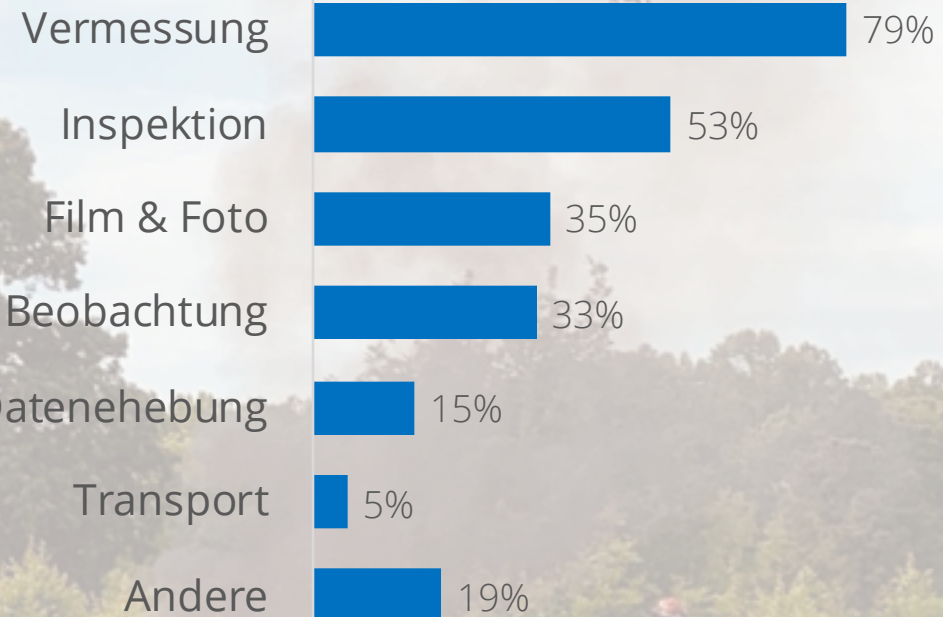


Der deutsche Drohnemarkt

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Februar 2019

Industrielle Nutzung



2019

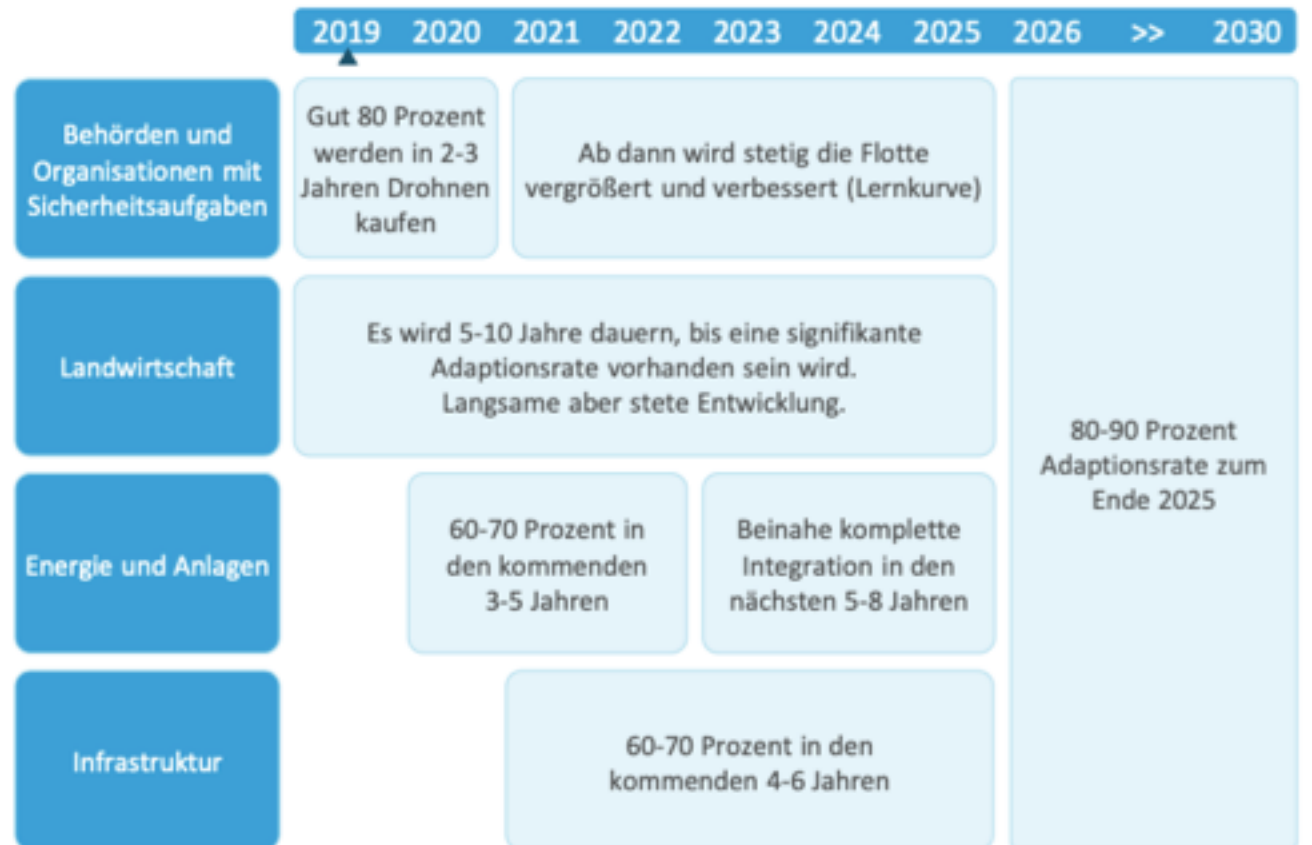
PROGNOSE DER MARKTENTWICKLUNG BIS 2030



Der deutsche Drohnemarkt
Verband Unbemannte Luftfahrt
Februar 2019

Adaption von Drohnentechnologie

Wann werden sich Drohnen in einzelnen Bereichen durchsetzen?



INDUSTRIEN



MENSCHEN WELTWEIT DURCH DROHNEN GERETTET

560⁺

Total Number of People Saved

339⁺

Number of Rescue Incidents

29⁺

Total Number of Countries

<https://enterprise.dji.com/drone-rescue-map> (05.03.2021)

North America
153

Europe
82

Asia
41

Latin America
15

Africa
1

Oceania
4







Generating Geodata with DJI UAS and DJI Software

- Fast
- Efficient
- Cheap
- High Quality





Energy

Case study: Valmont

Valmont has been utilizing drones to help inspect and maintain their structures.

With the newly developed M300 RTK and H20T they've found that it's helped them gather data more efficiently and in a shorter amount of time thereby increasing productivity.



Smart Inspection — Live Mission Recording

Quick and easy way to create automated flight missions

- Automatically add a new point when taking photos or recording videos
- Automatically add actions when adjusting gimbal pitch and pan to take a photo.
- After one manual flight, a waypoint inspection mission can be created for future automated missions



Smart Inspection – AI Spot-Check

Improves the Accuracy of Automated Missions

- Mission planning (Waypoints 2.0)
- Live Mission Recording
- AI Spot Check - As the mission is executed once more, the gimbal will automatically search for the object of interest, delivering accurate and consistent results

