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INNOVATION

EUR/NAT WORKSHOP

Paris Office

#FUTUREAVIATION



James Bell

Head of Innovation
UK Civil Aviation Authority

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\$74 BILLION BY 2035



DRONES
\$38
BILLION



AAM
\$32
BILLION



SERVICES
\$4
BILLION



Why is a regulator concerned with innovation?

There is an enormous opportunity on the horizon!

The UK Government recognises that the CAA is fundamental for ensuring safety in aviation, but also critical for enabling new technology and innovation.



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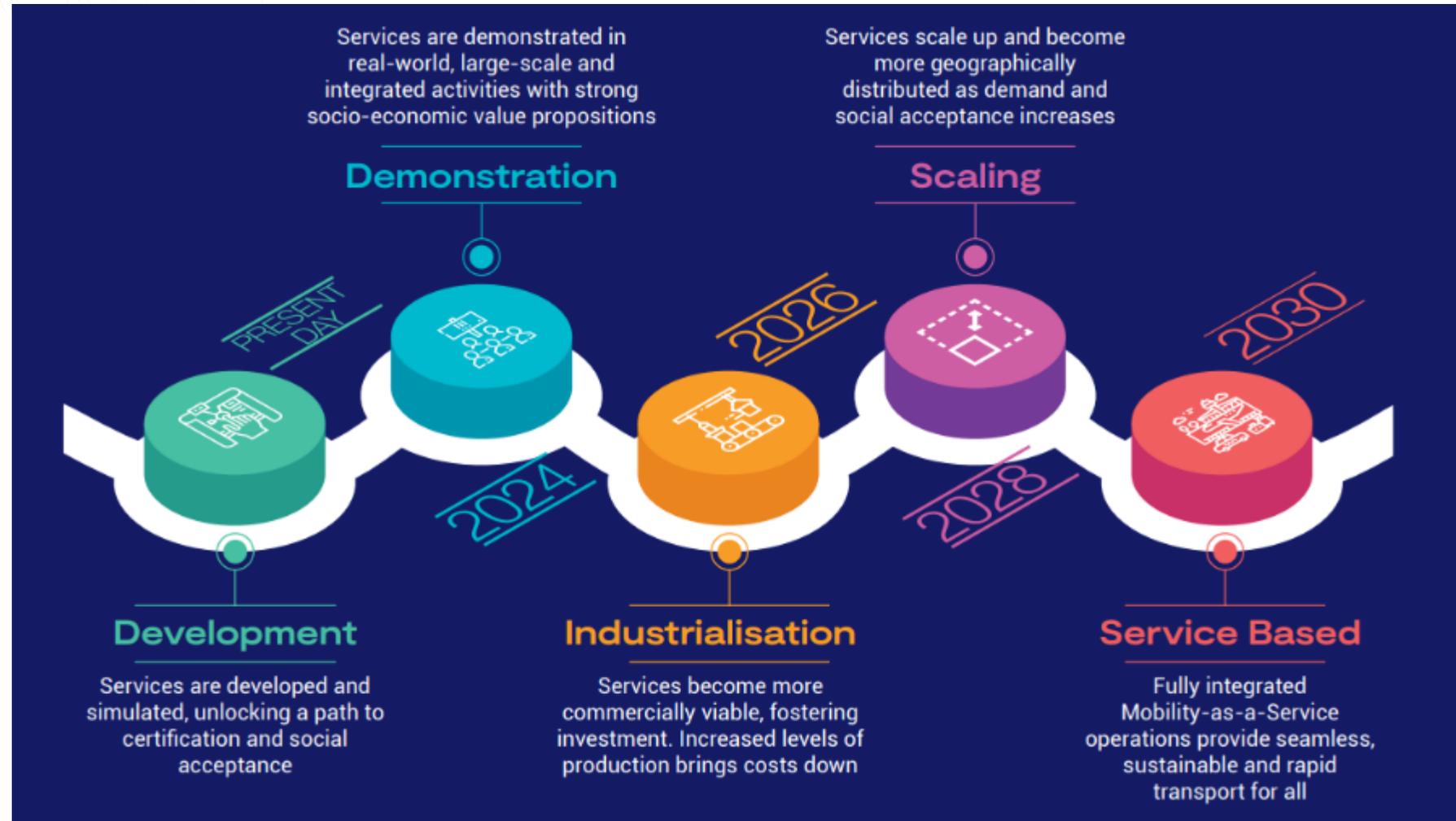


Future Flight Challenge: Vision & Roadmap

UK Industry has a vision for the future.

