Heliogen

Full-Year 2021
Earnings Presentation



Disclaimer

Forward-Looking Statements

This presentation contains forward-looking within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended These statements are often, but not always, made through the use of words or phrases such as “may,” “should,” “could,” “predict,” “potential,” “believe,” “will likely result,” “expect,” “continue,” “will,” “anticipate,” “seek,” “estimate,” “intend,” “plan,” “projection,” “would” and “outlook,” or the negative version of those words or other comparable words or phrases of a future or forward-looking nature. Forward-looking statements include but are not limited to, the Company’s projected financial information and guidance, commercial strategy and progress, market growth, and reaching key milestones. These forward-looking statements are not historical facts and are based on current expectations, estimates and projections about our industry, management’s beliefs and certain assumptions made by management, many of which, by their nature, are inherently uncertain and beyond our control. Accordingly, we caution you that any such forward-looking statements are not guarantees of future performance and are subject to risks, assumptions and certainties that are difficult to predict. Although we believe that the expectations reflected in these forward-looking statements are reasonable as of the date made, actual results may prove to be materially different from the results expressed or implied by the forward-looking statements. Important factors that could cause our actual results to differ materially from those indicated in these forward-looking statements include, but are not limited to the following: our ability to recognize the anticipated benefits of our recently consummated business combination, which may be affected by, among other things, (i) our financial and business performance, including risk of uncertainty in our financial projections and business metrics and any underlying assumptions thereunder; (ii) our ability to execute our business model, including market acceptance of our planned products and services and achieving sufficient production volumes at acceptable quality levels and prices; (iii) our ability to access sources of capital to finance operations, growth and future capital requirements; (iv) our ability to maintain and enhance our products and brand, and to attract and retain customers; (v) our ability to scale in a cost-effective manner; (vi) changes in applicable laws or regulations; (vii) the ongoing impacts of the COVID-19 pandemic and the potential impacts of Russia’s invasion of Ukraine on our business; (viii) developments and projections relating to our competitors and industry; (ix) our ability to access sources of capital to finance operations, growth and future capital requirements; (x) our ability to protect our intellectual property; and the other risks, uncertainties and factors described in the “Risk Factors” section in the prospectus filed with the SEC pursuant to Rule 424(b), dated December 3, 2021 and in our Annual Report on Form 10-K that will be filed for the annual period ended December 31, 2021 and other documents filed by the Company from time to time with the Securities and Exchange Commission. If one or more events related to these or other risks or uncertainties materialize, or if our underlying assumptions prove to be incorrect, actual results may differ materially from what we anticipate. Many of the important factors that will determine these results are beyond our ability to control or predict. Accordingly, you should not place undue reliance on any such forward-looking statements. Any forward-looking statement speaks only as of the date on which it is made, and, except as otherwise required by law, we do not undertake any obligation to publicly update or review any forward-looking statement made in this investor presentation, whether as a result of new information, future developments or otherwise. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures, or investments we may make. New factors emerge from time to time, and it is not possible for us to predict which will arise. In addition, we cannot assess the impact of each factor on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements.

Heliogen Conference Call Agenda

- Business overview
- Technology overview
- Review of progress and accomplishments
- Progress on commercial agreements
- Upcoming commercial & execution milestones
- Commercial strategy and updates
- Financial overview

The Heliogen Opportunity and Approach

The Opportunity

- Heavy industry is a critical market for decarbonizing technologies and is currently underserved
- Renewable energy for heavy industry must be near constantly available and cost effective

Our Technology-Focused Approach

- Provides clean thermal energy which can be used to make steam, electric power, or green hydrogen
- AI + software + computing power can simplify and reduce both hardware, installation, and maintenance cost
- High-volume, modular manufacturing techniques enable reliability, scale, and learning curve cost reductions

Heliogen’s AI-driven technology is designed to capture, concentrate and refine sunlight into **cost-efficient energy on demand**.

This low-carbon energy can be available as heat, power, or hydrogen fuel in modular deployments.

HelioHeat

HelioHeat™ provides heat of up to 1000°C to power industrial processes or mining.



~ 1 mile →

Delivery range approximately 1 mile

HelioPower

HelioPower™ delivers the HelioHeat solar thermal energy to a heat engine to produce electrical power.