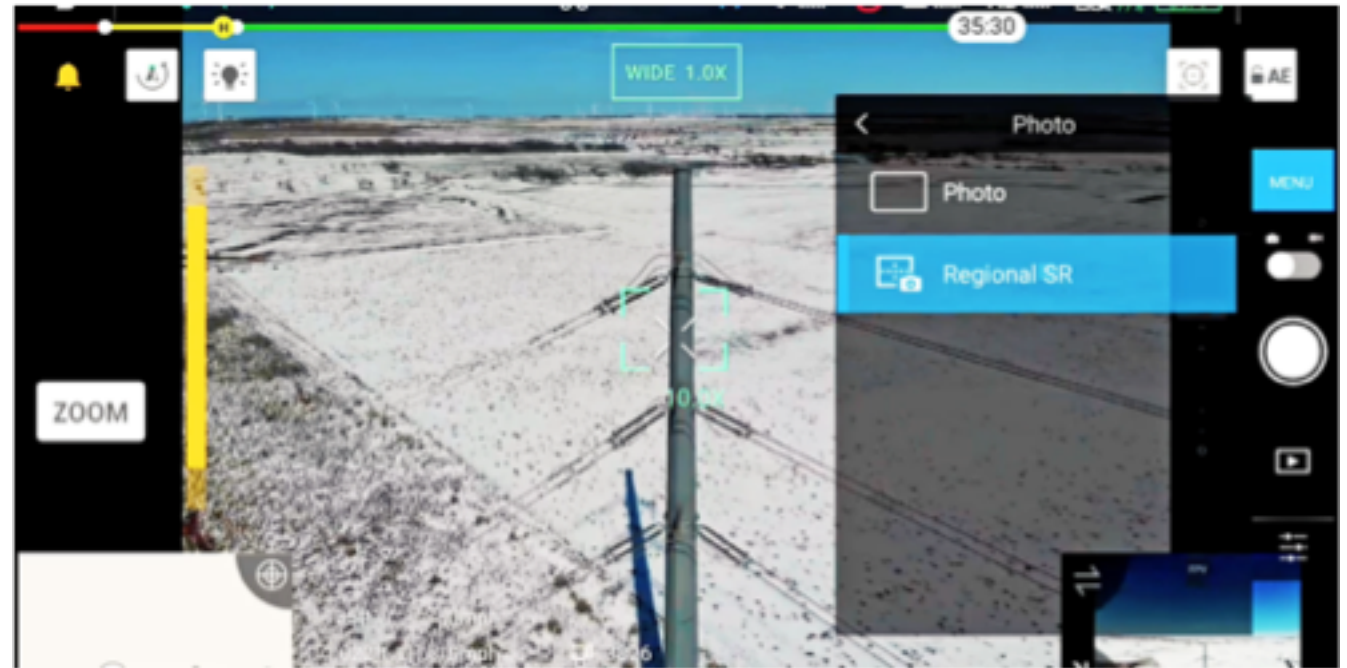


Click to play video

High-Res Grid Photo

Capture a set of high-resolution photos with one click

- Select an area of interest. The camera will automatically divide the area in a custom-grid pattern based on the focal length of the zoom camera
- One-click to capture images with the wide camera and zoom camera
- Automatically access these photos in a sub-folder for further assessment



Click to play video

EU DROHNEN- VERORDNUNG

GÜLTIG SEIT 01.01.2021

MIT ÜBERGANGSFRIST
BIS 31.12.2022

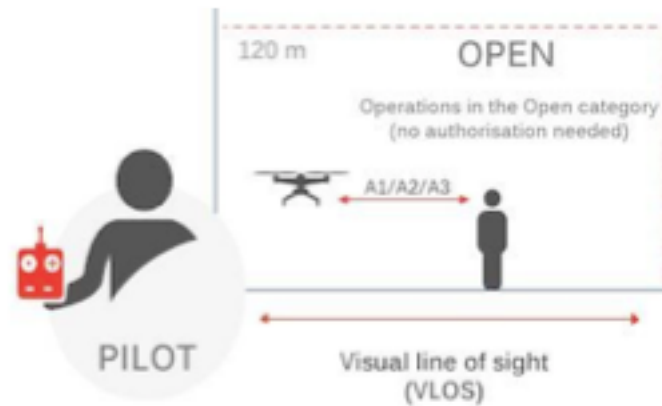


OPEN CATEGORY – NO APPROVAL NEEDED, IF...

– Implementing Act (Open Category):

Requirements on the Operator and the Operation, e.g. :

- Only VLOS Flights
- Not in No-Fly-Zones
- Max. height 120 m
- Minimum age of the pilot
- Distance from people



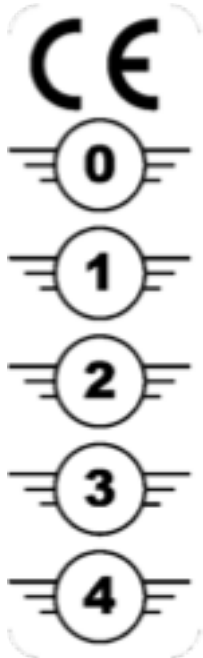
– Delegated Act (Open Category):

