



**Orson  
Associates**

## Initiatives for a New Generation of Cabins

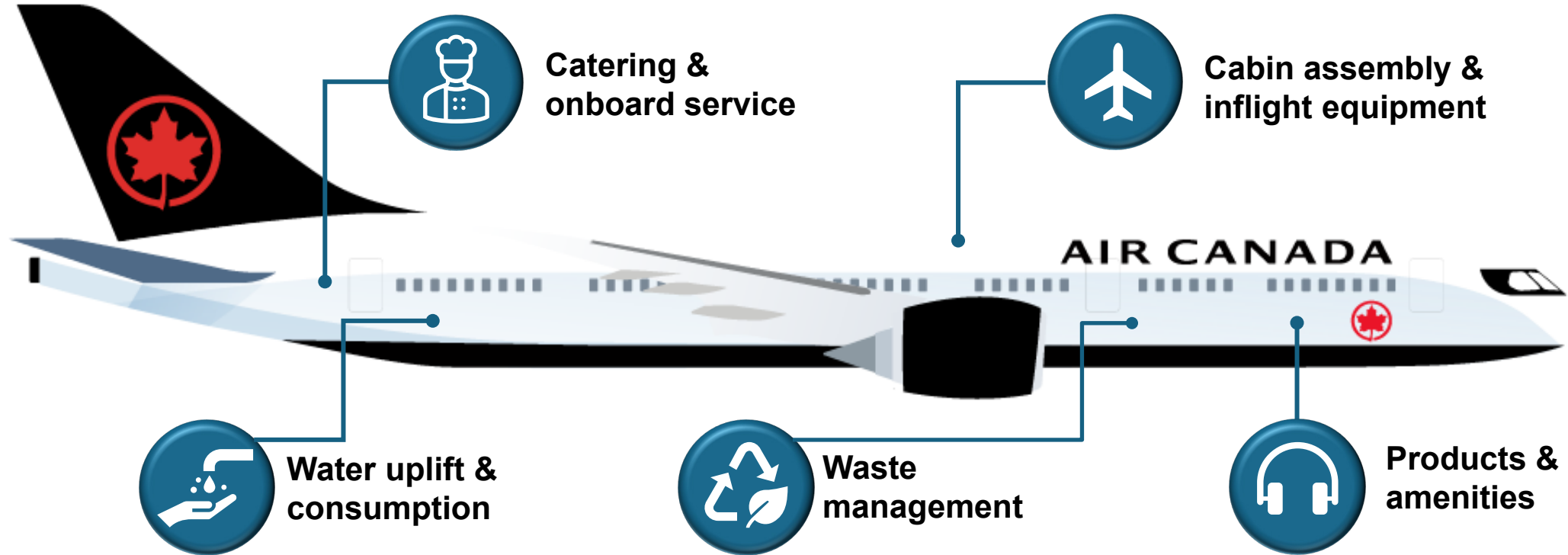
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**Ben Orson** – Orson Associates – CEO

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# Air Canada Context

Redefining the cabin experience through environmentally sustainable solutions



# The Challenge

## A new approach with many unknowns:

- What is the actual environmental impact of our current cabins?
- Which cabin components were more critical?
- Is most impact due to production, maintenance, or disposal?
- What solutions are possible, within which timeframe?

Needed a process to answer these questions and support decision-makers going forward.

*Without data, you're just another person with an opinion*  
**W. Edwards Deming**



# Project Origins

## ATI FlyZero Research Project (2021-22)

- Formation of Orson Associates' dedicated team.
- [Sustainable cabins research paper.](#)

## Passenger Experience Conference (2022)

- Orson Associates and Air Canada shared the view that data was key to efficiently drive real change.

## Orson Associates' sustainability team

- 30 years of cabin design experience + 30 years of sustainability and LCA experience



**AIR CANADA**

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# Phase 1: Big Picture

## Challenges

- Scale of task, too big for full LCA.

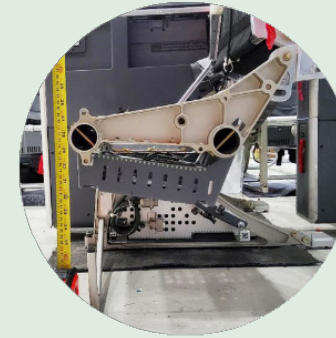
## Solution

- Bespoke MCDA qualitative assessment tool derived from the team's research.



2

AIRCRAFT TYPES  
SURVEYED



31

CABIN PRODUCTS  
MODELLED



27

MATERIALS ANALYSED



Develop  
Framework



Compile  
Inventory



Obtain  
Impacts



Qualitative  
Adjustments



Interpret  
Outputs

# Phase 1: Big Picture

## Outcome

- Heatmap - Impact rankings based on materials and use rates.
- 3x high impact/low complexity products selected for further study.
- Phase 1 enables confident, efficient focus for Phase 2.