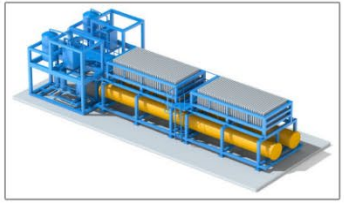


~ 100 miles →

Delivery range approximately 100 miles

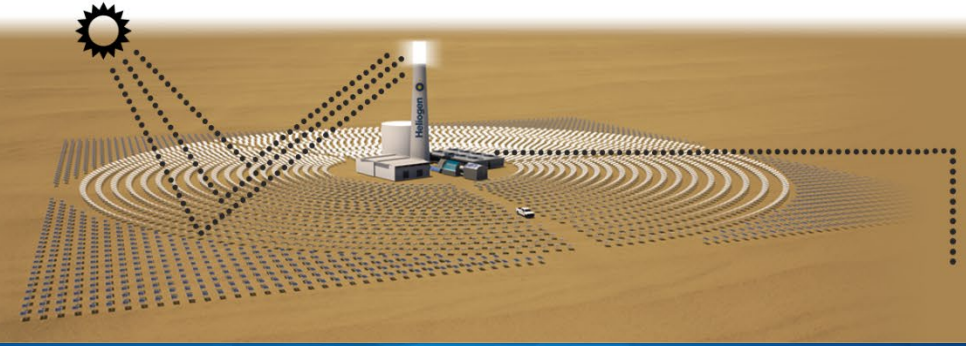
HelioFuel

HelioFuel™ systems couple a HelioPower plant with a large-scale water electrolyzer to produce green Hydrogen fuel.



> 10,000 miles →

Delivery range greater than 10,000 miles.



The collected sunlight is processed and converted to:

- HelioHeat
- HelioPower
- HelioFuel

Here's how our patented innovations make a huge difference

- **We can achieve higher temperature heat**
  Higher temperatures up to 1000°C means ability to enable broader industrial applications, higher capacity factors, and lower-cost storage
- **We need less frequent calibration AND are more precise**
  Closed-loop AI + computer vision control means there is NO temporary pre-calibration – our units are continuously calibrated
- **We can use fewer materials** – more bytes and fewer atoms
  Use software instead of steel to achieve accuracy and efficiency
- **We can use less manual labor**
  Heliostat can be made in factory instead of in the field, with potential for autonomous maintenance and installation

Full-Year 2021 and Subsequent Highlights

2021 2H Highlights

- Completed business combination with Athena Technology Acquisition Corp.
- Successful hydrogen production demonstration with Bloom Energy
- Finalized $39 million award from US DOE for deployment of concentrated solar power
- Completed first field test of ICARUS autonomous installation/maintenance robots
- Continued market progress advancing multiple commercial negotiations

2022 YTD Highlights

- Began site preparation and setup of manufacturing and R&D facility in Long Beach, CA
- Awarded exclusive right to lease Brenda Solar Energy Zone for green hydrogen production

Key Financial Highlights for Full-Year 2021

FY2021 Highlights:

- Revenue in line with prior guidance
- Over $222 million available liquidity to fund commercialization efforts

Full-Year 2021 Financial Highlights			
($ in millions)	**FY2021**	**FY2020**	**$Δ YoY**
Revenue	$8.8	$0.2	$8.6
R&D	$13.5	$3.6	$9.9
SG&A	$30.4	$3.7	$26.7

Available Liquidity at YE 2021	
($ in millions)	**12/31/2021**
Cash and cash equivalents	$190.1
Investments, available for sale	$32.3
Total	**$222.4**

Heliogen's Advantages

- **Differentiated Product**: The only public solar technology company focused on decarbonizing industrial energy production
- **Cutting-edge Software Makes It Work:** Utilizes artificial intelligence, software and cost-effective computation power to simplify and reduce hardware production, installation and maintenance costs and to generate more energy
- **Durable Competitive Advantages:** Extensive patent portfolio, trade secrets and learnings enables Heliogen to maintain and defend its competitive advantages
- **Large and Growing Market:** Forecast capex investment of ~$8.5 Trillion for renewable energy and >$150 billion for hydrogen by 2030
- **Vertical Integration:** Allows for utilization of Heliogen's AI across entire value chain to reduce costs
- **The Right Management Team:** Expertise in technology, financial management, EPC, manufacturing and solar design and sales well-suited to Heliogen's needs

