



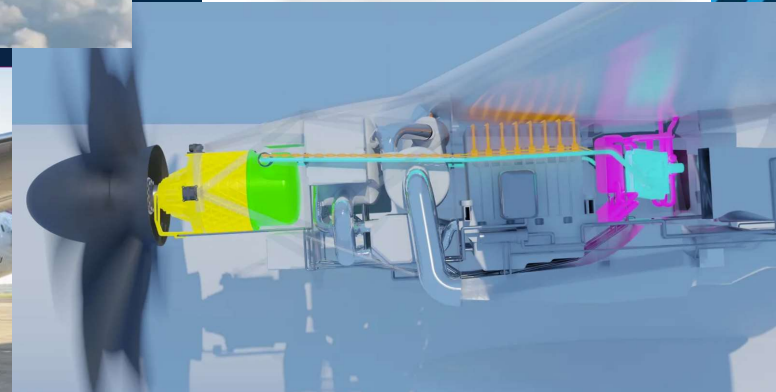
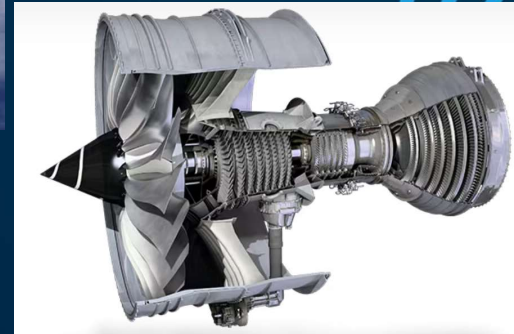
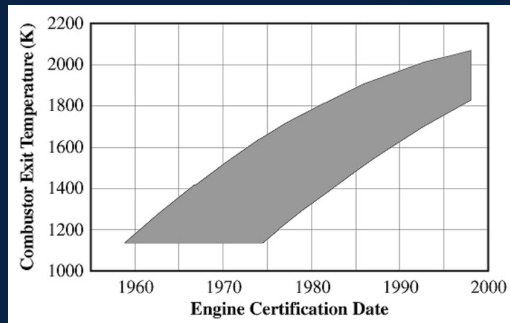
**Emerging  
Technologies  
Programme**

# De-Carbonisation Technologies in the Future of Aviation

**Disclaimer:  
Presentation is not CAA NZ policy**



# Technology pathways to de-carbonisation of aviation



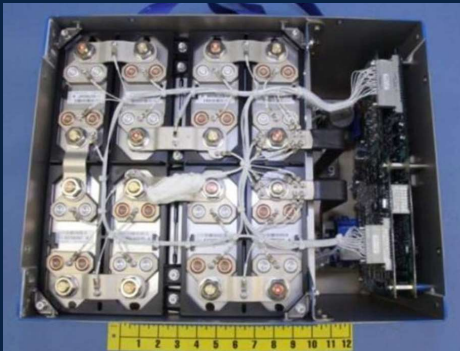
## ***Regulatory considerations for new aviation technologies:***

- Initial airworthiness certification***
- Pilot Training & Licencing***
- Maintenance Training & Continued airworthiness***
- Operations***
- Infrastructure***
- Airspace***
- General Operating Rules***

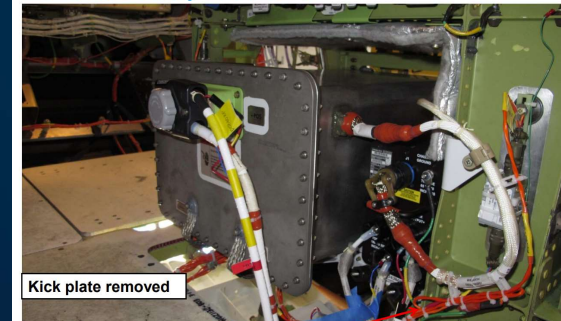


## Initial Airworthiness Certification – B787 Li-ion Battery:

- Airworthiness criteria stated that ...the battery design must preclude the occurrence of self-sustaining, uncontrolled increases in temperature or pressure...



787 Main Battery Enclosure



## ***Technologies have become 'baked into' existing rules***

- ***Engine, turbine***
  - ***What about Electric motor?***
  - ***What about a motor powered by another source of energy?***
- ***Aeroplane, helicopter***
  - ***What about VTOL/Powered-Lift?***
- ***Rulemaking is a lengthy and resource intensive process***
- ***Can new rules be created that are agnostic of technology?***



## ***Compliance-based vs Risk/Performance-based rules***

- Aviation rules are historically compliance based***
  - Explicit requirements against which compliance is shown***
- Relatively recent shift towards Risk/Performance based rules***
  - More onus placed on regulated party to identify and mitigate risks to their operation***
  - More enabling for new technologies***



## Challenges for Regulators

- How to enable new technologies to enter the system safely?
- CAA NZ taking a new approach with its Emerging Technologies Unit
  - Collaboration
  - Project management, if complex
  - Not constrained by existing process
- ETU & Innovators separated from Regulators by “Chinese wall”
- Still need to take Regulatory decision makers along on the journey
- Innovators handed off to Regulators when technology is sufficiently mature





***Example of CAA Emerging Technology Unit activity  
- Air New Zealand and Beta Technologies' CX300 electric aeroplane***

