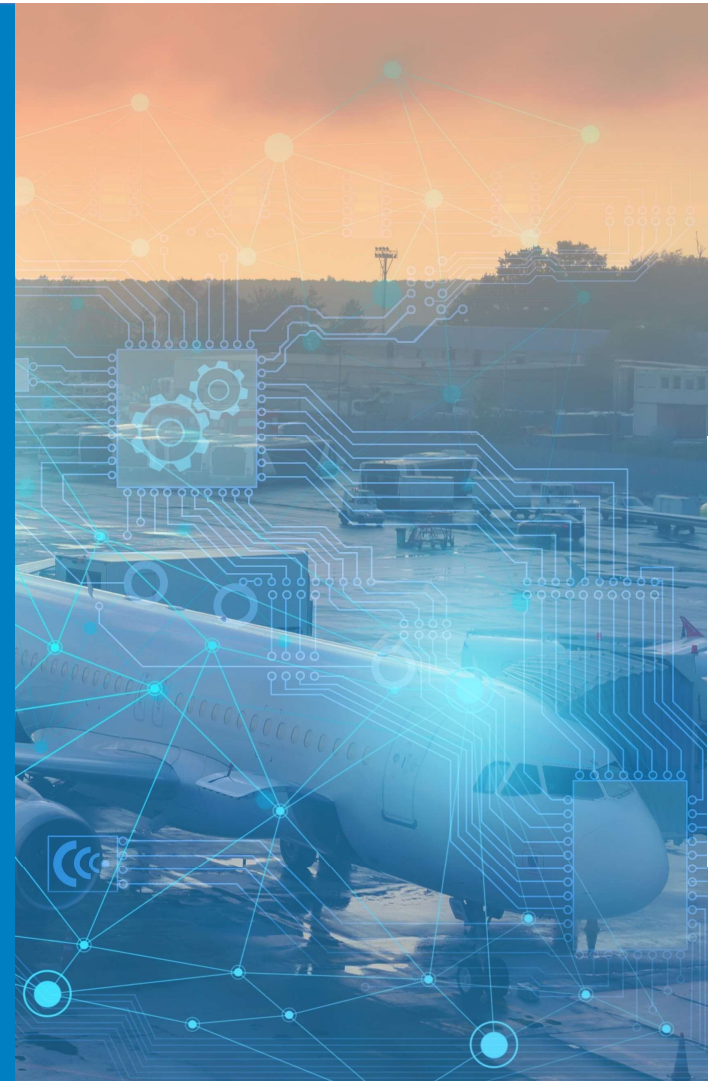


EASA AI Roadmap: Perspective on the Trustworthiness of Artificial Intelligence

Guillaume Soudain
Software Senior Expert
& AI Project Manager

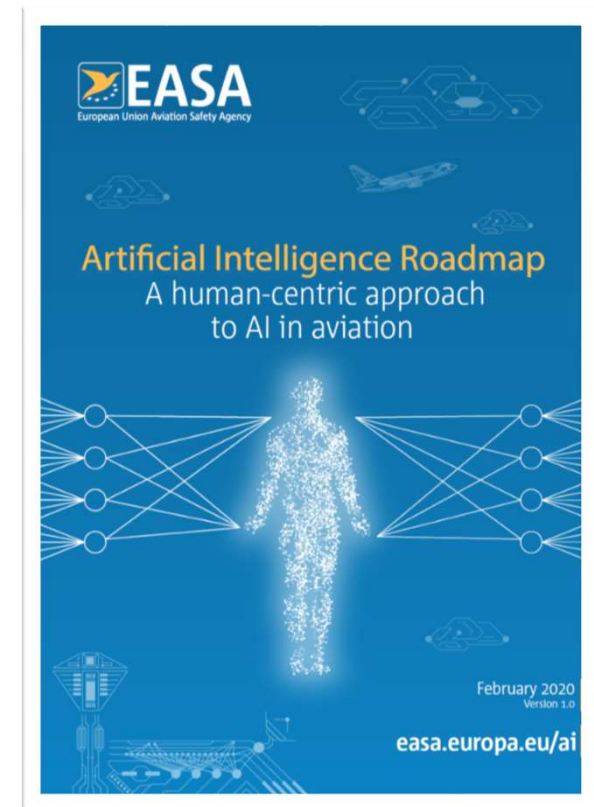
SESAR Webinar – 22nd July 2020

An Agency of the European Union



Presentation guideline

- EASA organisation for innovation
- Overview of the EASA AI Roadmap
- AI Trustworthiness as a driving concept
- Focus on the Learning Assurance building-block
- Perspective

