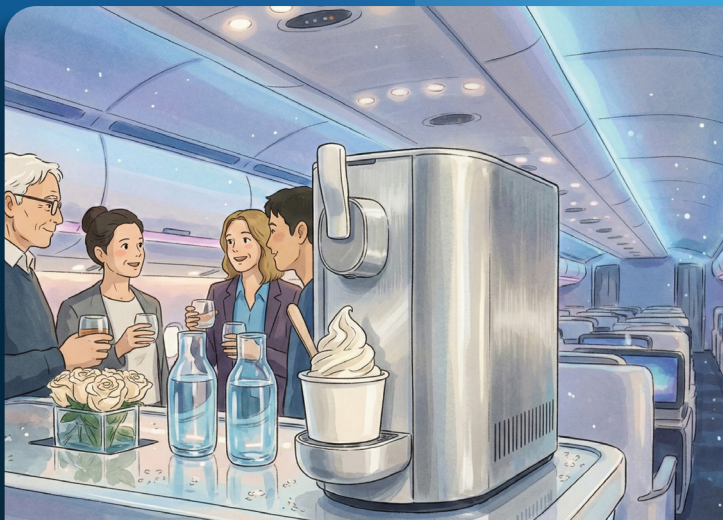




Cabin & Cargo Working Group



**From Concept to Cabin:  
Ice Cream at 30,000 Feet**

KI-generiert

**Circularity &  
Product-as-a-Service**  
in Aviation Cabins

# The circular cabin

The aircraft cabin, replaced multiple times during an aircraft's life, offers an ideal space for innovation, enhanced customer experience, and for lowering environmental impact.

The BDLI Cabin and Cargo Working Group looks into the chances that circularity can bring to different industry stakeholders, from raw materials to new products and services up to end-of-cycle solutions.

Let's evaluate business and design solutions that combine circularity aspects and economic benefits. We invite you to join an industry-wide collaboration to initiate new business models and design concepts.

## The Value Chain – Circularity Across Product Life Cycle Stages



Circularity applies at every stage, from raw material extraction to dismantling and recycling.

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## A fictive product – A real framework

To demonstrate how new business models could emerge, we envisioned a hypothetical product and examined the opportunities and challenges it might introduce across the whole value chain.



**Product-as-a-Service**  
**A circular ice machine**

**Simple. Tangible. Scalable.**

# The Business Case

In a more general manner, let's imagine which opportunities this visionary economic concept would bring within the next years. Securing long-term resilience and growth, from suppliers to OEMs, dismantlers and recyclers:

## Adapted-to-Last

Revenue via rental & continuous cabin refresh cycles, modular, upgradeable components



## Lifecycle Efficiency

Lifecycle cost and environmental performance per flight hour using full data transparency



## TCO Advantage



Total cost of ownership for airlines through modularity, data-driven maintenance, and scalable reuse

## Value Retention



End-of-cycle residual value, reverse logistics, traceable materials and reduced dependency on virgin materials

## Business Model for Circularity

Product-as-a-Service – Flow Proposal



- 1 Ice machine manufacturer stays owner of the asset and has access to data and fully closed-loop-material flow
- 2 Airline pays per activation / use
- 3 Predictive maintenance could be enhanced due to live usage and condition data
- 4 Optional design upgrades become more accessible due to product ownership
- 5 End-of-cycle: asset return & remanufacturing

# Opportunities & Challenges

## Potential Opportunities

### ✚ Expanding Circular Business Models

- Re-use of parts and materials
- Automated and scalable dismantling
- Cross-industry material valorisation
- Enhanced services (refurbishment and upgrades)

### ↻ Supply Chain Capabilities

- Repair & Refurbishment Capabilities
- Reverse Logistics

### 🔗 Data-Driven Transparency

- Usage history and part condition data
- Material composition and compliance information
- Digital Watermarking
- Global availability of reusable materials

### 📍 Market Pull & Sustainability Drivers

- “Adapted-to-Last” boosts customer satisfaction
- Alignment with airline sustainability expectations and regulatory trends



## Potential Challenges

### 📄 Certification, Compliance & Quality

- Certification of reused parts
- Verification of usage and quality history
- Compliance with substance bans (e. g. REACH)
- Clear traceability across component life cycles

### 🔗 Data Gaps & IP Ownership

- Missing part-number hierarchies & unique identifier solution (UID)
- Fragmented Information

### 📄 Lack of condition and performance history

- Manual processes with incomplete documentation
- Limited transparency across intermediaries

### 📄 Logistics Complexity & Cost Barriers

- Lack of global return infrastructure
- Customs, bureaucracy, and cross-border inconsistencies
- Difficulty locating and consolidating available material

### ✚ Volume, Market & Economic Uncertainty

- Low and inconsistent volumes of reusable cabin/cargo parts
- Supplier concerns over cannibalization of new-part revenue
- Emerging but underdeveloped recycling markets within aviation



# Product Design for Circularity

Three exemplary concepts:

## Product-as-a-Service

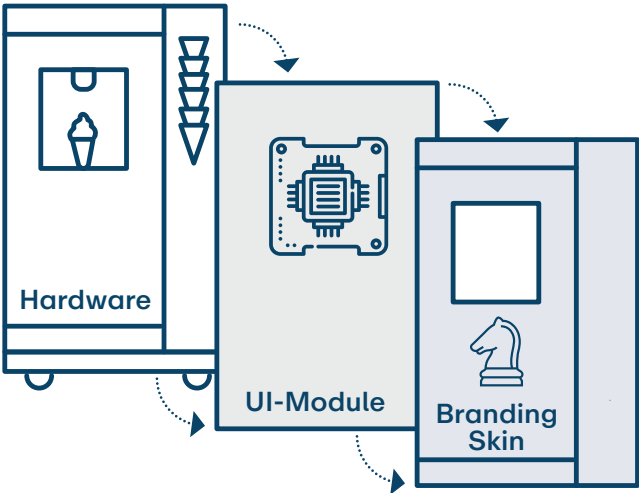
A product with optimized design and predictive maintenance through live usage data supports/empowers a “Pay-per-Use” business model. The modular platform and consumable cartridges enable recurring revenue and reduced airline Total Cost of Ownership.

## Modular Design

Easy separable mono-material modules are designed for material recovery and extended reuse cycles.

## Smart Front Panel Design

Adaptable for customer-specific branding and retro-fits. Replaceable front panel to reduce repair and spare parts costs.



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 Fraunhofer  
IPK

 HOLMCO

 INDEED



 Lufthansa Technik

 RECARO



 SAFRAN

# Do you want to shape the new cabin business model?

Because new business models can only succeed through collaboration across the entire value chain, starting from raw material sourcing to end-of-cycle solutions, we invite you to share your perspective. Join our industry-wide collaboration to break silos, co-create cross-value-chain business models, and actively shape the future of the cabin industry together.

## Next Stop: Cabin and Cargo Workshop

➔ **Scan the QR-Code to participate and let us know your opinion.**



- **Do you share this product vision, combining circularity with a business model as-a-Service?**
- **Which product area in Cabin and Cargo would be the most likely to adopt a business model as-a-Service?**
- **Which data need to be shared across the value chain to perform more circularity?**

## Who is hungry for information? Do you want to be part of the story?

Anyone who wants to discuss circularity and new potential business models in more detail is

## Meet us at one of our member booths!



German Aerospace  
Industries Association

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