Heliogen has the potential to profitably transform the world's energy production and meaningfully address climate change

Key Commercial and Execution Milestones in 2022

Area	Milestone	Expected Timing
Commercial	First module contracted	1H 2022
	Second module contracted (third module = stretch target)	2H 2022
Execution	First groundbreaking	2H 2022
	Assembly line heliostat production	2H 2022
	Key supply chain partners announced	2H 2022
	Testing of cleaning functionality for autonomous robots	2H 2022

Guidance for 2022

Key 2022 Performance Metrics

Primary Metric	Modules Contracted	2 – 3
Secondary Metric	Revenue	$20 – $25 million

Upside Opportunities

- Further fossil fuel price increase makes modules more cost-competitive
- High customer interest drives additional modules contracted during 2022
- More rapid project progress accelerates revenue recognition
- Total project cost estimates decrease

Downside Risks

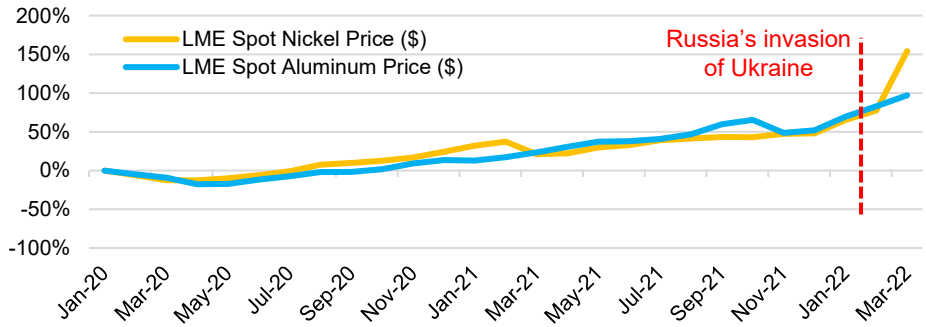
- DOE contract administration delays
- Ongoing metal price increases make modules less cost-competitive
- Project progress delays defer revenue recognition from 2022 to 2023
- Total project cost estimates increase

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Appendix

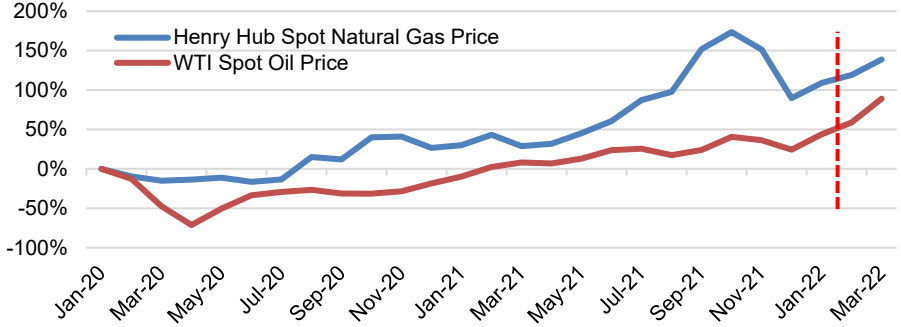
Potential Impacts from Recent Commodity Trends & World Events

Headwinds – Metals Commodity Costs



- Aluminum and nickel are key raw materials for Heliogen modules. Prior to Russia's invasion of Ukraine, both metals' prices were already up 65-70% vs. January 2020 (COVID impact). Post-invasion March prices grew further. Compared to January 2020:
  - Nickel +154%
  - Aluminum +97%
- Heliogen is working to mitigate with customers and supply chain, and challenging ourselves on design changes to reduce material quantities

Tailwinds – Hydrocarbon Pricing



- Hydrocarbon prices drive operating costs higher for many potential Heliogen customers, making our offering more cost-competitive. Pre-invasion, both natural gas and oil prices have increased during COVID, with natural gas up ~120% and oil up ~60% vs. 2020. Post-invasion March prices grew further.
- Compared to January 2020:
  - Natural gas +139%
  - Oil +89%

Note: Commodity prices are monthly averages excluding weekends, holidays and market closures through March 25, 2022

Notwithstanding current choppiness in the supply chain, long term, we expect higher fossil fuel prices and potential scarcity will strengthen Heliogen's business prospects.