The Future Flight Challenge (£300m R&D) aims for 2024. The CAA is embedded in the programme to help achieve this goal.

But there is a cultural challenge to overcome...



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Regulators

Operate within the legacy aviation system, designed over decades, with extensive aviation experience



Their priority is to achieve safety for the public, security, and protection of the consumer.



Working within policy and regulation assumptions that exist for current operations, services, and aircraft designs.



Often limited awareness of evolving business models and novel applications of technology, which may have emerged from other sectors.

Innovators

Often new to aviation sector and to regulation, with limited experience of such a heavily regulated sector.



Clear aspirations for their product or service, often with limited recognition of the regulatory requirements that might restrict those aspirations.



Desire for rapid response and immediate action, responding to the demands of their investors.



Technical and business knowledge specific to their innovation, often superior to the regulatory experts.

CULTURAL CHALLENGE



Regulators and Innovators need to be **aligned** for innovation to succeed

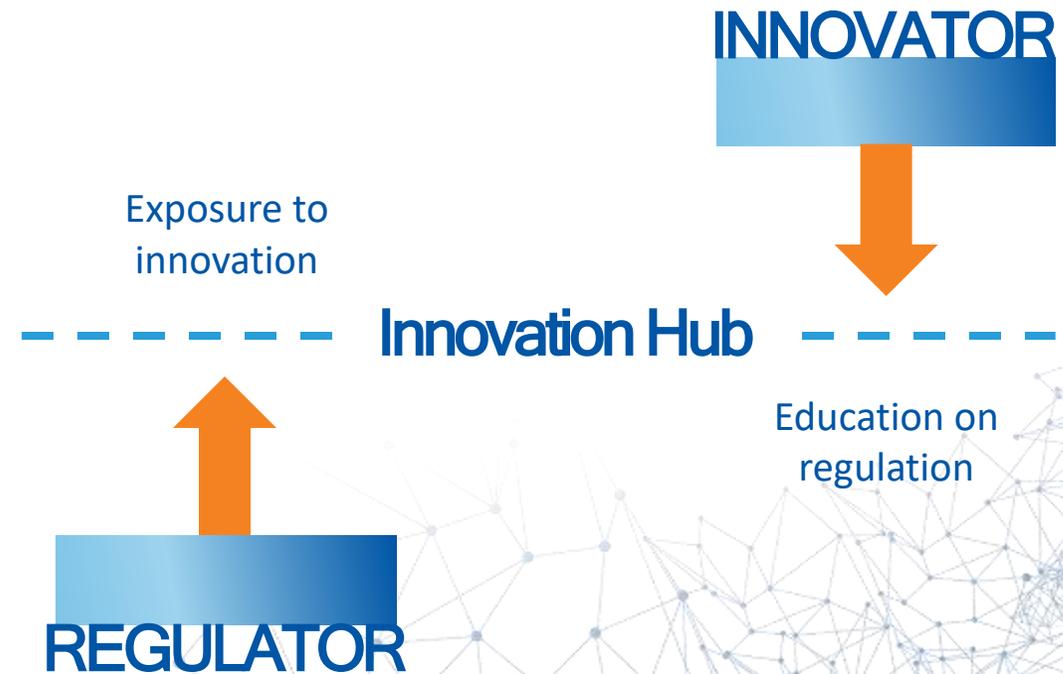
The cultural challenge can create **conflict** between the regulator and the innovation community.

It can damage the **relationship** and the **reputation** of the CAA.

The role of the Innovation Hub is to bring the two together, by employing techniques and approaches that

- **upskill** the regulator by exposing them to innovation.
- **educate** the Innovators on regulation.

