

LightSpray™ Technology: Innovating Athletic Footwear

Case Study of the Cloudmonster 3 Hyper



What is LightSpray™ technology?

On has dedicated the past seven years to developing LightSpray™, a new manufacturing technique created to revolutionize the footwear industry and the production of athletic footwear.

Now, in the early stages of scaling, this first-of-its-kind technology fabricates an ultralight, single-piece shoe upper through a streamlined, singular process. It eliminates the need for the stitching and bonding typically required in traditional shoe production.

How does LightSpray™ technology work?

Produces a continuous thread

Wraps around a rotating shoe last

A robotic arm layers the material

Creates a LightSpray Cloudmonster 3 Hyper*
shoe upper in approximately four minutes

The innovation of LightSpray™ technology

LightSpray™ was developed to revolutionize On's production technique, reducing environmental impact while enhancing athletic performance.

- 1 Simplified supply chain
- 2 Streamlined manufacturing
- 3 Eliminated assembly processes
- 4 Reduced waste
- 5 Optimized high-performance running shoes



Key findings

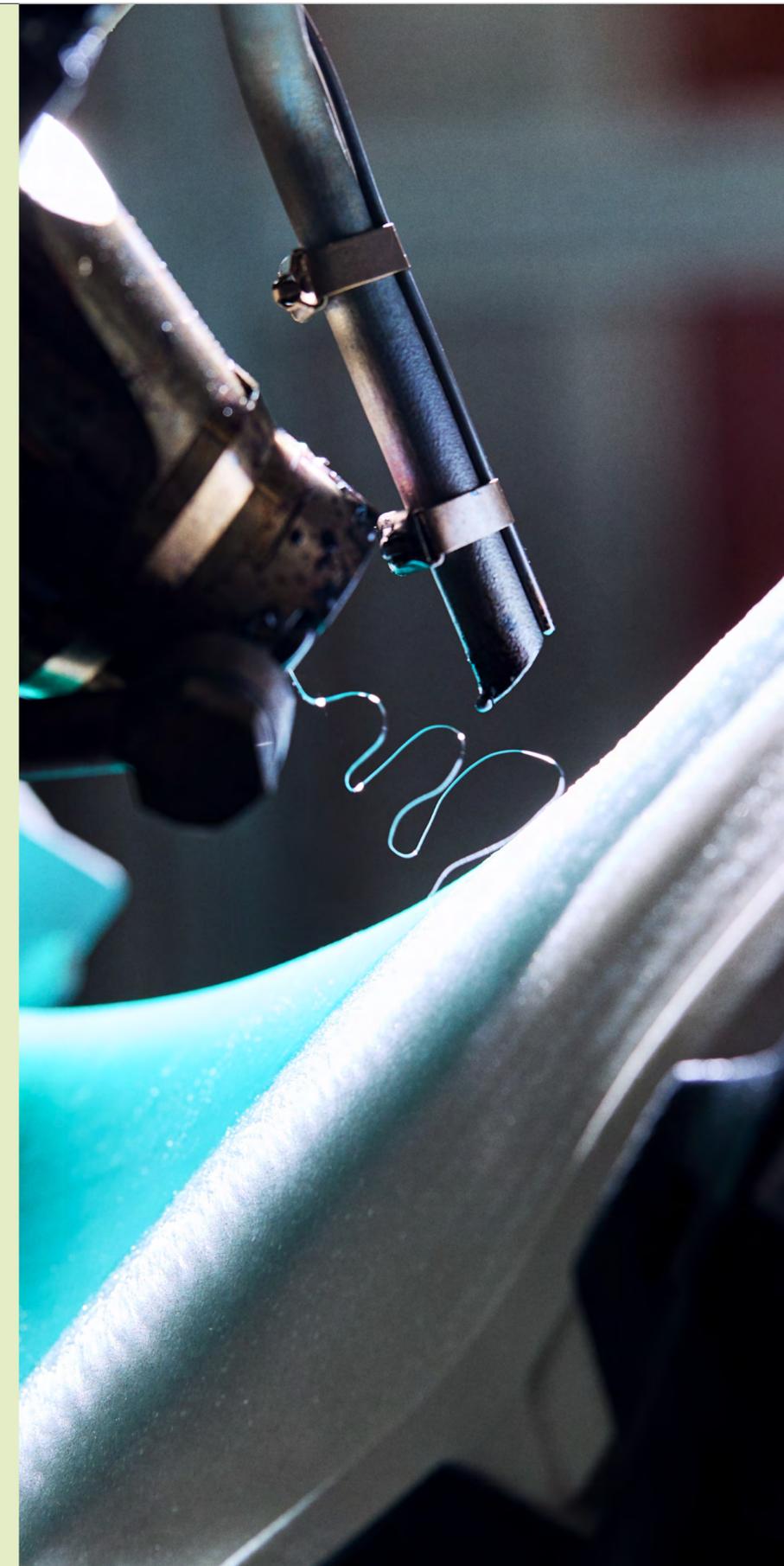
Comparing the Cloudmonster 3 Hyper with the LightSpray Cloudmonster 3 Hyper, manufacturing the shoe uppers with LightSpray™ technology demonstrates the following potential reductions in greenhouse gas emissions.