Heliogen's Woodside CA project rendering

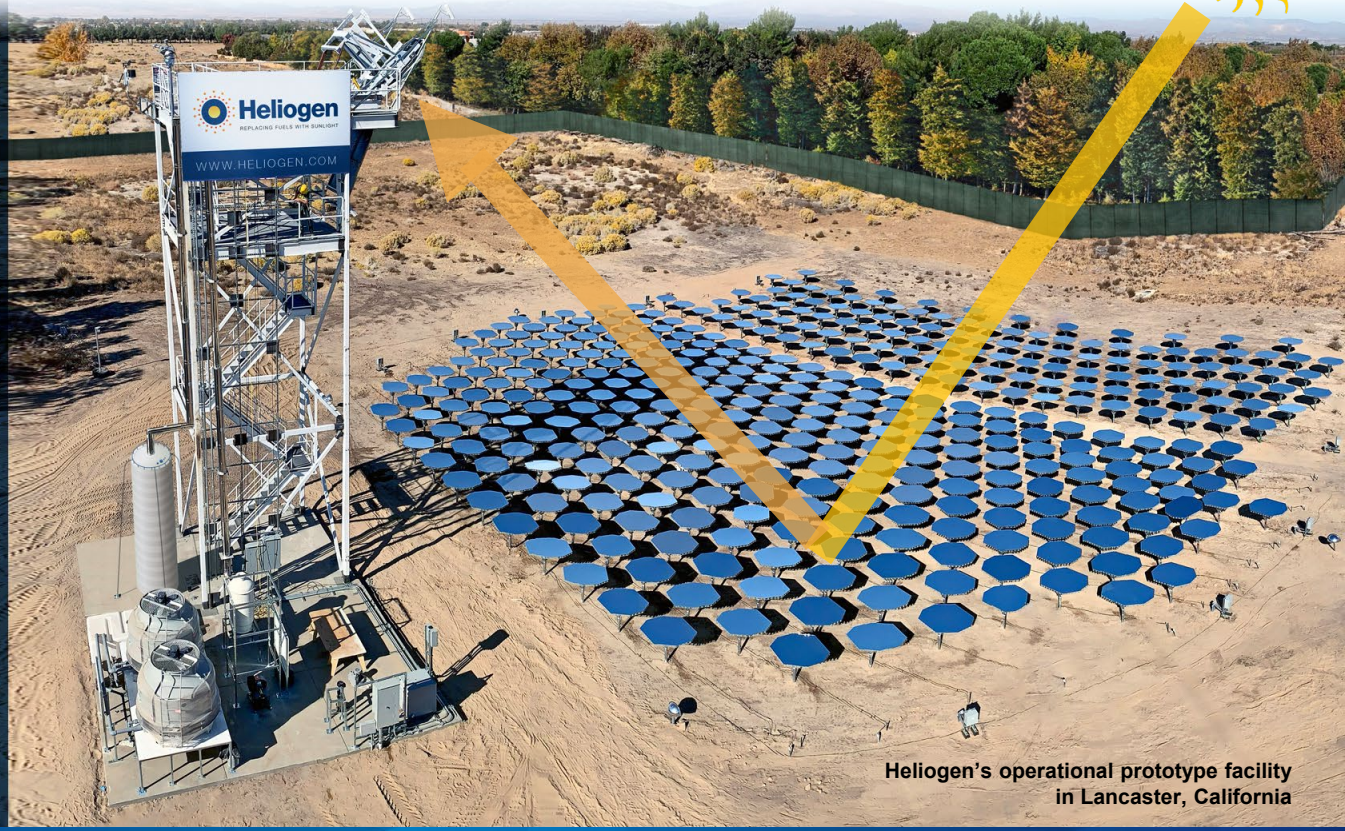


Heliogen aims to produce near always-available and transportable renewable energy – cost-effectively