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Introducing the **Innovation Hub**

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Introducing the **Innovation Hub**

Creating an environment where innovation in aviation can flourish, in line with our principles
(safety, security, consumer protection & the environment)



GATEWAY

To make it easier for innovators to access CAA expertise, guidance, and viewpoints on regulations by providing a focal point of contact and information.



SANDBOX

To maximise regulatory readiness for the trial of innovative concepts by testing them in safe environments and learning how they address regulatory challenges.

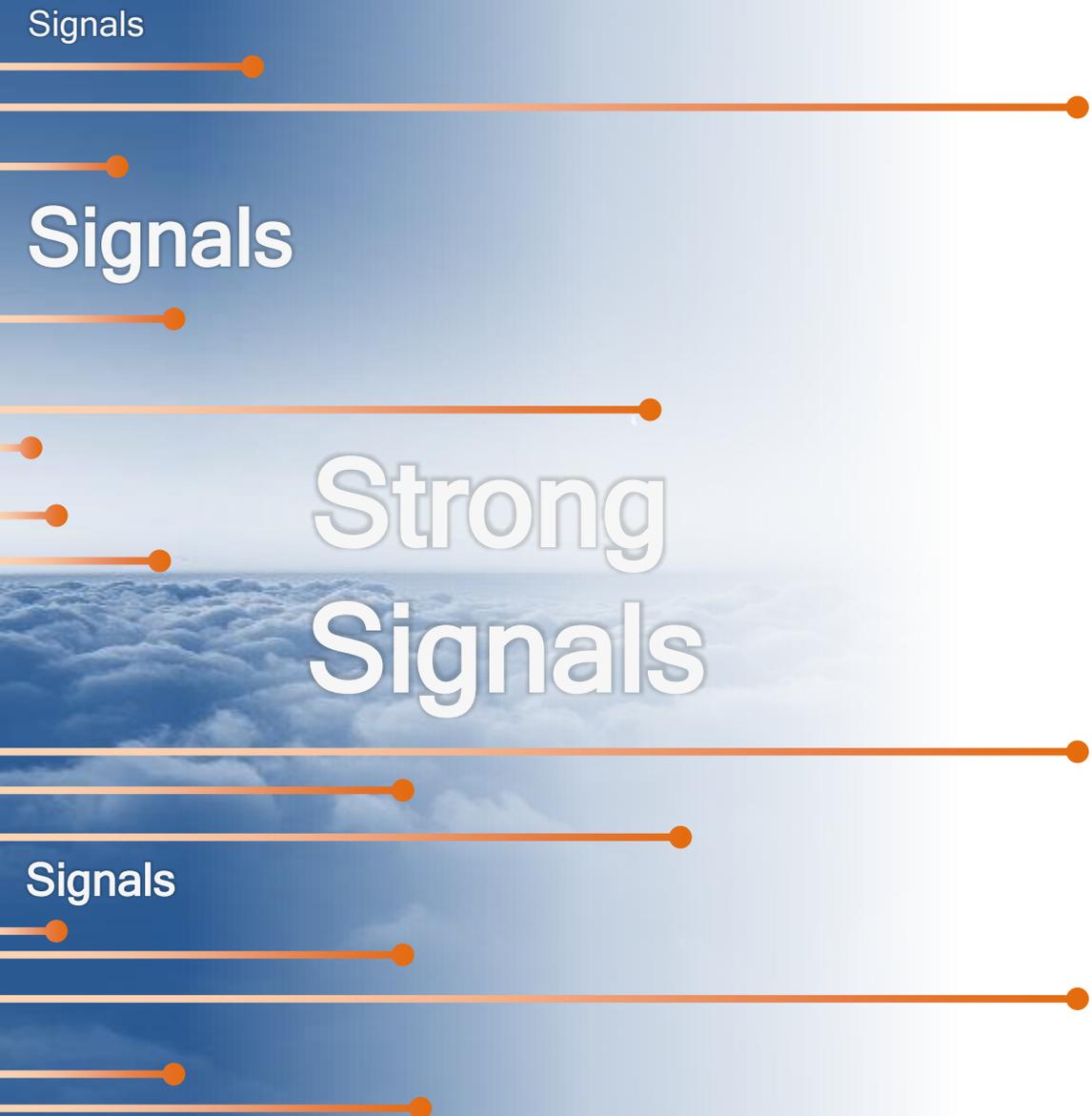


REGI LAB

To accelerate the development of new policies and regulations by anticipating regulatory challenges in areas of innovation and defining the requirements for new policies and regulations