Introducing Product Classes:

C0	C1	C2	C3	C4*
<250g	<900g	<4kg	<25kg	

and Product requirements, e.g.:

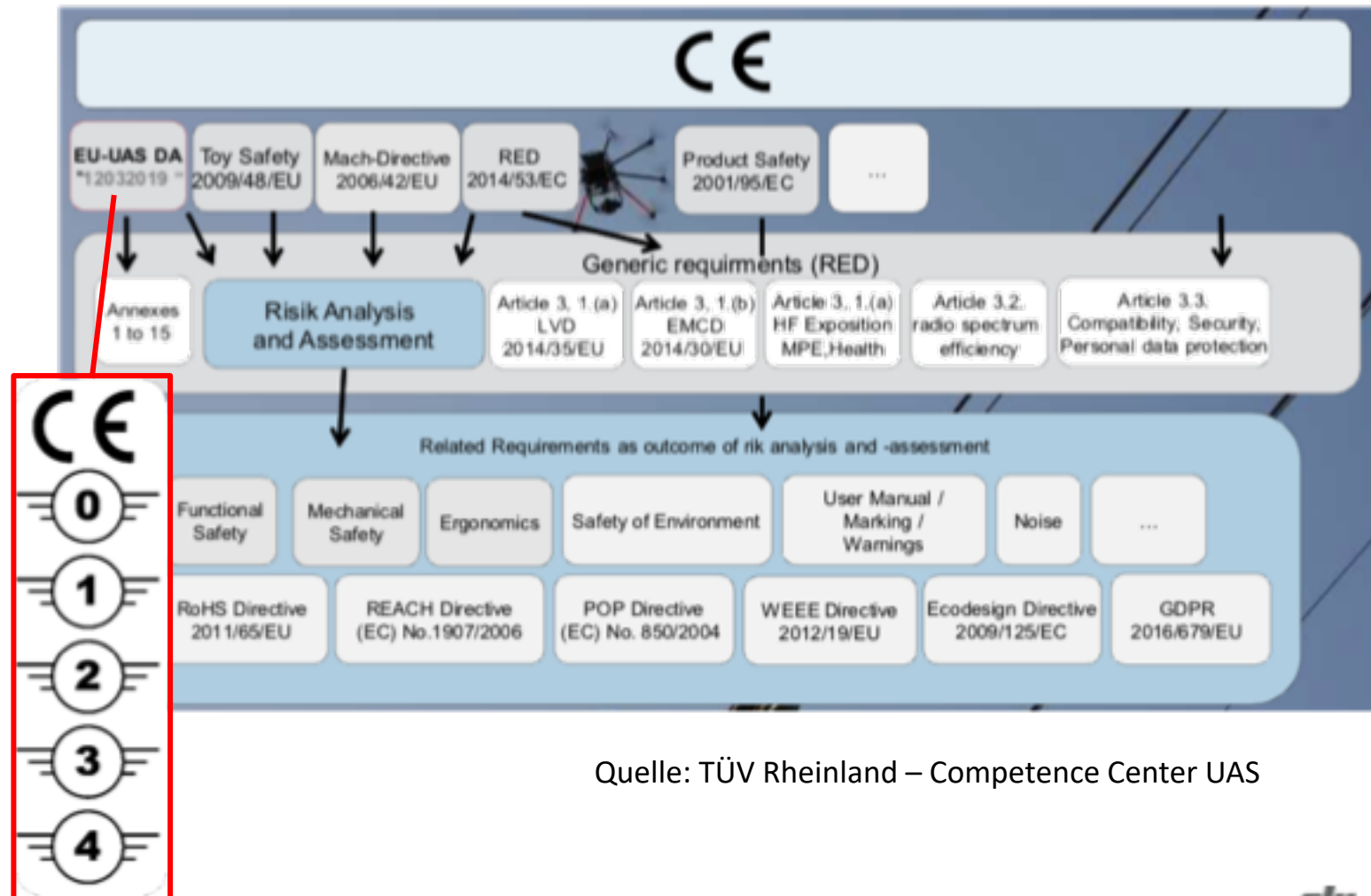
- max. (selectable) altitude
- Geo-awareness functionality
- Remote ID broadcast



