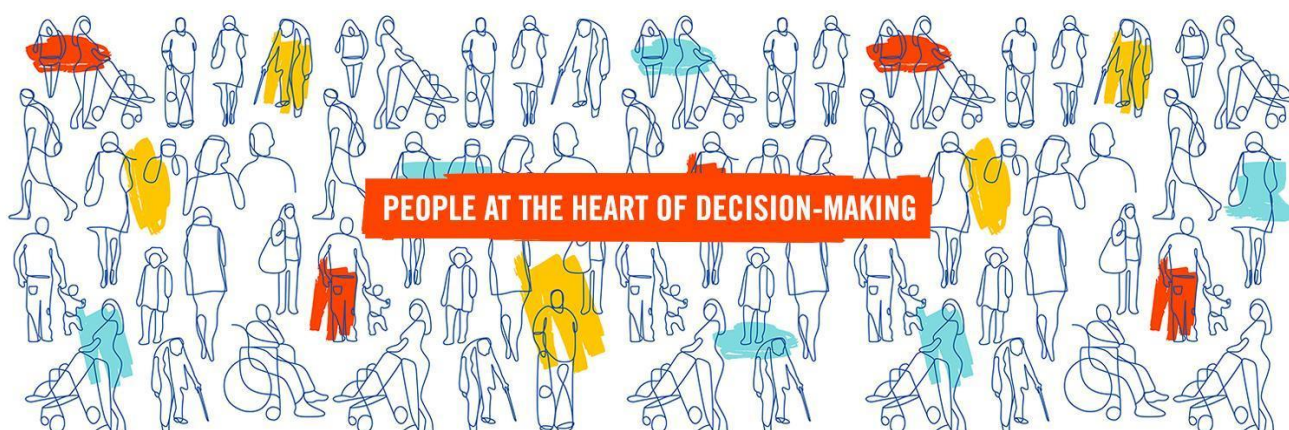




Future of Aviation

Workshop Report: Appendices

December 2023



01. Participant Demographics

Gender		
	Applied	Attended
Male	48	24
Female	9	6
Non-Binary	1	1
TOTAL	58	31

Age		
	Applied	Attended
18 - 24	27	14
25 - 34	14	6
35 - 45	10	5
45 - 64	7	6
TOTAL	58	31

Ethnicity		
	Applied	Attended
Asian, Asian British, Asian Welsh	19	7
Black, Black British, Black Welsh, Caribbean or African	4	2
Mixed or Multiple ethnicities	2	1
Other Ethnic Group	6	6
White	27	15
TOTAL	58	31

Student / Worker		
	Applied	Attended
Student	22	9

Worker	35	22
Not aviation-related	1	0
TOTAL	58	31

Level of concern about the impact of the aviation sector on climate change		
	Applied	Attended
Not at all concerned	2	2
Not very concerned	4	2
Fairly concerned	23	10
Very concerned	29	17
TOTAL	58	31

Roles - Attendees	
Aerospace Engineering Student	7
Braking and Steering Control systems	1
Certification Manager	1
Combustion engineer	1
Defence	1
Engineering programme manager or lead	2
Environmental Engineer	1
Fabrication	1
Flight Physics Capability Engineer or Intern	2
Graduate Trainee	1
Junior Battery Controls Engineer	1
Landing gear engineer or Intern	3
Principal Systems Engineer	2

Quality manager	1
Senior Lecturer	1
Stress Engineer	1
Structures Analysis Intern	1
Structures Test Engineering	1
Supply Chain Analyst	1
Tinsmith	1
TOTAL	31

Place of Employment / Study - Attendees	
GKN	2
Airbus	10
Rolls Royce	8
University of Bristol	6
UWE Bristol	1
Boeing	1
MBDA	1
Vertical Aerospace	1
Brill Power	1
TOTAL	31

02. Speakers

We had three brilliant speakers from across the sector who brought their knowledge and expertise about decarbonising the sector. Participants had the opportunity to hear them present on the topic of sustainable aviation and ask questions.