HORIZON SCANNING

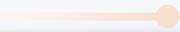
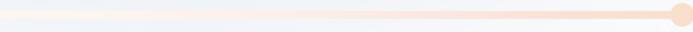


HORIZON SCANNING

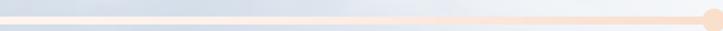
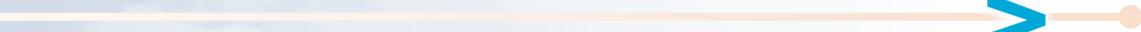
Signals



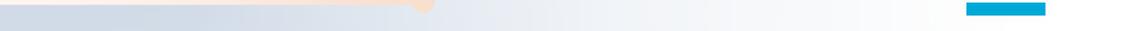
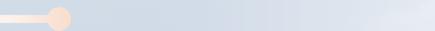
Signals



Strong
Signals



Signals



Innovation Trends

HORIZON SCANNING



Innovation Programmes

Public/Private Sector



Regulatory Sandbox



Regulatory Lab



*CAA
Government
Regulators*

HORIZON SCANNING

Signals

Signals

Strong
Signals

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Innovation Trends

Innovation Programmes

*Public/Private
Sector*



Regulatory
Sandbox

**Innovator Trials &
Regulatory Approvals**



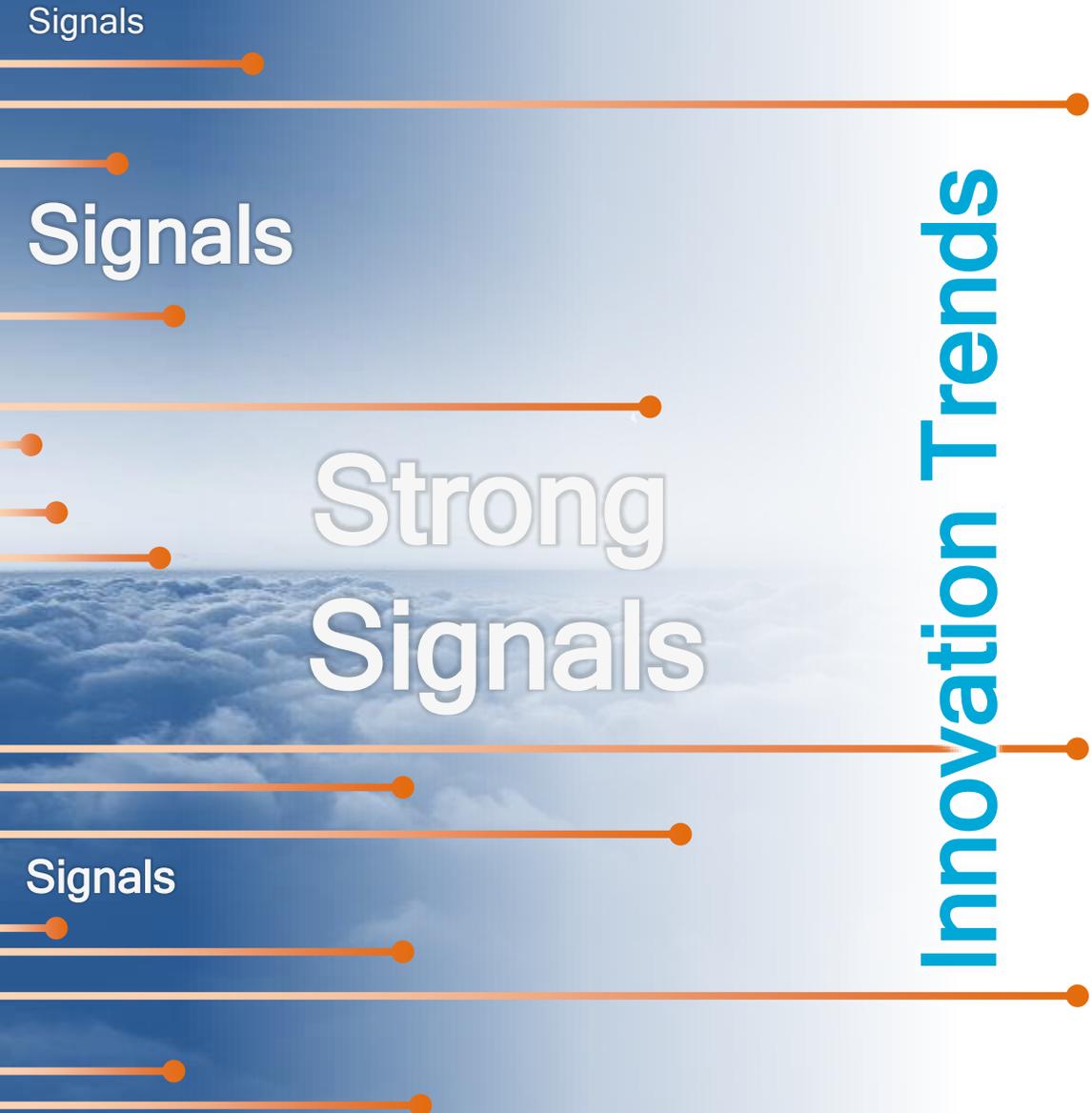
Regulatory
Lab

**Policy & Regulatory
Recommendations**



*CAA
Government
Regulators*

HORIZON SCANNING



Innovation Programmes

Public/Private Sector



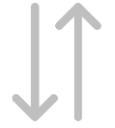
Regulatory Sandbox

Innovator Trials & Regulatory Approvals



Regulatory Lab

Policy & Regulatory Recommendations



*CAA
Government
Regulators*

Regulatory Sandbox: Creating collaborative partnerships

The Regulatory Sandbox allows Innovators to receive dedicated support and advice on their projects.

Demonstrate Technical Feasibility

Testing the Innovator's concepts to validate the technical feasibility against current regulations. We work collaboratively to identify:

- applicable regulations.
- safety risks that could slow approval
- showstoppers

Helping to Build Future Regulations

We adopt the short, iterative cycles of *planning, testing, & learning* to:

- identify gaps in the regulation (“regulatory challenges”)
- identify potential safety hazards
- test proposed mitigations in a safe environment.



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The Innovation Methodology