Different requirements for different kinds of operations and product categories

CE LABEL VS. CE KLASSENIDENTIFIKATIONS-LABEL FÜR DROHNEN (C0-C4)

- CE Klassen C0-C4 nur für Einsatz in der offenen Kategorie (open cat.)
- Verkauf von Drohnen auf dem EU Markt an CE Label gebunden
- Aktuelle Bestandsdrohnen ohne CE Klassenidentifikation können weiter betrieben werden (Ltd. open cat. + specific cat.)
- Bestandsdrohnen können nachträglich mit CE Klassenidentifikationslabel "zertifiziert" werden (Prozess unklar)



Quelle: TÜV Rheinland – Competence Center UAS

Status Quo (09.03.2021):
CE Klassen-Standards und Notifizierende Stellen zur finalen Klärung nicht vorhanden

Geo-Awareness (Deutsch: Geo-Sensibilisierung)

EU: UAS GEOZONES

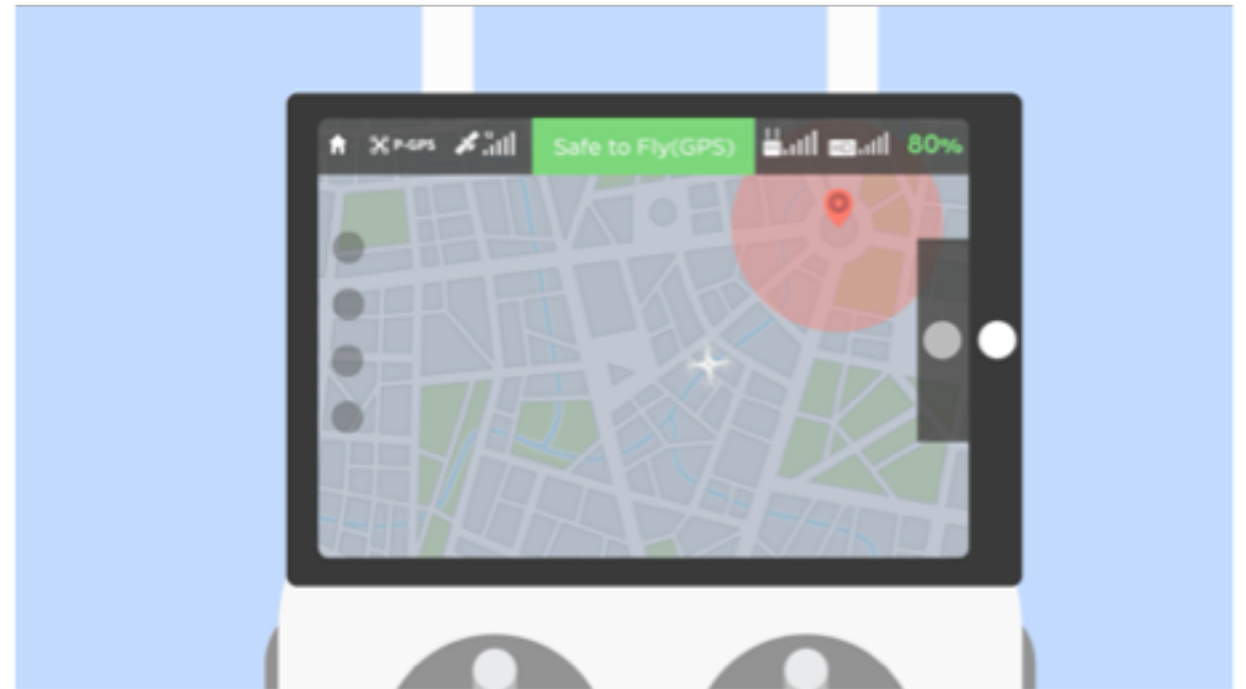
UAS GEOZONES are becoming one major Data needed for future UAS applications in the open and specific UAS category in Europe requiring Geo-Awareness or (optional) Geo-Fencing capabilities on the UA.

GEO-Awareness

Functionality on the UA to inform and warn the UAS operator that the UA is flying into non-authorized airspace (UAS GEOZONE).

GEO-Fencing

Functionality on the UA which actively prevents the UA to enter a UAS GEOZONE.