3.5 kg CO₂e ↓
reduced per pair of shoes compared to conventional production

65% ↓
reduction in production emissions for the shoe's upper with South Korea's current energy mix

78% ↓
reduction in production emissions for the shoe's upper if renewable energy is used

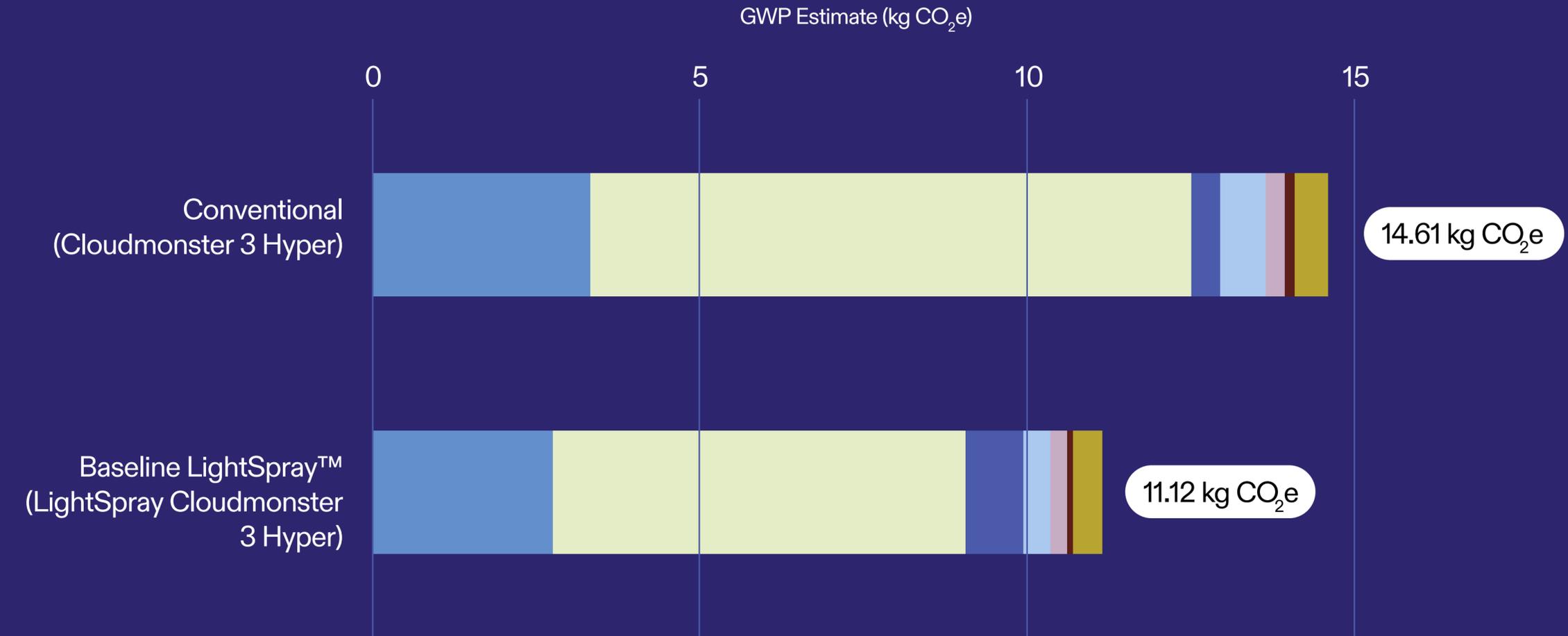
These calculations were done for a pair of men's US size 10 shoes, with the LightSpray™ uppers produced and subsequent shoe assembly of the LightSpray Cloudmonster 3 Hyper taking place in South Korea. The results include the whole production process, including raw materials, component processing, and end-of-life.