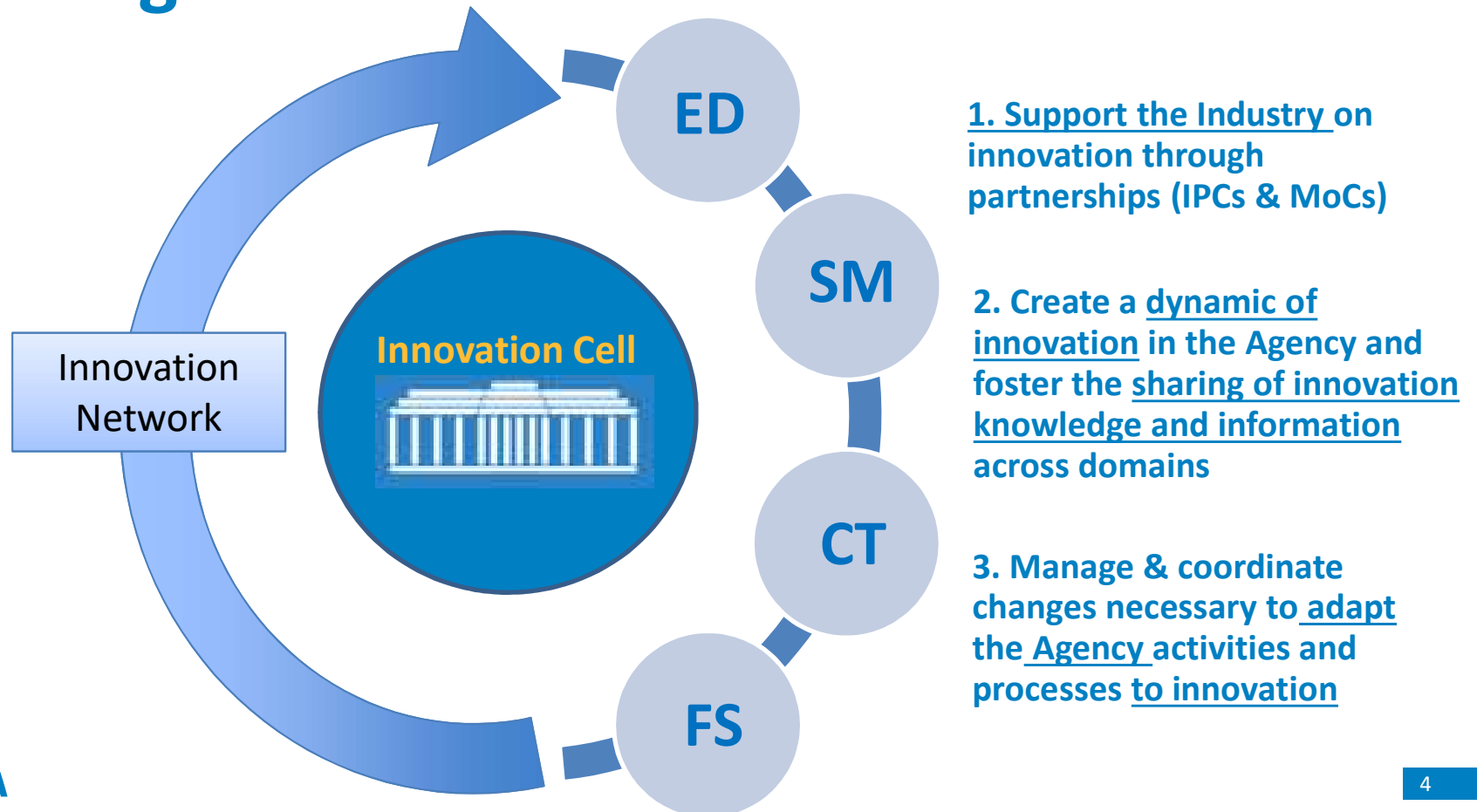


EASA organisation for innovation

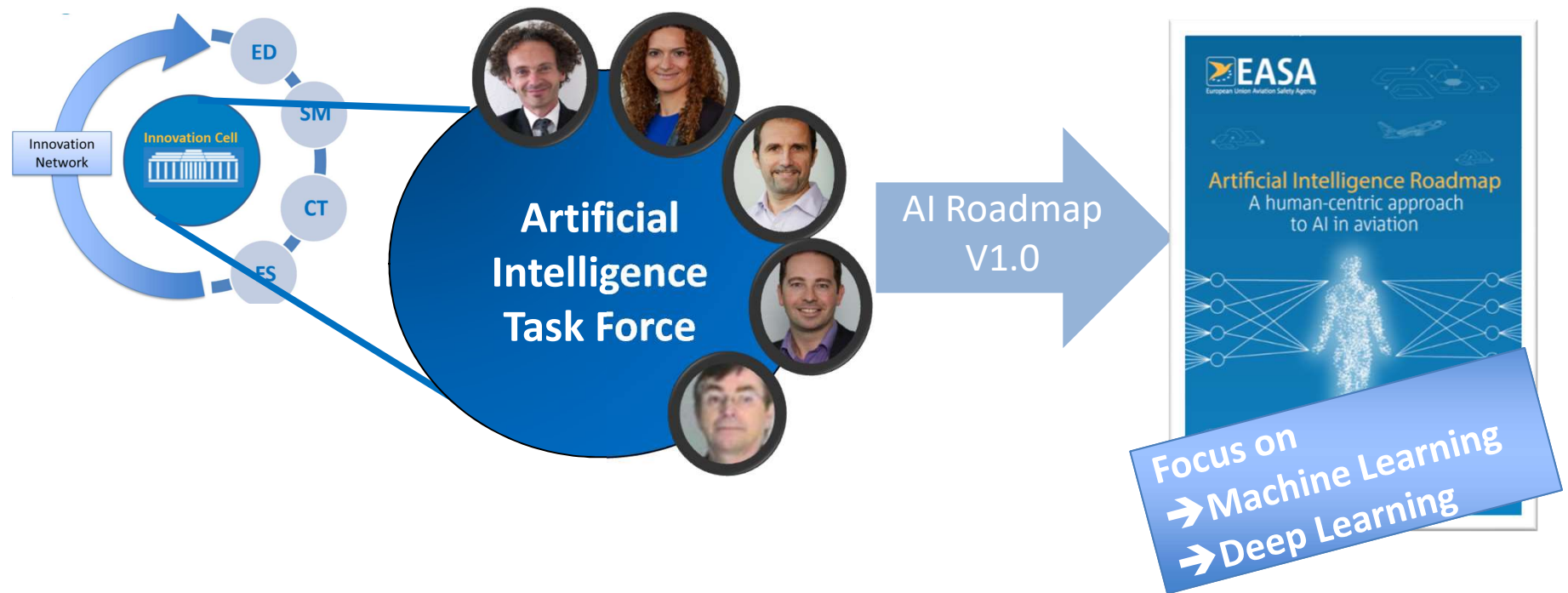
The EASA innovation network