# Phase 2: Deep Dive

## Challenge

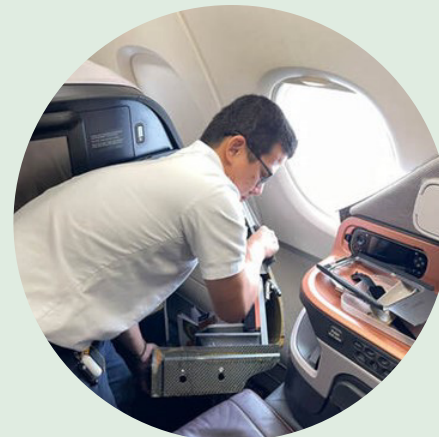
- Product systems design, not product design.
- In-use performance as important as manufacture and materials.
- Impact drivers include:
  - Materials qualities
  - Supply chain geography and processes
  - Product maintenance and longevity
  - End-of-life options



Materials extraction



Product Manufacture



Product Maintenance



End of Life

# Phase 2: Deep Dive

## Solution

- Full LCA aligned to industry standards (ISO 14040/44), using benchmark tools and processes.
- 26 suppliers, 35 products, 179 production processes.
- Modelled materials extraction, product manufacture, line-fit integration, through life maintenance and replacement, recycling, and disposal.