The most significant potential for reducing carbon emissions comes from using raw materials more efficiently, cutting energy use, and lowering product weight, which reduces transportation emissions. LightSpray™ technology also considerably lowers material and energy consumption and, most significantly, minimizes waste during production.

To be conservative, and considering all scenarios investigated, On is communicating a 65% carbon emissions reduction in the LightSpray™ shoe uppers manufactured for the LightSpray Cloudmonster 3 Hyper (compared to the conventional Cloudmonster 3 Hyper uppers).

Global Warming Potential (GWP) Comparison: Conventional and LightSpray™ Technology Product Systems (Baseline)



-65%

carbon emissions compared to the conventional upper in the Cloudmonster 3 Hyper

-24%

carbon emissions compared to the whole conventional Cloudmonster 3 Hyper shoe

- Raw Materials Extraction and Processing
- Component Processing and Assembly
- Packaging
- Inbound Transport
- Distribution
- Use Phase
- End-of-Life

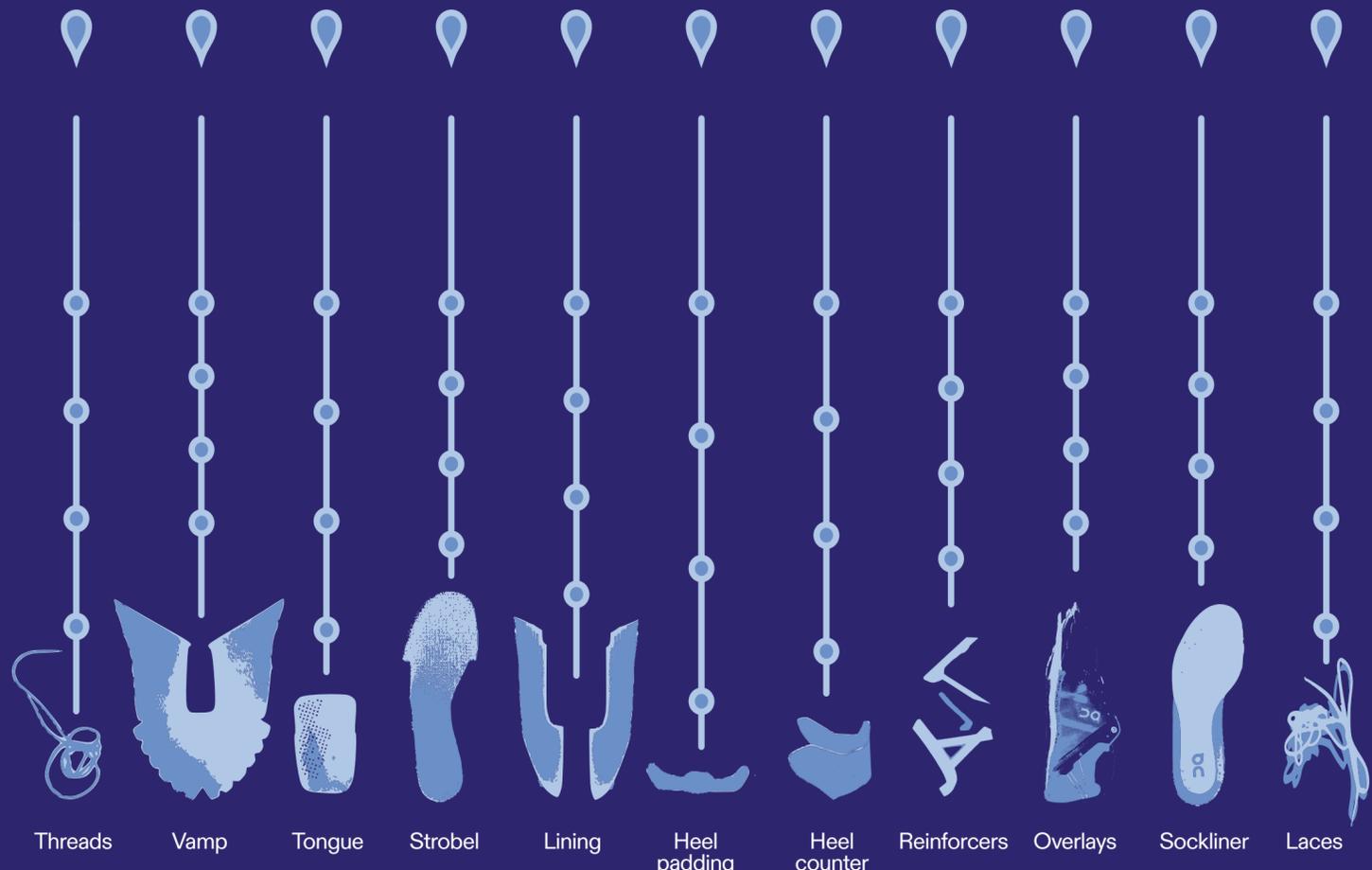
On's conventional athletic shoe manufacturing process compared with LightSpray™ technology