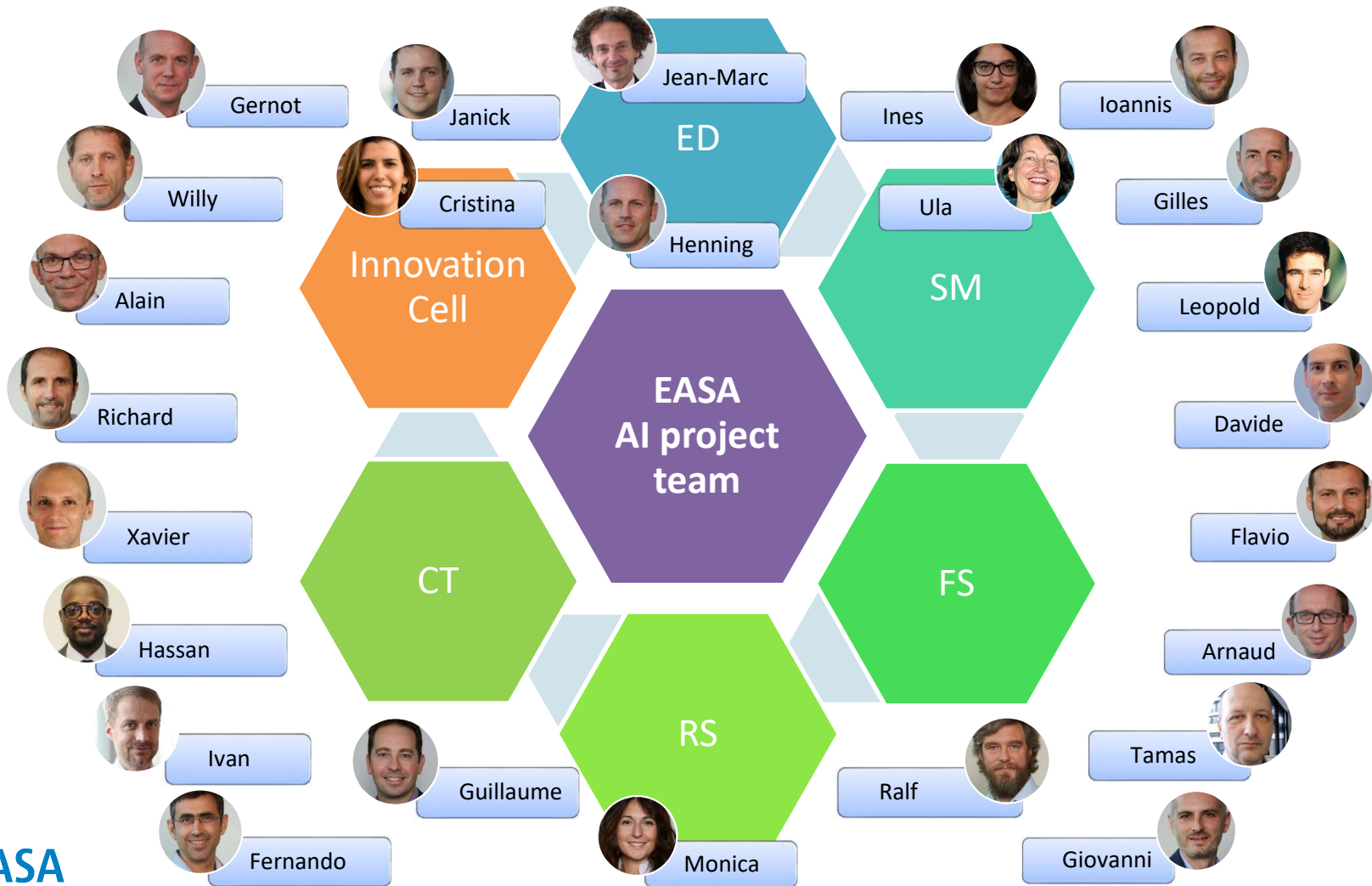


EASA organisation to deal with innovation



AI as first key topic for our innovation network



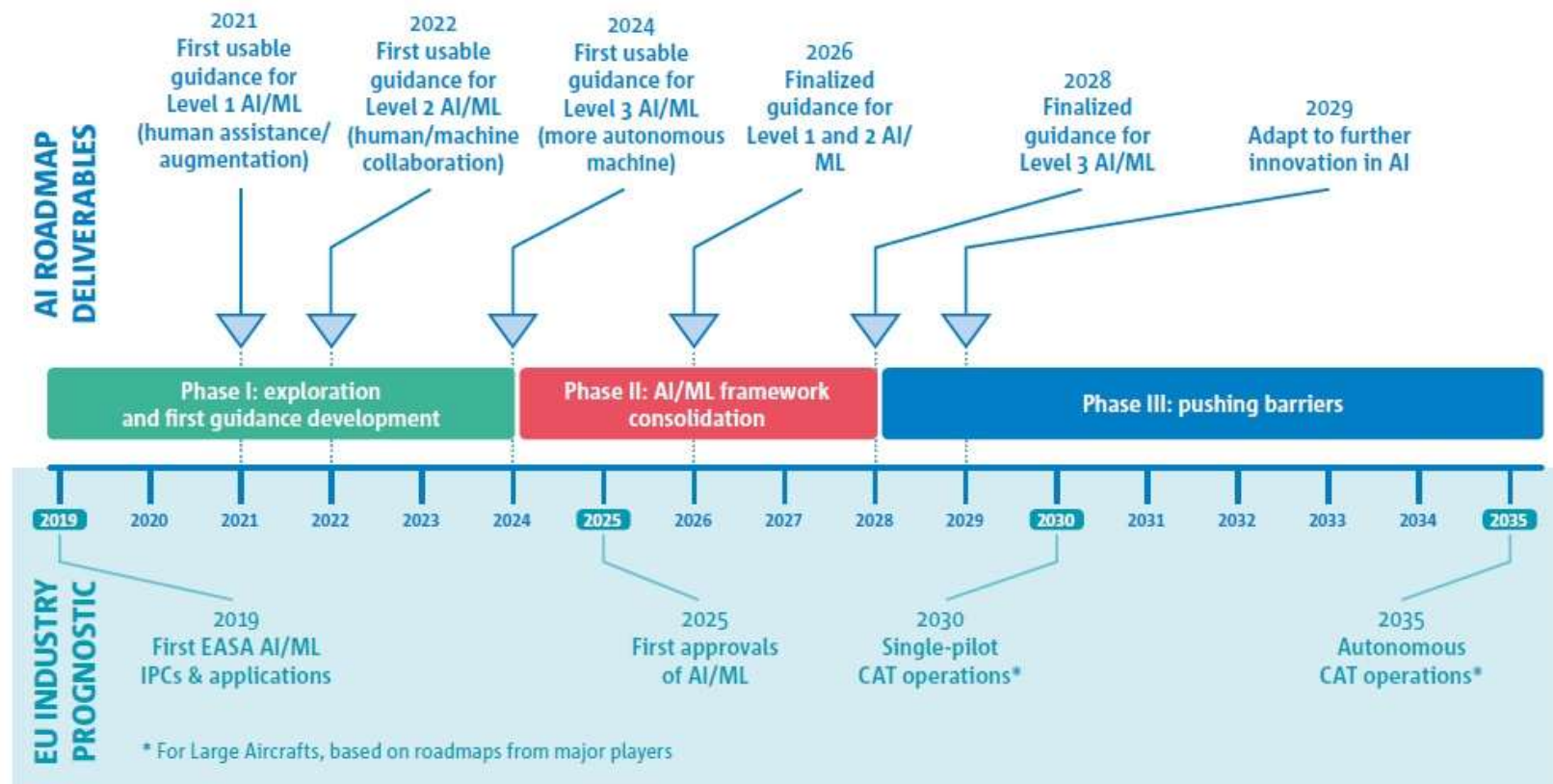