Bringing together the 3 Innovation Services (Gateway, Sandbox, & Regulatory Lab) we can prepare the CAA for new technologies, and increase the regulatory readiness of Innovators.

INNOVATION RESEARCH

Regulatory Challenges

Identifying, assessing and communicating Regulatory Challenges relating to an innovation, upfront and throughout a programme

Gaps

Between new innovations and existing regulatory frameworks

Risks

Identifying risks relating to innovations and the regulatory responsibilities



THOUGHT LEADERSHIP

Baseline Papers

Scoping, exploring, articulating, recommending

Guidance for Innovators

Clarifying CAA views and positions on innovations and regulatory gaps

Internal Guidance & Recommendations

Frameworks, evidence and research to support CAA strategy, policy and regulatory development.





Current Innovation Programmes



Advanced Air Mobility Challenge

BVLOS Integration Challenge

Preparing for Autonomy in Aviation

Dangerous Goods for Drones

Net Zero Propulsion

- Objective to enable the first passenger-carrying service of an electric vertical take-off and landing (eVTOL) aircraft by 2025.
- Exploring the regulatory challenges of these operations through research and testing.
- Describing the whole ecosystem, from flight operations through to infrastructure and maintenance.

- Objective to enable routine BVLOS operation in non-segregated airspace by 2024.
- Identifying the activities necessary within the CAA to meet this objective.
- Working collaboratively with innovators to explore the regulatory requirements.
- Unlocking the value added by using BVLOS drones in various use cases.

- Early exploratory work to identify the fundamental blockers to introducing artificial intelligence in aviation.
- Working with the Law Commission of England and Wales to explore legal challenges.
- Researching how automation and autonomy impact the safety case for aviation operations.