BASE MATERIALS

T2 / T3 FACTORIES

T1 FACTORY

FINAL SHOE



APPROX. **200** ASSEMBLY STEPS



*This solely refers to the upper manufacturing and final assembly process.

Calculating the potential impact of LightSpray™ technology

This report, conducted by Vaayu on behalf of On, evaluated the environmental impact of LightSpray™ as commercial production expands.

The analysis used life cycle assessment (LCA) to compare On's LightSpray Cloudmonster 3 Hyper shoe, produced using LightSpray™ technology, with On's conventional production technique for the Cloudmonster 3 Hyper.

Vaayu quantified the potential reduction in carbon footprint (in CO₂e) and delved deeper into the environmental benefits of further optimizing this technology as it scales.

What was calculated?

- A prospective attributional LCA for LightSpray™ technology applied specifically to the LightSpray Cloudmonster 3 Hyper
- A conventional attributional LCA for the existing (non-LightSpray™) technology used in the Cloudmonster 3 Hyper
- A comparative analysis between LightSpray™ technology and the existing approach, considering different scenarios

A baseline comparison between the Cloudmonster 3 Hyper (upper made with conventional technology) and the LightSpray Cloudmonster 3 Hyper (upper made with LightSpray™ technology)

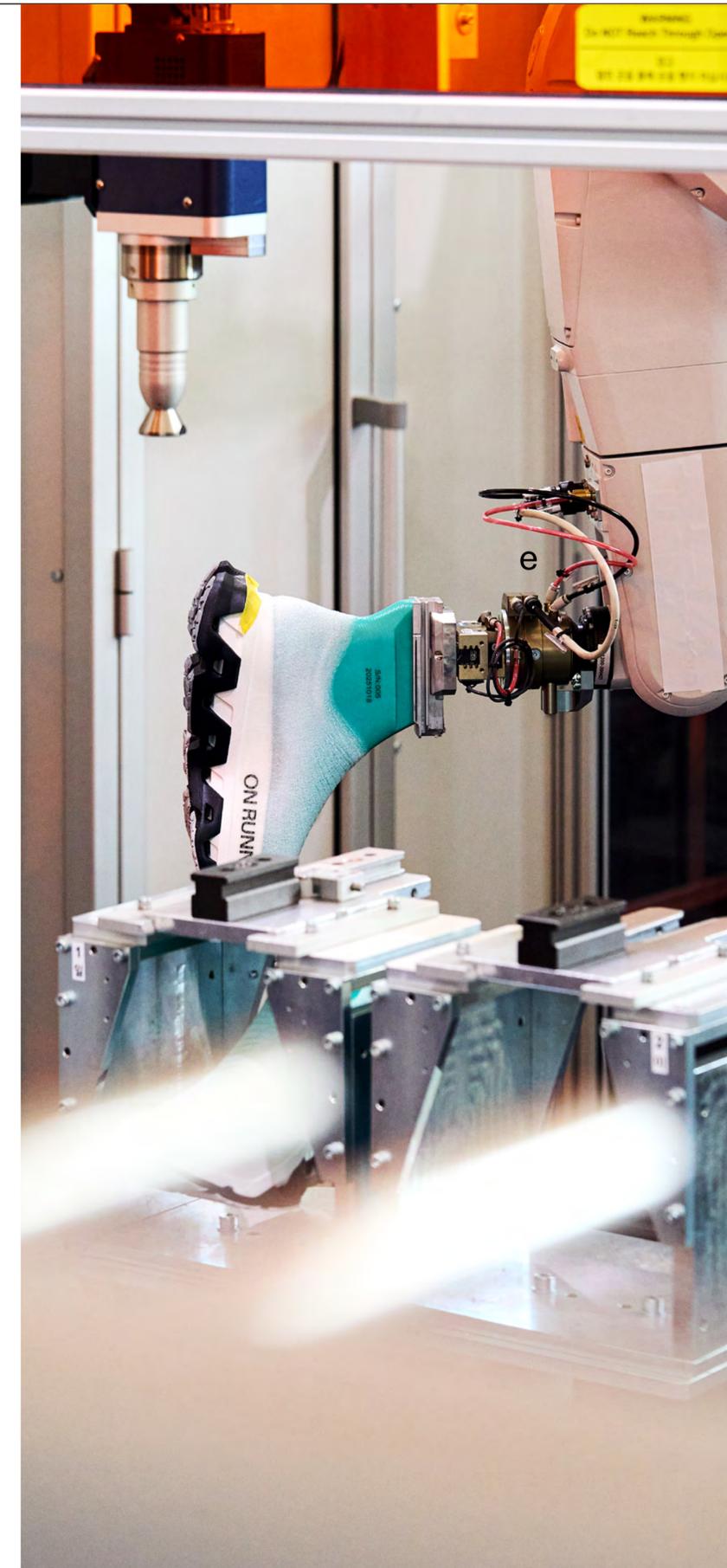
Assumptions:

- South Korea's current energy mix is used at the LightSpray™ production site in South Korea, where LightSpray Cloudmonster 3 Hyper shoe upper manufacturing takes place
- A probability of 7% that inbound transport takes place by air (from the South Korean production site to various warehouses in the Americas, Asia and Europe)
- A probability of 93% that inbound transport takes place by sea (from the South Korean production site to various warehouses in the Americas, Asia and Europe)

A scenario assuming renewable energy is used for manufacturing the shoe's upper in the LightSpray Cloudmonster 3 Hyper

Assumptions

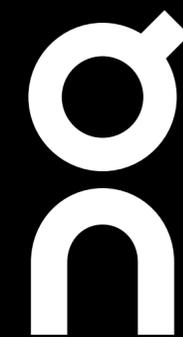
- 100% renewable energy is used at the LightSpray™ production site in South Korea, where LightSpray Cloudmonster 3 Hyper shoe upper manufacturing takes place
- Manufacturing of the conventional Cloudmonster 3 Hyper shoe remains the same
- Other previous assumptions remain the same



Right now, On is testing how LightSpray™ technology performs as it moves from innovation into scale, using these findings to target the reduction levers with the most potential across materials, energy, and logistics to drive meaningful reductions in environmental impact.



As it ramps towards wider commercial production, On will continue refining data and assessment to reflect real-world operating conditions, ensuring decisions remain science-based and effective.



Dream On.