Solange Baena is a multi-award winning aerospace engineer, with 15+ years experience in the aviation industry. She graduated from City University of London in 2005 with a 1st on a Masters Degree in Aerospace Engineering. As an engineer and techno-strategist, she has dedicated her career to the Sustainable Aviation journey at Airbus. She has comprehensive experience in leading high profile Sustainable Aviation Fuels (SAF) and Fuel Systems R&T projects, including the world's first in-flight emissions study using 100% SAF, that were and still are an integral part of Airbus' decarbonisation plan. She currently leads the UK environmental strategy of Airbus aircraft in operation, driving and contributing to the definition of Airbus' internal and external positions on environmental topics. Solange serves as the Airbus representative in the Jet Zero Council SAF and Non CO2 Working Groups. She is also a Member of Council in Sustainable Aviation UK and Chair of the Cleaner Working Group.



Tim Johnson is the Director of AEF with over 30 years experience in the aviation and environment field and holds a degree majoring in geography and transport planning. Tim currently provides AEF's representation at the UN International Civil Aviation Organisation (ICAO) via the environmental NGO coalition ICASA (the International Coalition for Sustainable Aviation), as well as on the Department for Transport's Airspace Strategy Board and the Airspace and Noise Engagement Group. At ICAO's Committee on Aviation Environmental Protection, Tim chairs ICAO's carbon calculator task force and previously co-led tasks related to the development of CORSIA, ICAO's offsetting mechanism for international aviation.

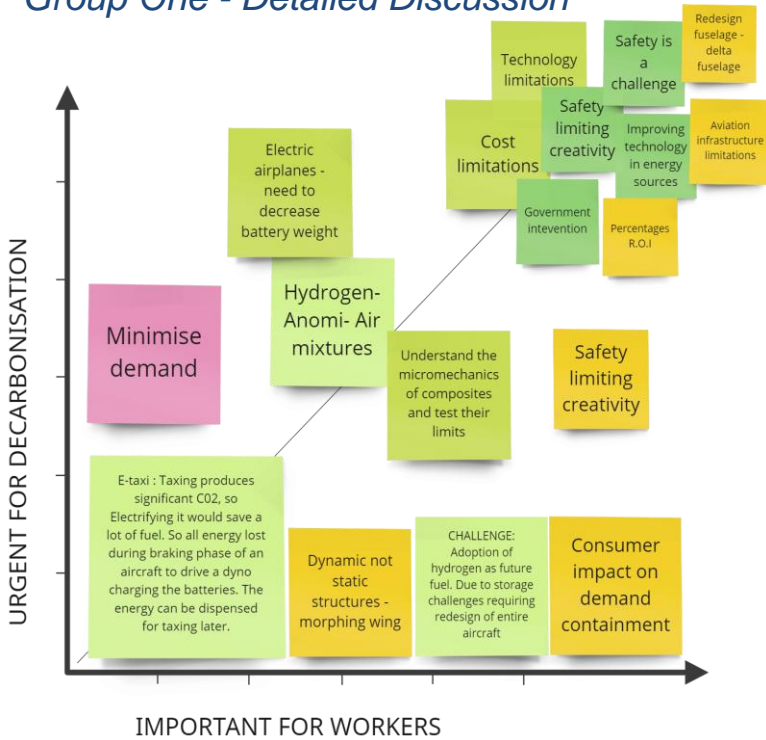


Rose Armitage is from the UK's Climate Change Committee, the UK Government's independent statutory advisor on climate change. Rose currently leads the CCC's work on aviation decarbonisation and international collaboration and technical assistance with mid-income countries through the UK PACT programme. Before the CCC, Rose worked on international and EU climate policy at the Department for Business, Energy and Industrial Strategy.