- The COVID-19 pandemic highlighted a need to reconnect remote communities with basic healthcare services.
- Trialling the delivery of medical equipment and specimens by drone.
- Uncovering the regulatory challenges, and driving forward the necessary changes to policy and guidance.

- New technological approaches to meeting the net zero emissions objective are emerging.
- Hydrogen, Electricity, sustainable aviation fuels, synthetic aviation fuels.
- CAA activity required to prepare for and respond to these, providing a regulatory framework that allows safe use of net zero technologies.

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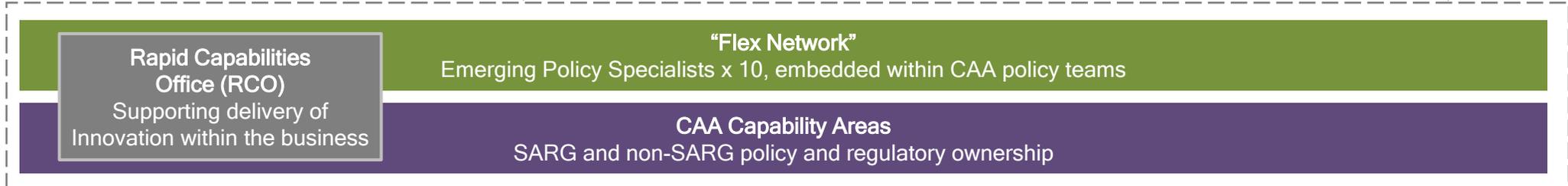
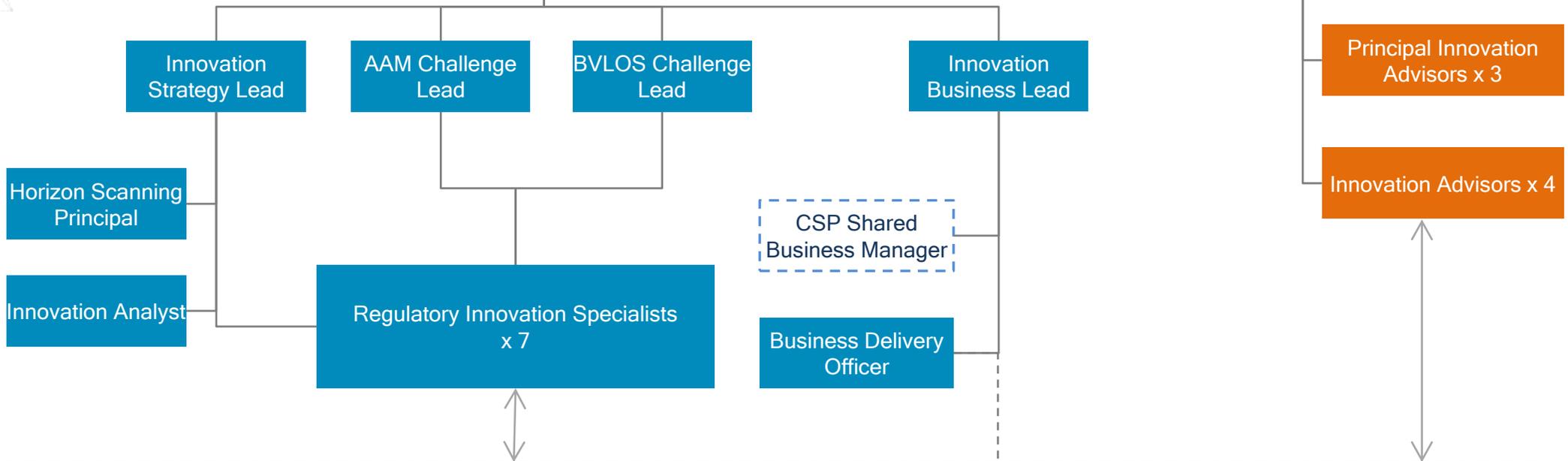
CAA Strategy & Policy

International Group

CAA Strategies

Head of Innovation

Head of Innovation
Advisory Services



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THANK YOU!