EASA AI Roadmap overview

**A human-centric approach to
AI in aviation**



EASA AI Roadmap timeframe and milestones



AI Trustworthiness

A driving concept

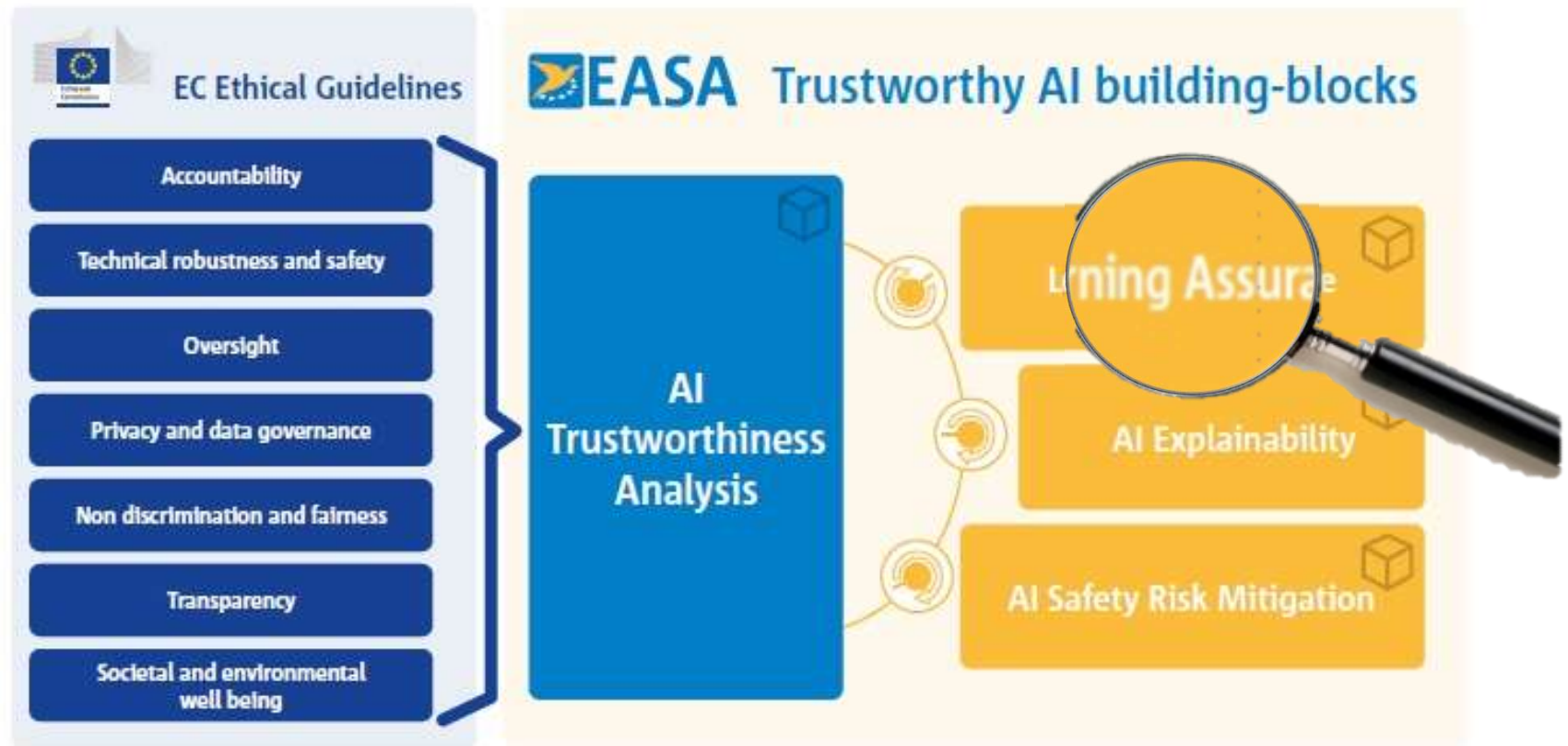


Building blocks towards “AI Trustworthiness”

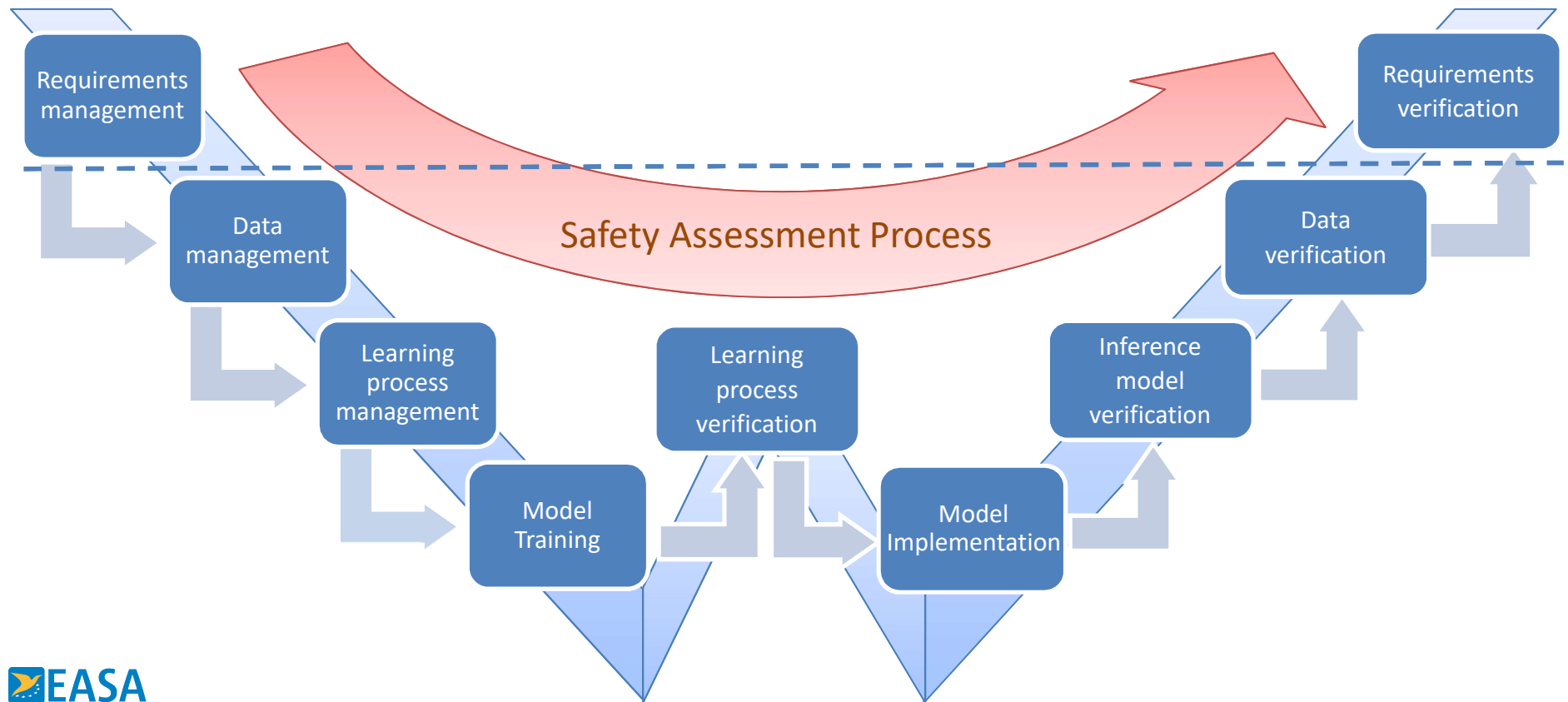
- By nature, AI can be considered as a black-box
 - Trusting a machine learning agent involves « opening the box » to a degree commensurate with its intended use