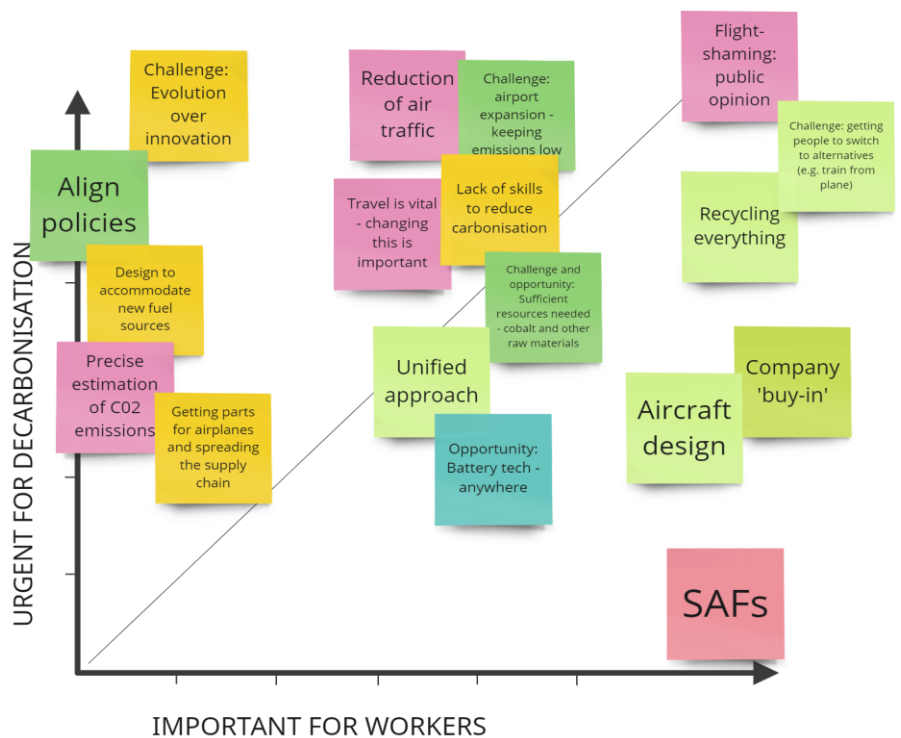
03. Detailed Discussions

'As an aviation worker, what do you think are the main challenges and opportunities for reducing the climate impact of aviation in the next 15 years?'