The Heliogen Process

Heliogen's closed-loop system uses computer vision to identify the precise position of every single mirror, then make micro-adjustments in real time to achieve a perfect focus. Closed-loop means that the mirrors are pointed more accurately with optical feedback, not just mechanical stiffness

1. Reflect sun rays to top of tower
2. Generate high temperatures in solar receiver
3. Store heat in solid media
4. Heat exchanger brings heat to heat engine
5. Heat engine makes power
6. Optional electrolyzer makes Hydrogen



Heliogen's operational prototype facility in Lancaster, California

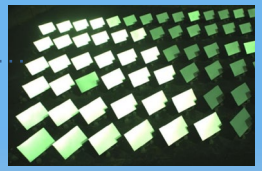
We believe our patented system is the first ever to achieve closed-loop tracking enabling cost-effective ultra-high temperatures at commercial scale



The sky is very bright next to the sun, and the intensity decreases further away

Sun & intensity gradient

4 cameras



Heliogen's Heliostat Operating System (H.O.S.)

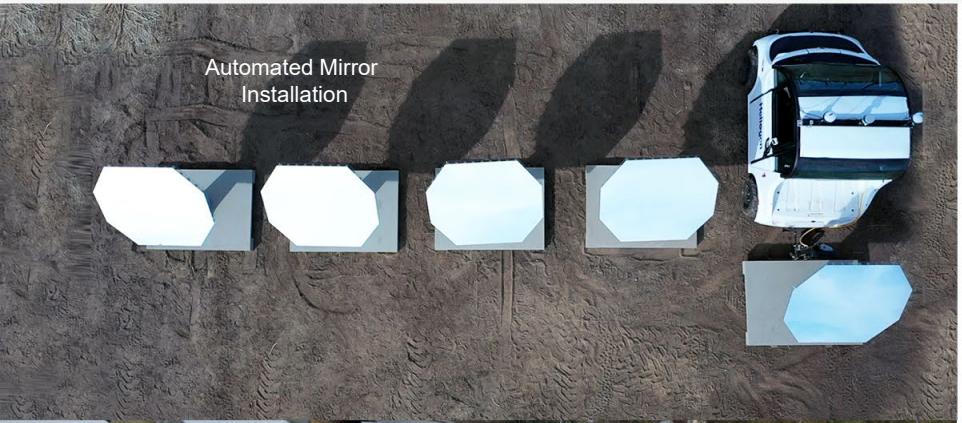
The cameras measure the intensity of sky reflected in each mirror.

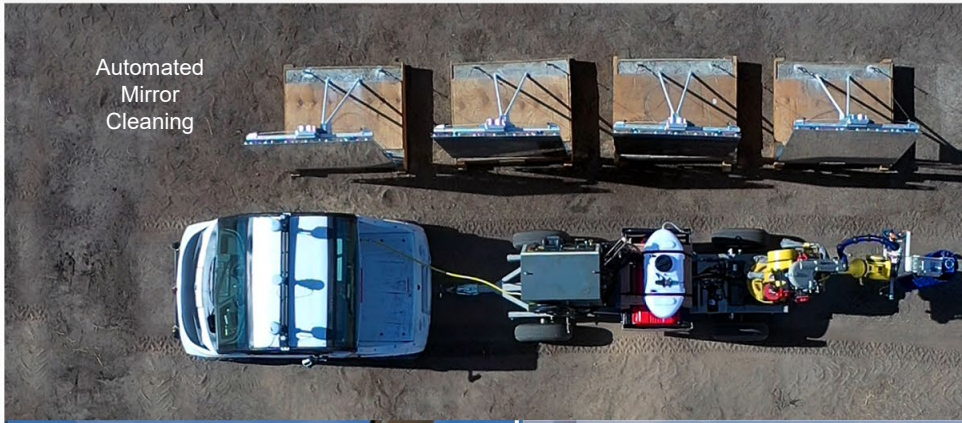
Using these four intensity measurements, we calculate the mirror orientation and therefore the direction of the beam, allowing real-time perfect tracking.

H.O.S. is the first commercial closed-loop heliostat field control system.

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ICARUS: Heliogen's AI-powered autonomous robots designed to lower installation & maintenance costs











*Robots will be enhanced & deployed in 2023 starting with maintenance

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