



# Long Beach Manufacturing Facility

Inside Heliogen's State-of-the-Art Manufacturing Facility  
for Concentrating Solar Thermal Technology

At Heliogen's Long Beach Manufacturing Facility, we have built a state-of-the-art production environment to fabricate the heliostats that are the backbone of our concentrating solar thermal technology. This facility is key to helping our customers achieve their carbon reduction goals by delivering modular renewable energy systems that are durable, high-performance, easy to deploy and maintain, and cost-competitive with fossil fuels.





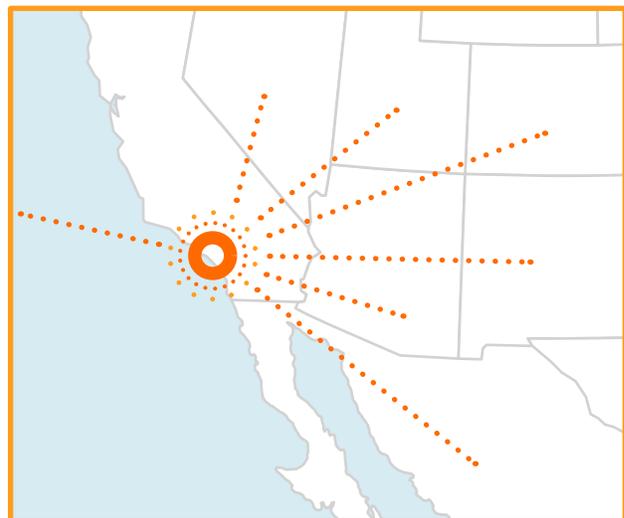
Heliostat robotic assembly line and storage in the background

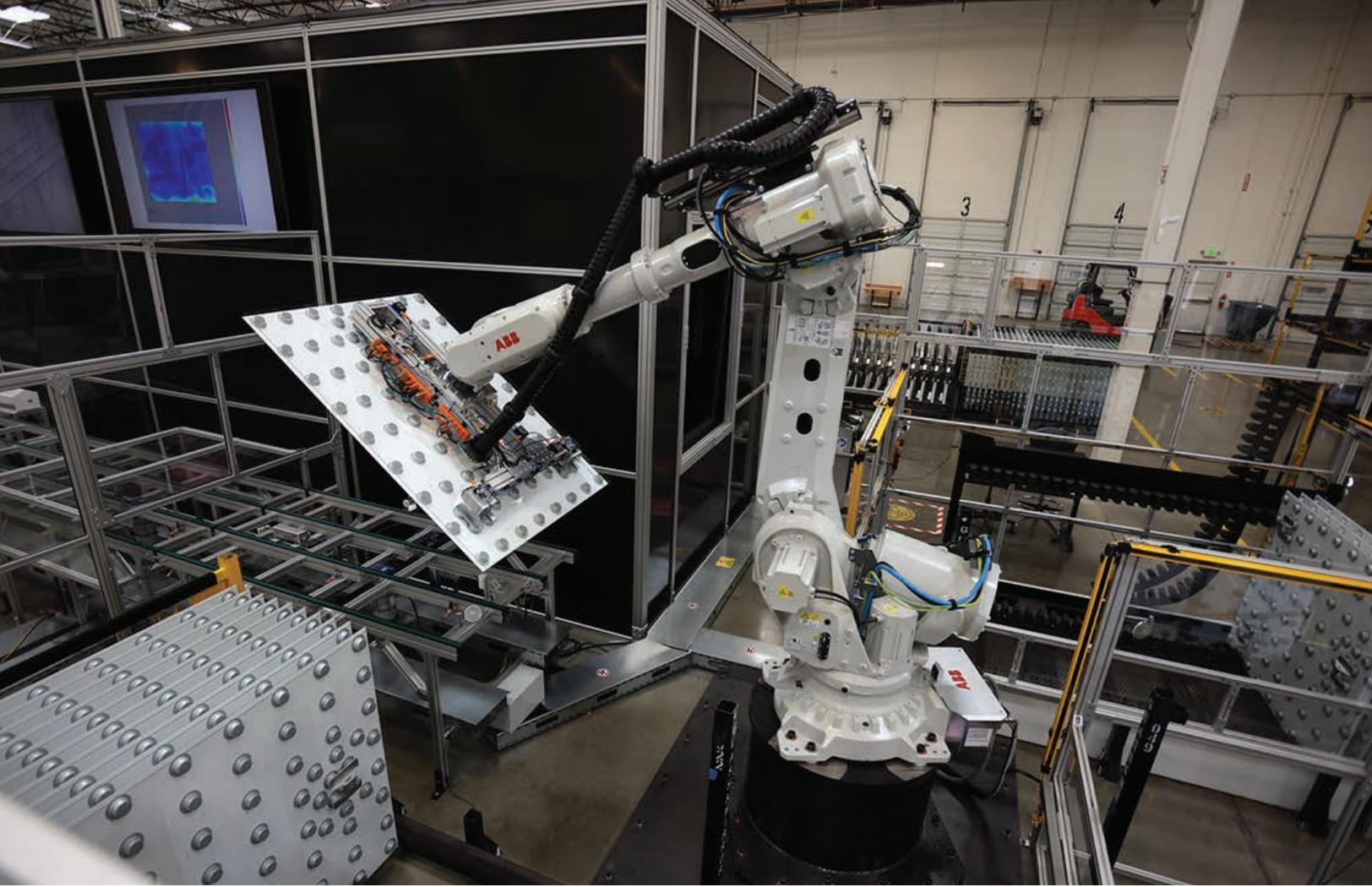
Extensive use of automated manufacturing technologies and a robotic assembly line will allow us to produce up to 2,000 heliostats per week (192,000 m<sup>2</sup> of mirror per year) off this single production line. In parallel, we are rapidly developing our 5th generation heliostat design and associated production to be deployed in 2024. The production system will aim to increase the annual production capacity of our current 4th generation heliostat by a factor of 10 on a single line.