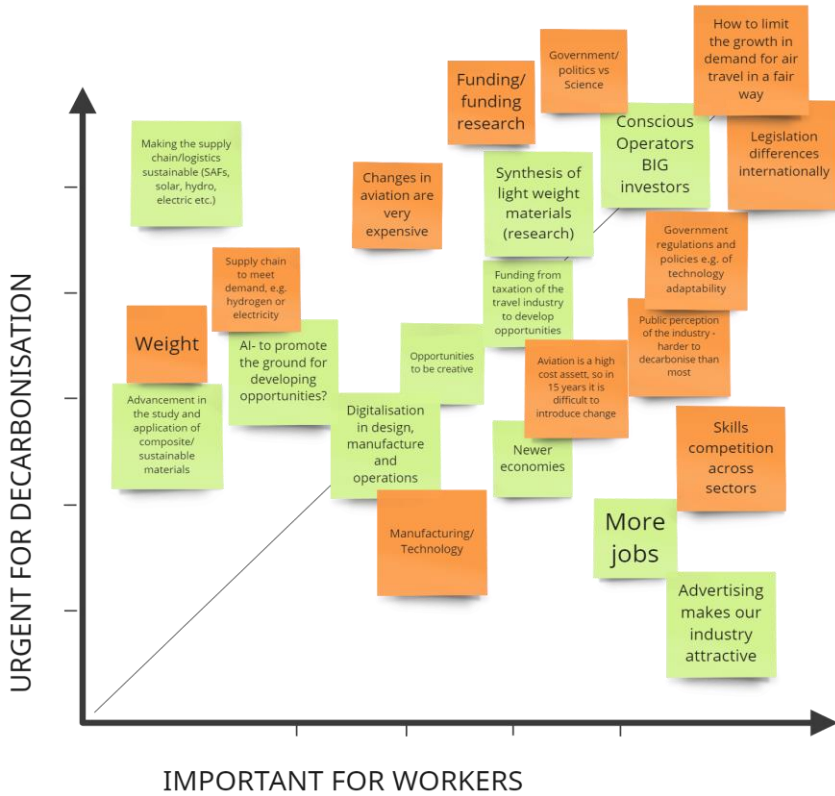
Group One - Detailed Discussion



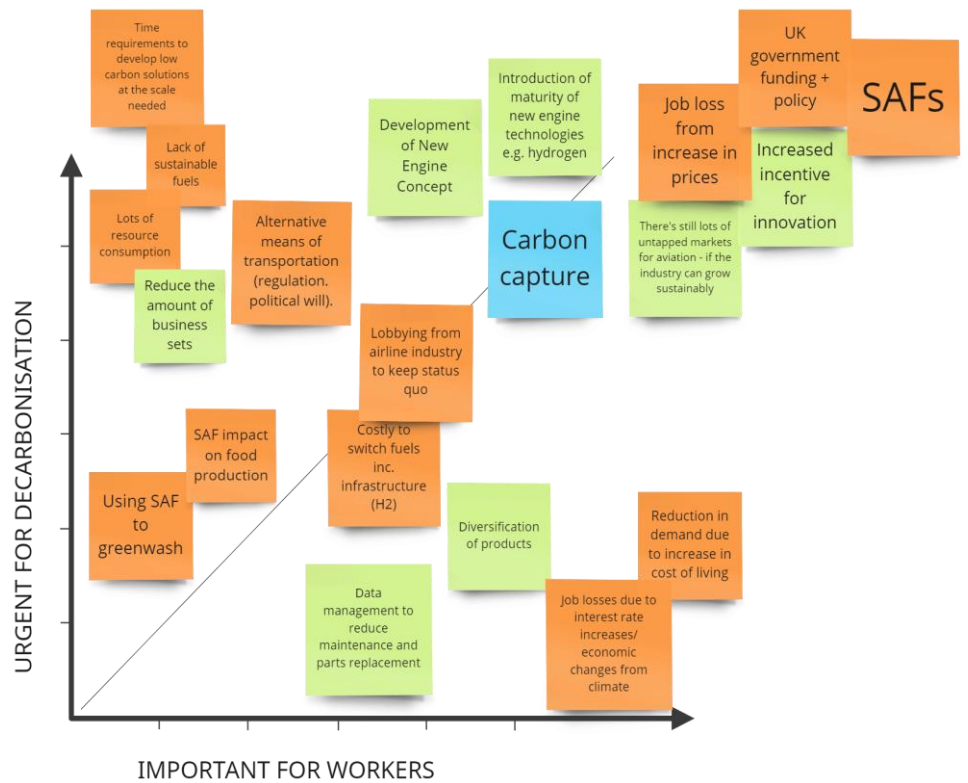
Group Two - Detailed Discussion



Group Three - Detailed Discussion



Group Four - Detailed Discussion



'If workers were to have an in-depth conversation about the sustainable future of aviation, what two questions do you think should be explored?'

To what extent do our solutions consider the constraints, compromises, and aspects of aviation as well as the impact on stakeholders?

Reasons why

- Are we looking into the right solutions?
- Are the solutions worth it?
- How profitable are these solutions?
- Where does SAF/hydrogen benefit an average person (stakeholder)?
- Are there limits/constraints towards making aviation sustainable?
- To what extent do our solutions consider limits, compromises and aspects of aviation and what are the impacts on stakeholders?

What should be targeted areas of focus of investment (design, manufacturing, R&D) and the role of collaboration in progression forward?

Reasons why

- Government levelling up
- Manufacturing design (branches of technology) development
- For research and development: will the future of aviation be of collaborations like reaction engines?
- Where would you like to see investment in the industry?
- What can industry do better to meet targets?

Is it possible to meet climate targets without demand reduction and, if not, how would this be achieved equitably?

Reasons why

- Current trajectories suggest demand reduction is needed
- This may have a negative impact of aviation jobs
- Note: workers are also consumers
- How could we meet our targets without limiting demand or restricting consumption?
- The idea of 'managing demand' - validity?
- How to educate consumers to use aviation more wisely?

