

TU/Delft - Airguard Circular Ski-Helmet

A Vision for Transitioning Ski-Helmets into the Circular Economy and its Systems of Maintaining, Increasing & Regaining Product Value

Project Information (EN)

Design for Upgrades, Remanufacturing & Recycling

The Airguard concept is developed for preventing environmental impact through remanufacturing and recycling. It uses recyclable materials, enables product disassembly and fast access to parts with high impact, embedded energy and economic value. A novel approach on energy-management — the TPU Airguard-System — enables the absorption of multiple impacts and supports remanufacturing. Parts with high deterioration can be easily replaced and the helmet can be modularly equipped with product add-ons and upgrades. This improves usability, flexibility and longevity and maintains value, resources and energy.

Downscaling Impact

Through controlled take-back, recycling and remanufacturing of parts with high impact, the concept aims at reducing the current helmets' footprint by 63% — only in the first use-cycle. The longer helmets are upgraded, the longer parts are remanufactured & the longer resources stay in close loops around the finished product — this impact gets downscaled even further. This circular system of continuous flows of resources, energy and value should stand as a vision to transforming a market of 5.000.000 units annual volume into a sustainable future. It should also inspire industries with current focus on the linear approach of take-make-waste to see the power of establishing circular flows.

Roadmap towards Sustainability

The project was developed in collaboration with Atomic Skis with the aim of challenging current unsustainable features and developing a vision-concept for ski-helmets within the Circular Economy. The decisions made build on a knowledge base of expert insights, user surveys, collaborative sessions, a thorough analysis of state of the art products and countless iterative development- and experimental setups. Alongside the developed vision, together with Atomic, an intermediate step and a development roadmap were developed to accelerate this transition and to make a confident step towards gradually scaling down impact and establishing the Circular Economy within the snow-sports industry.

Projectinformatie (NL)

Ontwerp voor upgrades, herfabricage en recycling

Het Airguard-concept is ontwikkeld om milieu-impact te voorkomen door middel van herfabricage en recycling. Het maakt gebruik van recyclebare materialen, maakt demontage van producten mogelijk en snelle toegang tot onderdelen met een hoge impact, ingebedde energie en economische waarde. Een nieuwe benadering van energiebeheer - het TPU Airguard-systeem - maakt de absorptie van meerdere schokken mogelijk en ondersteunt herfabricage. Onderdelen met een hoge achteruitgang kunnen eenvoudig worden vervangen en de helm kan modulair worden uitgerust met productuitbreidingen en -upgrades. Dit verbetert de bruikbaarheid, flexibiliteit en levensduur en behoudt waarde, middelen en energie.

Image List

Filename	Caption	Credit
211010-circular-ski-helmet-ddw2-1800-1010_1633886150.jpg	AirGuard — Circular Ski Helmet	Atomic Skis / Martin Steffner

Filename	Caption	Credit
211010-circular-ski-helmet-ddw1-1200-600_1633886159.jpg	AirGuard — Circular Ski Helmet	Martin Steffner
211010-circular-ski-helmet-ddw1-1200-6002_1633886166.jpg	AirGuard System	Martin Steffner
211010-circular-ski-helmet-ddw1-1200-6003_1633886173.jpg	Design for Disassembly	Martin Steffner
211010-circular-ski-helmet-ddw1-1200-6004_1633886179.jpg	AirGuard — Circular Ski Helmet	

The images above are included in the ZIP under /images.