- To enable the conditions of approval of AI/ML, some necessary building blocks have been identified.

AI Roadmap building blocks



Learning Assurance : W-Shaped Process



Learning Assurance: Focus on 'CoDANN' IPC

→ The purpose of this IPC was to

- 1) Mature selected key aspect of the concept of Learning Assurance
- 2) Investigate the embodiment of AI performance in Safety analyses

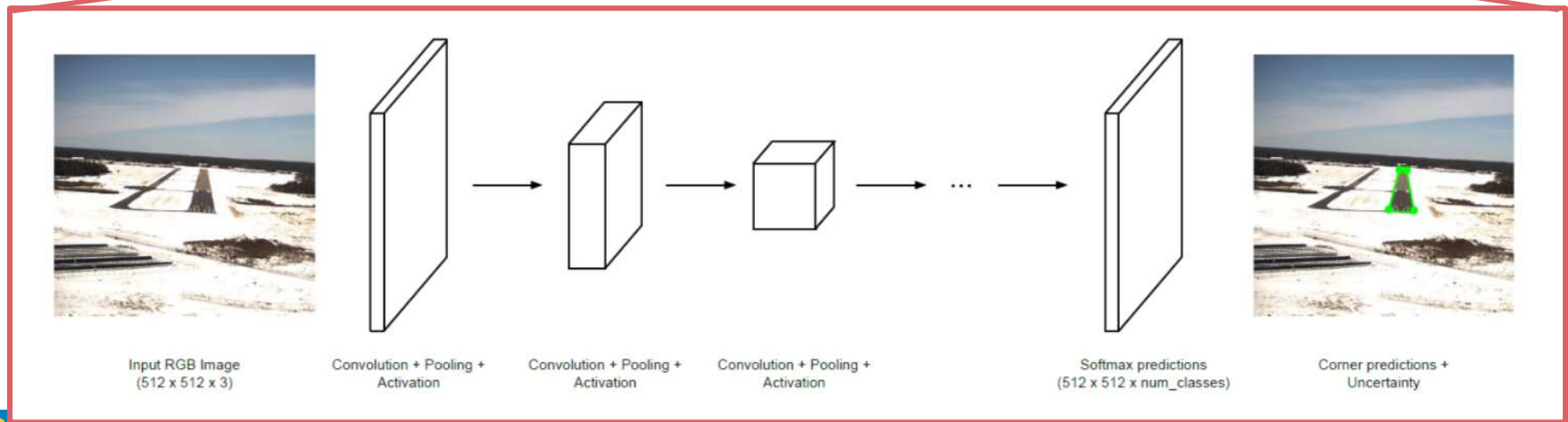
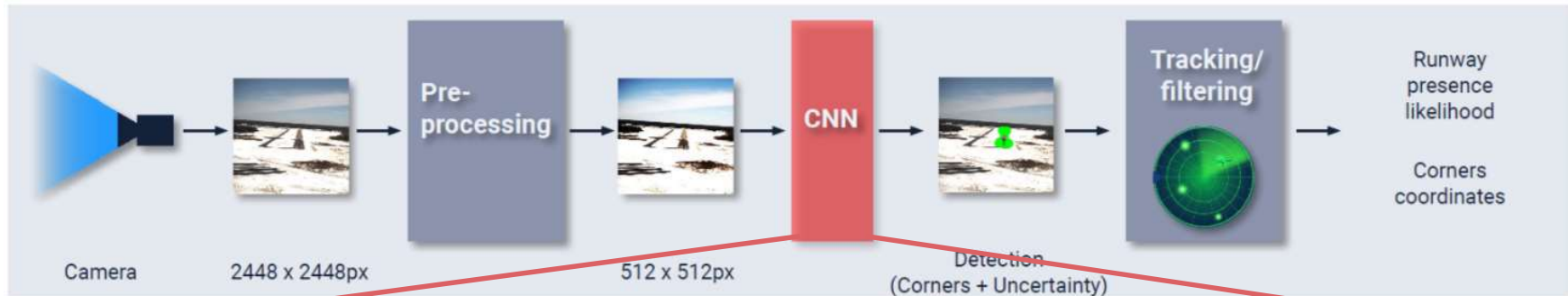
→ Timeline: June 2019 – February 2020