How do I know which decarbonisation-themed activities to prioritise?

Reasons why

- I have limited amount of time so how do we collect the data and metrics needed for discussion?
- Resources and funding are limited
- Quicker to decarbonise if you know the 'big fish'
- To know when to stop chasing diminishing returns
- Evaluating the potential impacts/benefits is tricky
- Leverage academics to help with evaluation of metrics
- Allows decision makers to properly allocate funding

What would drive aviation workers to commit to change?

Reasons why

- Generates discussion about responsibility and company incentives
- Importance for aviation workers to be perceived correctly
- "Triangle of inaction"

Should companies share technologies within the industry to further sustainability?

Reasons why

- Too big for one company
- Faster technology outcome
- More creativity and innovation
- Climate affects everyone so we share ideas

- Convincing shareholders to work together and fight the bigger cause: CLIMATE
- Sharing revenues from the shared technology

How confident are we that new tech (like SAF, hydrogen) can meet demand?

Reasons why

- Every strategy has an element of new technology
- All tech required massive investment
- Discrepancy between manufacturers and CCC forecasts requires coordination
- In the 15-year timespan, how will SAF production be sustainably ramped up?
- How confident are we really in the feasibility of carbon capture at a large scale?

What practical steps can aviation works take in order to decarbonise?

Reasons why

- This is what aviation workers want to know
- It can be asked to anyone in the industry

04. Participant Feedback

Feedback from Attendees	
100% of respondents rated the workshop 4 or 5 out of 5	94% of respondents agreed or strongly agreed that their group members respected what they had to say even if they didn't agree
94% of respondents said they would attend a similar workshop or series of workshops on sustainable aviation in the future	87% of respondents said they learned something new from the speakers

Now that the workshop has drawn to a close, if you could give just one message to industry leaders what would it be?
It was great, please do more
Big decisions need to be made if we are to avoid climate breakdown, and the longer these are postponed the bigger they have to be.
Listen and change by putting climate and sustainability before profit
Ask for other contributors from other aspects of aviation
Quicker, more uncomfortable changes in aviation might be necessary in order to gain the results we require to prevent climate change.
Sensibilize everyone of the industry to the climate change challenges, their causes and details, think of deep changes in the industry goals so it helps humanity staying in the planetary boundaries, think about the common interest first.
Consider the future of the next generation of engineers, both north and south of the country.
Addressing the climate crisis is possible without any impact on working staff numbers, as long as investment in new and alternative (but realistic) technologies begins now.
I feel very positive in knowing there are many young people that show such enthusiasm for the future of the aerospace industry.
Our future will be determined by how we are perceived by the public. We need to manage this so that our efforts are understood.
Collaboration of key stakeholders is a important to achieve net zero by 2050.
Collaborate with other companies to create the technologies needed for clean and environmentally sustainable air travel.
Involve employees in big decisions
Investment and collaboration are critical
It was great , please do more

Now that the workshop has drawn to a close, if you could say just one thing about your experience this evening to an aviation worker or student who hasn't participated in this workshop what would it be?

It was very enlightening and the topic is one that will impact us all more and more in the next few years.

Open your mind and heart to another perspective

UK is doing great about net zero and there is a huge awareness

I learned quite a lot about the requirements and issues faced in aviation with trying to combat climate change.

Really a safe place to share our opinions and feelings about the climate change crisis, good ideas discussed

You can't beat seeing the product or working on a product, not just reading about it or sitting behind a desk.

Very interesting to see the ideological split between students/new graduates in industry, and those who are older and have been in the industry for a while regarding their views on how to address aerospace's carbon footprint.

Keep your enthusiasm and passion and your future will be good

Consider participating in the future.

Sustainability discussions about the future of aviation are constantly being updated by new developments. Try keeping in touch with them!

Regulations to deal with climate change and CO2 emissions are a real threat to the continuity of the Aviation industry workers, manufacturing and demand, unless more is done to reduce Aircraft emissions.

It was a good experience

It was very worthwhile and a rare opportunity to make our collective opinion known.