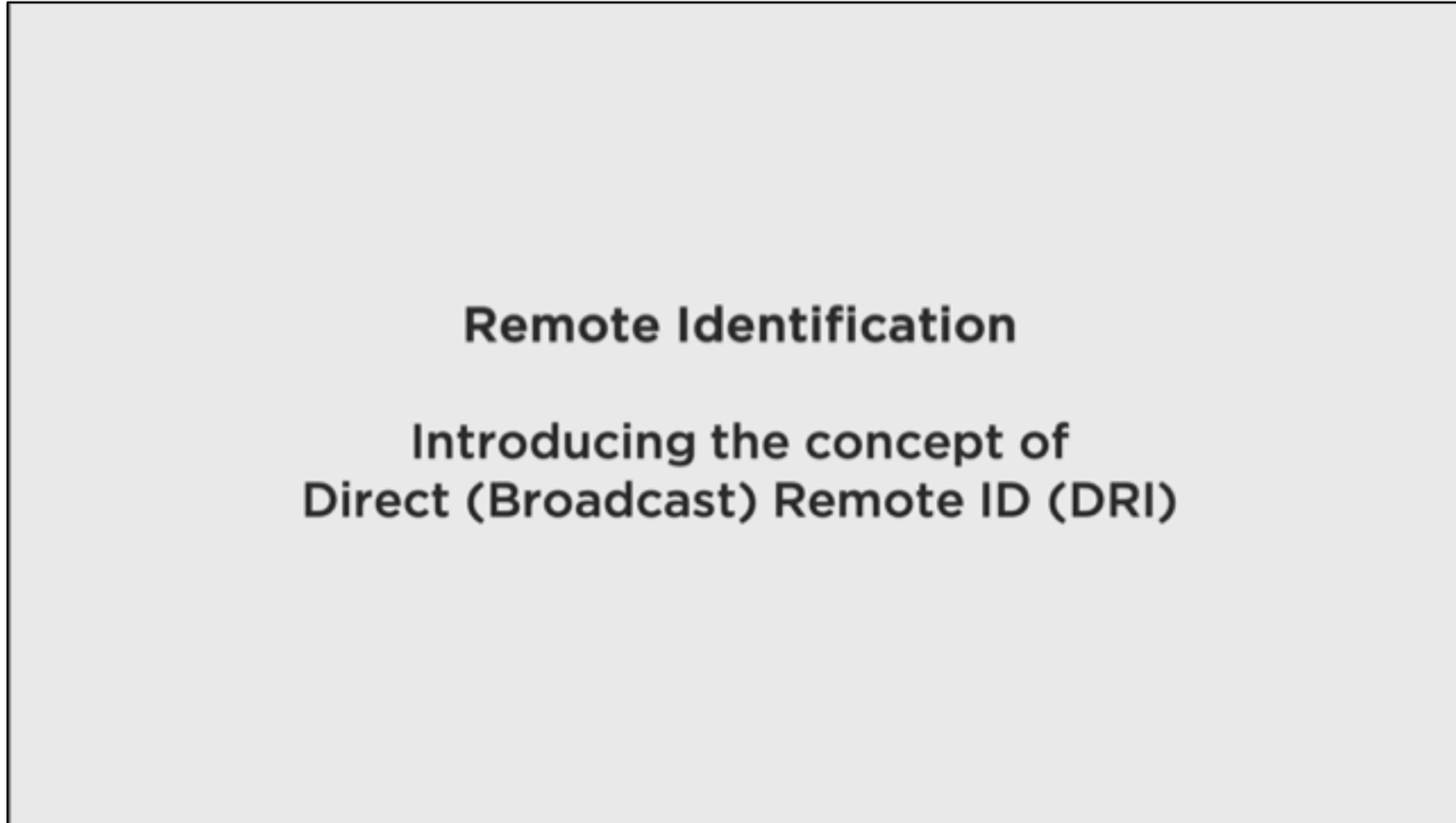


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Impact on UAS functionalities / UA flight performance
Thrusted Data source needed for UAS operation

Remote ID (Deutsch: Fernidentifikation)





THE FUTURE OF POSSIBLE