26

SUPPLIERS INTERVIEWED



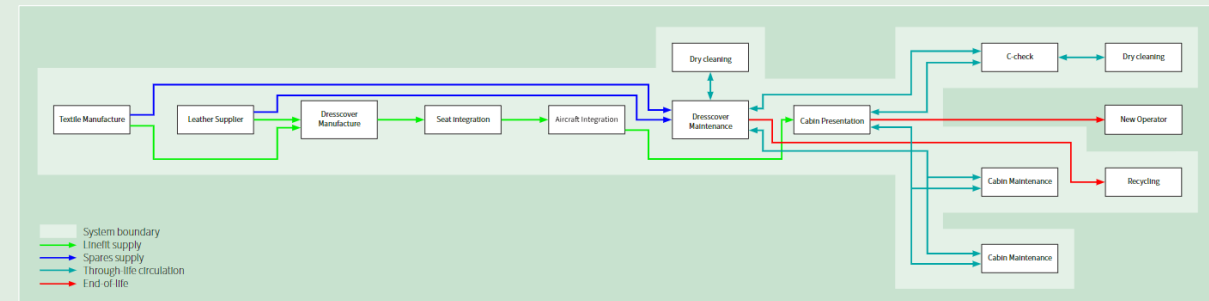
35

PRODUCTS



179

PROCESSES QUANTIFIED



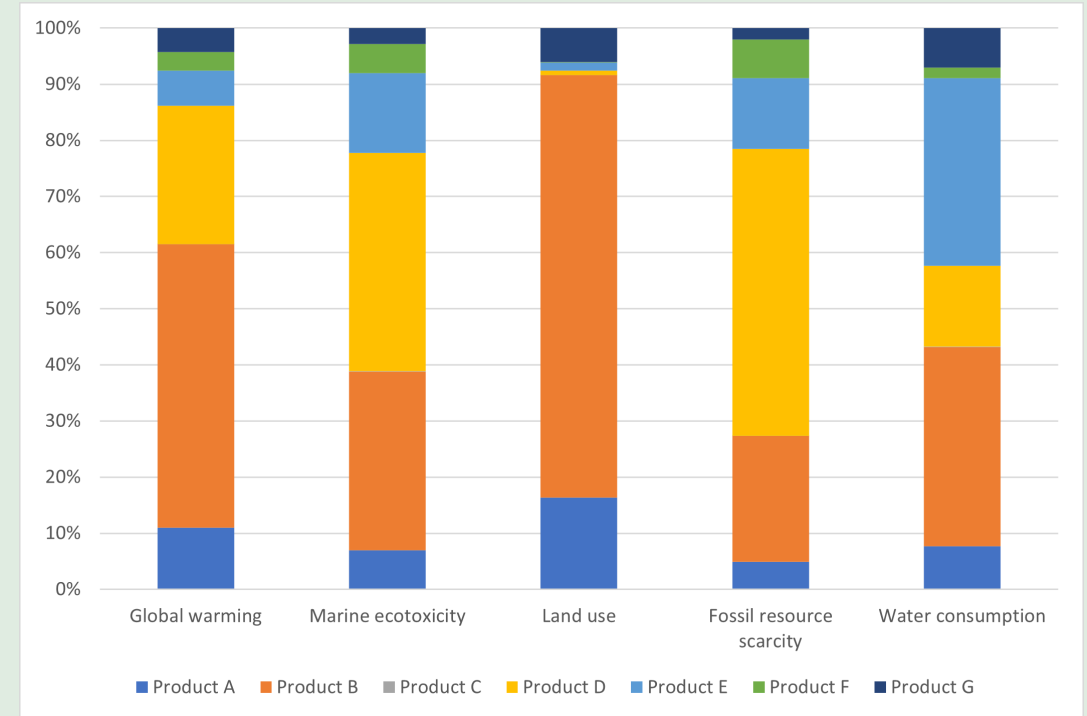
+ **eco**invent



# Phase 2: Deep Dive

## Outcome

- Digital quantified models of product lifecycles.
- Baseline data package enables targeted improvement during procurement.
- Impact breakdowns across multiple categories at aircraft, product, and material levels.
- Focused analysis to inform specific decisions, e.g. materials choices.



# Progress Summary

- An assessment of all products on 2x aircraft ranking items for impact.
- Detailed reference models of the product lifecycles of critical items prioritised in Phase 1.
- A quantified understanding of today's environmental footprint across selected impact categories and at multiple levels of detail.



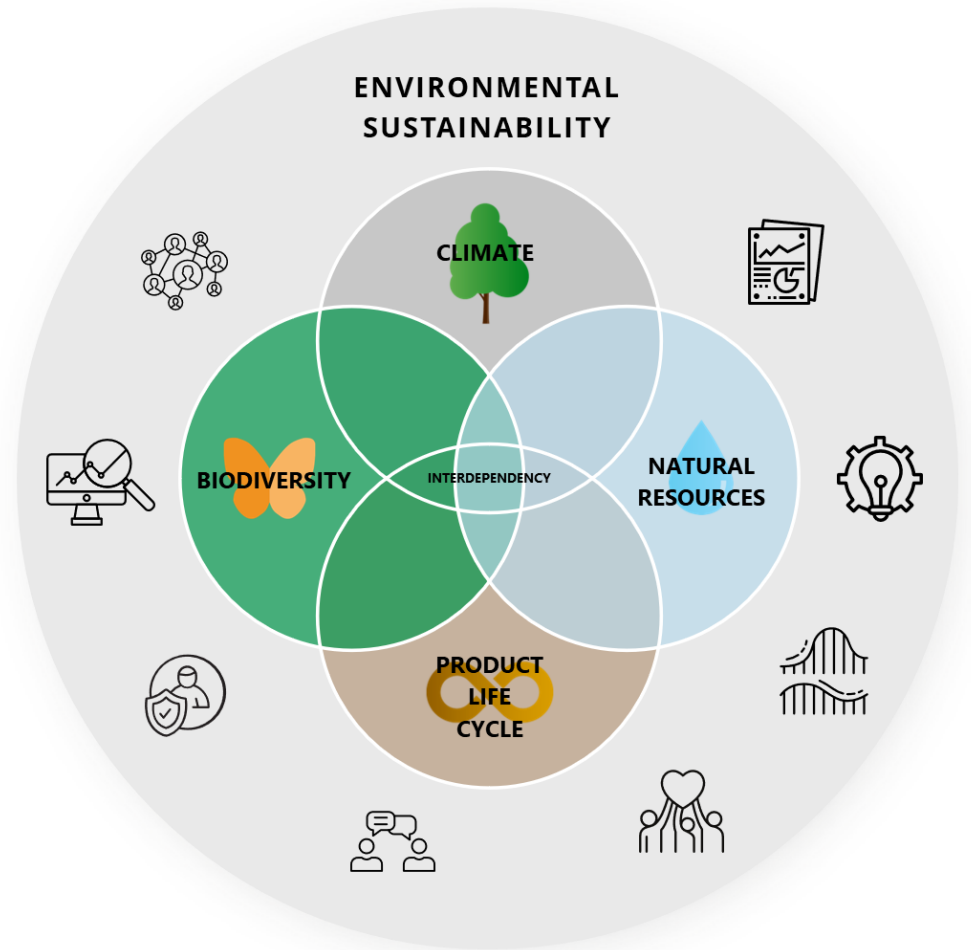
# Action Plan

- Proposals for follow up actions based on insights gained during the study. Insights into the character and scale of impacts enable precisely targeted mitigations.
- Some leverage available, off-the-shelf solutions, some operational changes, and some require new-product development.
- The lifecycle model allows these solutions to be tested and optimised in the context of Air Canada's specific operation prior to implementation.



# Next Steps for Air Canada

- Now have an initial flightpath for future cabin work
- Good ideas of what we can start to implement now, regardless of cabin design cycles
- Better equipped to integrate findings into corporate processes:
  - Start small and scale up
  - Apply lessons from the air on the ground
- Developed new structure for better synergy of sustainability programs





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Thank you  
Merci

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