In-house environmental test labs and prototyping departments support our goals to create durable, cost-effective, and sustainable products for our customers.

Our 90,000 square foot facility is located in the Douglas Park Campus adjacent to the Long Beach Airport. This prime location ensures

quick access to major transportation routes for easy transit of finished goods to customer locations in the southwestern United States, northern Mexico, and to the Port of Los Angeles for international shipping.





Heliostat robotic assembly line and storage in the background



Robotic arm dispensing adhesive during mirror assembly

## Our Facility in Action



Autonomous cleaning vehicle, ChariotAV, at our testing and demonstration facility in Lancaster, California



## Design for Cost, Sustainability and Manufacturability

From inception to delivery, our design process is thorough. Our data-driven supplier selection and negotiations are integrated with objective ESG assessments and risk profiling. Simulations are pivotal to validate and optimize design and production processes before they move to the next phase. This mindset allows our teams to keep production cost efficient while reducing materials and minimizing waste, to ultimately deliver high-quality products that are environmentally responsible.



Finalized heliostat T-drives placed in reusable shipping containers



## Inventory and Inspection

Heliogen's heliostat technology is built on simple and responsibly sourced materials, such as steel, aluminum, and glass. Our team completes multiple visual inspections of goods, while also relying on technology to make sure measurements and quality control is up to standard.



Close up Heliostat T-Drives

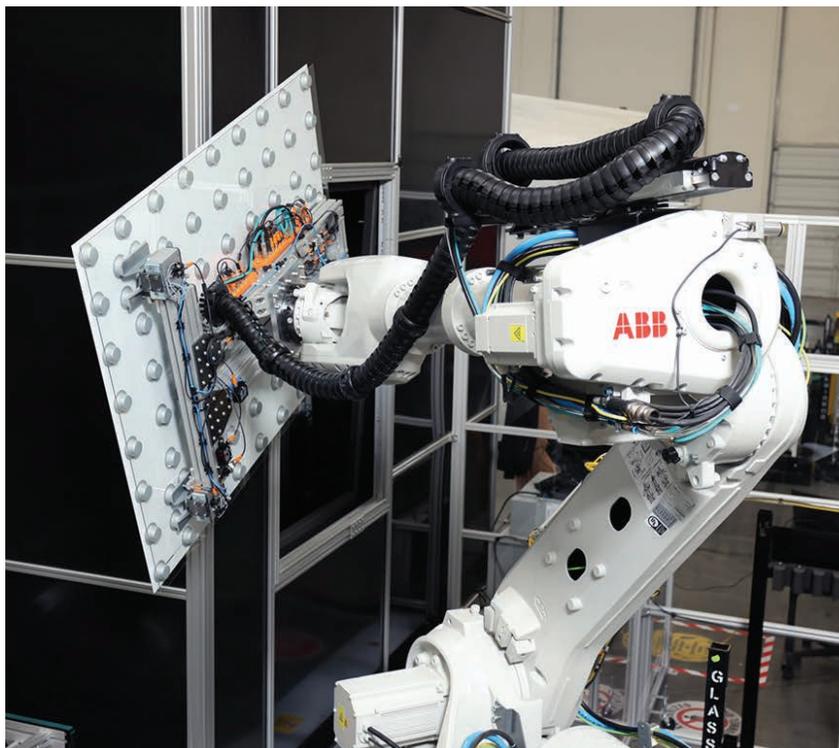


## Prototyping and Manual Assembly

Our in-house prototyping team supports the early phases of manufacturing, allowing for rapid iteration of design cycles. Bypassing vendor lead times and reducing part costs, we accelerate development while ensuring the highest quality final design. This improves manufacturing efficiency and leads to better end products for our customers.



Robotic arm loading mirror to the beginning of the production line



Robotic arm moving mirror to optical scanning system

## Efficient Mass Production

Mass production opens the door to de-risking, cost reduction, efficient engineering, on-time delivery, and most importantly, iterating future developments.



Operator inspecting heliostat assembly process



Mirrors undergoing lifetime testing in the environmental chamber

## Testing

Our products are validated to simulate 30 years of life via a suite of accelerated aging and environmental tests. These tests are derived from product requirements and are intended to simulate environmental extremes that the product will see. Testing includes: temperature and humidity cycling, wind, blowing sand and dust, mechanical testing, static and dynamic loading (snow loading), hail, high intensity UV exposure, corrosion (salt, copper), and continuous range of motion cycling.



**Advance your clean energy future today**

Contact us at [sales@heliogen.com](mailto:sales@heliogen.com)

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