→ Background:

- First EASA IPC dealing specifically with Deep Learning (DL)
- Daedalean brought expertise in computer vision and DL
- EASA brought expertise in safety, certification and ops



Learning Assurance: 'CoDANN' IPC use case

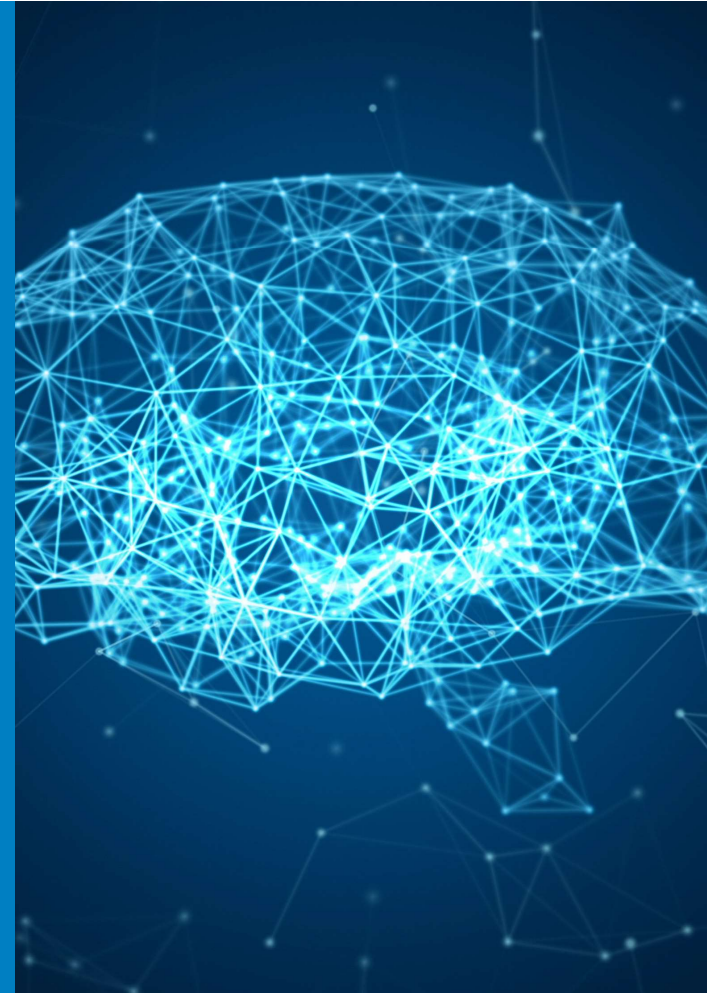


Learning Assurance: focus on Data Management

- Data management is a key process when dealing with Machine Learning applications
 - Introduction of **data quality attributes** (accuracy, resolution, assurance level, traceability, timeliness, completeness, formatting)
- Completeness has a major importance in the capability to give guarantees on the **generalizability of a NN**
 - This IPC emphasize an approach using a **distribution discriminator**
 - And to rely on mathematical theorems to guarantee certain **generalization bounds**

Generalization guarantee is a crucial characteristic of NNs, to ensure confidence that a ML model will perform as intended.

Conclusion and perspective



Conclusion and perspective

- We made a first **major step in the definition of the “Learning Assurance” process** with the publication of the CoDANN report.
- Next steps will focus on two other major building-blocks : **AI Trustworthiness Analysis** and **AI Explainability**.
- EASA is also involved in the joint EUROCAE/SAE working group WG-114/G-34 and in several research projects.

All of this will contribute to meeting our first essential Roadmap 1.0 milestone: **first usable guidance for ML applications in Q1/2021!**

Thank you for your attention!

TRUST

Any question?

Please contact us: guillaume.soudain@easa.europa.eu

easa.europa.eu/connect



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